DRAFT

Amendment 18

to the

Northeast Multispecies Fishery Management Plan

Including a

DRAFT Environmental Impact Statement (DEIS)

PENDING NMFS APPROVAL

June 30, 2015

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

Preliminary Submission of DEIS: April 21, 2015
Formal Submission of DEIS: June 30, 2015

Intentionally Blank

AMENDMENT 18 TO THE NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

Proposed Action: Adoption and implementation of management measures to adjust the fishery management program for the federally-managed Northeast Multispecies fishery through Amendment 18 to the Northeast Multispecies FMP.

Type of Statement: Draft Environmental Impact Statement (DEIS)

Responsible Agencies:
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

National Marine Fisheries Service, Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

For Further Information:
Mr. Thomas A. Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, Massachusetts 01950
Phone: (978) 465-0492
Fax: (978) 465-3116

Abstract: The New England Fishery Management Council and the NOAA Assistant Administrator for Fisheries propose to adopt, approve, and implement Amendment 18 to the Northeast Multispecies Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The Draft EIS presents the details of a management program designed to ensure compliance with the MSFMCA and a range of alternatives under consideration to address the specific goals and objectives identified by the Council for Amendment 18. The range of alternatives under consideration relate primarily to establishing an accumulation limit for the fishery, and other measures to promote fleet diversity and utilization of Annual Catch Entitlement. This document presents the range of alternatives with the proposed alternatives identified, a detailed description of the affected environment and valued ecosystem components, and analyses of the impacts of the measures under consideration on the affected environment. It also includes all information and analyses required under the National Environmental Policy Act (NEPA), the MSA, the Regulatory Flexibility Act (RFA), and other applicable laws.

Intentionally Blank

1.0 EXECUTIVE SUMMARY

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. The FMP has been updated through a series of amendments and framework adjustments since its inception in 1986.

Amendment 16 to the NE Multispecies FMP became effective on May 1, 2010 and greatly expanded the catch share (i.e., sector) program and implemented Annual Catch Limits (ACLs) and Accountability Measures (AMs) in compliance with 2006 revisions to the MSFCMA. The amendment also included a host of mortality reduction measures for "common pool" (i.e., non-sector) vessels and the recreational component of the fishery.

As Amendment 16 was being implemented, there were concerns raised by the public, the NEFMC, and the National Marine Fisheries Service (NMFS) that the transition to a fishery-wide catch share management system would lead to excessive consolidation of the fishery and reduced fleet diversity. Through recent specification processes (e.g., Framework Adjustments 44, 50, 53), catch limits for many multispecies stocks were set at very low levels, and these restrictions are anticipated to remain for the near future. There has been concern that the low catch limits, in conjunction with expanded sector management, would lead to excessive consolidation and lack of diversity in the groundfish fleet. Likewise, there has been concern regarding consolidation and diversity in the groundfish fleet as stocks rebuild and ABCs increase.

Because of concerns related to maintaining the diverse makeup of the fleet, as well as an interest in keeping active and thriving fishing ports throughout New England, the Council has considered a range of measures that would impose limits on the amount of fishery permits and/or Potential Sector Contribution (PSC) that individuals or groups of individuals may hold, as well as other measures that may promote fleet diversity or enhance sector management.

This Draft Environmental Impact Statement (DEIS) encapsulates the work of the Council on this action. The administrative components of this DEIS are the Alternatives Under Consideration (Section 1.0), the Alternatives Considered but Rejected (Section 5.0), the Affected Environment (Section 6.0), and the Environmental Impacts of the Management Alternatives (Section 7.0). In April 2015, the NEFMC selected preferred alternatives and approved the DEIS for submission to NMFS.

Proposed Action.

The Council recommends the following as preferred alternatives in Amendment 18:

- *Accumulation Limits.* Create an accumulation limit for individuals and entities on the Potential Sector Contribution that may be held in aggregate across all stocks to an average of no more than 15.5. Create a limit on the Northeast multispecies permits that may be held to no more than 5%. A permit holder could purchase, retain and renew permits with PSC in excess of the limit. The excess holdings could not be contributed to a sector or the common pool. PSC holdings in excess of a cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45;

- *Handgear A (HA) Permits.* Create a sub-ACL that HA permits could enroll in; remove the March 1-20 closure for common pool HA vessels; remove the standard fish tote requirement for HA vessels; allow sectors to annually request that HA vessels fishing in the sector be exempt from use of VMS (would use IVR);
- *Data Confidentiality.* Do not adjust what fishery data are considered confidential, specifically the price of ACE transferred within a sector or leased between sectors;
- *Inshore/Offshore GOM.* Do not establish an inshore/offshore boundary within the Gulf of Maine with associated measures; and
- *Redfish Exemption Area.* Establish an area in which vessels could fish with a smaller mesh net than the standard mesh size, targeting redfish.

Environmental Consequences of Proposed Action.

Table 1 to Table 5 summarize the potential impacts of the management measures under consideration in Amendment 18 on each of the VECs identified in this amendment and described in the Affected Environment. These evaluation criteria are defined in Table 87.

Impacts on Target Species. Management measures, in particular modifications implemented through Amendment 16, are expected to yield rebuilt and sustainable groundfish stocks in the future. The *Proposed Action* in Amendment 18 is expected to continue this trend, as no significant adverse impacts on regulated groundfish (target) species are anticipated. The modifications to management measures may have minor impacts (low positive to low negative) on regulated groundfish species, but are not expected to allow catch to exceed the ACLs (i.e., affect total fishing effort). The accumulation limit measures are administrative in nature, and are expected to not have any impacts on regulated groundfish species, because they would not change total fishing effort or fishing behavior. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels would have minimal impact on target species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing a Redfish Exemption Area within the FMP is expected to have minor impacts on target species, since catch is constrained by ACLs, though the direction of impact (positive or negative) is uncertain. The option to require 100% monitoring on trips using the exemption may produce biases in the catch data.

Impacts on Nontarget Species. Management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort, and decrease bycatch and discards. The *Proposed Action* in Amendment 18 is expected to continue this trend, as no significant adverse impacts on target species are anticipated. The modifications in management measures may have minor impacts (low positive to low negative) on nontarget species, but are not expected to allow catch to exceed the ACLs. The accumulation limit measures are administrative in nature, and are expected to not have any impacts on nontarget species, because they would not change total fishing effort or fishing behavior. Creating a Handgear A (HA) permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels would have minimal impact on nontarget species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing a Redfish Exemption Area within the FMP is expected to have minor impacts on nontarget species, since catch is constrained by ACLs, though the direction of impact (positive or negative) is uncertain. The option to require 100% monitoring on trips using the exemption may produce biases in the catch data.

Impacts on Physical Environment and Essential Fish Habitat. The *Proposed Action* in Amendment 18 would not have substantial impacts on EFH. The modifications in management measures may have minor impacts (low positive to low negative) on habitat, but changes in total fishing effort are not expected. The accumulation limit measures are expected to have neutral impacts on EFH, as geographic effort shifts are not expected. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to have no impact on EFH, because hook gear has no impact on EFH. Establishing a Redfish Exemption Area is expected to have positive impacts on habitat, as offshore effort would be encouraged, away from sensitive juvenile habitat.

Impacts on Protected Resources. The *Proposed Action* in Amendment 18 is expected to not have substantial impacts on protected resources. The accumulation limit measures are administrative in nature, and are expected to not have any impacts on protected resources, because they are expected to not change total fishing effort or fishing behavior. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to have no impact on protected resources, because hook gear has minimal interaction with protected resources. Establishing a Redfish Exemption Area is expected to have no impact on protected resources, because trawl gear has minimal interaction with protected resources in this area.

Impacts on Human Communities. The *Proposed Action* in Amendment 18 is expected to impact human communities (positive to negative). Neither the proposed PSC nor permit cap would constrain the current holdings of any individual or entity, thus resulting in no short-term negative economic impact. As no individual is currently approaching either constraint, it is unlikely that the scale efficiency of the groundfish fleet will be compromised, though no definitive statement on this can be made at this time. The proposed combination of an aggregate PSC cap of 15.5 and a 5% permit cap should be sufficient to prevent market power from being exerted. However, these caps are expected to allow consolidation of holdings to substantially increase from the present level. Thus, negative impacts to the size or continuing existence of fishing communities and participation in the fishery may occur. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to have a positive impact on HA permit holders, as it would allow more flexibility, though other stakeholders may consider these measures to be unfair. Establishing a Redfish Exemption Area is expected to have a positive impact on human communities, as it would encourage quota utilization of an under-harvested resource, and associated fishery investments.

Alternatives to the Proposed Action.

There are a number of alternatives analyzed in the document that are not identified as preferred alternatives, which are briefly described below:

- *Accumulation Limits.* Under No Action, there would continue to be no accumulation limit for individuals and entities on the PSC or permits. The other PSC limit alternatives would create a stock-specific PSC cap using various approaches;
- *Handgear A Permits.* Under No Action, there would continue to be two choices for HA permit holders to enroll their permits in, sectors and the common pool; the March 1-20 closure for common pool HA vessels would remain; the standard fish tote requirement for HA vessels would remain; and sectors would continue to not be allowed to annually request that HA vessels fishing in the sector be exempt from use of VMS;
- *Data Confidentiality.* The price of ACE transferred within a sector or leased between sectors would be non-confidential;
- *Inshore/Offshore GOM.* An inshore/offshore boundary within the Gulf of Maine would be established; inshore and offshore GOM cod sub-ACLs would be established; the GOM/GB Inshore Restricted Roller Gear Area boundary would be revised to conform to the inshore/offshore boundary; and declaration time periods would be created for fishing in the inshore and offshore areas.
- *Redfish Exemption Area.* There would be no area established in the FMP in which vessels could fish with a smaller mesh net than the standard mesh size, targeting redfish. Rather, annual sector exemption requests could continue to be made for this exemption

Impacts of Alternatives to the Proposed Action.

Impacts on Target Species. The non-preferred alternatives may have minor impacts (low positive to low negative) on regulated groundfish (target) species, but are not expected to allow catch to exceed the ACLs. The accumulation limit and data confidentiality measures are administrative in nature, and are expected to not have any impacts on target species, because they would not change total fishing effort or fishing behavior. Continuing the status quo regarding HA permits, would have minimal impact on target species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing an inshore/offshore boundary in the GOM and associated measures would have minor impacts on target species, as total effort on GOM cod would not change, but there may be detrimental impacts depending on how the sub-ACL specification matches actual cod distribution. Thus, the direction of impact (positive or negative) is uncertain. Not establishing a Redfish Exemption Area within the FMP could have either positive or negative impacts depending on the particulars of the sector exemption in any fishing year.

Impacts on Nontarget Species. The non-preferred alternatives may have minor impacts (low positive to low negative) on nontarget species, but are not expected to allow catch to exceed the ACLs. The accumulation limit and data confidentiality measures are administrative in nature, and are expected to not have any impacts on nontarget species, because they would not change total fishing effort or fishing behavior. Continuing the status quo regarding HA permits would have minimal impact on nontarget species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing an inshore/offshore boundary in the GOM and associated measures would have minor impacts on nontarget species, as total effort on GOM cod would not change, but there may be detrimental impacts depending on how the sub-ACL specification matches actual cod distribution. Thus, the direction of impact (positive or negative) is uncertain. Not establishing a Redfish Exemption Area within the FMP could have either positive or negative impacts depending on the particulars of the sector exemption in any fishing year.

Impacts on Physical Environment and Essential Fish Habitat. The non-preferred alternatives are not expected to have substantial impacts on EFH. The modifications in management measures may have minor impacts (low positive to low negative) on habitat, but changes in total fishing effort are not expected. The accumulation limit measures are expected to have minimal but uncertain impacts on EFH if effort shifts geographically within the region. Continuing the status quo regarding HA permits is expected to have no impact on EFH, because hook gear has no impact on EFH. Allowing the price of ACE lease data to be non-confidential is expected to have neutral impacts on EFH. Establishing an inshore/offshore boundary in the GOM and associated measures would have minor impacts on EFH, as total effort on GOM cod would not change, but there may be detrimental impacts depending on how the sub-ACL specification matches actual cod distribution. Thus, the direction of impact (positive or negative) is uncertain. Not establishing a Redfish Exemption Area within the FMP is expected to have neutral impacts on habitat if this Area continues to be approved through sector operation plans, but negative relative to disallowing the area annually, as offshore effort would not be encouraged.

Impacts on Protected Resources. The non-preferred alternatives are not expected to have substantial impacts on protected resources. The accumulation limit and data confidentiality measures are administrative in nature, and are expected to not have any impacts on protected resources, because they are expected to not change total fishing effort or fishing behavior. Continuing the status quo regarding HA permits is expected to have no impact on protected resources, because hook gear has minimal interaction with protected resources. Establishing an inshore/offshore boundary in the GOM and associated measures would have minor impacts on protected resources, as total effort on GOM cod would not change, but there may be detrimental impacts how effort may shift within the GOM. Thus, the direction of impact (positive or negative) is uncertain. Not establishing a Redfish Exemption Area within the FMP is expected to have no impact on protected resources, because trawl gear has minimal interaction with protected resources in this area.

Impacts on Human Communities. The non-preferred alternatives are expected to have substantial impacts on human communities (positive to negative). For the accumulation limit measures, some would constrain the current holdings of a few individuals or entities, likely resulting in short-term negative impacts or constraints on scale efficiency, though in the long-term preventing market power in the fishery. No Action would not prevent consolidation in holdings and market power. This could result in negative economic and social impacts to the fishery and to the continued participation of communities. However, all of the action alternatives are expected to allow a substantial amount of consolidation of holdings to occur from present level. Thus, negative impacts to the size or continuing existence of fishing communities and participation in the fishery are expected to not be prevented. Options are considered for any current or future holdings that exceed the limit, but their impacts would be negative for the individuals constrained relative to the proposed option. Continuing the status quo regarding HA permits is expected to have low negative impacts on human communities, as less flexibility would be given to HA permit fishermen. Establishing an inshore/offshore boundary in the GOM and associated measures are expected to have neutral to negative impacts on human communities, as less flexibility would be afforded the fleet. Particularly for smaller vessels with a limited fishing range, the measures would reduce their fishable GOM cod PSC. Not establishing a Redfish Exemption Area in the FMP would have neutral to positive impacts, as sector could still request this exemption annually (Status Quo), though not having this exemption (No Action) would have negative impacts as utilization of quota for an under-harvested resources would not be encouraged.

Table 1 - Potential impact of the accumulation limit alternatives (Section 4.1)

Alternatives/Options (* = Council preferred)		VEC: Target Species	VEC: Nontarget Species	VEC: Physical and EFH	VEC: Protected Resources	VEC: Human Communities
Section 4.1.2. Limit PSC holdings	Alternative 1 (No Action)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	Short-term **neutral**. Potentially **negative** long-term if market power is not prevented.
Section 4.1.2.2. Disposition of current holdings in excess of what is allowed	***Option A (hold permits but not use excess PSC)**	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown. **Neutral** re Option C.	**Neutral.** Total fishing effort unchanged.	**Uncertain** but minor. **Positive** re Option B, **low positive** re Option C for permit holder. **Low negative** re Option B, **neutral** re Option C for fishery. Both permit holder and fishery benefit.
	Option B (divest permits with excess PSC)	Short-term **low positive** while PSC is unused. Long-term **neutral**.	Short-term **low positive** while PSC is unused. Long-term **neutral**.	**Uncertain** but minor. Effort redistribution unknown.	**Neutral.** Total fishing effort unchanged.	**Uncertain** but minor. **Negative** re Options A and C for permit holder & **low positive** for fishery. Permit holder relinquishes entire permit, though fishery benefits.
	Option C (hold permits but divest excess PSC)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown. **Neutral** re Option A.	**Neutral.** Total fishing effort unchanged.	**Uncertain** but minor. **Low negative** re Option A, **positive** re Option B for permit holder. **Neutral** re Option A & **low negative** re Option C for fishery._Permit holder loses value of excess PSC when sold, though fishery benefits.

Section 4.1.2.2. Acquisition of future holdings	***Option A (hold permits but not use excess PSC)**	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown. **Neutral** re Option B.	**Neutral.** Total fishing effort unchanged.	**Low positive** for permit holder, **neutral** for fishery re Option B. Both permit holder and fishery benefit.
	Option B (hold permits but divest excess PSC)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown. **Neutral** re Option A.	**Neutral.** Total fishing effort unchanged.	**Low negative** for permit holder, **neutral** for fishery re Option A. Permit holder loses value of excess PSC when sold, though fishery benefits.
Section 4.1.2. cont. Limit PSC holdings	Alternative 2 (to control date maximum)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown.	**Neutral.** Total fishing effort unchanged.	Short-term **low negative** to **negative** to those constrained, **low positive** to fishery re Alt. 1. Long-term **low negative**, but potentially **high positive**. Would allow consolidation, but prevent market power.
	Alternative 3 (to 15.5 for each stock)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown.	**Neutral.** Total fishing effort unchanged.	Short-term **low negative** to those constrained, **low positive** to fishery re Alt. 1. Long-term **low negative,** but potentially **high positive**. Would allow consolidation, but prevent market power.

4.1.2. cont.	Alternative 3, Option A (divest excess PSC)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown.	**Neutral.** Total fishing effort unchanged.	Short-term **uncertain.** Long-term low **negative** to fishery. Could acquire additional permits, but excess would be redistributed.
	Alternative 4, Option A (by stock type, limit for all stocks)	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Neutral** to **uncertain** but minor. Total fishing effort unchanged. Effort redistribution unknown.	**Uncertain** but minor. Effort redistribution unknown.	**Neutral.** Total fishing effort unchanged.	Short-term **neutral** to **low neg.** re Alt. 1. Long-term **low neg.,** but potentially **high pos**. **Pos.** for fishery re Opt. B. Allows consolidation; prevents market power.
	Alternative 4, Option B (by stock type, limit for 3 stocks)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	Short-term **neutral** re Alt. 1. Long-term **low negative** to fishery, but may be **positive**. **Negative** for the fishery re Option A. Would allow consolidation, but prevent market power for only 3 stocks.
	Alternative 5 (to 30 for GB winterflounder, 20 for other stocks)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	Short-term **neutral** to **low negative** re Alt. 1. Long-term **low negative,** but potentially **high positive**. **Positive** for the fishery re Option B. Would allow consolidation, but prevent market power.

4.1.2. cont.	***Alternative 6 (limit collective PSC holdings)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	Short-term **neutral.** Long-term **negative** to fishery. Would allow consolidation and not prevent market power.
Section 4.1.3 Limit permit holdings	Alternative 1 (No Action)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	Short-term **neutral**. Long-term potentially **negative**.
	***Alternative 2 (limit permits to 5%)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral** re Alt. 1. Would allow consolidation and not prevent market power. Would allow more consolidation than PSC Alts. 2-5.

Table 2 - Potential impact of the Handgear A permit alternatives (Section 4.2)

Alternatives/Options (* = Council preferred)		VEC: Target Species	VEC: Nontarget Species	VEC: Physical and EFH	VEC: Protected Resources	VEC: Human Communities
Section 4.2.1. Establish HA permit sub-ACL	Alternative 1 (No Action)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic:*</u> **Neutral**. <u>*Social:*</u> **Neutral. Low negative** re Alt. 2.
	***Alternative 2 (establish)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>: **Neutral** to **low positive**. <u>*Social*</u>: **Low positive.** Increases choices for HA permit holders. Removes PSC for others and may seem to be unfair.

4.2.1. cont.	Alternative 2, <u>*Discards*</u> ***Option A (estimate annual rate and subtract)**	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Neutral.** <u>*Social*</u>: **Negative** for HA fishery re Option B; **positive** for others as it may seem more fair.
	Alternative 2, <u>*Discards*</u> Option B (assume de minimus discards)	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Neutral.** <u>*Social*</u>: **Positive** for HA fishery re Option A; **negative** for others as it may seem less fair.
	Alternative 2, <u>*In-season AMs*</u> Option A (close fishery when 100% is caught)	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Positive** re Alt. 1 and Option B. <u>*Social*</u>: **Positive** for HA fishery re Option B. Re Alt. 1, **neutral** for HA sector members & **uncertain** for common pool.
	Alternative 2, <u>*In-season AMs*</u> ***Option B (close fishery when 90% is caught)**	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Negative** re Alt. 1 & Option B. <u>*Social*</u>*:* **Negative** for HA fishery re Option A, but may better prevent overages. Re Alt. 1, **low negative** for HA sector members & **uncertain** for common pool.
	Alternative 2, <u>*Reactive AMs*</u> ***Option A (trigger if HA sub-ACL is exceeded)**	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Negative** re Option B; **low positive** re Alt. 1. <u>*Social*</u>*:* **Low negative** re Option B for HA fishery; **positive** for others as it may seem more fair.

4.2.1. cont.	Alternative 2, <u>Reactive AMs</u> Option B (trigger if HA sub-ACL & total ACL are exceeded)	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Size of HA sub-ACL is very small.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Positive** re Alt. 1 & Option A. <u>*Social*</u>*:* **Low positive** re Option A for HA fishery; **negative** for others as it may seem less fair.
Section 4.2.2. Remove March 1-20 HA closure	Alternative 1 (No Action)	**Neutral**. **Low positive** re Alt. 2. Spawning protections remain.	**Neutral**. **Low positive** re Alt. 2. Spawning protections remain.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	**Neutral**. **Low negative** re Alt. 2. Common pool HA vessels continue to be unable to fish March 1-20.
	***Alternative 2 (remove)**	**Low negative.** Some target species spawn in March.	**Low negative.** Some nontarget species spawn in March.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>: **Low positive.** <u>*Social*</u>*:* **Neutral** for current sector vessels, **positive** for common pool.
Section 4.2.3. Remove standard tote requirement	Alternative 1 (No Action)	**Neutral.** Tote not used for enforcement.	**Neutral.** Tote not used for enforcement.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	**Neutral**. **Low negative** re Alt. 2. Would continue a regulation considered unnecessary.
	***Alternative 2 (remove)**	**Neutral.** Fish tote requirement is not enforced.	**Neutral.** Fish tote requirement is not enforced.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	<u>*Economic*</u>*:* **Neutral.** <u>*Social*</u>*:* **Positive.** Improve deck operations.
Section 4.2.4. Exempt HA permits in sectors from VMS use	Alternative 1 (No Action)	**Neutral**. **Low positive** re Alt. 2. Catch attribution better w/ VMS.	**Neutral**. **Low positive** re Alt. 2. Catch attribution better w/ VMS.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	**Neutral**. **Low negative** re Alternative 2. Sectors may be cost-prohibitive for HA vessels.

4.2.4. cont.	***Alternative 2 (exempt)**	**Low negative.** IVR may be used for catch attribution.	**Low negative.** IVR may be used for catch attribution.	**Neutral.** Hook gear does not generate adverse impacts to EFH.	**Neutral.** No significant risk from hook gear in the area. Protected species interactions with hook gear are rare.	*Economic*: **Neutral** to **low positive**. *Social*: **Positive.** Incentivize participation in sectors.

Table 3 - Potential impact of the data confidentiality alternatives (Section 4.3)

Alternatives (* = Council preferred)		**VEC: Target Species**	**VEC: Nontarget Species**	**VEC: Physical and EFH**	**VEC: Protected Resources**	**VEC: Human Communities**
Section 4.3. Data confidentiality	***Alternative 1 (No Action)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral**. Trading unaffected. **Uncertain** but minor to **low negative** re Alt. 2.
	Alternative 2 (value of ACE movement would be non-confidential)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	*Economic*: **Uncertain,** potentially **low-positive.** *Social*: **Low positive.** May help fishery-wide participation in ACE markets & ACE use; may be seen as an overreach of management.

Table 4 - Potential impact of the inshore/offshore Gulf of Maine alternatives (Section 4.4)

Alternatives (* = Council preferred)		**VEC: Target Species**	**VEC: Nontarget Species**	**VEC: Physical and EFH**	**VEC: Protected Resources**	**VEC: Human Communities**
Section 4.4.1 Inshore/ Offshore Boundary	***Alternative 1 (No Action)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.

4.4.1. cont.	Alternative 2, Option A (@ 70°W)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	*Economic*: Short-term **neutral;** long-term **uncertain**. *Social*: **Neutral** re Alt. 1, but may be **low negative**.
	Alternative 2, Option B (@ 70°15'W)	**Neutral.** No change to total fishing effort or behavior.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.
	Alternative 2, Option C (@ 69°50'W & ME coast)	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Status quo effort. Inshore area covers more EFH than Option A or B.	**Neutral.** Total fishing effort and behavior unchanged.	*Economic*: Short-term **neutral;** long-term **uncertain**. *Social*: **Neutral** re Alt. 1, but may be **low negative**.
Section 4.4.2. Inshore/ Offshore GOM cod sub-ACLs	***Alternative 1 (No Action)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** No change to total fishing effort or behavior.
	Alternative 2, Option A (split set during specs)	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Allocation method to be determined.	**Neutral.** Status quo effort.	**Negative.** Increase reliance on leasing. **Low negative** re Options B & C.
	Alternative 2, Option B, sub-Option A (split based on last 10 years of catch)	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative. Perhaps more positive than sub-Option B.	**Neutral.** Status quo effort.	**Negative.** Increase reliance on leasing. **Low positive** re Option A & C & sub-Option B.
	Alternative 2, Option B, sub-Option B (split based on last 20 years of catch)	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative. Perhaps less positive than sub-Option A.	**Neutral.** Status quo effort.	**Negative.** Increase reliance on leasing. **Low positive** re Option A & C; **negative** re sub-Option A.

4.4.2. cont.	Alternative 2, Option C, sub-Option A (split based on last 10 years of cod distribution)	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative. Perhaps more positive than sub-Option B.	**Neutral.** Status quo effort.	**Negative.** Increase reliance on leasing. **Low positive** re Option A; **low negative** re Option B; **positive** re sub-Option B.
	Alternative 2, Option C, sub-Option B (split based on last 20 years of cod distribution)	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative. Perhaps less positive than sub-Option A.	**Neutral.** Status quo effort.	**Negative.** Increase reliance on leasing. **Low positive** re Option A; **low negative** re B; **low negative** re sub-Option A.
Section 4.4.3 GOM/GB Inshore Restricted Roller Gear Area	***Alternative 1 (No Action)**	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** Total fishing effort and behavior unchanged.	**Neutral.** No impact of roller gear size on protected resources.	**Neutral**. Increase reliance on leasing. Total fishing effort and behavior unchanged.
	Alternative 2 (revise to match inshore/offshore boundary)	**Varies. Negative** re Options A and B. Reduced area. **Positive** re C. Increased area.	**Varies. Negative** re Options A and B. Reduced area. **Positive** re C. Increased area.	**Varies. Negative** re Options A and B. Reduced area. **Positive** re C. Increased area.	**Neutral.** Status quo effort. No impact of roller gear size on protected resources.	*Economic*: Long-term **uncertain.** A – **Low positive**. B – **Low positive**. C – **Low negative.** *Social*: **Mixed. Unclear** if fishery operations would substantially change. A – **Low positive** for large rockhopper vessels, **low negative** for the fishery. B – **Positive** for large rockhopper vessels, **negative** for the fishery. C - **Negative** for large rockhopper vessels, **positive** for the fishery.

Section 4.4.4 Declaration Time Periods	***Alternative 1 (No Action)**	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Status quo effort.	Short-term **neutral.** Long-term **low positive.**	**Neutral.** Vessels would not have a time restriction. **Positive** re. Alt 2 - 4.
	Alternative 2 (annual declaration)	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Status quo effort.	Short-term **neutral.** Long-term **low negative.**	**Negative** re Alt. 1, 3 & 4. The most restrictive alternative, impacting larger vessels the most.
	Alternative 3 (seasonal declaration)	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Status quo effort.	Short-term n**eutral.** Long-term **low negative.**	**Negative** re Alt. 1 & Alt 4; **positive** re Alt. 2. Forgo opportunity to fish in other area on a trimester basis.
	Alternative 4 (trip declaration)	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Annual sub-ACLs limit removals.	**Neutral.** Status quo effort.	Short-term **neutral.** Long-term **low negative.**	**Low negative** re Alt. 1; **positive** re Alts. 2 & 3. Fishing location on a trip constrained.

Table 5 - Potential impact of the Redfish Exemption Area alternatives (Section 4.5)

Alternatives (* = Council preferred)		VEC: Target Species	VEC: Nontarget Species	VEC: Physical and EFH	VEC: Protected Resources	VEC: Human Communities
Section 4.5. Redfish Exemption Area	Alternative 1 (No Action)	**Uncertain** to **Low negative.** Greater retention of sub-legal fish.	**Uncertain** to **Low negative.** Greater retention of sub-legal fish.	**Varies.** Magnitude and direction of impacts more uncertain re Alt 2.	**Neutral.** Trawl gear interaction in Area currently low.	**Neutral** re Alt 2. Sectors could still benefit from annual exemptions.
	***Alternative 2,** *Monitoring* Option A (status quo observer coverage)	**Uncertain** but minor. Option A **neutral** re Alt. 1; **positive** re Option B.	**Uncertain** but minor. Option A **neutral** re Alt. 1; **positive** re Option B.	**Positive** re Alt. 1; **neutral** re status quo sector exemption; **negative** re Option B.	**Neutral.** Trawl gear interaction in Area currently low.	**Positive** to **neutral** re Alt 1. Option A **neutral** re Alt. 1; **low positive** re Option B.
	Alternative 2, *Monitoring* Option B (100% observed)	**Uncertain** but minor. Option A **negative** re Alt. 1 and Option B.	**Uncertain** but minor. Option A **negative** re Alt. 1 and Option B.	**Positive** re Alt. 1; **neutral** re status quo sector exemption; **positive** re Option A.	**Neutral.** Trawl gear interaction in Area currently low.	**Positive** to **neutral** re Alt 1. Option B **low negative** re Alt. 1 and Option A.

2.0 CONTENTS

2.1 TABLE OF CONTENTS

2.2 TABLES

2.3 FIGURES

2.4 APPENDICES

2.5 ACRONYMNS

ABC	Acceptable Biological Catch
ACE	Annual Catch Entitlement
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ASPD	Analysis and Program Support Division
ASSRT	Atlantic Sturgeon Status Review Team
BOF	Bay of Fundy
CA	Closed Area
CAM	Closed Area Model
CEA	Cumulative Effects Assessment
CPH	Confirmation of Permit History
CPUE	Catch Per Unit Effort
DAM	Dynamic Area Management
DAS	Days-At-Sea
DPS	Distinct Population Segment
EGB	Eastern Georges Bank
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FMP	Fishery Management Plan
FY	Fishing Year
GAP	Groundfish Advisory Panel
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GOM	Gulf of Maine
HA	Handgear A
HHI	Herfindahl-Hirschman Index
HPTRP	Harbor Porpoise Take Reduction Plan

LAPP	Limited Access Privilege Program
MMPA	Marine Mammal Protection Act
MRI	Moratorium Right Identifier
MSA	Magnuson-Stevens Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fishery Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
OY	Optimum Yield
PBR	Potential Biological Removal
PPRFFA	Past, Present, and Reasonably Foreseeable Future Actions
PSC	Potential Sector Contribution
RA	Regional Administrator
RIR	Regulatory Impact Review
RPA	Reasonable and Prudent Alternative
SAM	Seasonal Area Management
SAP	Special Access Program
SFA	Sustainable Fisheries Act
SNE/MA	Southern New England/Mid-Atlantic Bight
SRA	Statistical Reporting Area
SSC	Scientific and Statistical Committee
SST	Sea Surface Temperature
TAC	Total Allowable Catch
TMGC	Transboundary Management Guidance Committee
USCG	United States Coast Guard
VTR	Vessel Trip Report

3.0 INTRODUCTION

3.1 EXISTING MANAGEMENT SYSTEM

More detail and background information can be found at http://www.nefmc.org.

3.1.1 History of the Northeast Multispecies FMP

Today, 13 species are managed under the Northeast Multispecies Fishery Management Plan (FMP) as large mesh species, based on fish size and type of gear used to harvest the fish: American plaice, Atlantic cod, Atlantic halibut, Atlantic wolffish, haddock, pollock, redfish, ocean pout, yellowtail flounder, white hake, windowpane flounder, winter flounder, and witch flounder. Three species — offshore hake, red hake, and silver hake (whiting) — are managed under a separate small mesh multispecies program (per Amendment 12). Several large mesh species are managed as two or more stocks based on geographic region.

Groundfish stocks have been managed under the Magnuson-Stevens Act (MSA) beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan first relied on hard quotas (total allowable catches, or TACs) and proved unworkable. The quota system ended in 1982 with the adoption of the Interim Groundfish Plan, which controlled fishing mortality with minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank. The Council replaced this plan the Northeast Multispecies FMP in 1986, which initially continued to attempt to control fishing mortality with gear restrictions and minimum mesh size, and established biological targets based on a percentage of maximum spawning potential.

Amendment 5, implemented in 1994, was a major revision to the FMP that established a moratorium on groundfish permits, reduced days-at-sea (DAS) for major fleet components, and adopted large area closures to help reduce mortality (NEFMC 1993).

The Sustainable Fisheries Act (SFA), amended the MSA in 1996 and placed new demands on FMPs to reduce bycatch, identify and protect Essential Fish Habitat (EFH), and minimize adverse effects of fishing on EFH to the extent practicable. It also created National Standards that emphasized minimizing impacts to fishing communities, improving safety at sea, significantly reducing bycatch, and improving the collection and use of fishery and biological data (SFA 1996).

Amendment 7, implemented in 1999, accelerated the DAS reduction schedule extended large area closures throughout the year, eliminated some exemptions from the effort control program and as well implementing other conservation measures. Of all changes to the FMP prior to 2000, Amendments 5 and 7 had the greatest impact on the fishery, both for stock rebuilding and shaping the socioeconomic conditions of the industry and fishing communities.

Amendment 9, implemented in 1999, brought the FMP into compliance with SFA requirements by establishing new status determination criteria (overfishing definitions) and setting the optimum yield (OY) for twelve groundfish species.

From 1999 until 2003, the Council made many adjustments and other changes to the DAS management system to try to achieve target catch levels and meet SFA requirements for defining Essential Fish Habitat (EFH) and minimizing impacts on EFH to the extent practicable.

Amendment 13 was developed over a four-year period (1999-2003) to meet SFA requirements of ending overfishing on groundfish stocks and to rebuilding all of the groundfish stocks that were overfished. The Amendment addressed overfishing definitions, stock rebuilding, reduced fishing effort and capacity in the fishery, included measures to minimize bycatch, instituted improved reporting and recordkeeping requirements, and implemented EFH protections. The amendment also mandated a periodic review of stock data midway through the implementation period and called for corrective action if necessary.

Several framework adjustments were implemented subsequent to Amendment 13. The NEFMC sought to improve the effectiveness of the Amendment 13 effort control program, including the opportunities to target healthy stocks and to help mitigate the economic and social impacts of Amendment 13. Framework 42 (2006), in part, implemented a Vessel Monitoring System (VMS) requirement for DAS vessels.

3.1.1.1 Amendment 16

Amendment 16, implemented May 1, 2010, provided major changes in the realm of groundfish management. Notably, it greatly expanded the catch share sector program. Sectors are voluntary, self-selected groups of fishermen that are allocated a portion of the available catch. Amendment 16 also implements annual catch limits (ACLs); exceeding these limits triggers additional management actions called accountability measures (AMs) in compliance with the MSFCMA. The amendment also included a host of mortality reduction measures for “common pool” (i.e., nonsector) vessels and the recreational component of the fishery. The amendment established that, starting in FY 2012, the common pool would be managed with a trimester sub-ACL versus an annual one for all stocks except SNE/MA winter flounder, windowpane flounder, ocean pout, Atlantic wolffish, and Atlantic halibut.

3.1.1.2 Actions Subsequent to Amendment 16

Several frameworks have been implemented subsequent to the creation of the catch share program to set specifications and modify the sector and common pool programs. Amendment 17, which authorizes the function of NOAA-sponsored state-operated permit banks, was implemented in 2012. Framework 48, in part, exempted common pool handgear vessels from the trimester sub-ACL system for white hake. Framework 53, in part, allowed rollover of groundfish specifications and modified sector ACE carryover provisions.

3.1.2 EFH Omnibus Amendment

The NEFMC is currently developing an Omnibus Essential Fish Habitat (EFH) Amendment for all of its FMPs. The amendment is being completed in two phases. Phase I, completed in 2007, reviewed and updated EFH designations and considered identification of HAPCs (NEFMC 1998a). Phase II is reviewing and update the gear effects evaluation and consider alternatives for optimizing management measures for minimizing the adverse effects of fishing on EFH across all FMPs. Implementation is expected in 2015 or 2016.

3.2 PURPOSE AND NEED FOR ACTION

This amendment addresses concerns regarding fleet diversity and fishery consolidation within the Northeast Multispecies FMP. Low catch limits specified by the NE Multispecies FMP, in conjunction with expanded sector management, may lead to excessive consolidation and lack of diversity in the groundfish fleet as some permit holders buy permits from others to have sufficient PSC. Conversely, as stocks rebuild and ABCs increase, there may be increased future consolidation and decreased diversity in the groundfish fleet, if vessels earn above market rates of return, as has happened in the Northeast scallop fishery. The purpose of this action is to implement measures that affect the level of allocation that individuals or groups of individuals may control, gear restrictions, inshore offshore sub-ACL measures, and other measures aimed at maintaining the diversity of the fleet. The action is needed to promote resilience and stability of fishing businesses by encouraging diversification and quota utilization; to prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges, and to encourage active and thriving fishing ports throughout New England.

3.3 GOALS AND OBJECTIVES

3.3.1 Goals and Objectives of the Northeast Multispecies FMP

The goals and objectives of the Northeast Multispecies FMP remain as described in Amendment 13 and will continue to frame the long-term management of the resource and fishery.

3.3.1.1 Goals

1. Consistent with the National Standards and other required provisions of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law, manage the northeast multispecies complex at sustainable levels.
2. Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.
3. Maintain a directed commercial and recreational fishery for northeast multispecies.
4. Minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.
5. Provide reasonable and regulated access to the groundfish species covered in this plan to all members of the public of the United States for seafood consumption and recreational purposes during the stock rebuilding period without compromising the Amendment 13 objectives or timetable. If necessary, management measures could be modified in the future to insure that the overall plan objectives are met.
6. To promote stewardship within the fishery.

3.3.1.2 Objectives

1. Achieve, on a continuing basis, optimum yield for the U.S. fishing industry.
2. Clarify the status determination criteria (biological reference points and control rules) for groundfish stocks so they are consistent with the National Standard guidelines and applicable law.
3. Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the Sustainable Fisheries Act.
4. Implement rebuilding schedules for overfished stocks, and prevent overfishing.
5. Adopt measures as appropriate to support international transboundary management of resources.

6. Promote research and improve the collection of information to better understand groundfish population dynamics, biology and ecology, and to improve assessment procedures in cooperation with the industry.
7. To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.
8. Develop biological, economic and social measures of success for the groundfish fishery and resource that insure accountability in achieving fishery management objectives.
9. Adopt measures consistent with the habitat provisions of the MSA, including identification of EFH and minimizing impacts on habitat to the extent practicable.
10. Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

3.3.2 Goals of Amendment 18 to the Northeast Multispecies FMP

The NEFMC has identified four goals for this action. This document includes discussion of related measures and how they are proposed to impact the fishery.

1. Promote a diverse groundfish fishery, including different gear types, vessel sizes, ownership patterns, geographic locations, and levels of participation through sectors and permit banks;
2. Enhance sector management to effectively engage industry to achieve management goals and improve data quality;
3. Promote resilience and stability of fishing businesses by encouraging diversification, quota utilization and capital investment; and
4. Prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges.

3.4 PUBLIC SCOPING

3.4.1 Control Date, Notice of Intent and Scoping Process

At the request of the Council, NMFS published a control date of April 7, 2011 (NOAA 2012). The control date is intended to alert the fishing industry and the public that any present or future accumulation of fishing privileges may be limited or may not be allowed after or prior to the published control date. It also is intended to discourage speculative behavior in the market for fishing privileges while the Council considers whether and how such limitations on accumulation of fishing privileges should be developed. However, in establishing this date, the Council was not obligated to take any further action. No limits or restrictions have been imposed on the groundfish fishery by establishing this control date. However, fishermen were encouraged to preserve any documents relating to their holdings or control of fishing privileges in the event that the Council does decide to take a future action.

NMFS published a Notice of Intent (NOI) on December 21, 2011 to announce its intent to develop an amendment (later named Amendment 18) and prepare an Environmental Impact Statement (EIS) to analyze the impacts of the proposed management alternatives. The announcement stated that Amendment 18 would “reduce the likelihood that groundfish permit holders will acquire or control excessive shares of fishing privileges in the fishery and that over-consolidation will occur within the fleet" (NOAA 2011). The scoping period extended from that date until March 1, 2012 and included ten scoping hearings.

3.4.2 Scoping Comments

Comments were received from a variety of stakeholders, including university scientists, nonprofit organizations, individual fishermen, fishing corporations, state agencies, and other interested citizens. Oral (n=55) and written (n=56) comments were received from individuals or organizations (duplicates removed). All written comments and summaries of hearings are provided at www.nefmc.org. The majority of the oral and written comments indicated that the intent of Amendment 18 is very important.

3.4.2.1 Comments in Favor

Fleet Diversity. The majority of comments supported the concept of fleet diversity. The need for a firm definition of fleet diversity was expressed, but the comments did not elucidate specifics. Concerned citizens wanted to ensure that their access to seafood caught by locally-based fishermen continues, feeling that fish should not be just an investment for large entities. Comments foreshadowed coastal towns devoid of fishermen and associated infrastructure, job losses, negative impacts on future generations, and fewer options to enjoy fish. One commenter thought that a fleet that consisted of only large vessels would limit the Council's ability to react to changing stock assessments. Commenters wanted opportunity for a variety of vessel, gear, entity types, and ports to be active in the fishery, enable fishing communities to define diversity goals and have a degree of local control, maintain participation of rural and historic ports in the fishery, provide opportunity for new entrants in the fishery, and maintain viability of shoreside infrastructure and the inshore and offshore fleets.

Sub-ACL for HA permit holders. A few commenters would like a sub-ACL for Handgear HA permit holders to help protect a 400 year old fishery.

Inshore/Offshore Areas. The issue of larger, traditionally offshore vessels fishing more inshore since the removal of cod trip limits was very important to several commenters. The concept of fleet diversity was appealing to preserve the inshore fleet that supports a broad range of coastal communities. Biologically, smaller vessels were thought to not have as much of an impact on the aggregations of cod spawning inshore. Extreme frustration was expressed with the commitment and sacrifices that the inshore fleet made to rebuild the inshore cod stock only to have it seemingly wiped out by the influx of offshore boats. Some suggested that there be a boundary line to separate fishing areas for larger and smaller vessels, dividing the GOM cod into east and west areas. Localized depletion of GOM cod is exacerbating fleet consolidation, because the smaller vessels are unable to catch their quota.

Quota Set-Aside. It was suggested that allocation should be "taken off the top" for use by set-asides or permit banks. There were a number of suggested recipients of this quota, primarily new entrants due to the high costs of permits. It was expressed that smaller-scale fishermen have difficulty competing with larger corporations in the permit market, and that there needs to be a mechanism to help smaller-scale fishermen remain competitive. Quota set-asides could be used to establish community permit banks to help small vessels and specific communities. This may ensure the viability of the inshore fleets. Fishermen told of building their own businesses up over the span of a few decades only to lose it with the implementation of catch shares; they are now unable to pass their businesses on to their children, ending family traditions. Another idea was to use quota set-asides to reward sectors that meet certain benchmarks or. It was suggested that set-asides could be implemented as the resource recovers, but not at this time.

Incentives to Actively Fish. A portion of the comments expressed the need to prevent a situation where most all of the Potential Sector Contribution (PSC) is held by persons who do not actively fish, because it may lead to quota consolidation by large corporations that would largely export the fish, maximizing profits versus sustainable harvests. It was suggested that "use it or lose it" measures be adopted to ensure that holders of quota remain active in the fishery.

Baseline Criteria for Leasing and Allocations. Many felt that the formula to calculate PSC allocations is flawed and unfair, because it is based on catch history instead of vessel characteristics and/or the number of DAS that was associated with permits. Some fishermen felt unfairly disadvantaged by the formula, because of the rolling closures and trip limits during the period of time used in formulas. Some baseline leasing restrictions on GOM and GB cod, that would restrict the ability of large vessels to get quota from smaller vessels, were suggested, in addition to restricting the ability to lease into stock areas and certain species. Suggestions included retaining a certain percentage of a permit's allocation in the home state if it is sold, fixing the price of leased ACE, revisiting the GOM cod sub-ACL split between commercial and recreational fisheries, preventing fishing in multiple stock areas of a species in a single trip, having a more equitable distribution of allocation geographically, limiting corporate vessels to specific areas, and to only allow leases from larger to smaller vessel, not vice versa.

Accumulation Limits. Commenters in favor of accumulation caps indicated that caps are necessary as a disincentive for fishing businesses to expand. The status quo is allowing limiting stocks to be controlled by a small number of individuals who are able to buy up the quota. It was stated that 40% of GB winter flounder is controlled by three entities, and that this may happen with GOM cod if catch limits are reduced. A broad range of caps were suggested including individual, sector, permit number, quota control and PSC. Concerns were raised whether the current situation is in violation of National Standard 4. Commenters wanted to match capital with quota availability, while ensuring access to an economically viable number of participants, prevent windfall gains to a small number of individuals at the expense of others, and prevent market control and price-fixing by a small number of owners.

3.4.2.2 Comments Opposed

Those opposing this amendment generally wanted no caps on the number of permits or allocation, no ACE set-aside, no incentives, no owner requirements, no trading for fish only, no price controls, no area sign in, and no division of the fishery. Those opposed were concerned about the potential that an accumulation cap or restrictions to maintain fleet diversity may result in reduced flexibility and profitability of the fishery. Comments centered on the further complication of management and that diversity goals could be achieved at the sector level. It was thought that accumulation limits would violate the consolidation goals of Amendment 16. Amendment 16 did not create a LAPP system, and Amendment 18 was viewed as a way to backfill into a LAPP system. Amendment 18 may trap the fleet in untenable economic positions, but if closed areas were opened and more catch is allowed, it was thought that the problems would solve themselves. It was noted that the existence of this action is causing uneasiness with lenders of capital. One commenter opposing accumulation caps does not want to punish people who have worked hard to accumulate their quota. Several requested that if an accumulation cap is set, that any party holding quota above the cap be grandfathered in.

3.4.2.3 Non-regulatory Approaches

The scoping comments included ideas for non-regulatory approaches that would meet the Amendment 18 goals and objectives. For example, with criteria or guidelines, sectors could be given the latitude to create their own processes for maintaining an active fleet that reflects the diversity (e.g., vessels, owners, ports) of their membership. A marketing campaign could be created to highlight locally caught fish. Community supported fisheries could be fostered to better support local fishermen.

3.4.2.1 Other Comments

A few comments were received that were not directly related to the goals of this action. A couple of commenters thought that existing strategies were inappropriate to preserve the ecosystem. Closed areas should not be opened, and sport fishing should be prohibited in the closed areas. Fishermen expressed some concern about the compounding effect of monitoring costs and the expected further reductions in cod allocations following the benchmark assessment. For monitoring, tiered standards and alternatives to industry funding were suggested. Sector fees were thought to be too high. Fishermen in southern areas were concerned that what happened to cod might happen in other fisheries, such as monkfish. A small number were unhappy with the appearance of unethical voting by certain Council members.

3.4.3 Response to Scoping Comments

Summaries of the scoping hearings and all written scoping comments were provided to all Council members and made publically available. The Council reviewed scoping comments in June 2012. The Groundfish Committee (Committee) discussed issues raised during scoping at several of its meetings between 2012 and 2014. Some of the scoping comment themes were incorporated into the alternatives considered in this action and others were not, as described below.

3.4.3.1 Fleet Diversity

Sub-ACL for HA Permit Holders. In June 2013, the Council moved to consider creating a sub-ACL for HA permits and related measures, which were then developed and included in the Range of Alternatives (Section 4.0).

Inshore/Offshore Areas. In January 2014, the Groundfish Committee discussed the claim raised during scoping that, in the absence of trip limits, large vessels are fishing more in inshore areas, particularly targeting Gulf of Maine cod, resulting in area conflicts with smaller vessels and localized depletion. After much discussion, the Committee tasked the PDT with analyzing the effort by vessel classes in Statistical Area 514 and adjacent areas, as appropriate, between FY 2004 and FY 2012. In April, the Council moved to consider creating measures specific to inshore and offshore GOM, which were then developed and included in the Range of Alternatives (Section 4.4)

Quota Set-Asides. A Groundfish Advisory Panel (GAP) motion in April 2014 did not support developing quota set-aside measures, feeling that the groundfish fishery should not be used as a testing ground for such a concept in the Northeast. The Groundfish Committee then voted to not develop such measures, feeling that there is not sufficient quota for current fishery participants, the fishery cannot afford new entrants at this time, and that this would be more feasible when more stocks are rebuilt. In April 2014, the Council also passed such a motion.

Incentives to Actively Fish. In March 2014, the Groundfish Committee voted against a motion that would have created alternatives for a sunset provision, where lease-only PSC holders would relinquish their PSC after a certain period of time of being inactive in the groundfish fishery. The Committee discussed the potential to make this a topic that could be developed through a future framework, but did not pass motions to this effect. The Committee expressed concerned that a sunset might increase effort at a time when effort should be decreased, particularly on GOM cod. The Committee also felt that leasing protects fleet diversity and prevents consolidation of holdings, and was concerned about the potential impacts of reallocating the fishery.

Baseline Criteria for Leasing and Allocations. A GAP motion in April 2014 did not support baseline criteria for leasing. The Groundfish Committee then voted to not develop such measures, feeling that the benefits of allowing ACE to be traded across fishery gear types and vessel class sizes enhance efficiency and preventing this would limit fleet diversity. In April 2014, the Council also passed such a motion.

3.4.3.2 Accumulation Limits

In July 2013, the Council asked a consultant (Compass Lexecon) to provide an analysis of whether excessive shares exist in the Northeast multispecies fishery today and to recommend an appropriate excessive shares limit in the fishery. Their report was completed in December 2013 (Mitchell & Peterson 2013) and was peer reviewed in June 2014 by three Center for Independent Experts reviewers and one independent reviewer (Thunberg et al. 2014). Several accumulation limit alternatives are included in Section 4.1 that would limit permit or PSC holdings. Accumulation limits specific to permit banks were considered, as well as a regulatory definition for nonprofit permit banks, but the Council moved in April 2014 to not include such measures (Section 5.3.1). The Council felt that permit banks should be assigned the same accumulation limit as other entities. This position was also supported by the Committee and GAP at their April 2014 meetings.

4.0 ALTERNATIVES UNDER CONSIDERATION

This section is the Range of Alternatives for this action, as approved by the Council in November 2014.

4.1 ACCUMULATION LIMITS[1]

4.1.1 Provisions

The following provisions would apply to the accumulation limit alternatives selected in Section 4.1. In addition, none of the alternatives would limit ACE leasing.

4.1.1.1 Entities to Which Accumulation Limit Alternatives Would Apply

The alternatives under consideration in Section 4.1 apply to individuals, permit banks, and other entities. "Entities" includes groundfish sectors; the alternatives would constrain permit or PSC holdings of a sector, not the ACE allocated to it.

Rationale: Ensuring that an accumulation limit applies to individuals, not just entities, is a more effective approach to achieving the Amendment 18 goal of preventing excessive shares, as business entities can form and reform with different configurations of owners, perhaps to avert an accumulation limit. Compass Lexecon recommended accumulation limits at the individual level (Mitchell & Peterson 2013, p. 39). For MRIs held by more than one person, NMFS does not have data on the percent interest of persons in those MRIs (Section 6.5.4.1). Under the alternatives here, one may not be associated with more than X amount of PSC (Section 4.1.2) or permit/MRI (Section 4.1.3). Each individual permit holder would be subject to the accumulation limit alternative that is approved, no matter how permits were obtained (e.g., issued by NMFS, purchased, bequeathed).

Note: If an accumulation limit is implemented, NMFS may apply an accumulation limit to individuals and state-operated permit banks for the following reasons:

- Definitions for "permit bank" and "entity" have not been identified.
- For each of the nonprofit permit banks, there is an individual associated with each permit in the NMFS database.
- The permit cap in the scallop fishery applies to individuals. In Scallop Amendment 11, the preferred alternative had the permit cap apply to individuals and entities, but the Final Rule stated that the cap applies to just individuals. NMFS may take a similar approach.

4.1.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

Rationale: During the development of this action, the NMFS Greater Atlantic Regional Fisheries Office was convening the Northeast Multispecies Disaster Funding Vessel Buyout/Buyback Working Group, comprised of federal, state and industry representatives. The Group was developing recommendations for designing a potential federal permit buyback or buyout.

---

[1] Final data on PSC holdings used in this section will be provided by the Analysis and Program Support Division at GARFO.

However, no specifics of a plan have been finalized. This provision would enable the impact of a federal permit buyback or buyouts to be considered in a future adjustment of an accumulation limit through a framework action.

4.1.2 Limit the Holdings of PSC

4.1.2.1 Alternative 1: No Action

No action. Do not limit the PSC holdings by individuals, permit banks, and other entities.

Rationale: The absence of an accumulation limit would allow the market to determine the concentration of holdings for the fishery. While there is no federal requirement to implement accumulation limits for the fishery, NMFS does need to ensure that the FMP complies with National Standard 4.

4.1.2.2 Alternatives 2-6

Current PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected, there are cases where the current PSC held by an individual, permit bank, or entity exceeds the accumulation limit (Table 89). In February 2012, the public was notified that current holdings may be limited (NOAA 2012). The Council considered how to treat these excess holdings, and created the grandfathering provision and options below.

Note: Should NMFS determine that holdings above the accumulation limit selected through this action constitute an excessive share under the Magnuson-Stevens Act, an individual or entity may not be allowed to have holdings above the limit.

Grandfathering Current Holdings as of the Control Date. If an individual or entity held more PSC on the control date (April 7, 2011) than the accumulation limit alternative selected through this action, they would be exempt from the accumulation limit, but would be restricted to holding no more PSC than they held as of the control date. The grandfathered holdings may be fished or leased by the individual. The grandfathered status of an individual or entity is not transferrable and is not attached to the holdings itself.

This would allow certain permit holders to exceed the accumulation limit established through this action, those who held a higher amount of PSC on the control date than the accumulation limit. This may result in less disruption to the individuals with holdings above whichever accumulation limit alternative is adopted than if there was no grandfathering provision. For example, if the PSC limit for a stock is X, and one's holdings as of the control date = X+2 and as of the implementation date = X+3, the permits associated with a PSC of X+2 could still be held and used.

Disposition of Current Holdings in Excess of what is Allowed. This section pertains to how to treat holdings at the implementation of this action that are in excess of the accumulation limit alternative selected and which are not grandfathered as described above. The following three options are considered for how to treat these holdings (Table 6). *The Council may select Option A, B, or C.*

Option A. May hold permits, but not use excess PSC. ***(PREFERRED ALTERNATIVE)***
A permit holder could retain and renew permits with PSC in excess of the identified

accumulation limit. For holdings in excess, the holder could not contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of a cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45 (NEFMC 2011, Section 4.2.4; Section 6.5.4.3.3 this document). The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full PSC originally assigned to it is retained.

Rationale: This option would not force the divestiture of permits when holdings exceed the accumulation limit. For a permit that would put the holder in excess of a stock cap the PSC for stocks not exceeding the cap could still be contributed to a sector or the common pool. When a permit is sold, the seller and buyer can benefit from full amount of PSC originally assigned to it.

Option B. Must divest permits with excess PSC. A permit holder could not retain permits with PSC in excess of the identified accumulation limit. In the event that a permit holder is required to divest permits as a result of this action, adequate time will be provided to do so. In the interim, the PSC holdings in excess of the cap may not be fished or leased.

Rationale: This option allows flexibility for the permit holder to dispose of a permit, such that time would be provided to enable the sale of a permit, rather than forcing a holder to not renew a permit. When this permit is sold, the seller and buyer can benefit from full amount of PSC originally assigned to it.

Option C. May hold permits, but must divest excess PSC. A permit holder could retain and renew a permit with PSC that would result in exceeding the identified accumulation limit; however, the excess PSC must be permanently removed from the permit. The PSC would be redistributed to the rest of the groundfish fishery in the manner described in Framework 45. When the permit is sold, the excess PSC would no longer be attached to that permit.

Rationale: This option would not force the divestiture of an entire permit when holdings exceed the accumulation limit for certain stocks. For a permit that would put the holder in excess of a stock cap, the PSC for stocks not exceeding the cap could still be contributed to a sector or the common pool. When the permit is sold, the seller and buyer can benefit from the partial PSC that is retained with it.

Table 6 - Options for the disposition of current holdings in excess of what is allowed

	Option A	Option B	Option C
May permits with excess PSC be retained?	Yes	No	Yes
May the excess PSC be retained?	Yes	n/a	No
May the excess PSC be used?	No	n/a	n/a

Acquisition of Future Holdings. The Council considered whether an individual or entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock. Two options are considered (Table 7) pertaining to acquisition of future holdings. See also Section 4.1.1.2 regarding future federal permit buyouts and buybacks. *The Council may select Option A or B.*

Option A. May hold permits, but not use excess PSC. ***(PREFERRED ALTERNATIVE)*** Subsequent to the implementation of this action, a permit may be purchased with PSC that would result in exceeding the identified accumulation limit. For holdings in excess, the holder could not contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of the cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45 (NEFMC 2011, Section 4.2.4; Section 6.5.4.3.3 this document). The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full allocation is retained with it.

Rationale: This option would not force the divestiture of permits when holdings exceed the accumulation limit. This would enable the acquisition of additional permits. For a permit that would put the holder in excess of a stock cap, the PSC for stocks not exceeding the cap could still be contributed to a sector or the common pool. When a permit is sold, the seller and buyer can benefit from full amount of PSC originally assigned to it.

Option B. May hold permits, but must divest excess PSC. Subsequent to the implementation of this action, a permit holder may purchase a permit with PSC that would result in exceeding the identified accumulation limit. However, the PSC holdings in excess of the cap (which are not grandfathered) would be permanently split off that permit and PSC would be redistributed to the rest of the groundfish fishery in the manner described in Framework 45. It would not be used by the purchaser and would no longer be attached to that permit when it is sold.

Rationale: This option would allow permit holders to increase the PSC on stocks up to the accumulation limit by acquiring additional permits. This would enable the acquisition of additional permits. This option would not force the divestiture of an entire permit when holdings exceed the accumulation limit for certain stocks. For a permit that would put the holder in excess of a stock cap the PSC for stocks not exceeding the cap could still be contributed to a sector or the common pool. When the permit is sold, the seller and buyer can benefit from the partial PSC that is retained with it.

Table 7 - Options for the disposition of future holdings in excess of what is allowed

	Option A	Option B
May permits with excess PSC be retained?	Yes	Yes
May the excess PSC be retained?	Yes	No
May the excess PSC be used?	No	n/a

4.1.2.3 Alternative 2: Limit Holdings of Stock-specific PSC at the Maximum Held as of the Control Date

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the maximum stock-specific PSC that was held by an individual or permit bank as of the control date for Amendment 18 (April 7, 2011), rounded up to the nearest whole number (Table 8).

Rationale: Alternative 2 would establish an accumulation limit for the multispecies fishery that constrains the holdings of stocks in the multispecies complex. This alternative was developed based on the January 2014 Council motion to develop stock-specific PSC caps and uses the control date established by NMFS as requested by the Council. In the *Federal Register* notice, NMFS indicated that those individuals or entities holding permits/MRIs prior to the control date may be limited to their permit/MRI holdings as of the control date (NOAA 2011; 2012).

Table 8 - Potential accumulation limits under Alternative 2

Stock	PSC	Stock	PSC
GB cod	10	Witch flounder	9
GOM cod	8	GB winter flounder	23
GB haddock	15	GOM winter flounder	7
GOM haddock	7	Redfish	10
GB yellowtail flounder	14	White hake	8
SNE/MA yellowtail flounder	5	Pollock	6
CC/GOM yellowtail flounder	8	SNE/MA winter flounder	13
Plaice	9		

Note: Data represent the maximum PSC held by an individual or permit bank as of April 7, 2011, rounded up to the next whole number. This data have been prepared by the Groundfish Plan Development Team. The data are likely within 1% of the true values.

4.1.2.4 Alternative 3: Limit Holdings of Stock-Specific PSC to the Same Level for each Stock in the Fishery

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than 15.5 of the PSC for a single allocated stock. *The Council may select Option A in conjunction with Alternative 3.*

Rationale: Alternative 3 would establish an accumulation limit for the multispecies fishery that constrains the holdings of stocks in the multispecies complex. This alternative was developed based on the January 2014 Council motion to develop stock-specific PSC caps and an analysis provided by Compass Lexecon. Alternative 3 is consistent with the recommendations of Compass Lexecon, which concluded that a PSC cap of about 15 would be sufficient to ensure low concentration regardless of the competitive fringe (Mitchell & Peterson 2013; p. 53). Here, excessive shares is defined as in the Compass Lexecon report, “a share of access rights that would allow a permit owner [holder] or sector to influence to its advantage the prices of the fishery’s output or the prices paid for leased Annual Catch Entitlements” (Mitchell & Peterson 2013, p. i).

Option A: Individuals, permit banks, and other entities who have PSC holdings for a stock at 15.5 may acquire PSC for other stocks up to 15.5. Any PSC acquired that exceeds 15.5 would be split off a permit and redistributed to the fleet in the manner described in Framework Adjustment 45 (NEFMC 2011, Section 4.2.4; Section 6.5.4.3.3 this document).

Rationale: Option A would allow some flexibility to those permit holders with holdings at an accumulation limit for a stock to acquire additional permits.

4.1.2.5 Alternative 4: Limit Holdings of Stock-Specific PSC by Stock Type

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC. *The Council may select Option A or B:*

Option A: Limit the PSC holdings at 15 for the Gulf of Maine, Cape Cod, Southern New England, and Mid-Atlantic stocks, at 20 for the unit stocks, and at 30 for the Georges Bank stocks (Table 9).

Rationale: Option A would establish an accumulation limit for the multispecies fishery that constrains the holdings of all allocated stocks in the multispecies complex. This option was developed based on the January 2014 Council motion to develop stock-specific PSC caps and related comments from the public and the Council that accumulation limits could be lower for stocks held by a wider distribution of individuals. PSC holdings of GB stocks are generally more concentrated than the GOM, CC, SNE or unit stocks, though there are not necessarily fewer individual persons holding PSC for the GB stocks than the other stocks (Table 52). Option A is consistent with the recommendations of Compass Lexecon, as it would likely result in maintaining an *unconcentrated* fishery for the GOM/CC/SNE and unit stocks, and preventing no more than *moderate concentration* for the GB stocks (Mitchell & Peterson 2013).

Table 9 - Potential accumulation limits under Alternative 4, Option A

Stock	PSC	Stock	PSC
GB cod	30	Witch flounder	20
GOM cod	15	GB winter flounder	30
GB haddock	30	GOM winter flounder	15
GOM haddock	15	Redfish	20
GB yellowtail flounder	30	White hake	20
SNE/MA yellowtail flounder	15	Pollock	20
CC/GOM yellowtail flounder	15	SNE winter flounder	15
Plaice	20		

Option B: Limit the PSC holdings of GB cod at 30, GOM cod at 15, and pollock at 20.

Rationale: Option B would establish an accumulation limit for the multispecies fishery that constrains the holdings of three stocks in the multispecies complex. This option was developed based on the January 2014 Council motion to develop stock-specific PSC caps. Like Option A, Option B assigns an accumulation limit based on the type of stock (GB, GOM/CC/SNE, unit). However, the holdings of just one stock within each type would be limited. The stocks selected are the ones within each type that, as of FY 2013, had the most number of individuals holding PSC >1 (Table 52). This alternative would not limit ACE leasing.

4.1.2.6 Alternative 5: Limit Holdings of Stock-Specific PSC

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC: 30 of Georges Bank winter flounder and 20 for all other allocated stocks in the fishery.

Rationale: Alternative 5 would establish an accumulation limit for the multispecies fishery that constrains the holdings of selected stocks in the multispecies complex. According to the draft data of PSC holdings, PSC holdings for FY 2014 indicate that this alternative would not force divestiture of current holdings (Table 53). This alternative was developed by the Groundfish Committee in March 2014.

4.1.2.7 Alternative 6: Limit Collective Holdings of PSC

(PREFERRED ALTERNATIVE) For any single fishing year, individuals, permit banks, and other entities shall be assigned an average PSC of no more than 15.5 for all the allocated stocks in aggregate.

Rationale: Alternative 6 would establish an accumulation limit for the multispecies fishery that constrains the holdings of stocks in the multispecies complex. The formula for evaluating compliance with the cap would be as follows:

$$\text{Total PSC held} \leq (\text{\# of allocated stocks}) * 100 * 0.155$$

Thus, with 15 allocated stocks, as at present, the total PSC across all stocks held by an individual or entity must be ≤ 232.5 (an average of 15.5 per stock). This would allow an individual or entity to hold PSC for a single stock in excess of 15.5, so long as the total holdings do not exceed 232.5.

4.1.3 Limit the Holdings of Permits

4.1.3.1 Alternative 1: No Action

No action. Do not limit the holdings of Northeast multispecies permits by individuals, permit banks, and other entities.

Rationale: The absence of an accumulation limit would allow the market to determine the concentration of holdings for the fishery. While there is no federal requirement to implement accumulation limits for the fishery, NMFS does need to ensure that the FMP complies with National Standard 4.

4.1.3.2 Alternative 2: Limit the Holdings of Permits

(PREFERRED ALTERNATIVE) For any single fishing year, no individual, permit bank, or other entity shall hold > 5% of the limited access Northeast multispecies permits (Section 6.5.3.1 lists the permit categories). This includes permits issued to vessels and eligibilities in Confirmation of Permit History. If an individual or entity held >5% of the permits on the control date (April 7, 2011), they would be restricted to holding no more than the number of permits they held as of the control date.

Rationale: This alternative would establish an accumulation limit for the multispecies fishery that constrains the number of limited access Northeast Multispecies permits held (to 5%) by any individual or entity. The percentage in this alternative is consistent with the 5% permit cap in the Atlantic Sea Scallop Limited Access Individual Fishing Quota fishery, though that fishery has ~200 permit holders, whereas the groundfish fishery has ~1,500. Since PSC is allocated to the Moratorium Right Identifier (MRI) number associated with each multispecies permit, it is the number of MRIs that would, in fact, be limited. Within the NMFS data system, holdings of MRIs would be simpler to track than permits. With ~1,400 MRIs currently in the fishery, a 5% cap would be equivalent to ~70 MRIs.

4.2 HANDGEAR A PERMIT MEASURES

4.2.1 Establish a Handgear A Permit sub-ACL

4.2.1.1 Alternative 1: No Action

No action. Holders of Handgear A multispecies permits would continue to have the choice of enrolling in the common pool or a groundfish sector (HA permit holders could form their own sector or join an existing sector) and be subject to current regulations accordingly.

Rationale: Amendment 16 allowed HA permits to be enrolled in sectors, and thus, the ACE associated with these permits could then be leased and harvested using other gear types. Amendment 16 also established that in FY 2012, the common pool would be managed with a trimester sub-ACL versus an annual one for all stocks except SNE/MA winter flounder, windowpane flounder, ocean pout, Atlantic wolffish and Atlantic halibut. Then, Framework 48 exempted handgear from the trimester system for white hake. The discard rate for vessels fishing with HA permits in the common pool is calculated based on observed trips using trawls or gillnets, not handgear.

4.2.1.2 Alternative 2: Establish a Handgear A Permit sub-ACL

(PREFERRED ALTERNATIVE) A new groundfish fishery component sub-ACL would be created, which would be distinct from the common pool or sectors. A sub-ACL would be created only for HA permits, allocating the catch history (i.e., PSC) of the enrolled HA permits for Gulf of Maine cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, and pollock. The catch history qualification years would remain consistent with current PSC calculation methods. The HA sub-ACL would be managed on an annual basis. Holders of HA permits may elect to enroll in the HA sub-ACL, the common pool, or a sector. The PSC from HA permits would contribute to whichever sub-ACL their permit is enrolled in. Those electing to enroll in the HA sub-ACL would be limited to fishing in a single broad stock area for the fishing year and must declare which stock area they are going to fish in at the beginning of each year. Stocks that would not have a specific HA permit sub-ACL, but are caught (landings and discards) using a HA permit, would be accounted for under the Other Sub-components sub-ACLs. Options for how discards would be treated and for AMs are included below.

Up to 10% of unused HA sub-ACL would be able to be carried forward, provided that the total unused HA sub-ACL combined with sector sub-ACL carried forward for all sectors from the previous fishing year plus the total ACL does not exceed the ABC for the fishing year in which the carryover would be harvested (e.g., from FY 2015 to FY 2016). This catch, if used in the following year, would not be attributed to the sub-ACL for overage determination unless the total ACL is exceeded in that year. If the total exceeds the ABC, NMFS would adjust the maximum amount of unused carryover (down from 10%) to an amount equal to or less than the ABC of the following fishing year. The distribution in downward adjustment between the sector and HA sub-ACLs would be proportional to the ACLs of these two subcomponents. In a year where there was additional catch due to carryover, if the total ACL is exceeded and the HA sub-ACL is exceeded, the HA sub-ACL would be required to repay the carried over catch used. Most sectors elect to set aside 10% of their ACE at the beginning of the fishing year to help prevent overages, which if unused, they may carry over in the next fishing year. The HA sub-ACL would not have a set-aside upfront.

Table 10 and Table 11 illustrate what a potential HA sub-ACL might look like in the future for the five stocks under consideration. The table takes the FY 2015 PSC associated with all HA permits and calculates what a sub-ACL would be with the FY 2015 ACLs (NEFMC 2015). As enrollment in the HA sub-ACL would be voluntary, it is unknown how many HA permit holders would choose this new option vs. sectors or the common pool. Because FY 2015 sector enrollment will not be final until after the start of the fishing year, the grouping of HA PSC into common pool and sectors in Table 10 is based on FY 2014 enrollment. “Potential FY 2015 HA sub-ACL” assumes 100% enrollment of HA permits in the HA sub-ACL. It would be a hypothetical maximum that is likely to be ≤0.73% of the commercial sub-ACL for each of the five stocks, with the lowest being GOM haddock at 2,377 lbs.

Rationale: Alternative 2 would create a new sub-ACL component specifically for a HA permits for five stocks. Amendment 16 established that in FY 2012, the common pool would be managed with a trimester sub-ACL versus an annual one for all stocks except SNE/MA winter flounder, windowpane flounder, ocean pout, Atlantic wolffish and Atlantic halibut. Then, Framework 48 exempted handgear from the trimester system for white hake. In FY 2010 and FY 2011, most of the common pool effort occurred within the first three months of the fishing year. This could be due to a preference for fishing in seasonable weather, but there could also be a “race to fish” factor in play. The annual sub-ACLs were not exceeded. Since the implementation of trimesters, the common pool has exceeded its trimester sub-ACLs in a few cases. There are a number of convergent factors that cause managing the common pool quotas by trimesters challenging. For quotas that are as small as those for the common pool trimesters, the current data delivery systems make it difficult to estimate in-season when 90% of the TAC is projected to be reached. The trimester AM is a proactive AM, and it is not necessary to have proactive AMs.

The carryover provision for the HA sub-ACL would be consistent with the carryover provision for sectors adopted through Framework 53, which was revised to be compliant with a 2014 ruling of the U.S. District Court for the District of Columbia. However, the HA permit sub-ACL would not have a 10% set-aside to help prevent overages.

Table 10 - Potential Handgear A sub-ACL based on FY 2015 PSC, by stock

	Commercial Groundfish FY 2015 sub-ACL		Common Pool HA			Sectors HA			Total HA		
			Total FY 2015 HA PSC	Potential FY 2015 HA sub-ACL		Total FY 2015 HA PSC	Potential FY 2015 HA sub-ACL		Total FY 2015 HA PSC	Potential FY 2015 HA sub-ACL	
	(mt)	(lbs)		(mt)	(lbs)		(mt)	(lbs)		**(mt)**	**(lbs)**
GOM cod	207	456,356	0.003759111	0.8	1,715	0.003529933	0.7	1,611	**0.007289044**	**1.5**	**3,326**
GOM haddock	958	2,112,028	0.001043224	1.0	2,203	0.000082075	0.1	173	**0.001125299**	**1.1**	**2,377**
GB cod	1,787	3,939,660	0.001528204	2.7	6,021	0.000168089	0.3	662	**0.001696293**	**3.0**	**6,683**
GB haddock	21,759	47,970,383	0.000148542	3.2	7,126	0.000016405	0.4	787	**0.000164948**	**3.6**	**7,913**
Pollock	13,720	30,247,422	0.000649675	8.9	19,651	0.001458188	20.0	44,106	**0.002107862**	**28.9**	**63,757**

Notes:
These sub-ACLs are based on the FY 2015 ACLs and ABCs. Because FY 2015 sector enrollment will not be final until after the start of the fishing year, the grouping of HA PSC into common pool and sectors is based on FY 2014 enrollment.

Table 11 - Potential FY 2015 HA sub-ACL relative to the FY 2015 groundfish sub-ACL and FY 2014 cumulative discards of sectors and the common pool

	Potential FY 2015 HA sub-ACL (mt)	% of FY 2015 groundfish sub-ACL	% of FY 2014 cumulative discard of sectors and common pool[1]
GOM cod	1.5	0.73	6.5
GOM haddock	1.1	0.11	5.5
GB cod	3.0	0.17	22.5
GB haddock	3.6	0.02	1.3
Pollock	28.9	0.21	34.1

[1]FY 2014 cumulative discards from groundfish Commercial Catch Monitoring Report dated February 19, 2015 available at: http://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/Sectors/Commercial_Summary_2014.html.

Discards

Discards would be accounted for by one of the two options below. *The Council may select Option A or B.*

Rationale: The stocks not assigned to the HA sub-ACL are not commonly targeted by HA fishermen. Recent catch data for HA permits are provided in Section 6.5.6.3.

> **Option A:** ***(PREFERRED ALTERNATIVE)*** Calculate an annual discard rate based on available data for longline and hook gear. At the beginning of the fishing year, estimated discards would be subtracted from the HA sub-ACL (for GOM cod, GB cod, GOM haddock, GB haddock, and pollock) and the Other Sub-Components sub-ACL (for all other stocks) accordingly.

Rationale: This approach bases the discard rate on data from gear similar to what would be used in the HA sub-ACL. Since there would be no in-season observer trips, the discard rate would be the same for the whole year and set at the beginning of the fishing year. Only landings would be monitored throughout the year.

> **Option B:** Assume all discards from trips fishing within the HA sub-ACL to be *de minimus.* Only landings would count against the sub-ACLs.

Rationale: The discards from a potential HA sub-ACL are likely to be very small, well within the management uncertainty buffer of the commercial fishery. The discards of Gulf of Maine cod by handgear were 0.14% - 1.2% of the total commercial discards between FY 2010-2012 (Table 71). These HA discards were calculated based on discards from trawl and gillnets, and thus, are considered maximums.

In-season accountability measures

An in-season accountability measure (AM) would be established for the HA sub-ACL. To prevent overages in-season, trip limits for each stock with a HA sub-ACL would be set in specifications by the Regional Administrator to prevent overage. *The Council may select Option A or B.*

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

> **Option A:** When 100% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

Rationale: If the sub-ACL is reached for a stock, this approach would allow the HA vessels to continue fishing on other stocks. This approach is different than the current sector and common pool regulations, where if the sub-ACL is reached for a stock, the stock area closes.

> **Option B:** ***(PREFERRED ALTERNATIVE)*** When 90% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-

ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

Rationale: If the sub-ACL is reached for a stock, this approach would allow the HA vessels to continue fishing on other stocks. Given the small level of a potential HA sub-ACL, the difference between determining when 90% vs 100% is reached would be very difficult, and could still result in overages. This approach is different than the current sector and common pool regulations, where if the sub-ACL is reached for a stock, the stock area closes.

Reactive accountability measures

A reactive accountability measure (AM) would be established for the HA sub-ACL. Reactively, an overage in the sub-ACL for a stock would be subtracted from the sub-ACL in the fishing year following notification of the overage. *The Council may select Option A or B.*

Rationale: This AM would ensure that there are sufficient measures in place to prevent overages of sub-ACLs. Because of the timing of availability of data for this sub-ACL, the reactive AM would be implemented in the fishing year following the notification of the overage. Adopting AMs for the HA sub-ACL also ensures that overages caused by the HA sub-ACL would not negatively impact other components of the fishery. Having AMs linked to each sub-ACL ensures that each fishery component is held responsible for its catch.

Option A: ***(PREFERRED ALTERNATIVE)*** Reactive AMs would be triggered if the HA sub-ACL is exceeded.

Rationale: The HA sub-ACL would be accountable for every pound of its overage. Triggering the Handgear AMs based on an overage of the sub-ACL, regardless of whether the total ACL is exceeded, is consistent with the allocated stocks reactive AM trigger for sectors, the common pool, the small-mesh multispecies fishery, and for GB yellowtail flounder and GOM and GB haddock in the herring fishery.

Option B: Reactive AMs would be triggered if the HA sub-ACL and the total ACL are exceeded.

Rationale: Any HA sub-ACL overage would likely be very small relative to the total groundfish ACL. Triggering the Handgear AMs based if both the sub-ACL and total ACL are exceeded, is consistent with the non-allocated stocks reactive AM trigger for sectors, the common pool, and groundfish stocks that are bycatch in the scallop fishery.

4.2.2 Removal of March 1-20 HA Closure

4.2.2.1 Alternative 1: No Action

No Action. Handgear A vessels enrolled in the common pool are required to take a mandatory spawning block out of the fishery and may not fish for, possess, or land regulated multispecies from March 1 – 20 of each year. Vessels enrolled in sectors are exempt from this closure.

Rationale: Through Amendment 7, all groundfish vessels had to take a 20-day block that they had to call out during the March-May spawning season (NEFMC 1997). Handgear vessels were given March 1-20, because they were not required to use VMS, and NMFS would not be able keep track of when these vessels actually called out. Prohibiting HA vessels from fishing March 1-20 may reduce fishing effort on spawning stocks.

4.2.2.2 Alternative 2: Removal of March 1-20 HA Closure

(PREFERRED ALTERNATIVE) The March 1-20 fishing closure would be removed for all Handgear A vessels, regardless of which sub-ACL their permits are enrolled in.

Rationale: Currently, sector vessels are exempt from the 20-day spawning block as part of their operations plans, so this measure would make the regulations for HA vessels fishing in the common pool and under the potential HA sub-ACL (see Section 4.2.1) consistent with how sectors are managed. Alternative 2 would improve flexibility for HA vessels.

4.2.3 Removal of Standard Fish Tote Requirement

4.2.3.1 Alternative 1: No Action

No Action. Vessels fishing with a Handgear A permit are required to have at least one standard tote on board.

Rationale: In 1994, through an Emergency Rule and subsequently in Amendment 5, standard totes were required of all vessels (Section 6.5.6.3.3). Overtime, this requirement has been removed for vessels fishing with various permits and gear types, but still applies for vessels fishing with a Handgear A multispecies permit. Additional background on the tote provision is included in Section 6.5.6.3.3.

4.2.3.2 Alternative 2: Removal of the Standard Fish Tote Requirement

(PREFERRED ALTERNATIVE) Vessels operating under a HA permit would no longer be required to carry a standard fish tote on board.

Rationale: Currently, the U.S. Coast Guard does not use totes for at-sea enforcement. Since weights measured dockside are the only ones considered official, issuing a possession limit overage violation based solely on weight estimates made at sea would be untenable. The totes serve no practical purpose.

4.2.4 Sector Exemption from VMS Requirements

4.2.4.1 Alternative 1: No Action

No Action. All vessels fishing in a groundfish sector, including those with Handgear A permits, are required to use the Vessel Monitoring System (VMS).

Rationale: Through Framework 42, all limited access DAS groundfish vessels were required to use VMS to fish for groundfish while on a DAS. The Council had voted in Amendment 5 to adopt VMS, but technical issues had arisen upon implementation. The increasing complexity of the FMP made it necessary to impose this requirement on all groundfish vessels so that fishing activity can be monitored (NEFMC 2006). With the implementation of sectors, VMS continued to be required for sector vessels as a way to monitor the fishery. Use of VMS is a sector reporting requirement, thus is not currently eligible for a sector exemption request (NEFMC 2009a). VMS is used to monitor closed areas and to tie together all data sources for a trip that are used in catch monitoring.

4.2.4.2 Alternative 2: Sector Exemption from VMS Requirements

(PREFERRED ALTERNATIVE) A sector may request through its annual operations plans that vessels fishing with handgear in the sector may be exempt from the requirement to use the Vessel Monitoring System (VMS). Vessels fishing with handgear in a sector must declare trips through the Interactive Voice Response (IVR) system.

Rationale: The catch by HA vessels is typically much smaller than other commercial vessels that fish in sectors. Vessels fishing with handgear in the common pool use the IVR system to declare a trip and then submit a Vessel Trip Report upon completion of a trip. This alternative would allow the approach currently used for handgear vessels in the common pool to apply to those fishing in a sector. There are costs associated with purchasing the VMS hardware, satellite connections, and data transmission. Alternative 2 could be a lower-cost approach and may thus encourage participation in sectors by handgear vessels. This could result in increased diversity in sectors and participation in the catch share program.

4.3 DATA CONFIDENTIALITY

Alternatives in this section would potentially revise the data confidentiality policy for the groundfish fishery.

4.3.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No Action. The price of ACE traded between sectors and the movement of ACE within sectors would remain confidential. Other data on ACE trades between sectors (sectors, date of trade, stocks, amount of ACE) are currently posted to the GARFO "Sector ACE Transfer Summary" website (http://www.nero.noaa.gov/aps/monitoring/nemultispecies.html). Additional ACE trade data is summarized annually in the groundfish fishery performance report produced by the NEFSC (e.g., Murphy et al. 2015).

Rationale: NMFS has previously determined that ACE price data are not necessary for the administration of the program, and thus, do not warrant an exception from the Magnuson-Stevens Act data confidentiality provisions. Under No Action, there would be little incentive for inaccurate price reporting.

4.3.2 Alternative 2: ACE Disposition Data Would be Exempt from the Confidentiality Requirement

The value associated with the movement of PSC-determined catch allocations (ACE) within and between sectors would be considered non-confidential and made available to the public. Consistent with current data submission timeframes, price data on trades made between sectors would be made available during the fishing year. Price data on the movement of ACE within sectors would be made available after the end of the fishing year.

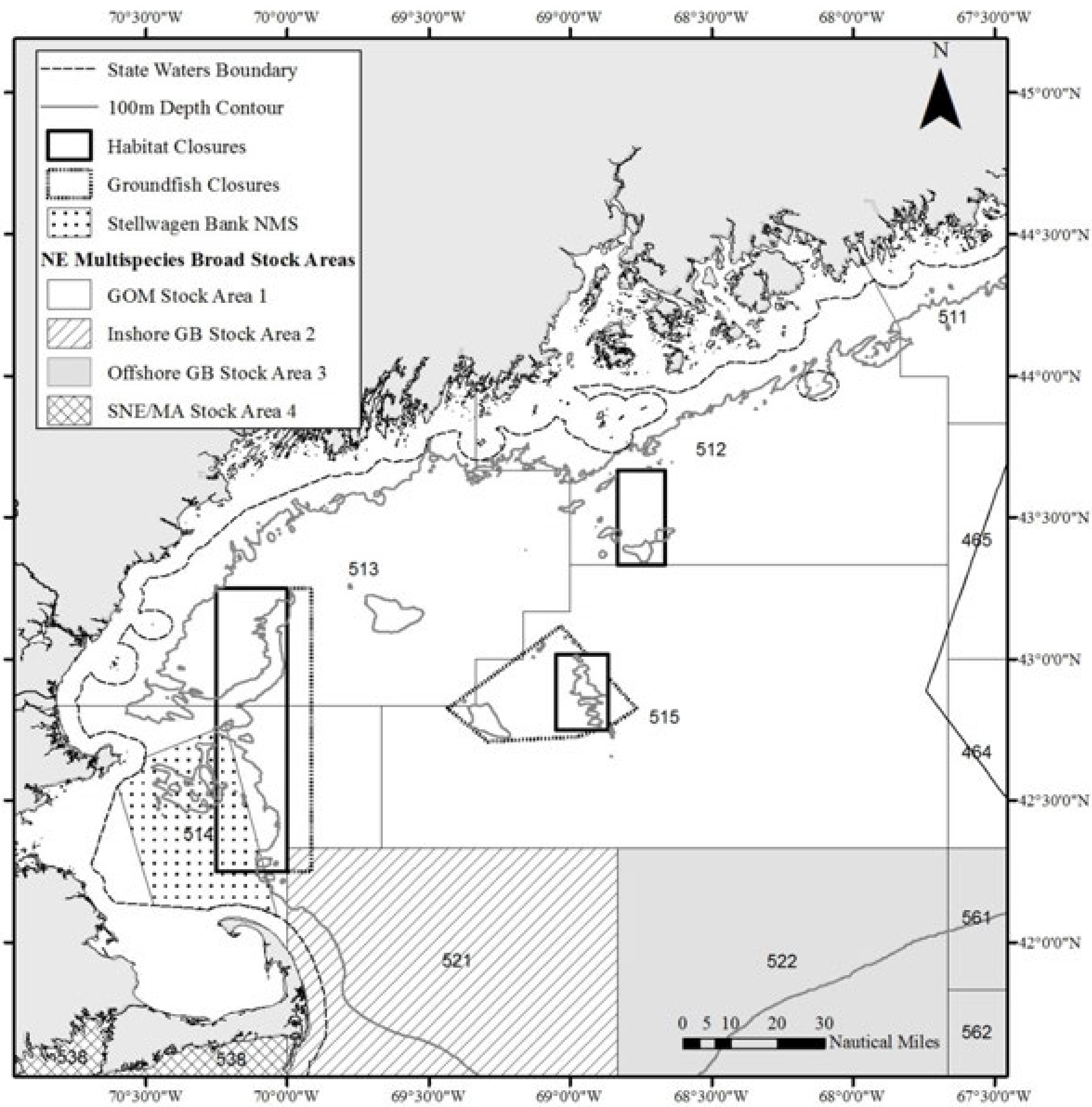
Rationale: This alternative may promote more transparency in how a public resource is used. Having the price data posted could help fishermen evaluate if they are paying a fair market price for ACE, though some trades have several stocks bundled together. It could also help managers understand the effects of the sector program and participation in the fishery.

4.4 INSHORE/OFFSHORE GULF OF MAINE

4.4.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 5) are identified in this section.

Figure 1 - Map showing statistical areas, existing year-round closures, and the Stellwagen Bank National Marine Sanctuary



4.4.1.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No action. Do not establish a new inshore/offshore boundary line in the Gulf of Maine.

4.4.1.2 Alternative 2: Establish an Inshore/Offshore Boundary

Establish a new sub-area boundary (Option A, B, or C below) within the Gulf of Maine Management Area to distinguish between inshore and offshore fishing practices. This boundary may be adjusted through subsequent framework action and would not apply to vessels with only state-water groundfish permits. *The Council may select Option A, B, or C.*

Rationale: The management sub-areas would allow the application of different ACLs or management measures in separate areas. This could provide more flexibility to the management program, as measures do not have to be applied to the entire area when they may be more appropriate in only one area. Because the boundary options considered do not align with statistical reporting area boundaries, additional catch reporting would be necessary to properly assign catch to the inshore and offshore area. This boundary may be adjusted through subsequent framework action, to provide the flexibility to revise management areas as additional information on stock structure is developed or fishing patterns change.

Option A. Establish an inshore/offshore Gulf of Maine boundary at 70°W longitude (Figure 2).

Rationale: This line is just inside the eastern boundary of the Western Gulf of Maine Closed area. It coincides with the eastern boundary of the Western Gulf of Maine Habitat Closure. The line would place the Stellwagen Bank National Marine Sanctuary entirely within the inshore area, and would not divide the fishery near Provincetown, MA to the degree that Option B would.

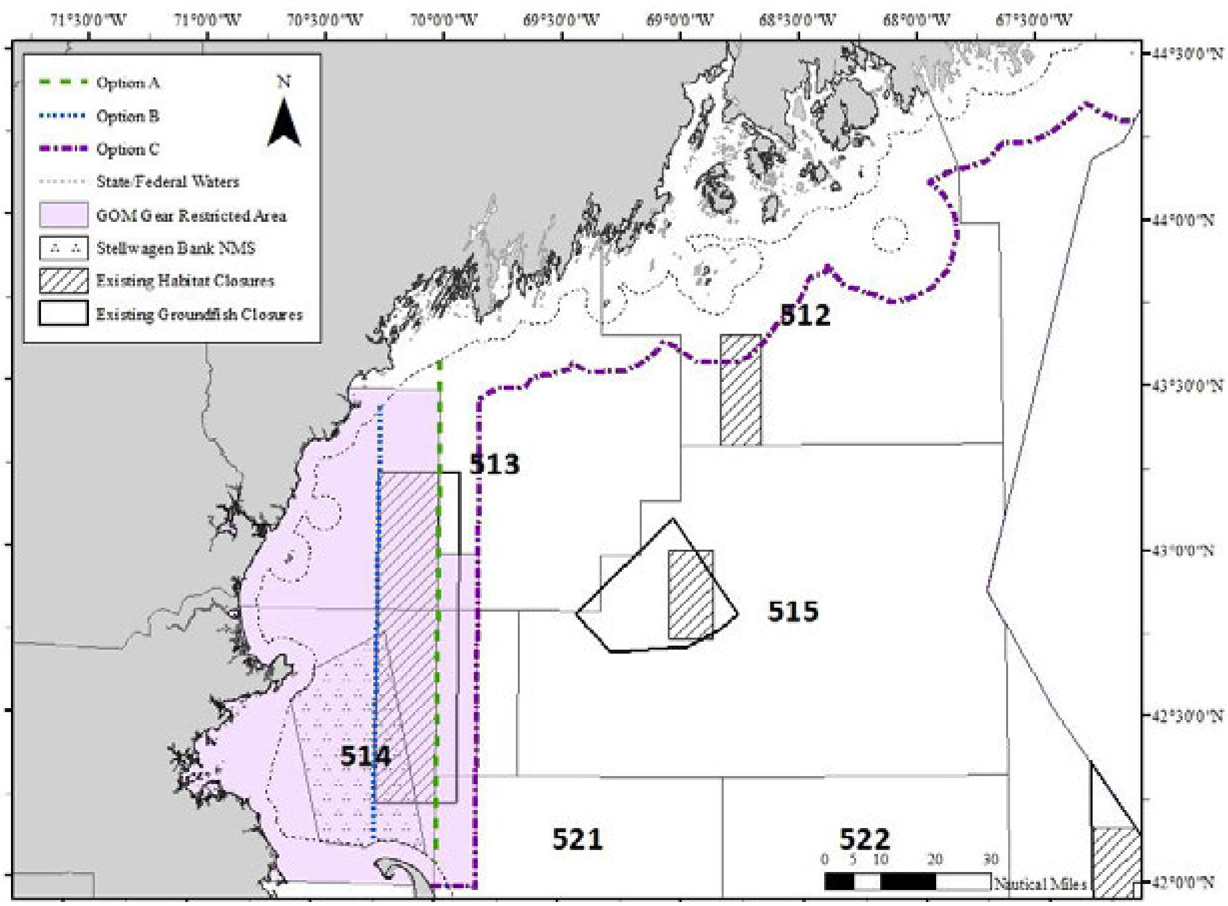
Option B. Establish an inshore/offshore Gulf of Maine boundary at 70°15'W longitude (Figure 2).

Rationale: This line creates a distinction between the day-boat and the trip boat fleets and coincides with the western boundary of the Western Gulf of Maine Habitat Closure, and would place the Western Gulf of Maine Area Closure and the Western Gulf of Maine Habitat Closure entirely within the offshore area. The line would intersect the Stellwagen Bank National Marine Sanctuary. The industry has designated this line as an inshore/offshore declaration line for reporting purposes, by a few sectors in FY 2013, and by all sectors in FY 2014 sector ops plans. The area to the west is considered part of Wilkinson Basin and is important to the pollock fishery.

Option C. Establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50'W, runs north along 69°50'W to the 12 nm territorial sea line, then follows Maine's 12 nm territorial sea line northeast to the Hague Line (Figure 2).

Rationale: This line creates a distinction between the day-boat and the trip-boat fleets and coincides with the GOM/GB Inshore Restricted Roller Gear Area, an existing inshore/offshore delineation for the 12" rockhopper restrictions (implemented through Framework 27 to the Multispecies FMP). This line would place the GOM/GB Inshore Restricted Roller Gear Area, the Western Gulf of Maine Area Closure, the Western Gulf of Maine Habitat Closure, and the Stellwagen Bank National Marine Sanctuary entirely within the inshore area. Unlike Options A and B, this line would not intersect the Maine coast, thus fishing that occurs along the entire Maine coast would be considered inshore. By using the 12 nm territorial sea line, it would use a boundary line that is already used in management (The State of Maine has jurisdiction of the lobster fishery out to 12 nm), rather than create a new line.

Figure 2 - Inshore/offshore Gulf of Maine boundary alternatives



Note: The GB/GOM Inshore Restricted Roller Gear Area would not be impacted by Alternative 2, but is shown for illustrative purposes only.

4.4.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

The Council cannot select Alternative 2 below unless Alternative 2 in Section 4.4.1 is selected.

4.4.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No action. Do not establish a sub-ACL within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

Rationale: Creating no new strata would maintain observer coverage requirements and not results in cost increases. The current catch accounting system would continue to be used, and a new more complicated system would not need to be developed.

4.4.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. This alternative would not change catch attribution methods for federally-permitted vessels fishing in state waters.

This would create two new strata, which may change the observer coverage needed to achieve monitoring requirements and the resolution of catch data. Because the sub-area boundaries do not align with Statistical Reporting Areas (SRAs), a new catch accounting system would need to be developed, perhaps akin to that used for the Atlantic herring fishery (combining VTRs, VMS reports and dealer reports). Framework 3 to the Herring FMP describes the data auditing process (NEFMC 2014a; Section 3.6.1).

The distribution of allocation within the commercial fishery would remain unchanged. The catch history qualification years would remain consistent with current PSC calculation methods. For example, if the GOM cod PSC associated with a permit is 1.0, then the PSC for each sub-ACL would also be 1.0.

For commercial vessels, reporting measures would be established to accurately attribute catch to the inshore and offshore GOM areas. VTRs cannot be used alone, or would need to be modified, to monitor these sub-ACLs. This would create an exception, and thus a complication, to using VTRs to monitor which ACL to charge for a groundfish stock. A catch monitoring approach akin to how the Atlantic herring fishery is monitored may be necessary, where management areas do not align with statistical area boundaries. Herring catch is tracked using data provided by daily VMS reports (herring catch by management area and all fish kept by statistical area) and weekly VTR catch reports, in combination with federal/state dealer data. If VTR and dealer reports do not match a VMS catch report, herring management area is determined using the statistical area, latitude, and longitude provided on the VTR reports. Once all matching is complete, summed dealer data on kept catch by area for a given VTR serial number is used in the weekly herring report, unless VTR kept is >90% of dealer kept, in which case VTR kept is used (assumes missing dealer reports). Framework 3 to the Herring FMP further describes the data auditing process.

Rationale: Creating inshore and offshore GOM cod sub-ACLs would limit catch of this stock to more specific areas within the Gulf of Maine. Limiting the new sub-ACLs to just one stock makes quota setting, allocations, observer coverage, and catch monitoring easier with lower potential for error than if all groundfish stocks were managed with this sub-ACL. This alternative focuses on GOM cod due to substantial public concern about this stock for many years (e.g., Section3.4.2), it is a stock that is caught throughout the Gulf of Maine, and this is one of the groundfish stocks that have PSC held by the greatest number of individuals (Table 53). However, there would still be complexities, as this creates a new management program for just one stock in the fishery. Alternative 2 would not involve reallocating the fishery.

Determining the GOM cod inshore/offshore split

The Council may select Option A, B, or C.

Option A. During each GOM cod specifications process, the Council would determine the control rule to be used at the time to determine the split between the inshore and offshore sub-ACLs. The control rules could be based on cod distribution, catch, different time periods, etc.

Rationale: This option would provide the Council and NMFS with flexibility to adjust the sub-ACLs in the future based on different parameters.

Option B. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of commercial catch in each sub-area. Two sub-options for the fishing years used to determine the level of catch are considered. *The Council may select Sub-option A or B.*

Rationale: Establishing the control rule in advance provides a degree of predictability for the specifications process. This option would ensure that the catch in each area is proportional to the historical catch. Fishing years are used in the sub-options, because catch is calculated on a fishing year basis.

Sub-Option A. The last 10 fishing years prior to the year in which the specifications are developed.

Rationale: In the near-term, Sub-option A would capture the variability before and after FY 2010.

Sub-Option B. The last 20 fishing years prior to the year in which the specifications are developed.

Rationale: In the near-term, Sub-option B would capture a longer period of variability than Sub-option A, including that before and after FY 2010.

Option C. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of GOM cod distribution in each area. Two sub-options for the calendar years used to determine the level of fish distribution are considered. *The Council may select Sub-option A or B.*

Rationale: Establishing the control rule in advance provides a degree of predictability for the specifications process. This option would ensure that the catch in each area is proportional to the distribution of Gulf of Maine cod between each area. Calendar years are used in the sub-options, because stock assessments are performed on a calendar year basis.

Sub-Option A. The last 10 calendar years prior to the year in which the specifications are developed.

Rationale: In the near-term, Sub-option A would capture the variability before and after FY 2010.

Sub-Option B. The last 20 calendar years prior to the year in which the specifications are developed.

Rationale: In the near-term, Sub-option B would capture a longer period of variability than Sub-option A, including that before and after FY 2010.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can correctly attribute catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Declarations would be made to the sector manager via the Trip Start Hail. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

Rationale: This would promote more fine-scale attribution of catch within the Gulf of Maine (to the sub-areas) relative to No Action. Monitoring would be required for fishing in both sub-areas on a given commercial trip, because it would be very difficult to attribute catch to the two sub-areas without monitoring. This provision is designed similar to the Inshore Gulf of Maine Declaration Plan that has been developed by sectors and is included in the FY 2014 operations plans for all sectors. For monitored trips, this provision would provide flexibility to be able to fish in both sub-areas on a single trip.

4.4.3 GOM/GB Inshore Restricted Roller Gear Area

The Council cannot select Alternative 2 below unless Alternative 2 in Section 4.4.1 is selected.

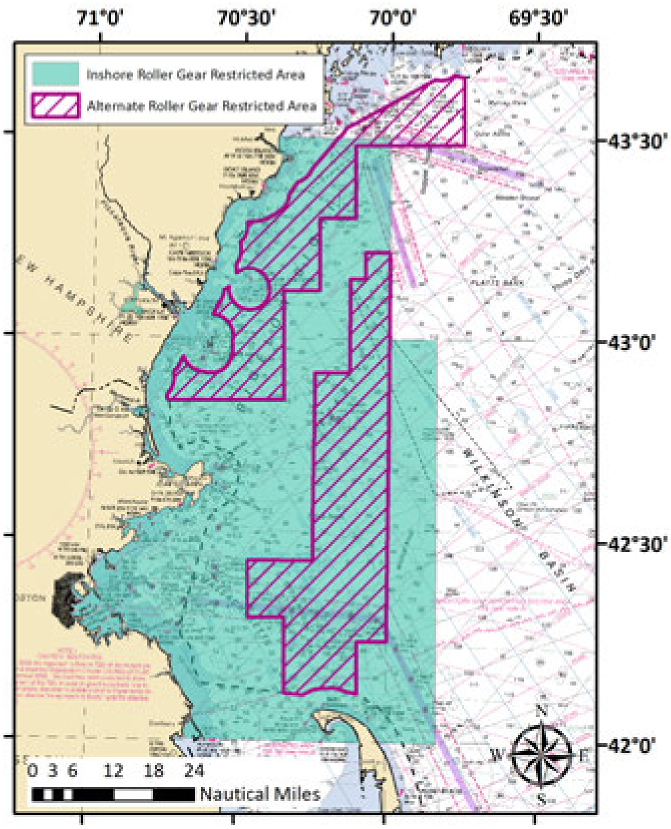
4.4.3.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No Action. Do not revise the current GOM/GB Inshore Restricted Roller Gear Area. In Figure 3, the polygon in aqua is the current trawl roller area (12” max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp).

Rationale: This gear restriction was implemented through Framework 27 to the Multispecies FMP (NEFMC 1999) primarily to reduce GOM cod mortality, though limiting trawl activity on complex habitat was discussed.

Potential No Action. The No Action alternative may change pending measures approved and implemented through the Habitat Omnibus Amendment 2. The Habitat action contains alternatives that may revise the GOM/GB Inshore Restricted Roller Gear Area (see Volume III, Section 2.1.3). In April 2015, the Council selected a preferred alternative (Alternative 7) that would apply the 12” roller gear restriction to all bottom trawl gear. Another alternative would change the restricted area to that identified by the pink polygons in Figure 3. However, this was not a preferred alternative.

Figure 3 - No action alternatives 1 (aqua) and 1A (pink) for the GOM/GB Inshore Restricted Roller Gear Area



Source: Habitat Omnibus Amendment 2 (Volume III, Map 11, p. 69).

4.4.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area

Revise the GOM/GB Inshore Restricted Roller Gear Area to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2. The commercial allocation, monitoring, and reporting provisions in Section 4.4.2 Alternative 2 would not apply, unless that alternative is selected.

Rationale: By making the GOM/GB Inshore Restricted Roller Gear Area boundary consistent with the inshore/offshore boundary, this option may be easier to administer and enforce relative to either the current or potential No Action alternatives.

4.4.4 Declaration Time Periods for the Commercial Fishery

For the following alternatives, there would be no change to the leasing provisions; allowing ACE to be traded would provide a mechanism for ACE to be obtained. *The Council cannot select Alternatives 2, 3, or 4 below unless Alternative 2 in Section 4.4.1 is selected.*

4.4.4.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No action. Do not specify time periods for which a commercial vessel must declare into or out of one of the Gulf of Maine management sub-areas, as defined in Section 4.4.1.2.

Rationale: This alternative would not create fishing declaration time periods for the commercial fishery. Vessels could continue to choose to fish in either or both areas on the same trip and at any point throughout the year. This alternative would involve less reporting than the other alternatives in this section, though existing reporting requirements would remain unchanged.

4.4.4.2 Alternative 2: Annual Declaration

For each fishing year, commercial vessels must declare their intent to fish in either the inshore or the offshore Gulf of Maine management sub-area, as defined in Section 4.4.1.2. Vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given fishing year. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Rationale: This alternative would aid in catch attribution to the inshore and offshore areas by creating declaration time periods on an annual basis for the commercial fishery. Vessels may only fish in the non-declared area on a non-groundfish trip, because there is a chance that cod could be caught on a groundfish trip.

4.4.4.3 Alternative 3: Seasonal Declaration

For each trimester as defined below, commercial vessels must declare their intent to fish in either the inshore or the offshore Gulf of Maine management sub-area, as defined in Section 4.4.1.2. Vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given season. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Trimester 1: May 1 – August 31

Trimester 2: September 1 – December 31

Trimester 3: January 1 – April 30

Rationale: This alternative would aid in catch attribution to the inshore and offshore areas by creating declaration time periods on a trimester basis for the commercial fishery. Vessels may only fish in the non-declared area on a non-groundfish trip, because there is a chance that cod could be caught on a groundfish trip. Seasonal declarations would provide more flexibility than annual declarations for the fleet to choose in which sub-area to fish for groundfish.

4.4.4.4 Alternative 4: Trip Declaration

For each trip, vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for the trip. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Rationale: This alternative would aid in catch attribution to the inshore and offshore areas by creating declaration time periods on a trip by trip basis for the commercial fishery. Vessels may only fish in the non-declared area on a non-groundfish trip, because there is a chance that cod could be caught on a groundfish trip. Trip level declarations would provide more flexibility than seasonal or annual for the fleet to choose in which sub-area to fish for groundfish.

4.5 REDFISH EXEMPTION AREA

4.5.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5” minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption published in the FY 2015-2016 Sector Rule regarding redfish is as follows. Allow commercial vessels fishing in sectors to use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015c).

Stipulations:

1) Prior to leaving the dock, vessel operators would be required to declare their intent to fish in the Redfish Exemption Area through the Vessel Monitoring System (VMS) by checking the box next to "Redfish Trip";
2) In the first part of the trip, vessel operators could fish with conventional groundfish codends (6.5”) in the GOM and GB regulated mesh areas, except when towing a separator trawl on GB where the codend may be 6”;
3) Vessel operators would be allowed to switch to 5.5” (or larger) codend at the end of the trip after submitting VMS notification;
4) Vessel operators would report catch from the entire trip (incl. redfish and non-redfish portions) through the VMS prior to returning to port; and
5) Vessel operators would submit a separate Vessel Trip Report to report catch for each codend.

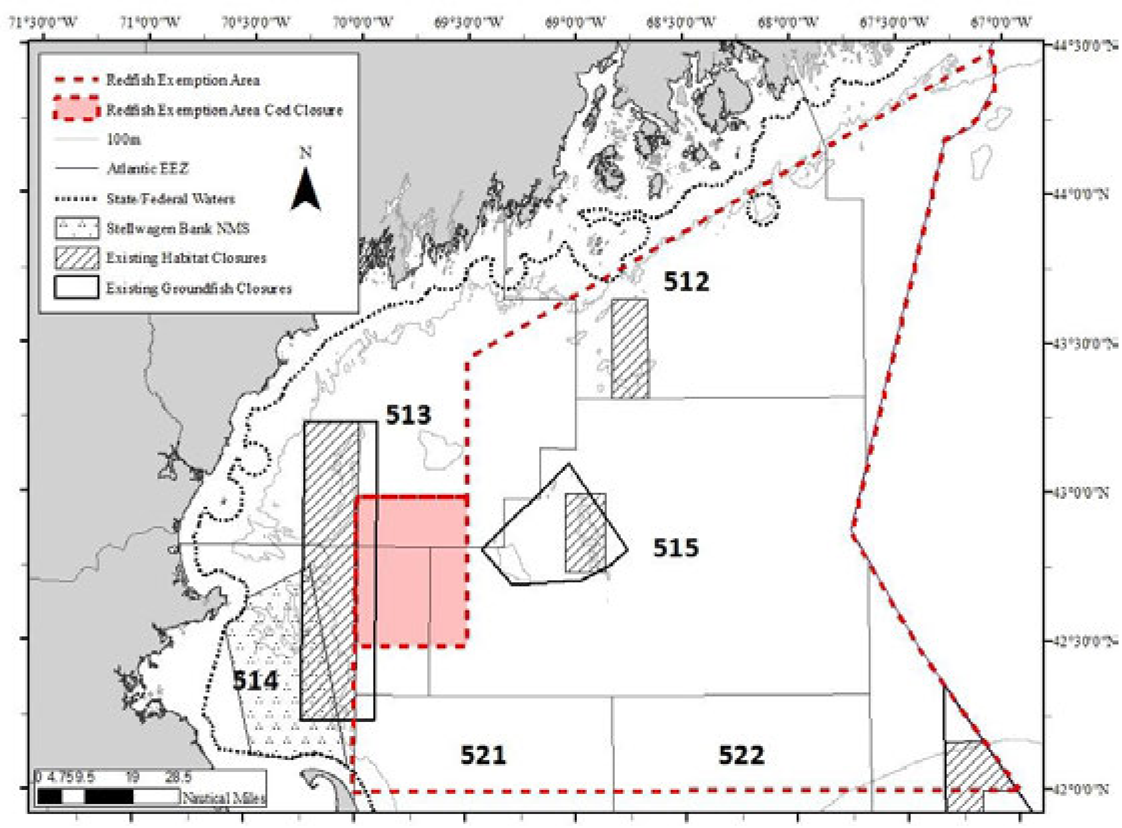
Rationale: The sector exemption approval process allows NMFS to determine annually if requested exemptions are appropriate for groundfish sectors in a given fishing year, and/or if they could potentially be modified in response to a management need or opportunity (e.g., improved catch efficiency). Relative to the sector exemption approved for FY 2014, vessels would not be able to use the exemption in Statistical Reporting Area 131 in February and March, due to the presence of GOM cod and the potential for bycatch of this stock. Also, Area 138 would not be included because there has been very little redfish catch in that area historically.

Table 12 - Coordinates for the sector redfish exemption area approved for FY 2015-2016 and included in Alternative 2

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

[a] The intersection of 42°00' N. latitude and the U.S.-Canada Maritime Boundary. Longitude is approximate.

Figure 4 - Map of the sector redfish exemption area approved for FY 2015-2016 and included in Alternative 2



4.5.2 Alternative 2: Establish a Redfish Exemption Area within the FMP

(PREFERRED ALTERNATIVE) Establish in the fishery management plan that commercial vessels fishing in sectors may use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Approval through the annual (or biennial) sector operations plan approval process would not be necessary. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage levels are considered. Sectors may continue to request other exemptions related to redfish.

Stipulations:

1) Prior to leaving the dock, vessel operators could be required to declare their intent to fish in the Redfish Exemption Area through the Vessel Monitoring System (VMS) by checking the box next to "Redfish Trip";
2) In the first part of the trip, vessel operators would fish with conventional groundfish codends (6.5”) in the GOM and GB regulated mesh areas, except when towing a separator trawl on GB where the codend may be 6”;
3) Vessel operators would be allowed to switch to 5.5” (or larger) codends at the end of the trip after submitting VMS notification;
4) Vessel operators would report catch from the entire trip (incl. redfish and non-redfish portions) through the VMS prior to returning to port; and
5) Vessel operators would submit a separate Vessel Trip Report to report catch for each codend.

Differences between Alternative 2 and the proposed FY 2015 and 2016 Sector Rule:

- Alternative 2 would incorporate this exemption into the FMP, so that sectors would no longer need to make annual exemption requests (though they could still do so for other exemptions).
- Alternative 2 would approve this exemption indefinitely, rather than through FY 2016.

Rationale: Alternative 2 would encourage vessels to target redfish, which is currently under-harvested. Sectors would no longer need to request a redfish exemption, reducing administrative burden of the annual exemption request process. The mesh size would allow greater retention of redfish than a standard net. Recent studies of the REDNET project show that vessels can selectively target redfish with minimal bycatch, though this work has not yet been peer-reviewed (Pol & He 2014). The intent is to not supersede or allow fishing under this exemption in any existing or future closed areas within the Redfish Exemption Area boundary.

Commercial Catch Monitoring - *The Council may select Option A or B.*

(THE COUNCIL HAS NOT YET SELECTED A PREFERRED ALTERNATIVE)

Option A. Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

Rationale: This option would keep the catch monitoring rate consistent across the fishery and not impact the random-stratified design of the observer program.

Option B. Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

Rationale: This option would fully account for the catch of target and nontarget species on exempted trips.

5.0 ALTERNATIVES CONSIDERED BUT REJECTED

5.1 SPLIT PERMIT AND/OR PSC

5.1.1 Split Groundfish Permits off of a Suite of Limited Access Permits

5.1.1.1 Alternative 2: Permit Splitting

Northeast Multispecies permits may be split off of a suite of limited access permits.

Rationale for not including Section 5.1.1: Permit splitting would best be accomplished via an omnibus amendment. Limited access permits were linked by an omnibus consistency amendment in the late 1990s (NMFS 1999). Splitting off multispecies permits has the potential for implications in other fisheries, particularly if effort in other fisheries is increased. Such shifts may not pose problems for the managed stocks per se, as they are managed under catch limits. However, the habitat and protected resources impact analyses often examine the potential for spatial and temporal effort shifts within a fishery. Depending on the magnitude of shifts, this could have minor to significant impacts that may be difficult to predict how shifts may occur, because that requires being able to forecast fishing behavior. If there is a desire to control potential effort shifts into other fisheries, this might require some development of restrictions in those fisheries and FMPs. The groundfish plan could only make permit changes that are applicable to groundfish permits, and without making the changes to other FMPs, some permit holders might wind up with a groundfish permit that cannot be added or combined to any other permit. Permit splitting has the potential to advance consolidation in the fishery, particularly without an accumulation limit in place.

5.1.2 Split Groundfish PSC off of a Suite of Limited Access Permits

5.1.2.1 Alternative 2: PSC Splitting

The Potential Sector Contribution (PSC) for any specific Northeast Multispecies stock may be split off of a suite of limited access permits.

Rationale for not including Section 5.1.2: PSC splitting would involve too much administrative complication. Splitting PSC of a multispecies stock off of a suite of permits is possible, but could greatly increase tracking complexity. It may not be possible to detach PSC from the multispecies permit it is associated with, without splitting said permit. There could be significant implementation challenges if permit or PSC splitting is recommended for implementation. The Analysis and Support Division of the GARFO should be consulted on the feasibility of specific approaches.

5.2 VESSEL UPGRADE RESTRICTIONS

Alternatives: Alternatives were never developed in detail.

Rationale for not including Section 5.2: Vessel upgrade restrictions would best be accomplished via an omnibus amendment, but that change to vessel length and horsepower provisions should also be considered. GARFO is proposing an omnibus amendment to all FMPs to modify the fishing vessel baseline specifications and upgrade restrictions (NOAA 2015). This action was submitted by the NEFMC and MAFMC, with implementation targeted for fall 2015. The proposed action would be fairly narrow:

1. Remove the gross and net tonnage restrictions from baseline and upgrade restrictions; and
2. Remove the one-time upgrade restriction.

GARFO is not proposing changes to the vessel length or horsepower provisions, so those elements would remain as part of the vessel baseline, and upgrades would continue to be restricted to 10% of the baseline length and 20% of the baseline horsepower.

5.3 ACCUMULATION LIMITS

5.3.1 Regulatory Definition of a Nonprofit Permit Bank

5.3.1.1 Alternative 2: Defining a Nonprofit Permit Bank

Definition:

An entity shall be considered a nonprofit permit bank under the following criteria:

1. It is a partnership, voluntary association, or other nonprofit entity established under the laws of the U.S.;
2. It holds Northeast Multispecies permits/MRIs;
3. It maintains transparent qualification criteria and application processes for the distribution of ACE to fishermen; and
4. It must distribute ACE to at least three distinct business entities in any fishing year.

Other Conditions:

A. Nonprofit permit banks shall not be allocated ACE, but must join a groundfish sector.

B. Nonprofit permit banks shall comply with existing and relevant leasing and transfer regulations that currently apply to sectors and individual permit-holders including lease reporting protocols, size-class or baseline restrictions (in the vessel transfer provisions), etc.

C. Nonprofit permit banks will be approved annually by the National Marine Fisheries Service, provided a complete application has been submitted by agreed upon deadlines. NMFS will ensure that all requirements listed above are fully and satisfactorily met prior to approval.

D. Nonprofit permit banks shall submit a performance report annually to the National Marine Fisheries service, which shall be a public document. These reports shall explain how the above qualification criteria were met.

Rationale: State-operated permit banks have already been defined through Amendment 17 to the Northeast Multispecies FMP. If permit banks are to be treated differently than other permit holders in terms of accumulation limits, a definition would be necessary to identify the other entities to which these alternatives would apply. Like state-operated permit banks, a nonprofit permit bank is designed to transfer groundfish allocations to active groundfish vessels in need of assistance. Unlike state-operated permit banks, nonprofit permit banks do not have an agreement with NMFS or any state agency, but are independent nonprofit entities.

Rationale for not including Section 5.3.1: Alternatives defining nonprofit permit banks are unnecessary at this time. Several ideas for a definition of nonprofit permit banks were discussed. These entities provide a public good, support fleet diversity, and should have a higher accumulation cap than other entities. On the other hand, there has been concern that the collective holdings of permit banks should be limited, as they compete with active fishermen for PSC and may, collectively, accumulate too much quota. Additional regulations are unnecessary to help permit banks achieve their missions and that a higher accumulation limit for them may result in an unfair advantage over commercial fishermen. Several aspects of Alternative 2 would need further development if a definition were to be considered in the future, as presented below.

Supporting the public good: If permit banks are to be used as a tool to support the public good, it could be further clarified what sort of public good should be achieved. Under Alternative 2 as drafted, a permit bank has free choice to limit to who and how much of its ACE would be available, though technically, a sector controls who the ACE is distributed to, not its members. Also, the "three distinct business entities" that it must distribute ACE to could be board members of the permit bank or owned by the same person. It has not yet been clarified what public good these entities should be achieving.

Preventing permit bank control of the fishery: If this is a desired outcome, then Alternative 2 would need further refinement, since becoming formally recognized as a nonprofit permit bank would be voluntary, as drafted. There could be many small permit banks that, in total, hold a great deal of quota. Additionally, Alternative 2 does not specify how much ACE a recognized nonprofit permit bank must lease out or how many nonprofit permit banks a nonprofit entity may have.

Requiring official nonprofit status: Nonprofit organizations may earn a profit and invest those profits (e.g., in the stock market) with the intent of earning more money. However, all of the money made by the organization must be held by the organization. Profit sharing by members/owners is not allowed. Individual states grant official nonprofit status, and they may do so in slightly different ways. To avoid an accumulation limit, a nonprofit entity could create more than one nonprofit permit bank.

Maintaining transparent qualification criteria and application processes: Unless otherwise recommended by the Council, NMFS may interpret "maintain" and "transparent" in Alternative 2 as requiring that a sector operations plan, a public document, detail if it has any nonprofit permit bank members that have been approved by NMFS and how those permit banks plan to distribute their ACE. The actual distribution of that ACE would be difficult to control, because the distribution of sector ACE is made by sectors themselves.

NMFS cannot enforce distribution of ACE within a sector: As long as nonprofit permit banks have to join a sector, as in Alternative 2, NMFS would be unable to enforce Criterion #4 that requires that ACE be distributed to at least three business entities. This criterion is inconsistent with current accounting practices, and would require a change in how ACE distribution is monitored. Currently, it is up to a sector to decide how its allocated ACE is distributed; NMFS does not have the authority to control within-sector ACE distribution. This control would require individual allocations (i.e., a LAPP). One approach may be to require that nonprofit permit banks be distinct from sectors. When sectors and the ACE trading process were established, it was specifically decided that since trading happens at the sector level, NMFS was not going to replicate tracking of DAS. NMFS had tracked DAS and how many DAS were leased in, the hierarchy of order which DAS were used (leased DAS first, then carry-over DAS, then allocated DAS, because you couldn't re-lease DAS or carry-over twice). NMFS intentionally did not engineer ACE tracking at an individual level. To back engineer that would require both a change to individual allocations (a huge issue that would require a referendum) and there would have to be a new administrative system to support it.

Requiring public reports: The condition that the annual reports be public would require additional development. Currently, the annual reports submitted by state-operated permit banks and sectors are not public documents, because of certain confidential data they contain. It would need to be clarified what nonconfidential content such public reports should include.

Leasing at or below market values: It would be difficult (if not impossible) to enforce this criterion, and would require more reporting than currently practiced. First, NMFS would have to be able to determine the daily market rate for leasing ACE of all stocks. Generally, the government has difficulty on its own determining prices in a competitive market. Currently, sectors do submit price data to NMFS, but this is voluntary and only for inter-sector trades. Also, these prices are not necessarily stock-specific. Second, nonprofit permit banks would need to show receipts or other proof of sales price that correlate with the daily-fluctuating market rate. The only way to enforce this is to have required reporting of prices and a way to validate the price.

5.3.2 Limit Holdings of Permit Banks Collectively

5.3.2.1 Alternative 2: Limit Holdings of Permits by Permit Banks Collectively

For any single fishing year, all permit banks, public and nonprofit, shall hold no more than X% of Northeast Multispecies permits.

Rationale for not including Section 5.3.2: An aggregate cap on permit bank holdings may prevent new permit banks from forming in the future. Without a collective cap, permit banks may acquire and control a large share of fishery access privileges.

5.3.3 Limit Use of PSC

5.3.3.1 Alternative 2: Limit Use of PSC

For any single fishing year, no individual, or business entity shall harvest through allocated and acquired fishing access privileges more than X% of a stock-specific PSC. Those individuals or business entities holding permits/MRIs prior to the control date (April 7, 2011) will be restricted to harvesting[2] the percent of stock-specific PSC harvested as of the control date unless the allocated and acquired fishing access privileges exceeds the maximum percentage (X%) in which case harvesting will be allowed up to allocation/acquired percentage held as of the control date.

Rationale for not including Section 5.3.3: There is too much variability in ACLs and catch each year to make a fixed limit on usage work, and that the utility of permits purchased after the control date would be limited, because each permit has a unique portfolio of PSC associated with

[2] The PDT has suggested that since "harvest" typically refers to landings and discards, it would be easier to constrain just landings, rather than landings and discards, since discards are not estimated for individual entities.

it. Logistically, this could involve tracking the allocations, leasing and catch of individual entities, which may be difficult since allocations are made to sectors.

5.3.4 PSC Holdings in Excess of Accumulation Limit

5.3.4.1 Grandfathering Current Holdings that are in Excess of an Accumulation Limit

Option A. Do not grandfather current holdings. Under this option, if an individual or entity held more PSC than the accumulation limit as of the implementation of Amendment 18, the individual or entity would be restricted to holding no more than the accumulation limit. Current holdings that result in exceeding the PSC holdings limit would need to be divested (permits sold or not renewed).

Rationale: This option would ensure that the current holdings of all permit holders do not exceed the accumulation limit upon establishment of this action.

Example: If the PSC limit for a stock is X, and one's holdings as of the implementation date = X+3, the permits associated with a PSC of 3 would have to be divested.

Rationale for not including Section 5.3.4.1: A permit holder should not have to divest holdings above the accumulation limit, which would disrupt the fishery.

5.4 HANDGEAR A PERMIT FISHERY

5.4.1 Alternative 2: Establish a Fishery for Handgear A Permits

[All other options under Alternative 2 remain in Section 4.2.1.2.]

Option: Grandfathering

Under this option, HA permit holders may opt to enroll in a sector versus the HA fishery. For HA permits enrolling in sectors, the PSC contribution of those permits would be included in the sector sub-ACL rather than the HA fishery sub-ACL. In sectors, the PSC associated with HA permits may only be used by HA fishermen that are using handgear. All HA permit holders who enrolled in sectors in FY 2012 and FY 2013 and leased their ACE to active fishermen of other gear types may continue to do so.

Rationale for not including Section 5.4.1: Because NMFS cannot currently control how ACE is used once it has been distributed to a sector, this option would be inconsistent with current practice.

5.5 TRADING U.S./CANADA TACS

5.5.1 Alternative 2: Allow In-season Trades of U.S./Canada Stocks

The Regional Administrator would be allowed to adjust the U.S./Canada TACs for the transboundary GB stocks (Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder), consistent with any trade agreed upon with Canada, during the fishing year. Prior to approving a trade, NMFS would consult with the Council and would advise the Council what trades were under consideration. Any trade between the U.S. and Canada would also be approved by the appropriate U.S./Canada management body (i.e., the Transboundary Management Guidance Committee and/or U.S./Canada Steering Committee). Table 13 contains a possible in-season trading timeline. *The Council may select Option A and B.*

Table 13 - Possible in-season U.S./Canada quota trading timeline

Month	Canada	U.S.
September	Request for trade made by Canada and/or U.S. through Transboundary Steering Committee (including species, ratio, quantities)	
		U.S. receives further input on proposed trade from Council and sectors
October	Canada receives further input on proposed trade from Gulf of Maine Advisory Committee (GOMAC); Proposal forwarded to Groundfish fleet to determine level of interest	
	U.S. or Canadian Co-Chair responds to proposed trade; (accept/counter/decline)	
November/ December	If U.S. counters, Canada receives further input on offer from Gulf of Maine Advisory Committee (GOMAC)	If Canada counters, U.S. receives further input on offer from Council and sectors
	Counter offer accepted or declined	
	Final approval of quota trade by Minister.	NMFS publishes notice in Federal Register of revised U.S./Canada TACs for current fishing year; revisions to U.S./Canada TACs for upcoming fishing year incorporated into Council action
January	**Start of Canadian fishing year**	
May		**Start of U.S. fishing year**
Note: Canada's GOMAC only meets at specified times of the year (typically March and October).		

Option A. Allow in-season trades of sector sub-ACL Only the quota of the overall sector sub-ACL would be traded away and received as a result of a trade with Canada. Any changes to the overall sector sub-ACL would be applied to sectors based on the cumulative PSCs for the respective stock held by each sector.

Rationale: This option would apply any trade to only the commercial groundfish sector fishery component, with quota given/received only distributed to the overall sector sub-ACL. This would ensure that only the component of the fishery trading away quota would benefit from any additional quota received from Canada. This mechanism would increase flexibility for the sector fishery by potentially providing additional quota for limiting stocks, which could increase fishing opportunities for sector vessels.

For example, if the U.S. receives 50 mt of yellowtail flounder quota in FY 2015, and gives Canada 100 mt of haddock for FY 2016:

- The overall sector sub-ACL for GB yellowtail flounder would be increased in-season by 50 mt for FY 2015, and the additional quota would be distributed to each sector based on the cumulative PSCs for GB yellowtail flounder in that sector; and
- The overall sector allocation for GB haddock that is specified to the Eastern U.S./Canada Area would also be reduced by 100 mt for the upcoming fishing year (FY 2016) consistent with the trade (Note: This would reduce the total U.S. TAC for eastern GB

haddock for FY 2016, but the reduction would only be applied to the overall sector allocation.).

Option B. Allow in-season trades of sector ACE (Committee-recommended *Preferred Alternative)* Any groundfish sector may voluntarily participate in a trade with Canada. A sector(s) could choose to contribute to a trade with Canada by notifying the Regional Administrator how much of its ACE for any U.S./Canada stock it was willing to provide. Only sectors in compliance with the necessary reporting and administrative requirements would be permitted to participate in any trades with Canada. The Regional Administrator would then propose this trade with Canada. If approved, the sector(s) would receive the ACE that results from the trade.

Rationale: This option would apply any trade to only the groundfish sectors that voluntarily participate in a trade by contributing ACE of the respective stock. This option would ensure that only the sectors that agreed to participate would be affected by any trade with Canada. This option increases flexibility for sectors, and allows sectors to contribute as little, or as much, ACE as desired towards any trade with Canada. This provides sectors the ability to maximize the benefits of the U.S./Canada trading process by increasing quota for limiting stocks as much as possible to increase fishing opportunities for their vessels.

For example, if the U.S. receives 50 mt of yellowtail flounder quota in FY 2015, and gives Canada 100 mt of haddock quota for FY 2015:

- For those sectors that contributed haddock ACE to the trade, their ACE of GB yellowtail flounder for FY 2015 would be increased proportional to the amount of haddock ACE contributed by that sector; and
- For each sector that voluntarily contributed haddock ACE, the sector's ACE of GB haddock that is specified for the Eastern U.S./Canada Area for FY 2015 would be reduced by the amount contributed.

Rationale for not including Section 5.5: Additional work by the U.S. (e.g., A18 measures) is necessary to enable in-season trading, though trading is unfeasible for the foreseeable future given current stock levels. It is preferable to focus on more near-term priorities.

Details needing further development: These questions should be considered if the development of in-season trading measures is taken up through a future action:

1. Should there be a limit on the number of trades that may be negotiated per year?
2. Should there be constraints on the timing for proposing and negotiating a trade?
3. Should there be a minimum size threshold for a proposed trade?
4. What is the rationale for not developing options for allowing the common pool to participate in an in-season trade?
5. Before trades may be offered to Canada, should a right of first refusal be allowed for other groundfish sectors or other U.S. fisheries (e.g., the scallop fishery) to benefit from the available quota?
6. What degree of Council consultation is envisioned? Prior to approving a trade, should NMFS consult with just the Groundfish Committee or the entire Council?

6.0 AFFECTED ENVIRONMENT

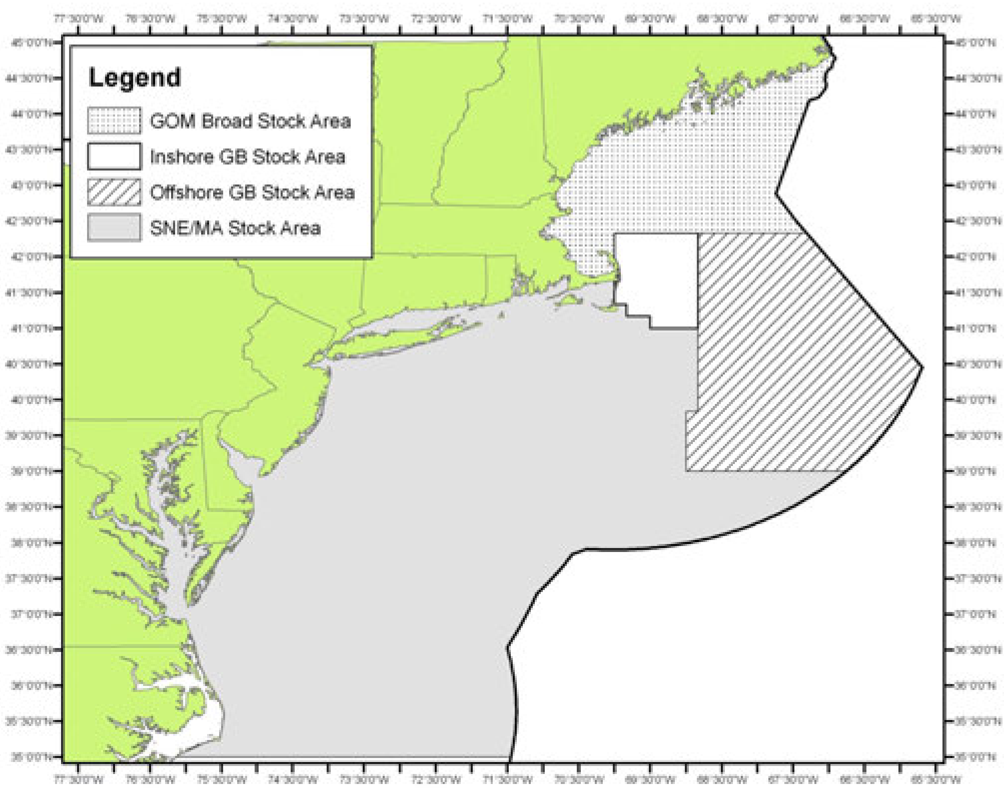
The Affected Environment is described in this document based on valued ecosystem components (VECs), including: target species, nontarget species, physical environment and Essential Fish Habitat (EFH), protected resources, and human communities.

VECs represent the resources, areas and human communities that may be affected by the management measures under consideration in this amendment. VECs are the focus, since they are the "place" where the impacts of management actions are exhibited.

6.1 TARGET SPECIES

This section describes the life history and stock population status for each allocated fish stocks harvested under the Northeast Multispecies FMP. Figure 5 identifies the four broad stock areas used in the fishery. Further information on life history and habitat characteristics of the stocks managed in this FMP can be found in the Essential Fish Habitat Source Documents (NEFSC 2011c).

Figure 5 - Broad stock areas as defined in Amendment 16



The allocated target stocks for the Northeast Multispecies FMP are: GOM Cod, GB Cod, GOM Haddock, GB Haddock, American Plaice, Witch Flounder, SNE/MA Winter 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 Northeast Multispecies FMP also manages Atlantic halibut, ocean pout, windowpane flounder, and wolffish. While OFLs, ABCs, and ACLs are specified for these stocks, they were not allocated to sectors through Amendment 16. These species are discussed in Section 6.2.

The following discussions have been adapted from the most recent stock assessment reports (NEFSC 2013f). Table 14 summarizes the status of the northeast groundfish stocks, which groundfish stocks are overfished or are experiencing overfishing. For FY 2014, a total of nine stocks were overfished ($B < ½ B_{MSY}$) while ten stocks were not overfished. Similarly, a total of five stocks were experiencing overfishing ($F > F_{MSY}$) while 13 stocks were not experiencing overfishing. Five of the stocks are both overfished and experiencing overfishing. Nine stocks were classified as not overfished and not experiencing overfishing. The status of two stocks is unknown.

Table 14 - Status of the Northeast groundfish stocks for FY 2014

Stock Status	Stock	Assessment Source
Overfished, Overfishing		
Biomass < ½ B_{MSY} $F > F_{MSY}$	GB Cod	55th SAW (NEFSC 2013b)
	GOM Cod	Update assessment
	Cape Cod/GOM Yellowtail Flounder	Assessment update (NEFSC 2012b)
	Witch Flounder	Assessment update (NEFSC 2012b)
	Northern Windowpane	Assessment update (NEFSC 2012b)
Overfished, not Overfishing		
Biomass < ½ B_{MSY} $F \leq F_{MSY}$	Ocean Pout	Assessment update (NEFSC 2012b)
	Atlantic Halibut	Assessment update (NEFSC 2012b)
	Atlantic Wolffish	Assessment update (NEFSC 2012b)
	SNE/MA Winter Flounder	52nd SAW (NEFSC 2011b)
Not Overfished, Overfishing		
Biomass ≥ ½ B_{MSY} $F > F_{MSY}$		
Not Overfished, not Overfishing		
Biomass ≥ ½ B_{MSY} $F \leq F_{MSY}$	Acadian Redfish	Assessment update (NEFSC 2012b)
	American Plaice	Assessment update (NEFSC 2012b)
	GB Haddock	Assessment update (NEFSC 2012b)
	GB Winter Flounder	Operational Assessment (NEFSC 2015)
	GOM Haddock	59th SAW (NEFSC 2014)
	Pollock	Operational Assessment (NEFSC 2015)
	White Hake	56th SAW (NEFSC 2013c)
	SNE/MA Yellowtail Flounder[a]	54th SAW (NEFSC 2012a)
	Southern Windowpane	Assessment update (NEFSC 2012b)
Unknown		
	GB Yellowtail Flounder	2014 TRAC (TRAC 2014)
	GOM Winter Flounder	Operational Assessment(NEFSC 2015)

Notes:
B_{MSY} = biomass necessary to produce maximum sustainable yield (MSY)
F_{MSY} = fishing mortality rate that produces the MSY
[a] Rebuilding, but no defined rebuilding program due to a lack of data.

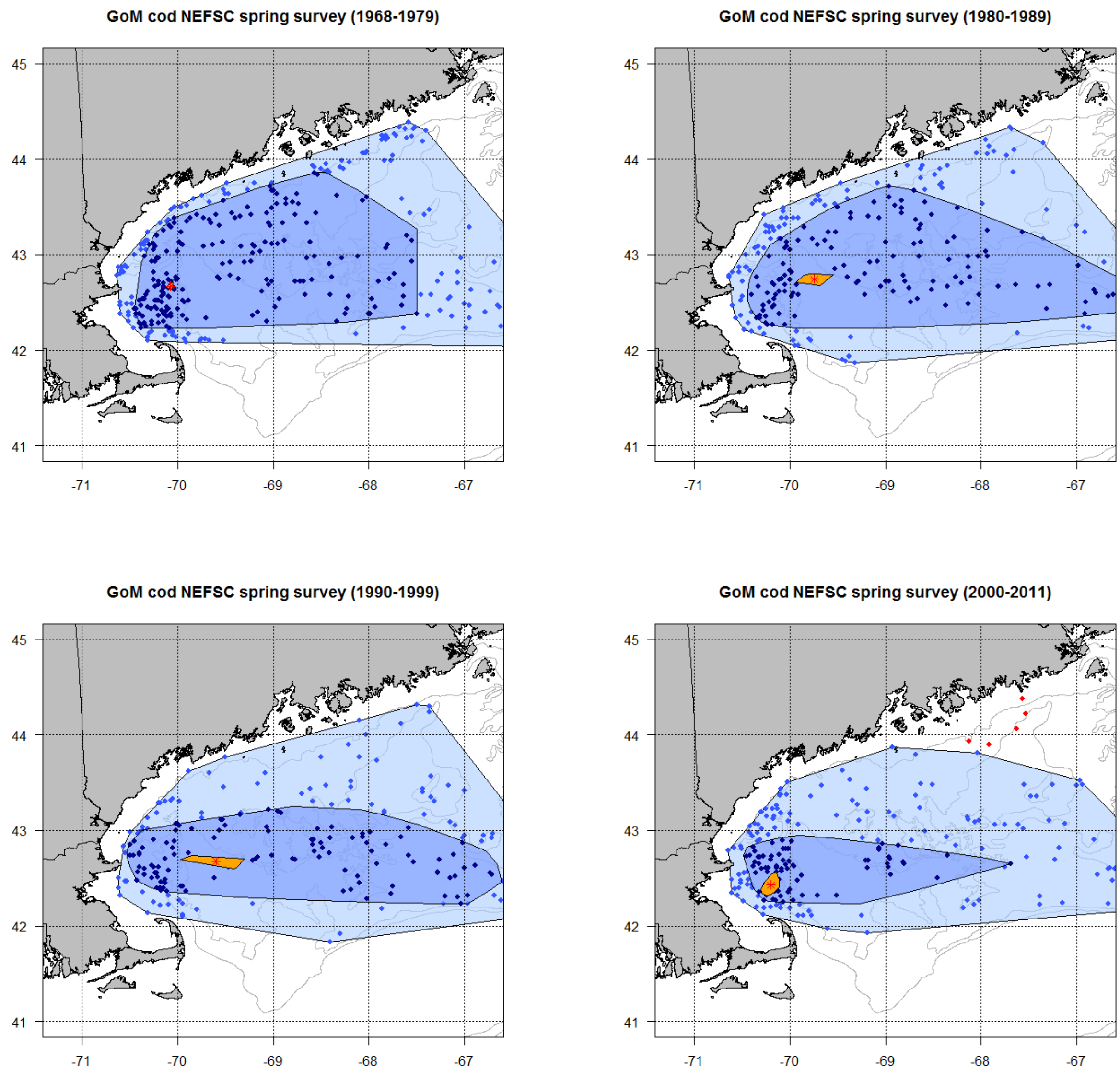
6.1.1 Gulf of Maine Cod

Life History. The Atlantic cod, *Gadus morhua*, is a demersal gadoid species found on both sides of the North Atlantic. In the western North Atlantic, cod occur from Greenland to North Carolina. In U.S. waters, cod are assessed and managed as two stocks: GM and GB. GOM cod attain sexual maturity at a later age than GB cod due to different growth rates between the two stocks. The greatest concentrations of cod off the U.S. Northeast coast are on rough bottoms 33 - 492 ft (10 - 150 m) deep and at 32 - 50°F (0 - 10°C). Spawning occurs year-round near the ocean bottom, with a peak in winter and spring. Peak spawning corresponds to 41 - 45°F (5 - 7°C) water. It is delayed until spring when winters are severe and peaks in winter when mild. Eggs are pelagic, buoyant, spherical, and transparent. They drift for 2 - 3 weeks before hatching. The larvae are pelagic for about three months until reaching 1.6 - 2.3 in (4 - 6 cm), when they descend to the seafloor. Most remain on the bottom, and there is no evidence of a subsequent diel, vertical migration. Adults tend to move in schools, usually near the bottom, but also occur in the water column (NEFSC 2011c).

Population Status. The inshore GOM stock appears to be relatively distinct from the offshore cod stocks on the banks of the Scotian Shelf and Georges Bank based on tagging studies. GOM cod spawning stock biomass is estimated to have been just over 22,000 mt in 1982. After a period of decline in the 1980's, SSB returned to roughly 20,000 mt in 1990 before decreasing again in the 1990's. The use of separate assessment models (M=.2 and M-ramp) in the last two assessments yield two estimates for SSB in recent years, though both indicate a shape decline in SSB since 2010. The stock remains low relative to historic levels and is subject to a formal stock rebuilding plan. The 2013 biomass estimate, the most recent estimate available, was 3-4% percent of the biomass rebuilding target. Currently, the GOM cod stock is overfished and overfishing is occurring (Palmer 2014).

Population Distribution. Data from cod survey catches (weight) and locations from NEFSC spring bottom-trawl surveys, 1968-2011, show that the GOM cod stock appears to have concentrated into Statistical Reporting Area (SRA) 514 in the area around Stellwagen Bank, whereas in the past GOM cod was more widely distributed (NEFMC 2014b). Other information from a recent NMFS stock assessment report (NEFSC 2013a) shows similar broad-scale patterns (e.g., proportional distribution plots, Gini indices, centroids, landings trends) as does the recent survey report from the Maine-New Hampshire inshore GOM trawl survey (Sherman et al. 2012). 2013). Furthermore, the cod industry-based survey, in 2003-2007, was designed to examine the distribution of cod in the GOM, and determined that cod biomass is centered in the western GOM with few fish found in the eastern GOM.

Figure 6 - Bagplots of GOM cod survey catches shown for 10-year groupings, 1968-2011



Notes:
The red asterisk is the bivariate median (catch weighted Lat, Lon). The orange area is approximate 95% confidence interval for differences in bivariate median. The dark blue area contains the middle 50% of the data (the interquartile range, IQR). The light blue area encompasses approximately upper quartiles up to around 1 and 99%. The red dots outside of these areas are outliers (i.e., low survey catches in waters off the coast of Downeast Maine; 2000-2011).
Source:
NEFMC spring bottom-trawl surveys, 1968-2011 NEFMC (2014b).

6.1.2 Georges Bank Cod

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

Population Status. GB cod is a transboundary stock co-managed by the U.S. and Canada. The GB cod stock underwent a benchmark assessment in 2012, which indicated that the stock is overfished and overfishing is occurring. SSB in 2011 was estimated to be 13,216 mt which is 7% of the SSB_{MSY} (186,535 mt). The 2011 fully recruited fishing mortality (ages 5+) is estimated to be 0.43, which is more than twice as high as the F_{MSY} (0.18). The assessment model exhibits a strong retrospective pattern (tending to overestimate SSB and underestimate F), which was corrected for when providing the estimates of SSB and F for 2011, stock status and projection starting points (NEFSC 2013b).

6.1.3 Gulf of Maine Haddock

Life History. Gulf of Maine haddock, *Melanogrammus aeglefinus*, is a demersal gadoid species found in the North Atlantic Ocean, occurring from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland. Six distinct haddock stocks have been identified, and two occur in U.S. waters associated with Georges Bank and the Gulf of Maine. Haddock are highly fecund broadcast spawners, spawing over various substrates including rocks, gravel, smooth sand, and mud. In the Gulf of Maine, spawning occurs from early February to May, usually peaking in February to April. Haddock release their eggs near the ocean bottom in batches where a courting male then fertilizes them. Fertilized eggs become buoyant and rise to the surface water layer and remain in the water column to development. Larvae metamorphose into juveniles in roughly 30 to 42 days at lengths of 0.8 to 1.1 in (2 - 3 cm). Juveniles initially live in the epipelagic zone and remain in the upper water column for 3 - 5 months, but they visit the seafloor in search of food. They settle into a demersal existence once they locate suitable habitat. Haddock do not make extensive migrations, but prefer deeper waters in the winter and tend to move shoreward in summer (NEFSC 2011c).

Population Status. The GOM haddock underwent a benchmark assessment in 2014, which indicated that the stock is not overfished, and overfishing is not occurring. The 2013 SSB is estimated at 4,153 mt, above the <2,452 mt overfishing threshold, a change from the 2012 assessment update when the stock was experiencing overfishing. Fishing mortality has been below F_{MSY} since 1992 (NEFSC 2014).

6.1.4 Georges Bank Haddock

Life History. The life history of GB haddock, *Melanogrammus aeglefinus*, is comparable to the GOM haddock (Section 6.1.3). On Georges Bank, spawning occurs from January to June, usually peaking from February to early-April. This is the principal haddock spawning area in the Northeast U.S. Shelf Ecosystem, concentrating on the northeast peak of Georges Bank. Median age and size of maturity differ slightly between the GB and GOM haddock stocks (NEFSC 2011c). The GOM haddock have lower weights at age than the GB stock and the age at 50% maturity was also lower for GOM haddock than GB haddock.

Population Status. The GB haddock stock is a transboundary stock co-managed by the U.S. and Canada. The stock is not overfished and overfishing is not occurring. The fishing mortality rate for this stock has been low in recent years. There has been a steady increase in SSB from ~15,000 mt in the early 1990s, to about 252,000 mt in 2007. The dramatic increase 2005 - 2007 is due to the exceptionally large 2003 year class reaching maturity. From 2007 - 2010, SSB decreased 35% as that 2003 year class decreased due to natural and fishing mortality. The fishing mortality rate for this stock has been low in recent years. Substantial declines have recently occurred in the weights at age due to slower than average growth. This was particularly true of the 2003 year-class. This decline is affecting productivity in the short-term. The growth of subsequent year-classes is returning to the earlier rates (NEFSC 2012b).

6.1.5 American Plaice

Life History. American plaice, *Hippoglossoides platessoides*, is an arctic-boreal to temperate-marine pleuronectid (righteye) flounder that inhabits the continental shelves of the North Atlantic. Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine-Georges Bank region. American plaice are batch spawners, releasing eggs in batches every few days over the spawning period. Adults spawn and fertilize their eggs at or near the bottom. Buoyant eggs lack oil globules and drift into the upper water column. Eggs hatch at the surface and the time between fertilization and hatching varies with water temperature. Transformation of the larvae and migration of the left eye begins when the larvae are ~0.8 in (20 mm). Dramatic physiological transformations occur during the juvenile stage; the body shape flattens and widens. As the migration of the left eye across the top of the head to the right side reaches completion, descent towards the seafloor begins. In U.S. and Canadian waters, adult American plaice are sedentary, migrating only for spawning and feeding (NEFSC 2011c).

Population Status. In the Gulf of Maine and Georges Bank, the American plaice is not overfished and overfishing is not occurring. Commercial catch has declined since 1995. However, a stock assessment conducted in 2012 indicates that the stock will not rebuild by 2014 to the SSB_{MSY} of 18,398 mt, the currently specified rebuilding target date, even if no fishing is allowed on the. Because of this inadequate rebuilding progress, a revised rebuilding program is necessary and will be developed for use no later than May 1, 2014 (NEFSC 2012b).

6.1.6 Witch Flounder

Life History. Witch flounder, *Glyptocephalus cynoglossus*, is a demersal flatfish distributed on both sides of the North Atlantic. In the western North Atlantic, the species ranges from Labrador southward, and closely associates with mud or sand-mud bottom. In U.S. waters, witch flounder are common throughout the Gulf of Maine, in deeper areas on and adjacent to Georges Bank, and along the shelf edge as far south as Cape Hatteras, North Carolina. Witch flounder is managed as a unit stock. Spawning occurs at or near the bottom; however, the buoyant eggs rise into the water column where subsequent egg and larval development occurs. The pelagic stage of witch flounder is the longest among the species of the family Pleuronectidae. Descent to the bottom occurs when metamorphosis is complete, at 4 - 12 months of age. There has been a decrease in both the age and size of sexual maturity in recent years. Witch flounder spawn from March to November, with peak spawning occurring in summer. The general trend is for spawning to occur progressively later from south to north. In the Gulf of Maine-Georges Bank region, spawning occurs from April to November, and peaks from May to August. Spawning occurs in dense aggregations that are associated with areas of cold water. Witch flounder spawn at 32 - 50 °F (0 - 10°C) (NEFSC 2011c).

Population Status. Witch flounder are overfished and overfishing is occurring as of 2010; the spawning stock biomass was 4,099 mt, 41% below SSB_{MSY} (10,051 mt) and 2010 fishing mortality was 0.47, 173% above F_{MSY} (F=0.27). Total catch has declined in recent years and is below the time series average. Spawning stock biomass has shown a general declining trend over the time series (NEFSC 2012b).

6.1.7 Gulf of Maine Winter Flounder

Life History. Winter flounder, *Psuedopleuronectes americanus*, is a demersal flatfish distributed in the western North Atlantic from Labrador to Georgia. Important U.S. commercial and recreational fisheries exist from the Gulf of Maine to the Mid-Atlantic Bight. Winter flounder is managed and assessed in U.S. waters as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Adult GOM winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring. Peak spawning occurs in Massachusetts Bay and south of Cape Cod during February and March, and somewhat later along the coast of Maine, continuing into May. After spawning, adults typically leave inshore areas when water temperatures exceed 59°F (15°C), although some remain inshore year-round. Winter flounder eggs are demersal, adhesive, and cluster together. Larvae are initially planktonic, but 5 - 6 weeks after hatching become increasingly bottom-oriented with metamorphosis, as the left eye migrates to the right side of the body and the larvae become "flounder-like." This finishes by the time the larvae are 0.3 - 0.4 in (8 - 9 mm) long at ~8 weeks old. Newly metamorphosed young-of-the-year winter flounder reside in shallow water where individuals may grow to ~4 in (100 mm) within the first year (NEFSC 2011c).

Population Status. The overfished status remains unknown because a biomass reference point or proxy cannot be determined and an analytical assessment model has not been accepted.

6.1.8 Georges Bank Winter Flounder

Life History. The life history of the GB winter flounder**,** *Psuedopleuronectes americanus*, is comparable to the GOM winter flounder life history (Section 6.1.7) (NEFSC 2011c). On Georges Bank, winter flounder are generally found at depths <82 m (Collette & Klein-MacPhee 2002). There is limited mixing of fish among the three current stock units, with about 1%-3% between the GOM and SNE/MA, about 1% between GBK and SNE/MA, and <1% between GOM and GBK. Also, the GB stock tends to mature the fastest (NEFSC 2011c).

Population Status. GB winter flounder underwent an operational assessment in 2014, which indicated that the stock was not overfished and overfishing was not occurring.

6.1.9 Cape Cod/Gulf of Maine Yellowtail Flounder

Life History. Yellowtail flounder, *Limanda ferruginea*, is a demersal flatfish that occurs from Labrador to Chesapeake Bay. It generally inhabits depths between 131 - 230 ft (40 - 70 m). It is managed as three stocks off the U.S. coast: CC/GOM, GB, and SNE/MA. Spawning occurs from March through August at temperatures of 41 - 54 °F (5 - 12°C), along the continental shelf northwest of Cape Cod. Yellowtail flounder spawn buoyant, spherical, pelagic eggs that lack an oil globule. Pelagic larvae are brief residents in the water column with transformation to the juvenile stage occurring at 0.5 - 0.6 in (11.6 - 16 mm) standard length. There are high concentrations of adults around Cape Cod in spring and autumn. The median age at maturity for females is 2.6 years off Cape Cod (NEFSC 2011c).

Population Status. The CC/GOM yellowtail flounder stock continues to be overfished and overfishing is continuing, as of 2010. The spawning stock biomass (SSB = 1,680 mt) is below the biomass target ($SSB_{MSY\ proxy}$ = 7,080 mt). However, fishing mortality has been declining since 2000 and was at the lowest level observed in the time series in 2009. SSB has been increasing since 2005. There appears to be a moderately strong 2005 year class (NEFSC 2012b).

6.1.10 Georges Bank Yellowtail Flounder

Life History. The life history of the GB yellowtail flounder, *Limanda ferruginea,* is comparable to the Cape Cod/GOM yellowtail (Section 6.1.9). It is a transboundary resource in Canadian and US jurisdictions. The median age at maturity for females is 1.8 years on Georges Bank. Spawning takes place along continental shelf waters of Georges Bank (NEFSC 2011c).

Population Status. The exact status determination for GB yellowtail flounder is unknown, and overfishing is unknown (TRAC 2014).

6.1.11 Southern New England/Mid-Atlantic Yellowtail Flounder

Life History. The life history of the SNE/MA yellowtail flounder, *Limanda ferruginea,* is comparable to the Cape Cod/GOM yellowtail (Section 6.1.11). The median age at maturity for females is 1.6 years off southern New England (NEFSC 2011c).

Population Status. Southern New England/Mid-Atlantic yellowtail flounder is not overfished, not subject to overfishing, and considered rebuilt as of a 2012 assessment (NEFSC 2012a). Spawning stock biomass was estimated to be 3,873 mt and average fishing mortality for ages 4-5 ($F_{4\text{-}5}$) is 0.12. This is a change in the overfishing status from the Groundfish Assessment Review Meeting (GARM) III model results which indicated that overfishing was occurring (NEFSC 2008). Conclusions about whether the stock is overfished depend on which recruitment scenario is used. Spawning biomass has been in decline since 1990. There are some signs of rebuilding from a strong 2005 year class. Fishing mortality has had a decreasing trend since 2001 but remains slightly above F_{MSY}. The assessment concluded that the stock is less productive than previously believed and, as a result, the overall biomass at recently seen low levels represents the rebuilt state of nature for the stock.

6.1.12 Acadian Redfish

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

Redfish are a slow-growing, long-lived, ovoviviparous species with an extremely low natural mortality rate and low fecundity. Redfish fertilize their eggs internally. The eggs develop into larvae within the oviduct, and are released near the end of the yolk sac phase. The release of larvae lasts for 3 – 4 months with a peak in late May to early June. Newly-spawned larvae occur in the upper 10 m of the water column, at 0.4 - 1.0 in (10 – 25 mm). The post-larvae descend below the thermocline when about 1 in (25 mm) in length. Young-of-the-year are pelagic until reaching 1.6 - 2.0 in (40 - 50 mm) at 4 - 5 months old. Therefore, young-of-the-year typically move to the bottom by early fall of their first year. Adult redfish are 9 in (22 cm) or greater. Generally, the size of landed redfish positively correlates with depth. This may be due to differential growth rates of stocks, confused species identification (deepwater redfish are a larger species), size-specific migration, or gender-specific migration (females are larger). Redfish make diurnal vertical migrations linked to their primary euphausiid prey. Nothing is known about redfish breeding behavior. However, fertilization is internal and fecundity is relatively low (NEFSC 2011c).

Population Status. The redfish stock is not overfished and overfishing is not occurring. At a spawning stock biomass of 314,750 mt in 2010, the stock is above the biomass target, $SSB_{MSY\ proxy}$ = 238,000 mt. Spawning biomass has increased substantially since the mid-1990s. Fishing mortality has been below F_{MSY} since 1997.

6.1.13 Pollock

Life History. Pollock, *Pollachius virens*, occur on both sides of the North Atlantic. In the western North Atlantic, it is most abundant on the western Scotian Shelf and in the Gulf of Maine. There is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Although some differences in meristic and morphometric characters exist, there are no significant genetic differences among areas. As a result, pollock are assessed as a single unit. The principal pollock spawning sites in the western North Atlantic are in the western Gulf of Maine, Great South Channel, Georges Bank, and on the Scotian Shelf. Spawning takes place from September to April. Spawning time is more variable in northern sites than in southern sites. Spawning occurs over hard, stony, or rocky bottom. Spawning activity begins when the water cools to near 46 °F (8^{o} C) and peaks when temperatures are ~40 - 43 °F (4.5 - 6^{o}C). Thus, most spawning occurs within a comparatively narrow range of temperatures. Pollock eggs are buoyant and rise after fertilization. The pelagic larval stage is 3 - 4 months, when the small juveniles or “harbor pollock” migrate inshore to inhabit rocky subtidal and intertidal zones. Pollock then undergo a series of inshore-offshore movements linked to temperature until near the end of their second year. At that point, the juveniles move offshore where the pollock remain throughout the adult stage. Pollock are a schooling species and occur throughout the water column. With the exception of short migrations due to temperature changes and north-south movements for spawning, adult pollock are fairly stationary in the Gulf of Maine and along the Nova Scotian coast. Male pollock reach sexual maturity at a larger size and older age than females. Age and size at maturity of pollock have declined in recent years, as has been reported in other marine fish species such as haddock and witch flounder (NEFSC 2011c).

Population Status. The pollock stock was declared rebuilt in 2010 (NEFSC 2010). The stock was assessed in 2014, and is not overfished and overfishing is not occurring (report in prep).

6.1.14 White Hake

Life History. The white hake, *Urophycis tenuis*, occurs from Newfoundland to southern New England and is common on muddy bottom throughout the Gulf of Maine. The depth distribution of white hake varies by age and season. Juvenile white hake typically occupy shallower areas than adults, but individuals of all ages tend to move inshore or shoalward in summer and disperse to deeper areas in winter. The northern spawning group of white hake spawns in late summer (August-September) in the southern Gulf of St. Lawrence and on the Scotian Shelf. The timing and extent of spawning in the Georges Bank - Middle Atlantic spawning group has not been clearly determined. The eggs, larvae, and early juveniles are pelagic. Older juvenile and adult white hake are demersal. The eggs are buoyant. Pelagic juveniles become demersal at 2.0 to 2.4 in (50 - 60 mm) total length. The pelagic juvenile stage lasts about two months. White hake attain a maximum length of 53 in (135 cm) and weigh up to 49 lbs (22 kg). Female white hake are larger than males (NEFSC 2011c).

Population Status. The 2013 assessment for white hake concluded that the stock is not overfished and overfishing is not occurring (NEFSC 2013c). This favorable determination of stock status is a change from the previous stock assessment in which white hake was judged to be overfished and subject to overfishing. Fishing mortality has varied over a wide range since the 1970s but presently is well below the $F_{MSY\ proxy}$. The improving condition of the stock is indicated by the more than three-fold increase in spawning stock biomass from a time series low in 1997.

6.1.15 Southern New England/Mid-Atlantic Winter Flounder

Life History. The life history of SNE/MA winter flounder**,** *Psuedopleuronectes americanus*, is comparable to the GOM winter flounder life history (Section 6.1.7). There is limited mixing of fish among the three current stock units, with about 1%-3% between the GOM and SNE/MA, about 1% between GBK and SNE/MA, and <1% between GOM and GBK (NEFSC 2011c).

Population Status. As of 2010, the SNE/MA winter flounder stock was overfished but overfishing was not occurring. This is an improvement from 2007 when the stock was overfished and was experiencing overfishing. Spawning stock biomass decreased from 20,100 mt in 1982 to a record low of 3,900 mt in 1993 and then increased to 8,900 mt by 2000. SSB has varied between 4,500-8,000 mt during 2001-2009 and was 7,076 mt in 2010 (NEFSC 2011b).

6.2 NONTARGET SPECIES

6.2.1 Nonallocated Groundfish Species

The Northeast Multispecies FMP also manages Atlantic halibut, ocean pout, northern (GOM/GB) and southern (SNE/MA) windowpane flounder, and wolffish. However, the federal fishery does not receive an allocation of these species. Sector and common pool vessels may not land wolffish, ocean pout, or northern and southern windowpane flounder, but may retain one halibut per trip.

6.2.1.1 Northern Windowpane Flounder

Life History. Windowpane flounder or sand flounder, *Scophthalmus aquosus*, is a left-eyed, flatfish species that occurs in the northwest Atlantic from the Gulf of St. Lawrence to Florida (Collette & Klein-MacPhee 2002). Windowpane prefer sandy bottom habitats and occur at depths from the high water mark to 656 ft (200 m), with the greatest abundance at depths < 180 ft (55 m), and at temperatures of 32º-80ºF (0º-26.8ºC) (Moore 1947). On Georges Bank, it is most abundant at depths < 60 m during late spring through autumn but overwintering occurs in deeper waters to 366 m (Chang et al. 1999). Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB) and Southern New England-Mid-Atlantic Bight (SNE/MA) due to differences in growth rates, size at maturity, and relative abundance trends. Windowpane generally reach sexual maturity between ages 3 and 4 (Moore 1947), though males can mature at age 2 (Grosslein & Azarovitz 1982). On Georges Bank, median length at maturity is nearly the same for males (8.7 in, 22.2 cm) and females (8.9 in, 22.5 cm) (O'Brien et al. 1993). Spawning occurs on Georges bank during July and August and peaks again between October and November at temperatures of 55º- 61ºF (13º-16ºC) (Morse & Able 1995). Eggs incubate for 8 days at 50º-55ºF (10º-13ºC) and eye migration occurs approximately 17- 26 days after hatching (Klein-MacPhee, unpub.data, in Collette & Klein-MacPhee 2002). During the first year of life, spring-spawned fish have significantly faster growth rates than autumn-spawned fish, which may result in differential natural mortality rates between the two cohorts (Neuman et al. 2001). Young windowpanes settle inshore and then move offshore to deeper waters as they grow. Windowpane on Georges Bank aggregate in shallow water during summer and early fall and move offshore in the winter and early spring (Grosslein & Azarovitz 1982).

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

6.2.1.2 Southern Windowpane Flounder

Life History. The life history of Southern New-England/Mid-Atlantic Bight Windowpane flounder, *Scophthalmus aquosus*, is comparable to Northern Windowpane Flounder (Section 6.2.1.1). In Southern New England, median length at maturity is nearly the same for males (8.5 in, 21.5 cm) and females (8.3 in, 21.2 cm) (O'Brien, et al. 1993). A split spawning season occurs between Virginia and Long Island with peaks in spring and fall (Chang, et al. 1999). Spawning occurs in the southern Mid-Atlantic during April and May and then peaks again in October or November (Morse & Able 1995).

Population Status. As of 2010, the stock is not overfished, overfishing is not occurring, and the stock is above the biomass target ($B_{MSY\ proxy}$). Therefore, the stock is considered to be rebuilt (NEFSC 2012b).

6.2.1.3 Ocean Pout

Life History. Ocean pout, *Zoarces americanus*, is a demersal eel-like species found in the northwest Atlantic from Labrador to Delaware. Ocean pout are most common on sand and gravel bottom (Orach-Meza 1975) at depths of 49-262 ft (15-80 m) (Clark & Linvingstone 1982) and temperatures of 43º-48º F (6º-9º C) (Scott 1982). In US waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. In the Gulf of Maine, median length at maturity for males and females is 11.9 in (30.3 cm) and 10.3in (26.2 cm), respectively. Median length at maturity for males and females from Southern New England is 12.6 in (31.9 cm) and 12.3in (31.3 cm), respectively (O'Brien, et al. 1993). According to tagging studies conducted in Southern New England, ocean pout appear not to migrate, but do move between different substrates seasonally. In Southern New England-Georges Bank they occupy cooler rocky areas in summer, returning in late fall (Orach-Meza 1975). In the Gulf of Maine, they move out of inshore areas in the late summer and then return in the spring. Spawning occurs between September and October in Southern New England (Olsen & Merriman 1946) and in August and September in Newfoundland (Keats et al. 1985). Adults aggregate in rocky areas prior to spawning. Eggs are internally fertilized (Mercer et al. 1993; Yao & Crim 1995) and females lay egg masses encased in a gelatinous matrix that they then guard during the incubation period of 2.5-3 months (Keats, et al. 1985). Ocean pout hatch as juveniles on the bottom and are believed to remain there throughout their lives (Methven & Brown 1991; Yao & Crim 1995).

Population Status. Between 1975 and 1985, NEFSC spring trawl survey biomass indices increased to record high levels, peaking in 1981 and 1985. Since 1985, survey catch per tow indices have generally declined, and the 2010 index was the lowest value in the time series. Catch and exploitation rates have also been low, but stock size has not increased. Fishing mortality has been well below F_{MSY} since 1992. As of 2010, ocean pout was overfished, but overfishing was not occurring. There are no signs of stock rebuilding despite that fishing mortality is relatively low (NEFSC 2012b).

6.2.1.4 Atlantic Halibut

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

Population Status. Atlantic halibut is overfished, but overfishing is not occurring, as of 2010. Survey indices are highly variable because the NEFSC trawl surveys catch low numbers of halibut. The spring survey abundance index suggested a relative increase during the late 1970s to the early 1980s, a decline during the 1990s, and an increase since the late 1990s. Biomass has been stable (B_{2010} = 1,700 mt) and well below $B_{MSY\ proxy}$ (49,000 mt) since the late 1800s. Fishing mortality has been below F_{MSY} since 1995 (NEFSC 2012b).

6.2.1.5 Atlantic Wolffish

Life History. Atlantic wolffish, *Anarhichas lupus*, is a benthic fish distributed on both sides of the North Atlantic Ocean. In the northwest Atlantic, the species occurs from Davis Straits off of Greenland to Cape Cod and sometimes in southern New England and New Jersey waters (Collette & Klein-MacPhee 2002). In the Georges Bank-Gulf of Maine region, abundance is highest in the southwestern portion at depths of 263 - 394 ft (80 - 120 m), but wolffish are also found in waters from 131 - 787 ft (40 - 240 m) (Nelson & Ross 1992) and at temperatures of 29.7º - 50.4º F (-1.3º - 10.2º C) (Collette & Klein-MacPhee 2002). They prefer complex benthic habitats with large stones and rocks (Pavlov & Novikov 1993). Atlantic wolffish are mostly sedentary and solitary, except during mating season. There is some evidence of a weak seasonal shift in depth between shallow water in spring and deeper water in fall (Nelson & Ross 1992). Most individuals mature by age 5-6 when they reach ~18.5 in (47 cm) total length (Nelson & Ross 1992; Templeman 1986). Northern wolffish mature at smaller sizes than faster growing southern fish. Peak spawning is believed to occur from September to October for Gulf of Maine-Georges Bank wolffish (Collette & Klein-MacPhee 2002), though laboratory studies have shown that wolffish can spawn most of the year (Pavlov & Moksness 1994). Eggs are laid in masses, and males are thought to brood for several months. Incubation time is dependent on water temperature and may be 3 - 9 months. Larvae and early juveniles are pelagic between 20 - 40 mm TL, with settlement beginning by 50 mm TL (Falk-Petersen & Hansen 1991).

Population Status. Abundance and biomass of Atlantic wolffish generally has declined over the last two to three decades. On February 10, 2009, the Council voted to include wolffish in the multispecies management unit, impose a prohibition on retention of wolffish by commercial and (private, party and charter) recreational fishermen, and to designate wolffish EFH. Atlantic wolffish are encountered infrequently on NEFSC bottom trawl surveys and there is uncertainty as to whether the NEFSC surveys adequately sample this species (NDPSWG 2009). Atlantic wolffish continues to be considered a data poor species. An assessment update in 2012 determined that the stock is overfished, with current SSB at 29% of SSB_{MSY}, but overfishing is not occurring (F_{2010} is 21% of F_{MSY}). The "overfished" status remains unchanged since the 2008 assessment, but the overfishing status has changed from "unknown" to "overfishing not occurring" (NEFSC 2012b).

6.2.2 Nongroundfish Species

The Northeast multispecies fishery interacts with fisheries for several other species, including: spiny dogfish, skates, monkfish, summer flounder, American lobster, whiting (silver hake), loligo squid, and Atlantic sea scallops.

6.2.2.1 Spiny Dogfish

Life History. Spiny dogfish, *Squalus acanthias*, occurs in the western North Atlantic from Labrador to Florida. Spiny dogfish is considered to be a unit stock off the coast of New England. In summer, dogfish migrate northward to the Gulf of Maine-Georges Bank region and into Canadian waters. They return southward in autumn and winter. Spiny dogfish tend to school by size and, when mature, by sex. The species bears live young, with a gestation period of 18 – 22 months, and produce 2 - 15 pups (average of 6). Size at maturity for females is ~31 in (80 cm), but can vary from 31 - 33 in (78 - 85 cm) depending on the abundance of females (NEFSC 2013h).

Population and Management Status. The NEFMC and MAFMC jointly manage spiny dogfish FMP for federal waters and the Atlantic States Marine Fisheries Commission (ASMFC) has a state waters plan. 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. At the 2010 TRAC, managers agreed to determine stock status using the model from SAW 43 and NEFSC spring survey data through 2009. The stock is not presently overfished and overfishing is not occurring. NMFS declared the spiny dogfish stock rebuilt for the purposes of federal management in May 2010 (TRAC 2010).

6.2.2.2 Skates

Life History. There are seven species in the Northeast Region skate complex: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis)*, thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). The barndoor skate is the most common skate in the Gulf of Maine, on Georges Bank, and in southern New England. Georges Bank and southern New England is the center of distribution for the little and winter skates in the Northeast Region. The thorny and smooth skates typically occur in the Gulf of Maine. The clearnose and rosette skates have a more southern distribution, and occur primarily in southern New England and the Chesapeake Bight. Skates are not known to undertake large-scale migrations, but move seasonally with changing water temperature; they move offshore in summer and early autumn and then return inshore during winter and spring. Skates lay eggs enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 - 12 months, with the young having the adult form at the time of hatching. Catches of these species are largely interrelated with the NE multispecies, monkfish, and scallop fisheries (NEFSC 2013h).

Population and Management Status. NMFS implemented the Northeast Skate Complex Fishery Management Plan (Skate FMP) in September 2003 (NEFMC 2003b). The FMP required by both dealers and vessels to report skate landings by species. Possession prohibitions of barndoor, thorny, and smooth skates in the Gulf of Maine were also provisions of the FMP. The FMP implemented a trip limit of 10,000 lbs (4,536 kg) for winter skate, and required fishermen to obtain a Letter of Authorization to exceed trip limits for the little skate bait fishery. In 2010, Amendment 3 to the Skate FMP implemented a rebuilding plan for smooth skate and established an ACL and annual catch target for the skate complex, total allowable landings for the skate wing and bait fisheries, and seasonal quotas for the bait fishery. Possession limits were reduced, in-season possession limit triggers were implemented, as well as other measures to improve management of the skate fisheries. Due to insufficient information about the population dynamics of skates, there remains considerable uncertainty about the status of skate stocks. Based on NEFSC bottom trawl survey data through autumn 2011/spring 2012, one skate species was overfished (thorny) and overfishing was not occurring in any of the seven skate species. Skate landings have generally increased since 2000. The landings and catch limits proposed by Amendment 3 have an acceptable probability of promoting biomass growth and achieving the rebuilding (biomass) targets for thorny skates. Modest reductions in landings and a stabilization of total catch below the median relative exploitation ratio should cause skate biomass and future yield to increase.

6.2.2.3 Monkfish

Life History. Monkfish, *Lophius americanus*, (i.e., "goosefish"), occur in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish occur from inshore areas to depths of at least 2,953 ft (900 m). Monkfish undergo seasonal onshore-offshore migrations, which may relate to spawning or possibly to food availability. Female monkfish begin to mature at age 4 with 50% of females maturing by age 5 (~17 in [43 cm]). Males generally mature at slightly younger ages and smaller sizes (50% maturity at age 4.2 or 14 in [36 cm]). Spawning takes place from spring through early autumn. It progresses from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil that can be as large as 39 ft (12 m) long and 5 ft (1.5 m) wide, and only a few mm thick. The larvae hatch after 1 - 3 weeks, depending on water temperature. The larvae and juveniles spend several months in a pelagic phase before settling to a benthic existence at a size of ~3 in (8 cm) (NEFSC 2013h).

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

- Limiting the number of vessels with access to the fishery and allocating DAS to those vessels;
- Setting trip limits for vessels fishing for monkfish; minimum fish size limits;
- Gear restrictions;
- Mandatory time out of the fishery during the spawning season; and
- A framework adjustment process.

The Monkfish FMP defines two management areas for monkfish (northern and southern), divided roughly by an east-west line bisecting Georges Bank. As of 2013 data, monkfish in both management areas are not overfished and overfishing is not occurring (NEFSC 2013e).

6.2.2.4 Summer Flounder

Life History. Summer flounder, *Paralichthys dentatus*, occur in the western North Atlantic from the southern Gulf of Maine to South Carolina. Summer flounder are concentrated in bays and estuaries from late spring though early autumn, when an offshore migration to the outer continental shelf is undertaken. Spawning occurs during autumn and early winter, and the larvae are transported toward coastal areas by prevailing water currents. Development of post larvae and juveniles occurs primarily within bays and estuarine areas. Most fish are sexually mature by age 2. Female summer flounder may live up to 20 years, but males rarely live for more than 10 years. Growth rates differ appreciably between the sexes with females attaining weights up to 11.8 kg (26 lbs.) (NEFSC 2013h).

Population and Management Status. The FMP was developed by the MAFMC in 1988, and scup and black sea bass were later incorporated into the FMP. Amendment 2, implemented in 1993, established a commercial quota allocated to the states, a recreational harvest limit, minimum size limits, gear restrictions, permit and reporting requirements, and an annual review process to establish specifications for the coming fishing year. In 1999, Amendment 12 revised the overfishing definitions for all three species, established rebuilding programs, addressed bycatch and habitat issues and established a framework adjustment procedure for the FMP to allow for a streamlined process for relatively minor changes to management measures (MAFMC 1998). The stock is not overfished and overfishing is not occurring (NEFSC 2013d).

6.2.2.5 American Lobster

Life History. American lobster, *Homarus americanus*, occurs in continental shelf waters from Maine to North Carolina. There are three biological stock units: the Gulf of Maine, Georges Bank, and Southern New England. The American lobster is long-lived and known to reach more than 40 pounds in body weight (Wolff 1978). Lobsters are encased in a hard exoskeleton that is periodically cast off (molted) for growth and mating to occur. Eggs are carried under the female's abdomen during a 9 - 12 month incubation period. Larger lobsters produce eggs with greater energy content and thus, may produce larvae with higher survival rates (Attard & Hudon 1987). Seasonal timing of egg extrusion and larval hatching is somewhat variable among areas and may also vary due to seasonal weather patterns. Hatching tends to occur over a four month period from May – September, occurring earlier and over a longer period in the southern part of the range. The pelagic larvae molt four times before they resemble adults and settle to the bottom. Lobsters molt more than 20 times over 5 - 8 years before they reach the minimum legal harvest size.

Population and Management Status. The states and NMFS cooperatively manage the American lobster resource through the ASMFC under the provisions of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). Inshore landings have increased steadily since the early 1970s. States have jurisdiction for implementing measures in state waters, while NMFS implements complementary regulations in federal waters. Fishing effort is intense and increasing throughout much of the range of the species. The majority of the landings are reportedly harvested from state waters. While each stock area has an inshore and offshore component, Gulf of Maine and Southern New England areas support predominantly inshore fisheries and the Georges Bank supports a predominantly offshore fishery.

The most recent 2009 Stock Assessment Report concluded that "(t)he American lobster fishery resource presents a mixed picture, with stable abundance for much of the Gulf of Maine stock, increasing abundance for the Georges Bank stock, and decreased abundance and recruitment yet continued high fishing mortality for the Southern New England stock" (ASMFC 2009).

6.2.2.6 Whiting (Silver Hake)

Life History. Silver hake, also known as whiting, Merluccius bilinearis, range primarily from Newfoundland to South Carolina. Silver hake are fast swimmers with sharp teeth, and are important fish predators that also feed heavily on crustaceans and squid (Lock & Packer 2004). In U.S. waters, two stocks have been identified based on differences of head and fin lengths

(Almeida 1987), otolith morphometrics (Bolles & Begg 2000), otolith growth differences, and seasonal distribution patterns (Lock & Packer 2004). The northern silver hake stock inhabits Gulf of Maine - Northern Georges Bank waters, and the southern silver hake stock inhabits Southern Georges Bank - Middle Atlantic Bight waters. Silver hake migrate in response to seasonal changes in water temperatures, moving toward shallow, warmer waters in the spring. They spawn in these shallow waters during late spring and early summer and then return to deeper waters in the autumn (Brodziak et al. 2001). The older, larger silver hake especially prefer deeper waters. During the summer, portions of both stocks can be found on Georges Bank, whereas during the winter fish in the northern stock move to deep basins in the Gulf of Maine, while fish in the southern stock move to outer continental shelf and slope waters. Silver hake are widely distributed, and have been observed at temperature ranges of 2-17° C (36-63° F) and depth ranges of 11-500 m (36-1,640 ft). However, they are most commonly found between 7-10º C (45-50º F) (Lock & Packer 2004).

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

The otter trawl remains the principal gear used in the U.S. fishery, and recreational catches have been low since 1985. Silver hake are managed under the NEFMC's Northeast Multispecies FMP ("non-regulated multispecies" category). In 2000, the NEFMC implemented Amendment 12 to this FMP, and placed silver hake into the "small mesh multispecies" management unit, along with red hake and offshore hake. This amendment established retention limits based on net mesh size, adopted overfishing definitions for northern and southern stocks, identified essential fish habitat for all life stages, and set requirements for fishing gear (NEFMC 2000). As of the last assessment in 2010, silver hake is not overfished and overfishing is not occurring in the northern or southern management area (NEFSC 2011a).

6.2.2.7 Loligo Squid

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

Population and Management Status. The domestic fishery occurs primarily in Southern New England and Mid-Atlantic waters, but some fishing also occurs along the edge of Georges Bank. Fishing patterns reflect seasonal Loligo distribution patterns and effort is generally directed offshore during October through April and inshore during May through September. The fishery is dominated by small-mesh otter trawlers, but near-shore pound net and fish trap fisheries occur during spring and summer. Since 1984, annual offshore landings have generally been three-fold greater than inshore landings. The stock is managed by the MAFMC Council under the Atlantic Mackerel, Squid, and Butterfish FMP. Management measures for the *L. pealeii* stock include annual TACs, which have been partitioned into seasonal quotas since 2000 (trimesters in 2000 and quarterly thereafter), a moratorium on fishery permits, and a minimum codend mesh size of 1 7/8 inches. At the latest assessment in 2009, overfishing was not occurring, and the overfished status could not be determined as there is no biomass reference point (NEFSC 2011a).

6.2.2.8 Atlantic Sea Scallops

Life History. Sea scallops, *Placopecten magellanicus,* are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20^{o}C (68^{o}F). North of Cape Cod, concentrations generally occur in shallow water <40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths 25 - 200 m (14 - 110 fathoms), with commercial concentrations generally 35 - 100 m (19 - 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart & Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 - 80% in shell height and quadruple their meat weight. Sea scallops have been known to live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. Larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three year olds were often exploited. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality (NEFSC 2013h).

Population and Management Status. The commercial fishery for sea scallops is conducted year round, primarily using offshore New Bedford style scallop dredges. A small percentage of the fishery employs otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. The NEFMC established the Scallop FMP in 1982. The scallop resource was last assessed in 2014, and it was not overfished, and overfishing was not occurring (NEFSC 2014).

6.2.2.9 Scup

The scup fishery is managed by the MAFMC. The primary commercial fishery management measure is a quota that is distributed to three trimester periods and to individual states. Other federal regulations include minimum mesh size, gear restricted areas, and a minimum fish size. States typically restrict harvest to their quota using seasons and trip limits. As of 2011, the stock was not overfished and overfishing was not occurring (Terceiro 2012).

6.2.2.10 Atlantic Herring

The Atlantic Sea herring fishery is managed by the NEFMC. The fishery uses quotas by area and season. Prosecuted primarily by mid water trawls (single and paired) and purse seines, management measures include restrictions on the incidental catch of haddock and other regulated groundfish. Mid-water trawls are allowed access to the groundfish closed areas as an exempted fishery but their use of the areas is subject to numerous regulatory restrictions. As of 2011, Atlantic herring was not overfished and overfishing was not occurring based on a comparison of the MSY reference points with the estimates of F and SSB (NEFSC 2012a).

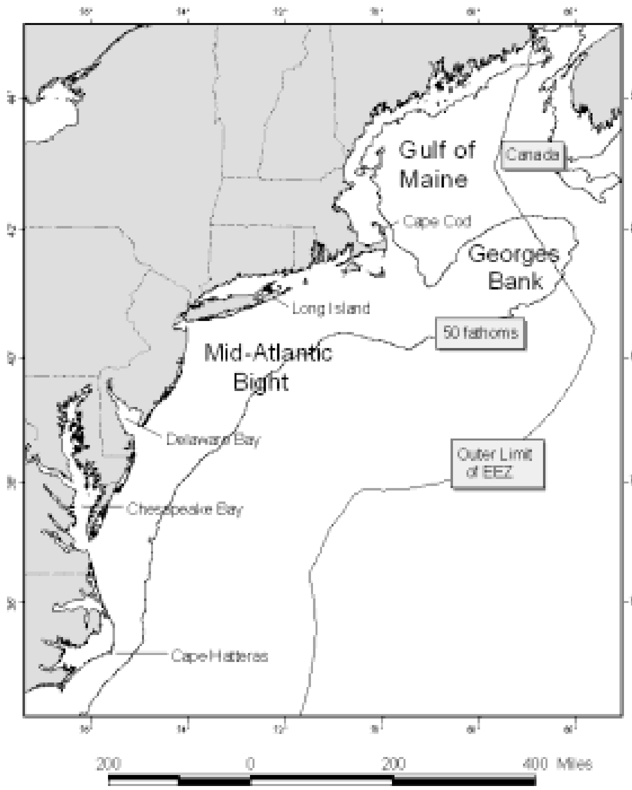
6.2.3 Bycatch

The MSA defines bycatch as fish which are harvested in a fishery, but which are not sold or kept for personal use, including economic discards and regulatory discards. Fish released alive under a recreational catch and release fishery management program are not included. The MSA requires that, to the extent practicable, bycatch and the mortality of bycatch that cannot be avoided should both be minimized. To consider whether these objectives are being met, bycatch must be reported and assessed. To this end, the MSA requires that a standardized reporting methodology assess the amount and type of bycatch occurring in a fishery. The primary tools used to report bycatch in the multispecies fishery are the Vessel Trip Report system (VTR) and the NEFSC Observer Program (NEFOP). Each federally permitted groundfish vessel is required to report discards and landings on every trip from each statistical area they fish in. The sea sampling/observer program places personnel on boats to observe and estimate the amount of discards on a haul-by-haul basis. More information on bycatch may be found at: http://www.greateratlantic.fisheries.noaa.gov/

6.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem (Figure 7) includes area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 6,562 ft (2,000 m). Four distinct sub-regions are identified: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The groundfish fishery primarily occurs in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic areas. Therefore, the description of the physical environment focuses on these sub-regions. Southern New England is a sub-region occasionally described. Here, its distinctive features are included in the sections describing Georges Bank and the Mid-Atlantic Bight.

Figure 7 - Northeast U.S. continental shelf ecosystem



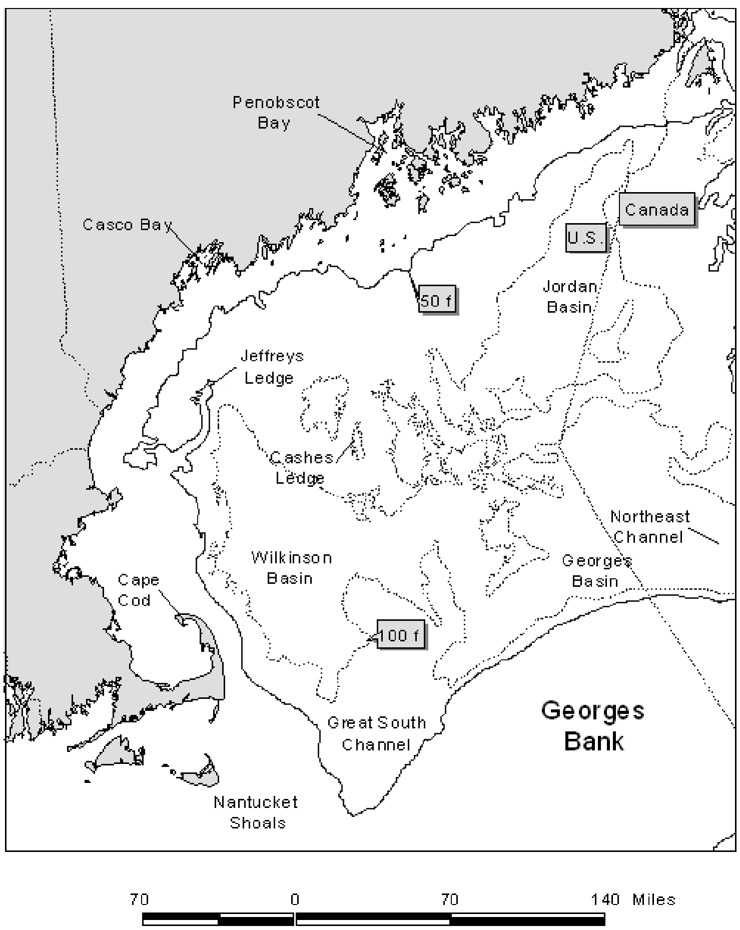
Source: Stevenson et al. (2004).

Information on the affected physical environments relevant to this amendment is contained in Stevenson et al. (2004) and its primary source references including: Abernathy (1989); Backus (1987); Beardsley et al. (1996); Brooks (1996); Cook (1988); Dorsey (1998); Kelley (1998); Mountain et al. (1994); NEFMC (1998a); Reid and Steimle (1988); Schmitz et al. (1987); Sherman et al. (1996); Steimle et al. (1999); Stumpf and Biggs (1988); Townsend (1992); Tucholke (1987); and Wiebe et al. (1987). Additional information may be found in prior groundfish actions (NEFMC 2012).

6.3.1 Gulf of Maine

The Gulf of Maine is bounded on the east by Browns Bank, on the north by the Nova Scotia (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 8). The Gulf of Maine is a boreal environment characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 820 ft. (250 m), with a maximum depth of 1,148 ft (350 m) in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 30 ft (9 m) below the surface.

Figure 8 - Gulf of Maine



Source: Stevenson et al. (2004).

The Gulf of Maine is an enclosed coastal sea that was glacially derived and contains a system of deep basins, moraines, and rocky protrusions. The Gulf of Maine is topographically diverse from the rest of the continental border of the U.S. Atlantic coast. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[3] sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a water depth of about 197 ft. (60 m). Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 66 - 131 ft. (20 - 40 m), except off eastern Maine where a gravel-covered plain exists to depths of at least 328 ft. (100 m). Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches (Stevenson, et al. 2004).

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

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

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

---

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

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

7. Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always >46°F (8°C): upper slope fauna extending into the Northeast Channel.

Two studies (Gabriel 1992; Overholtz & Tyler 1985) reported common[5] demersal fish species by assemblages in the Gulf of Maine and Georges Bank:

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

6.3.2 Georges Bank

Georges Bank is a shallow (10 - 492 ft. [3 - 150 m depth]), elongated (100 mi.(161 km) wide by 20 mi (322 km) long) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Figure 7). It has a steep slope on its northern edge, a broad, flat, gently sloping southern flank, and steep submarine canyons on its eastern and southeastern edges. It has highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. Erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents may reduce the amount of sand and cause an overall coarsening of the bottom sediments (Valentine & Lough 1991).

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

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

---

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

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

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

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

6.3.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 7). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. It generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight consists of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to 62 - 124 ft (100 - 200 km) offshore, where it transforms to the slope (328 - 656 ft. [100 - 200 m water depth]) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson, et al. 2004). Like the rest of the continental shelf, sea level fluctuations during past ice ages largely shaped the topography of the Mid-Atlantic Bight. Since that time, currents and waves have modified this basic structure.

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

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

In terms of numbers, amphipod crustaceans and bivalve mollusks dominate the benthic inhabitants of this primarily sandy environment. Mollusks (70%) dominate the biomass (Stevenson, et al. 2004). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

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

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

Colvocoresses and Musick (1984) identified the following assemblages in the Mid-Atlantic sub region during spring and fall.[6]

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

6.3.4 Habitat Requirements of Groundfish (focus on demersal life stages)

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

6.3.5 Essential Fish Habitat Designations

The Sustainable Fisheries Act defines EFH as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The proposed action could potentially affect EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; Atlantic sea scallop; monkfish; deep-sea red crab; northeast skate complex; Atlantic herring; summer flounder, scup, and black sea bass; tilefish; squid, Atlantic mackerel, and butterfish; Atlantic surf clam and ocean quahog FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. Table 15 summarizes the EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs. Full descriptions and maps of EFH for each species and life stage are available on the GARFO website at http://www.greateratlantic.fisheries.noaa.gov/hcd/index2a.htm. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna.

---

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

Table 15 - Summary of geographic distribution, food sources, Essential Fish Habitat features and commercial gear used to catch each species in the Northeast Multispecies Fishery Management Unit

Species	Geographic Region	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
Atlantic Cod	Gulf of Maine, Georges Bank and southward	Omnivorous (invertebrates and fish)	(J): 82-245 ft. (25-75 m) (A): 33-492 ft. (10-150 m)	(J): Cobble or gravel bottom substrates (A): Rocks, pebbles, or gravel bottom substrate	Otter trawl, bottom longlines, gillnets
Haddock	Southwestern Gulf of Maine and shallow waters of Georges Bank	Benthic feeders (amphipods, polychaetes, echinoderms), bivalves, and some fish	(J): 115-328 ft. (35-100 m) (A): 131-492 ft. (40-150 m)	(J): Pebble and gravel bottom substrates (A): Broken ground, pebbles, smooth hard sand, smooth areas between rocky patches	Otter trawl, bottom longlines, gillnets
Acadian redfish	Gulf of Maine, deep portions of Georges Bank and Great South Channel	Crustaceans	(J): 82-1,312 ft. (25-400 m) (A): 164-1,148 ft. (50-350 m)	(J): Bottom habitats with a substrate of silt, mud or hard bottom (A): Same as for (J)	Otter trawl
Pollock	Gulf of Maine, extends to Georges Bank, and the northern part of Mid-Atlantic Bight	Juvenile feed on crustaceans, adults also feed on fish and mollusks	(J): 0-820 ft. (0-250 m) (A): 49-1,198 ft. (5-365 m)	(J): Bottom habitats with aquatic vegetation or substrate of sand, mud or rocks (A): Hard bottom habitats including artificial reefs	Otter trawl, gillnets
Atlantic Halibut	Gulf of Maine, Georges Bank	Juveniles feed on annelid worms and crustaceans, adults mostly feed on fish	(J): 66-197 ft. (20-60 m) (A): 328-2,297 ft. (100-700 m)	(J): Bottom habitat with a substrate of sand, gravel or clay (A): Same as for (J)	Otter trawl bottom longlines
Ocean Pout	Gulf of Maine, Cape Cod Bay, Georges Bank, Southern New England, Middle Atlantic south to Delaware Bay	Juveniles feed on amphipods and polychaetes. Adults feed mostly on echinoderms, mollusks & crustaceans	(E): <164 ft. (<50 m) (L): <164 ft. (<50 m) (J): 262 ft. (<80 m) (A): 361 ft. (<110 m)	(E): Bottom habitats, generally hard bottom sheltered nests, holes or crevices where juveniles are guarded (L): Hard bottom nesting areas (J): Bottom habitat, often smooth areas near rocks or algae (A): Bottom habitats; dig depressions in soft sediments	Otter trawl
White hake	Gulf of Maine, Georges Bank, Southern New England	Juveniles feed mostly on polychaetes and crustaceans;	(J): 16-738 ft. (5-225 m)	(J): Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	Otter trawl, gillnets

		adults feed mostly on crustaceans, squids and fish	(A): 16-1,066 ft. (5-325 m)	(A): Bottom habitats with substrate of mud or find grained sand	
Yellowtail flounder	Gulf of Maine, Southern New England, Georges Bank	Amphipods and polychaetes	(J): 66-164 ft. (20-50 m) (A): 66-164 ft. (20-50 m)	(J): Bottom habitats with substrate of sand or sand and mud (A): Same as for (J)	Otter trawl
American plaice	Gulf of Maine, Georges Bank	Polychaetes, crustaceans, mollusks, echinoderms	(J): 148-492 ft. (45-150 m) (A): 148-574 ft. (45-175 m)	(J): Bottom habitats with fine grained sediments or a substrate of sand or gravel (A): Same as for (J)	Otter trawl
Witch flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Mostly polychaetes (worms), echinoderms	(J): 164-1,476 ft. (50-450 m) (A): 82-984 ft. (25-300 m)	(J): Bottom habitats with fine grained substrate (A): Same as for (J)	Otter trawl
Winter flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Polychaetes, crustaceans	(E): 16 ft. (<5 m) (J): 0.3-32 ft. (0.1-10 m) (3-164 age 1+) (1-50 m) (A): 3.2-328 ft. (1-100 m)	(J): Bottom habitats with a substrate of mud or fine grained sand (A): Bottom habitats including estuaries with substrates of mud, sand, gravel	Otter trawl, gillnets
Atlantic wolffish	Gulf of Maine & Georges Bank	Mollusks, brittle stars, crabs, and sea urchins	(J): 131, 2-787.4 ft. (40-240 m) (A): 131.2-787.4 ft. (40-240 m)	(J): Rocky bottom and coarse sediments (A): Same as for (J)	Otter trawl, bottom longlines, and gillnets
Windowpane flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Juveniles mostly crustaceans; adults feed on crustaceans and fish	(J): 3.2-328 ft. (1-100 m) (A): 3.2-574 ft. (1-75 m)	(J): Bottom habitats with substrate of mud or fine grained sand (A): Same as for (J)	Otter trawl

6.3.6 Gear Types and Interaction with Habitat

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

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

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

6.3.6.1 Trawl Gear

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

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

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

A flatfish trawl is a type of bottom otter trawl designed with a low net opening between the headrope and the footrope and more ground rigging on the sweep. This type of trawl is designed so that the sweep follows the contours of the bottom. As flounders lie in contact with the seafloor, these animals respond to the bottom-tending sweep by swimming up off the bottom where they can be entrained into net. Flatfish trawls are used on smooth mud and sand bottoms. A high-rise or fly net with larger mesh has a wide net opening and is used to catch demersal fish that tend to rise higher off the bottom than flatfish (NEFSC 2002).

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

The raised-footrope trawl was designed to provide vessels with a means of continuing to fish for small- mesh species without catching groundfish. Raised-footrope trawls fish about 1.6 - 2.0 ft. (0.5 - 0.6 m) above the bottom. Although the doors of the trawl still ride on the bottom, underwater video and observations in flume tanks have confirmed that the sweep in the raised-footrope trawl has much less contact with the seafloor than the traditional cookie sweep (Carr & Milliken 1998).

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

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

6.3.6.2 Gillnet Gear

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

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

6.3.6.3 Fish Traps and Pots

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

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

6.3.6.4 Hook and Line Gear

6.3.6.4.1 Hand Lines/Rod and Reel

Fishermen use hand lines as well as rods and reels in the Northeast Region to catch a variety of demersal species. Handlines are the simplest form of hook and line fishing. It may be fished using a rod and reel or simply "by hand." The gear consists of a line, sinker (weight), gangion, and at least one hook. The line is typically stored on a small spool and rack and varies in length. The sinkers vary from stones to cast lead. The hooks can vary from single to multiple arrangements in "umbrella" rigs. Fishermen use an attraction device such as natural bait or an artificial lure with the hook. Handlines can be carried by currents until retrieved or fished in such a manner as to hit bottom and bounce (Stevenson, et al. 2004).

6.3.6.4.2 Mechanized Line Fishing

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

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

6.3.6.4.3 Bottom Longlines

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

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

6.3.6.5 Gear Interaction with Habitat

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

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

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

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

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

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

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

- Providing recommendations on measures to minimize those adverse impacts.

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

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

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

Morgan and Chuenpagdee (2003) evaluated the habitat effects of ten different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls have relatively high habitat impacts; bottom gillnets and pots and traps have low to medium impacts; and bottom longlines have low impacts. As in the International Council for the Exploration of the Seas and National Research Council reports, the panel did not evaluate individual types of trawls and dredges. The impacts of bottom gillnets, traps, and bottom longlines were limited to warm or shallow water environments with rooted aquatic vegetation or "live bottom" environments (e.g., coral reefs).

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

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

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

6.4 PROTECTED RESOURCES

6.4.1 Species Present in the Area

Numerous protected species inhabit the environment within the Northeast Multispecies FMP management unit (Table 17). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA).

Table 17 - Species protected under the Endangered Species Act and/or Marine Mammal Protection Act that may occur in the operation area for the Northeast multispecies fishery

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

Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected	Yes
Gray seal (*Halichoerus grypus*)	Protected	Yes
Harp seal (*Phoca groenlandicus*)	Protected	Yes
Hooded seal (*Cystophora cristata*)	Protected	Yes
Critical Habitat		
North Atlantic Right Whale[5]	ESA-listed	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA-listed	No

Notes:
[1] There are two species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.
[2] Prior to 2008, this species was called "common dolphin."
[3] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.
[4] Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters. On March 23, 2015, a proposed rule was issued to remove the current range-wide listing and, in its place, list eight DPSs as threatened and three as endangered (80 FR 15272).
[5] Originally designated June 3, 1994 (59 FR 28805); Newly proposed February 20, 2015 (80 FR 9314).

Cusk, a NMFS "species of concern," as well as a "candidate species" under the ESA, occurs in the affected environment of the multispecies fishery (Table 17). Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the *Federal Register*. Candidate species also receive no substantive or procedural protection under the ESA. However, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate/proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Once a species is proposed for listing the conference provisions of the ESA apply (50 CFR 402.10).

Regarding cusk, NMFS initiated a status review due to concerns over the status of and threats to cusk, particularly bycatch. NMFS is involved in various proactive conservation initiatives to obtain more information on this data poor species to assess its status and further conservation efforts. These initiatives involve cooperative efforts with industry, scientists, and other partners to learn more about cusk. NMFS is especially interested in the investigation and identification of methods to reduce bycatch or discard mortality of cusk, and, in particular, studies of how to alleviate barotrauma effects in released cusk are of high interest. In the Northeastern U.S., cusk are predominantly caught in the Gulf of Maine in commercial bottom trawl, bottom longline, gillnet, lobster trap, and handline/rod and reel gears, as well recreational handline gear (GMRI 2012; O'Brien, et al. 1993). Additional information on cusk and some conservation efforts can be found at http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/CuskSOC.html. However, as cusk receive no substantive or procedural protection under the ESA (due to its candidate species status), this species will not be discussed further in this document.

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

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

6.4.3 Species Potentially Affected by the Proposed Action

The multispecies fishery may affect multiple protected species of cetacean, sea turtles, pinnipeds, and fish (Table 17). Of primary concern is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interaction with particular fishing gear types. Information on species occurrence in the affected environment of the multispecies fishery is presented in this section, while information on protected species interactions with fishery gear is presented in Section 6.4.4.

6.4.3.1 Sea Turtles

Status and Trends. Table 18 includes the four ESA listed species of sea turtles that occur in the affected environment of the multispecies fisheries. Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (Conant et al. 2009; Hirth 1997; NMFS & USFWS 1995; 2007b; c; 2013; NOAA 2007; TEWG 1998; 2000; 2009), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992) (NMFS and USFWS 1998a), Kemp's ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (NMFS & USFWS 1991)(NMFS and USFWS 1998b).

Table 18 - Sea turtle species found in the affected environment of the multispecies fishery

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

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

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

Hard-shelled sea turtles

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

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

Leatherback sea turtles

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

6.4.3.2 Large Cetaceans

Status and Trends. Table 19 is the species of large whales occurring in the affected area. For additional information on the biology, status, and distribution of each species, refer to: Waring et al. (2014) and NMFS (1991; 2005; 2010a; 2011; 2012).

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

Table 19 - Species of large whales occurring in the affected area

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock[1]
North Atlantic Right Whale	Yes-Endangered	Yes	454	positive and slowly accelerating	Yes
Humpback Whale	Yes-Endangered	Yes	823	positive	Yes
Fin Whale	Yes-Endangered	Yes	2,817	unknown	Yes
Sei Whale	Yes-Endangered	Yes	236	unknown	Yes
Minke Whale	No	Yes	16,199	unknown	No

[1]A strategic stock is defined under the MMPA as a marine mammal stock: for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.
Source: Waring et al. (2014).

As the affected area of the multispecies fishery occurs in waters north of 35^{o}N, and whales may be present in these waters throughout the year, the multispecies fishery and large whales are likely to co-occur in the affected area. To further assist in understanding how the multispecies fishery overlaps in time and space with the occurrence of large whales, Table 20 gives an overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery. For additional information on the biology, status, and range wide distribution of each whale species, refer to: Waring et al. (2014) and NMFS (1991; 2005; 2010a; 2011; 2012).

Table 20 - Large cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multispecies fishery

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
North Atlantic Right Whale	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey, New York, Rhode Island, and Southern Massachusetts (migratory corridor to/from feeding and calving grounds; primarily November through April).	• Approximately April-July: Great South Channel and GB (foraging grounds) • Approximately January through May: Cape Cod and Massachusetts Bays (foraging grounds) • Approximately March

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
	• Winter through summer (approximately December/January-July 31): Distributed in greatest densities in GOM and GB sub-regions (foraging grounds). • Increasing evidence of wintering areas (approximately November – January) in Cape Cod Bay; GOM (e.g., Jeffreys and Cashes Ledges, Jordan Basin); and Massachusetts Bay (e.g., Stellwagen Bank).	through April: waters off the eastern shore of Cape Cod (foraging grounds)
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey, New York, Rhode Island, and Southern Massachusetts throughout the year (migratory corridor to/from feeding and calving grounds). • Spring through fall (approximately March through November), distributed in greatest densities in the GOM and GB sub-regions (foraging grounds). • Increasing evidence of wintering areas (for juveniles) in the Mid-Atlantic (e.g., waters in the vicinity of Chesapeake and Delaware Bays; peak presence approximately January through March)	From approximately March through November: • GOM • Massachusetts (esp. Stellwagen Bank) and Cape Cod Bays • GB
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey, New York, Rhode Island, and Southern MA (migratory corridor to/from feeding/calving grounds). • Spring through fall (approximately March through August): distributed in greatest densities in the GOM and GB sub-regions; lower densities are found in these regions in the fall (approximately September-November). • Evidence of wintering areas in mid-shelf areas east of New Jersey, Stellwagen Bank; and eastern perimeter of GB.	From approximately March through August: • Massachusetts Bay (esp. Stellwagen Bank) • Great South Channel • Waters off Cape Cod (~40-50 m contour) • western GOM (esp. Jeffrey's Ledge) • Eastern perimeter of GB • Mid-shelf area off the east end of Long Island.
Sei	• Uncommon in shallow, inshore waters of the Mid-Atlantic, SNE, GB, and GOM sub-regions; however, occasional incursions during peak prey	Throughout the spring and summer:

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
	availability and abundance. • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks • Spring through summer, found in greatest densities in offshore waters of the GOM and GB sub-regions.	• GOM • GB (esp. eastern and southwestern edge (Hydrographer Canyon) into Northeast Channel
Minke	Spring through fall found in greatest densities in the GOM and GB sub-regions	From approximately March through December (peak=July through October): • Massachusetts Bay (esp. Stellwagen Bank) • Cape Cod Bay • GOM
Notes: Information presented in table is representative of large cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 m isobath. *Sources*: NMFS (1991; 2005; 2010a; 2011; 2012); Hain et al. (1992); Payne (1984); Hamilton and Mayo (1990); Schevill et al. (1986); Watkins and Schevill (1982); Payne et al. (1990); Winn et al. (1986); Kenney et al. (1986; 1995); Khan et al. (2010; 2011; 2012; 2009); Brown et al. (2002); NOAA (2008); 50 CFR 224.105; CETAP (1982); Clapham et al. (1993); Swingle et al. (1993); Vu et al. (2012); Baumgartner et al. (2001); Cole et al. (2013); Risch et al. (2013); Waring et al. (2014).		

6.4.3.3 Small Cetacean

Status. Table 21includes the species of small cetaceans (dolphins and porpoises) occurring in the affected area. For additional information on the biology, status, and range wide distribution of each small cetacean species, refer to Waring et al. (2014).

Occurrence and Distribution. Small cetaceans are found throughout the waters of the Northwest Atlantic Ocean. In the affected area, they can be found throughout the year from Cape Hatteras, NC (35°N), to the Canadian border (Waring, et al. 2014). Within this range; however, there are seasonal shifts in species distribution and abundance. As the affected area of the multispecies fishery occurs in waters north of 35°N, and small cetaceans may be present in these waters throughout the year, the multispecies fisheries and small cetaceans are likely to co-occur.

Table 21 - Small cetaceans that occur in the affected environment of the multispecies fishery

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

[1] Harbor porpoise are considered a strategic stock under the MMPA as the level of direct human-caused mortality has exceeded the PBR level for this species.
[2,3] Both northern and southern migratory coastal stocks of bottlenose dolphins are considered a strategic stock under the MMPA as both stocks are designated as depleted under the Act.
Source: Waring et al. (2014).

To understand how the multispecies fishery overlaps in time and space with the occurrence of small cetaceans, an overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery is in Table 22. Waring et al. (2014) has additional information on the biology, status, and range distribution of each species.

Table 22 - Small cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multispecies fishery

Species	Prevalence and Approximate Months of Occurrence (if known)
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions; however, most common in the SNE, GB, and GOM sub-regions (i.e., shelf waters from Hudson Canyon (~ 39°N) and into GB, Massachusetts Bay, and the GOM). • Seasonal shifts in distribution: ***January-May**: low densities found from GB to Jeffreys Ledge; ***June-September**: Large densities found from GB, through the GOM; ***October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic sub- regions), low densities found year round, with waters off Virginia and North Carolina representing southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily 100-2,000 m) of the Mid-Atlanitc, SNE, and GB sub-regions (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Occasionally found in the GOM. • Seasonal shift in distribution: ***January-May**: occur from Cape Hatteras, NC, to GB * **Mid-summer-autumn**: moves onto GB; *Peak abundance* found on GB in the autumn.
Risso's Dolphin	• Common in the continental shelf edge waters of the Mid-Atlantic, SNE, and GB sub-regions; rare in the GOM sub-region. • From approximately March-November: distributed along continental shelf edge from Cape Hatteras, NC, to GB. • From approximately December-February: distributed in continental shelf edge of the Mid-Atlantic (SNE and Mid-Atl. sub-regions).
Harbor Porpoise	• Distributed throughout the continental shelf waters (primarily in waters < 150 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions. • Seasonal shifts in distribution: ***July-September**: Concentrated in the northern GOM; low numbers can be found on GB. ***October-December**: widely dispersed in waters from NJ to Maine. ***January-March**: intermediate densities in waters off New Jersey to North Carolina (SNE and Mid-Atl sub-regions); low densities found in waters off New York to GOM. ***April-June**: widely dispersed from New Jersey to Maine
Bottlenose Dolphin	**Western North Atlantic Offshore Stock** • Spring-Summer: Primarily distributed along the outer continental shelf/edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Winter: Distributed in waters south of 35°N **Western North Atlantic Northern Migratory Stock** • Summer (July-August): distributed from the coastal waters from the shoreline to approximately the 25-m isobaths between the Chesapeake Bay mouth and Long Island, New York (Mid-Atl and SNE sub-regions).

Species	Prevalence and Approximate Months of Occurrence (if known)
	• Winter (January-March): Distributed in coastal waters south of 35°N. **Western North Atlantic Southern Migratory Stock** • Spring and Summer (April-August): Distributed along coastal waters from North Carolina to Virginia (Mid-Atl and SNE sub- regions). • Fall and Winter (October-March): Distributed in coastal waters south of 35°N.
Pilot Whales: Short- and Long-Finned	**Short- Finned Pilot Whales** • Primarily occur south of 40°N (Mid-Atl and SNE sub-regions); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily in the continental shelf edge-slope waters of Mid-Atlantic and SNE sub-regions from approximately May through December, with individuals moving to more southern waters (i.e., 35°N and south) beginning in the fall. **Long-Finned Pilot Whales** • Range from 35°N to 44°N • Winter to early spring (approximately November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Late spring through fall (approximately May through October): movements and distribution shift onto/within GB, the Great South Channel, and the GOM. **Area of Species Overlap:** between 38°N and 40°N (Mid-Atl and SNE sub-regions)
Note: Information presented in table is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 m isobath. *Sources*: Waring et al. (2007; 2014; 1992); Payne and Heinemann (1993); Payne (1984); Jefferson et al. (2009).	

6.4.3.4 Pinnipeds

Status and Trends. Table 23 provides the species of pinnipeds that occur in the affected environment of the multispecies fishery. Waring et al. (2014) has additional information.

Table 23 - Pinniped species that occur in the affected environment of the multispecies fishery

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

Occurrence and Distribution. Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. In the affected area, they are primarily found throughout the year or seasonally from New Jersey to Maine. However, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N) (Waring, et al. 2007; Waring, et al. 2014). As the affected area of the multispecies fishery is in waters north of 35°N, and pinnipeds may be present in these waters year-round, the multispecies fishery and pinnipeds are likely to co-occur. A general overview of species occurrence and distribution in the affected environment of the multispecies fishery is in Table 24. For additional information, refer to Waring et al. (2007; 2014).

Table 24 - Pinniped occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multispecies fishery

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

6.4.3.5 Atlantic Sturgeon

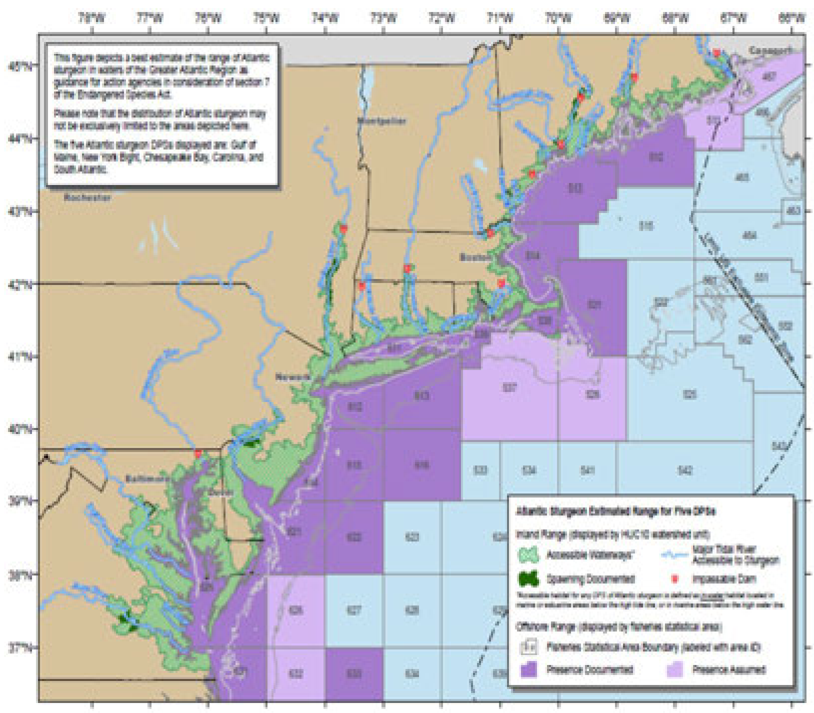
Status. Table 25 lists the 5 DPSs of Atlantic sturgeon likely to occur in the affected area. For additional information, refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

Table 25 - Atlantic sturgeon DPSs listed under the ESA

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

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

Figure 9 - Estimated range of Atlantic sturgeon distinct population segments



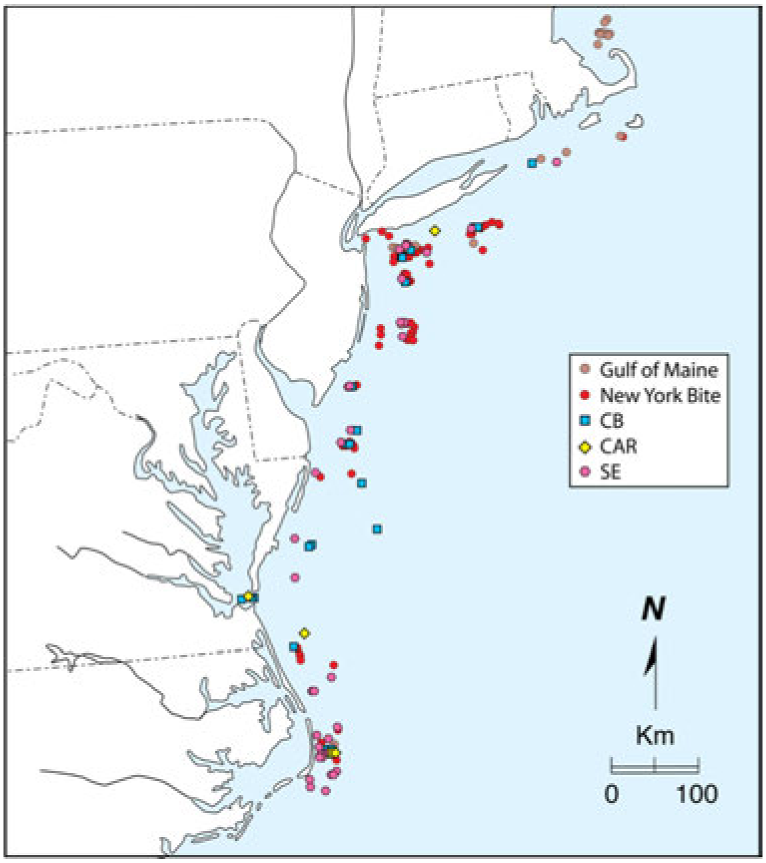
Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 m depth contour (Dunton, et al. 2010; Erickson, et al. 2011; Stein et al. 2004a; Stein, et al. 2004b).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

Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard; depths in these areas are generally ≤25 m (Dunton, et al. 2010; Erickson, et al. 2011; Laney, et al. 2007; Stein, et al. 2004b). Although additional studies are still needed to clarify why these particular sites are chosen by Atlantic sturgeon, there is some indication that they may serve as thermal refuge, wintering sites, or marine foraging areas (Dunton, et al. 2010; Erickson, et al. 2011; Stein, et al. 2004b). The following are the currently known marine aggregation sites located within the range of the multispecies fishery:

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

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

Figure 10 - Capture locations and DPS of origin assignments for observer program specimens



Source: Map by Dr. Isaac Wirgin (Damon-Randall, et al. 2013).
Note: N=173

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

6.4.3.6 Atlantic Salmon (Gulf of Maine DPS)

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily northern portion of the GOM), to the coast of Greenland (Fay et al. 2006; NMFS & USFWS 2005). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay, et al. 2006; Hyvarinen et al. 2006; Lacroix & Knox 2005; Lacroix & McCurdy 1996; Lacroix et al. 2004; NMFS & USFWS 2005; Reddin 1985; Reddin & Friedland 1993; Reddin & Short 1991). For additional information on the on the biology, status, and range wide distribution of the GOM DPS of Atlantic salmon, refer to NMFS and USFWS (2005); Fay et al. (2006). Based on the above information, as the multispecies fishery operates throughout the year, and is known to operate in the GOM, it is possible that the fishery will overlap in time and space with Atlantic salmon migrating northeasterly between U.S. and Canadian waters.

6.4.4 Interactions Between Gear and Protected Resources

Protected species described in Section 6.4.3 are all known to be vulnerable to interactions with various types of fishing gear. Available information on gear interactions with a given species (or species group) is in the sections below. These sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on those gear types that are known to pose the greatest risk to the species under consideration.

6.4.4.1 Marine Mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery.[7] The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

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

- **Tier 1**- considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are ≤ 10% of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III.[8] -If mortality and serious injury rates are >10% of PBR, the following Tier 2, analysis occurs.
- **Tier 2** -considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (Table 26).

The following discussion on fishery interactions with marine mammals (large cetaceans, and small cetaceans and pinnipeds) use the Tier 2 classifications of fisheries (Table 26).

Table 26 - Descriptions of the Tier 2 fishery classification categories

Category	Level of incidental mortality or serious injury of marine mammals	Annual mortality and serious injury of a stock in a given fishery is…
Category I	frequent	≥50% of the PBR level
Category II	occasional	1% - 50% of the PBR level
Category III	remote likelihood, or no known	≤1% of the PBR level
Source: 50 CFR 229.2		

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

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

6.4.4.1.1 Large Cetaceans

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. The greatest entanglement risk to large whales is posed by fixed fishing gear (e.g., sink gillnet and trap/pot gear) comprised of lines (vertical or ground) that rise into the water column. Any line can become entangled in the mouth (baleen), flippers, and/or tail of the whale when the animal is transiting or foraging through the water column (Hartley et al. 2003; Johnson et al. 2005; Kenney 2001; NMFS 2014a; Waring, et al. 2014; Whittingham, Garron, et al. 2005; Whittingham, Hartley, et al. 2005). For instance, in a study of right and humpback whale entanglements, Johnson et al. (2005) attributed: 1) 89% of entanglement cases, where gear could be identified, to fixed gear consisting of pot and gillnets; and 2) entanglement of one or more body parts of large whales (e.g., mouth and/or tail regions) to four different types of line associated with fixed gear the buoy line, groundline, floatline, and surface system lines).[9] Although available data, such as Johnson et al. (2005), provide insight into large whale entanglement risks with fixed fishing gear, to date, due to uncertainties surrounding the nature of the entanglement event, as well as unknown biases associated with reporting effort and the lack of information about the types and amounts of gear being used, determining which part of fixed gear creates the most entanglement risk for large whales is difficult. As a result, any type or part of fixed gear is considered to create an entanglement risk to large whales and should be considered potentially dangerous to large whale species (Johnson, et al. 2005).

The effects of entanglement to large whales range from no injury to death (Angliss & DeMaster 1998; Johnson, et al. 2005; Moore & van der Hoop 2012; NMFS 2014a). "When… [whales] become fouled in gear, normal breathing and movement may be impaired or stopped completely. If the animal does manage to struggle free, portions of gear may remain attached to the body. This trailing gear, often made of durable synthetic material, may create excess drag, snag onto objects in the environment and impede normal behavior like breathing, feeding, movement, or breeding. Other effects include infections and deformations" (quote from Center for Coastal Studies, May 14, 2003, in Moore & van der Hoop 2012; NMFS 2014a). Considering these factors, the risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014a). Although the interrelationships among these factors are not fully understood, and the data needed to provide a more complete characterization of risk are not available, to date, available data do indicate that the entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 27) (Waring, et al. 2014).

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

Table 27 - Summary of confirmed serious injury and mortality of fin, minke, humpback, sei, and North Atlantic right whales due to fisheries entanglements, 1997-2011

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

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

As in Section 6.4.3, there are four species of large whales likely to occur in the affected area of the multispecies fishery: North Atlantic right whale; humpback whale; fin whale; and minke whale. Table 11 summarizes all known serious injury and fatal entanglements of humpback, fin, sei, minke, and North Atlantic right whales from 1997 to 2011 (NMFS 2014a; Waring, et al. 2014). The entanglement data come from the 2014 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Report and pertains only to entanglements that the NMFS considers to be the primary cause of serious injury or death to a whale (Waring, et al. 2014).[10] In addition, only entanglement data from U.S. waters are presented.

As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, it is important to recognize that the information presented in Table 27 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Further, scarring data suggest that entanglements may be occurring more frequently than the observed incidences indicate (NMFS 2014a). For instance, a study conducted by Robbins (2009) analyzed entanglement scars observed in photographs taken during 2003-2006. This analysis suggests high rates of entanglements of GOM humpback whales in fishing gear. In an analysis of the scarification of right whales, 519 of 626 (82.9%) whales examined during 1980-2009 were scarred at least once by fishing gear. Using the North Atlantic Right Whale Catalogue, 8.6% - 33.6% of right whales have been involved annually in entanglements (Knowlton et al. 2012). Based on this information, care should be taken when interpreting entanglement data as it is likely that more entanglements occur than observation alone indicates.

Pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean. As humpback, fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (Section 6.4.3). Section 118(f)(1) of the MMPA requires the preparation and implementation of a

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

Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[11] In 1997, the ALWTRP was implemented; however, since 1997, the Plan has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In fact, two recent adjustments include the Sinking Groundline Rule (September 2, 2008; 73 FR 51228), and the Vertical Line Rule (79 FR 36586, June 27, 2014; 79 FR 73848, December 12, 2014; 80 FR 14345, March 19, 2015; 80 FR 30367, May 28, 2015).[12]

Broadly, the Plan consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586; 79 FR 73848; 80 FR 14345; 80 FR 30367). Specifically, the Plan identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in the Northeast, Mid-Atlantic, and Southeast regions of the U.S.; these fisheries must comply with all regulations of the Plan.[13]

Table 28 has the specified gear modification requirements and restrictions under the ALWTRP for trap/pot or gillnet fisheries in the Northeast or Mid-Atlantic region of the U.S. As the affected environment of the proposed action will not extend into the Southeast region, those provisions of the Plan will not be discussed further. Details on the gear modification requirements and restrictions under the ALWTRP are at: http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/.

Except for the universal gear requirements, the additional gear modification requirements and restrictions identified in Table 28 will vary by location (i.e., management areas) and dates. Table 29, Figure 11, and Figure 12 provide the Management Areas recognized by the ALWTRP in the Northeast and Mid-Atlantic. Details on the specific gear modification requirements and restrictions in each Management Area are at http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/.

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

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

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

Table 28 - Summary of gear modification requirements and restrictions for the Northeast and Mid-Atlantic trap/pot and gillnet fisheries under the Atlantic Large Whale Take Reduction Plan

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

Table 29 - Northeast and Mid-Atlantic Gillnet or Trap/Pot Management Areas under the Atlantic Large Whale Take Reduction Plan

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

Figure 11 - Trap/Pot Management Area under the Atlantic Large Whale Take Reduction Plan

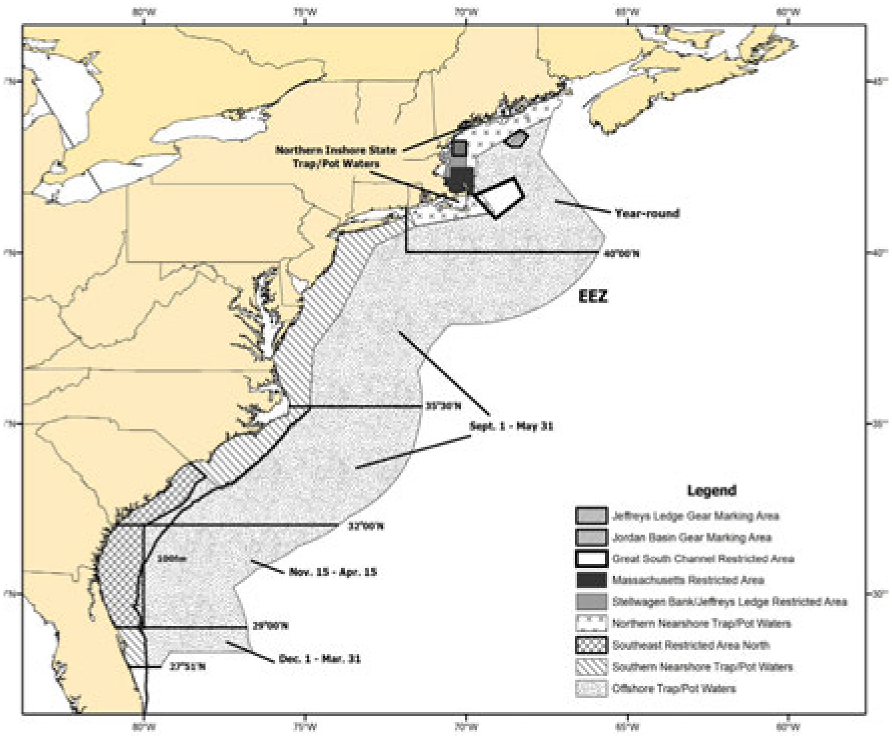
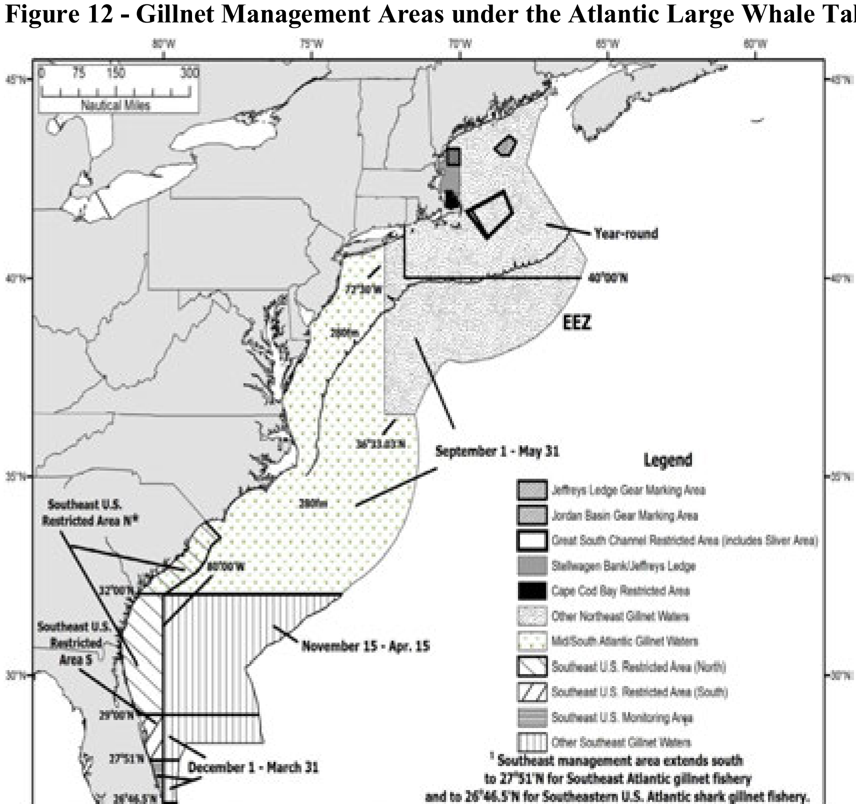


Figure 12 - Gillnet Management Areas under the Atlantic Large Whale Take Reduction Plan



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

6.4.4.1.2 Small Cetaceans and Pinnipeds

Small cetaceans and pinnipeds are found throughout the waters of the Northwest Atlantic (Section 6.4.3). As they feed, travel and breed in many of the same ocean areas utilized for commercial fishing, they are at risk of becoming entangled or bycaught in various types of fishing gear, with interactions resulting in serious injury or mortality to the animal. Pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Table 30 has information on the Category I and II fisheries that occur in the affected environment of the multispecies fishery, and the small cetacean and pinniped species that have been observed incidentally injured and/or killed by these fisheries. Information is also provided on the most recent mean annual mortality estimates for those species observed incidentally injured/killed in the fishery from 2007-2011. For additional information on those species observed incidentally injured or killed in a particular fishery prior to 2007, refer to Waring et al. (2014). Table 30 is not a comprehensive list of all species affected by each fishery; it only addresses those species that occur in the affected environment of the multispecies fishery (Section 6.4.3). The recently issued LOF contains a comprehensive list of species affected by each category of fishery.

Table 30 - Small cetacean and pinniped species observed seriously injured and/or killed by Category I, II, and III fisheries in the affected environment of the multispecies fishery

Fishery	Species Observed Injured/Killed	Observed 2007-2011	Mean Annual Mortality[1]
Category I			
Northeast Sink Gillnet	Bottlenose dolphin (offshore)	N	N/A
	Harbor porpoise[2]	Y	462
	Atlantic white sided dolphin	Y	33
	Short-beaked common dolphin	Y	41
	Pilot whale	Y	1
	Harbor seal	Y	346
	Gray seal	Y	1,043
	Harp seal	Y	208
Mid-Atlantic Gillnet	Bottlenose dolphin (N. Migratory coastal)[2]	N	N/A
	Bottlenose dolphin (S. Migratory coastal)[2]	N	N/A
	Bottlenose dolphin (offshore)	N	N/A
	Long-finned pilot whale	N	N/A
	Short-finned pilot whale	N	N/A
	White-sided dolphin	N	N/A
	Harbor porpoise	Y	198
	Short-beaked common dolphin	Y	12
	Risso's dolphin	Y	6.8
	Harbor seal	Y	49
	Harp seal	Y	63
	Gray seal	Y	57
Pelagic Longline	Long-finned pilot whale[2]	N	N/A
	Risso's dolphin	Y	10

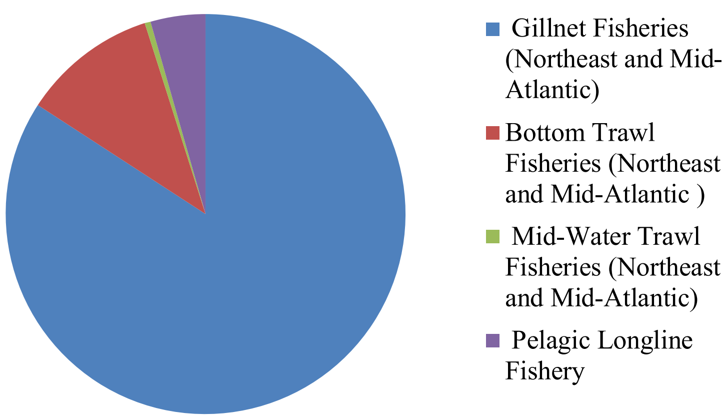
	Short-finned pilot whale[2]	Y	119
	Short-beaked common dolphin	Y	1.7
	Bottlenose dolphin (offshore)	Y	1.7
Northeast/Mid-Atlantic American Lobster Trap/Pot	Harbor seal	N	N/A
Category II			
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	Bottlenose dolphin (offshore)	N	N/A
	Risso's dolphin	Y	0.2
	White-sided dolphin[2]	Y	6
	Short-beaked common dolphin	Y	0.6
	Long and short-finned pilot whales	Y	2.4
	Gray seal	Y	0.2
	Harbor seal	Y	0.2
Northeast Mid-Water Trawl-Including Pair Trawl	White-sided dolphin	N	N/A
	Short-beaked common dolphin	N	N/A
	Long and short-finned pilot whales[2]	Y	4
	Harbor seal	Y	0.7
Northeast Bottom Trawl	Harp seal	Y	0.4
	Harbor seal	Y	0.8
	Gray seal	Y	9.2
	Long and short-finned pilot whales	Y	10
	Short-beaked common dolphin	Y	19
	White-sided dolphin[2]	Y	73
	Harbor porpoise	Y	4.5
	Bottlenose dolphin (offshore)	Y	20
	Risso's dolphin	Y	2.5
Mid-Atlantic Bottom Trawl	White-sided dolphin	Y	4
	Long and short-finned pilot whales[2]	Y	26
	Short-beaked common dolphin[2]	Y	96
	Risso's dolphin[2]	Y	42
	Bottlenose dolphin (offshore)	Y	20
	Harbor seal	Y	0.2
Northeast Anchored Float Gillnet	Harbor seal	N	N/A
	White-sided dolphin	N	N/A
Atlantic Blue Crab Trap/Pot	Bottlenose dolphin (N. Migratory coastal)[2]	N	N/A
	Bottlenose dolphin (S. Migratory coastal)[2]	N	N/A
Mid-Atlantic Haul/Beach Seine	Bottlenose dolphin (N. Migratory coastal)[2]	N	N/A
	Bottlenose dolphin (S. Migratory coastal)[2]	N	N/A

Notes:
[1] Based on NEFOP data from 2007-2011. Waring et al. (2014) has estimates of serious injury and mortality for every year of observation, and estimated "combined mortality" per year of observation. This is equal to the "estimated serious injury" + "estimated mortality" for every year observed. The "mean annual mortality" is the average of each "estimated combined mortality" value over the five year period of observation.
[2] Those species driving the fisheries classification.
Sources: Waring et al. (2014); August 25, 2014, List of Fisheries (79 FR 50589).

Based on the data in Table 30, it is apparent that there are multiple Category I and II fisheries in the affected environment of the multispecies fishery that result in the serious injury and morality of small cetaceans and pinnipeds. Of these fisheries; however, the Northeast and Mid-Atlantic gillnet fisheries, followed by the bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (Figure 13). Based on the available NEFOP data from 2007-2011 (Table 30), ~4% of the total mean annual mortality to marine mammals (small cetaceans + seals, large whales excluded) is attributed to gillnet fisheries, followed by bottom trawl (10.94%), pelagic longline (4.42%) and mid-water trawl (0.48%) fisheries.

Although there are multiple Category I and II fisheries that result in the serious injury and morality of small cetaceans and pinnipeds, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance, the following figures (Figure 14 and Figure 15) depict observed marine mammal takes (large whales excluded) in gillnet and trawl gear in the GOM, GB, and SNE sub-regions of the multispecies fisheries from 2007-2011.[14] Over the last five years, there appears to be particular areas of the GOM, GB, and SNE sub-regions where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence (Figure 14 and Figure 15).

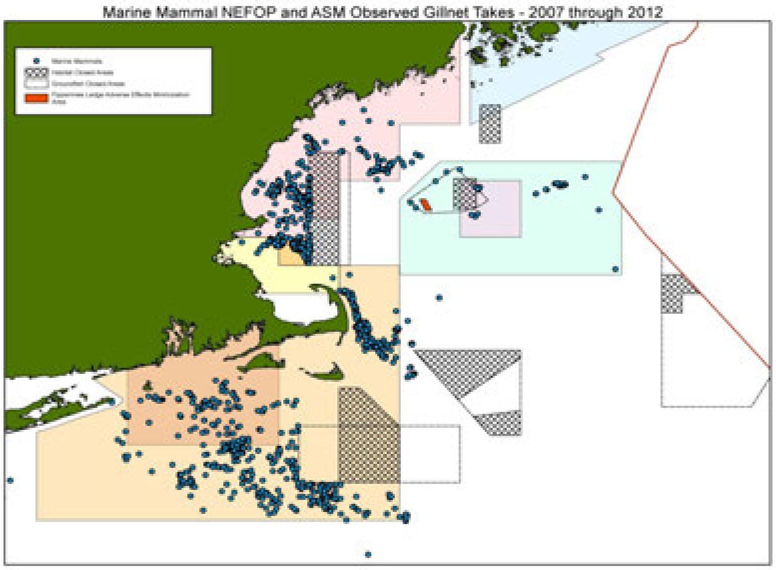
Figure 13 - Total mean annual mortality of small cetaceans and pinnipeds by Category I and II fisheries, 2007-2011



Although uncertainties such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species remain, the available NEFOP data (Figure 14 and Figure 15) do provide some insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds.

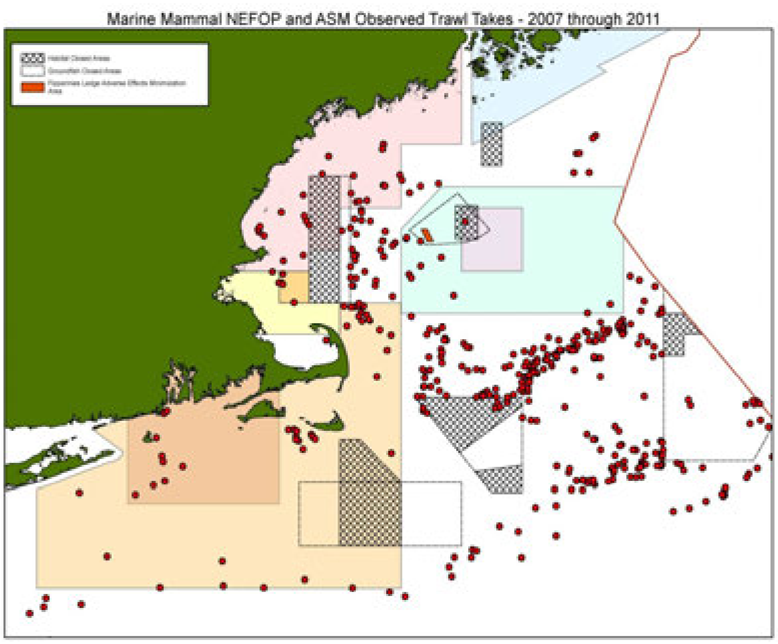
[14] Additional maps of marine mammal takes in various fishing gear can be found in Waring et al. (2014).

Figure 14 - Map of marine mammal bycatch in gillnet gear in the Northeast (excluding large whales) observed by traditional fishery observers and at sea monitors, 2007 - 2011.



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

Figure 15 - Map of marine mammal bycatch in trawl gear in the Northeast (excluding large whales) observed by traditional fishery observers and at sea monitors, 2007 - 2011.



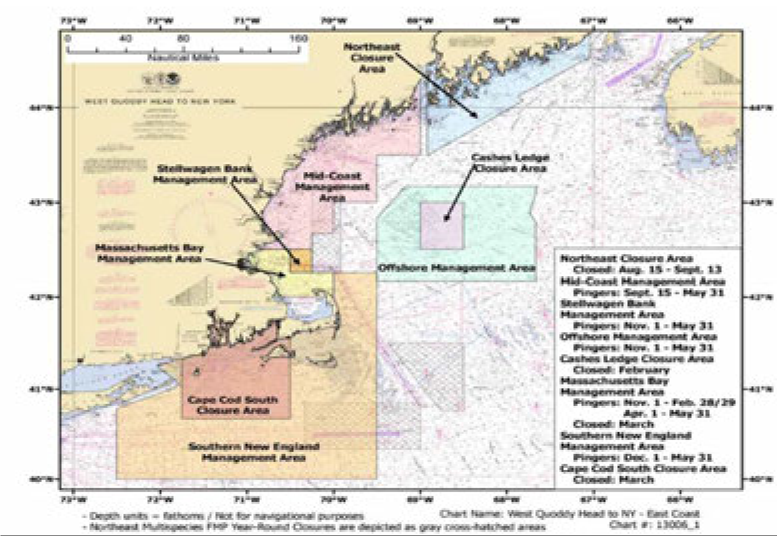
Notes: Small cetacean and pinnipeds observed taken primarily in: (1) the waters between and around CA I and CA II (Groundfish closed areas): Short-beaked common dolphin, pilot whales, white-sided dolphins, gray seals, and some risso's dolphins and harbor porpoise; and (2) eastern side of the GOM Habitat/Groundfish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

Numerous species of small cetaceans and pinnipeds interact with Category I and II fisheries in the Atlantic Ocean; however, several species in Table 30 have experienced such great losses to their populations as a result of interactions with Category I and II fisheries that they are now considered strategic stocks under the MMPA.[15] These species are the harbor porpoise, the Western North Atlantic Northern Migratory Coastal Stock of bottlenose dolphin and the Western North Atlantic Southern Migratory Coastal Stock of bottlenose dolphin. Section 118(f)(1) of the MMPA requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II fisheries. As a result, the Harbor Porpoise TRP (HPTRP or Plan) and the Bottlenose Dolphin TRP (BDTRP or Plan) were developed and implemented for these species. The following is an overview for each TRP. Additional information on each TRP can be found at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.

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

New England Region: The New England component of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the Plan includes time and area closures, as well as closures to multispecies gillnet fishing unless pingers are used in the manner prescribed in the TRP regulations (Figure 16). Details are in 50 CFR 229.33 and the outreach guide at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/doc/hptrpnewenglandguide_2015.pdf.

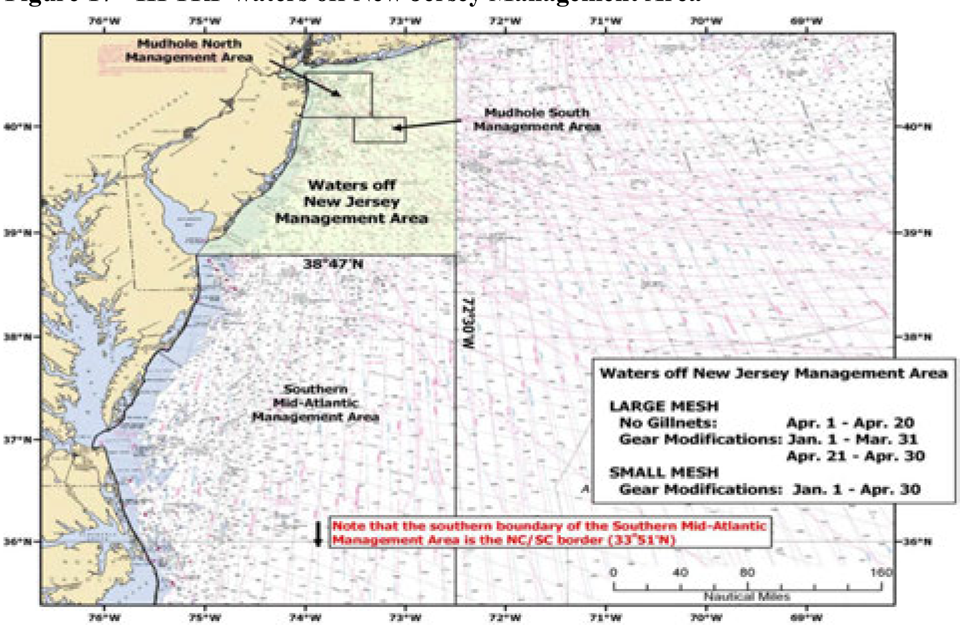
Figure 16 - HPTRP Management Areas for New England



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

Mid-Atlantic Region: The Mid-Atlantic portion of the HPTRP includes the shoreline from the southern shoreline of Long Island, New York to the N. Carolina/S. Carolina border. It includes four management areas (Waters off New Jersey, Mudhole North (located in waters off New Jersey Management Area), Mudhole South (located in waters off New Jersey Management Area), and Southern Mid-Atlantic), each with time and area closures to gillnet fishing unless the gear meets certain specifications. During regulated periods, gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (>5 inches to <7 inches) and large (7-18 inches) mesh gear. The Plan includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Figure 17 and Figure 18 depict the Mid-Atlantic Management Areas. Details are in 50 CFR 229.34 and the outreach guide: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/doc/hptrpmidatlanticguide_2015.pdf.

Figure 17 - HPTRP waters off New Jersey Management Area



Notes:

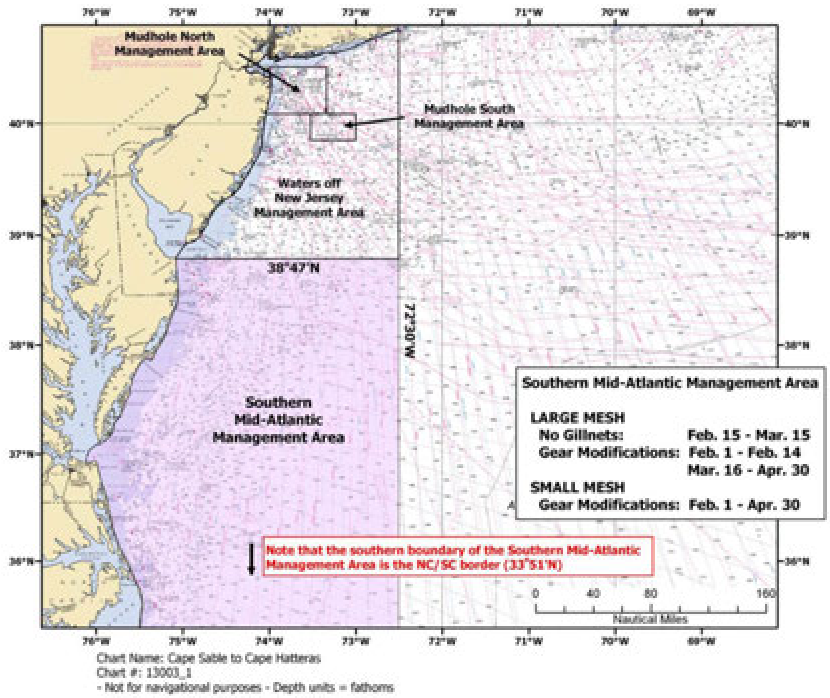
Mudhole North Management Area Small Mesh
Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15

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

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

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

Figure 18 - HPTRP Southern Mid-Atlantic Management Area



Bottlenose Take Reduction Plan. In April 2006, NMFS implemented the TRP for the WNA coastal stock of bottlenose dolphin (April 26, 2006, 71 FR 24776) to reduce the incidental mortality and serious injury in the Mid-Atlantic gillnet fishery and eight other Atlantic coastal fisheries operating within the dolphin's distribution, including the North Carolina inshore gillnet fishery, Southeast Atlantic gillnet fishery, Atlantic blue crab trap/pot fishery, Mid-Atlantic haul/beach seine fishery, NC long haul seine fishery, NC roe mullet stop net fishery, Southeastern U.S. Atlantic shark gillnet fishery, and the Virginia pound net fishery (NMFS 2002). The large mesh size restriction was revised under the Mid-Atlantic large mesh gillnet rule for conservation of endangered and threatened sea turtles to be consistent among Federal and state management. The BDTRP was amended on July 31, 2012 (77 FR 45268) to permanently continue restricting nighttime fishing of medium mesh gillnets operating in NC state waters. The Plan includes gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and educational o reduce dolphin bycatch below the PBR. Details on the BDTRP are at: http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.

6.4.4.2 Sea Turtles

Sea turtles are widely distributed in the waters of the Northwest Atlantic (Section 6.4.3), so they often occupy many of the same ocean areas used for commercial fishing and therefore, interactions with fishing gear are possible. Sea turtles have been incidentally injured or killed in various gear types (e.g., gillnets, trawls, hook and line gear, dredge); however, of the gear types that could be possibly used in the multispecies fishery, trawl and gillnet pose the greatest risk to sea turtles. Most of the observed interactions of sea turtles with trawl and gillnet gear have been in the Mid-Atlantic rather than the GOM. As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl or gillnet gear in these regions and therefore, produce a bycatch estimate for these regions. The following bycatch estimates are based on interactions in the Mid-Atlantic.

Warden (2011a) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., south of Cape Cod, MA, to approximately the NC/SC border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but being released through a Turtle Excluder Device.[16] Of the 292 average annual observable loggerhead interactions, about 44 of those were adult equivalents.[17] This estimate is a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated to be 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a; b). Warden (2011b), using species landed, also estimated total loggerhead interactions attributable to managed species. Five loggerhead interactions (estimated observable and unobservable but quantifiable) were attributed to the Northeast multispecies fishery. In addition, green, Kemp's ridley, and leatherback sea turtles have been documented in bottom trawl gear in areas that overlap with the fishery (NEFSC FSB database). One of these, a leatherback sea turtle, was captured on a trip where the top landed species was whiting, while another sea turtle (unknown species) was captured on trip where the top landed species was pollock.

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear from 2007-2011. Based on 2007-2011 NEFOP data, interactions between these species and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually. However, average interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013). Murray (2013) also estimated interactions by managed species landed in gillnet gear from 2007-2011. An estimate was not made for the Northeast multispecies fishery; but, takes have been observed in sink gillnet fisheries targeting other species. One of these was documented by an observer north of 42° N. Leatherback, Kemp's ridley, and green sea turtles have also been documented in Mid-Atlantic gillnet gear by observers (NEFSC FSB database), with observed takes of Kemp's ridley and leatherback sea turtles in overlapping areas with the Northeast multispecies fishery.

Although sea turtles can interact with multiple gear types (e.g., trawl, gillnet), interaction is affected by multiple factors, including where and when fishing effort is focused, gear type, environmental conditions, and sea turtle occurrence and distribution. Murray and Orphanides (2013) recently evaluated fishery-independent and dependent data to identify environmental conditions associated with turtle presence and the subsequent risk of a bycatch encounter. Fishery independent encounter rates were a function of latitude, sea surface temperature (SST), depth, and salinity. When the model was fit to fishery-dependent data (gillnet, bottom trawl, and scallop dredge), encounter rates decreased as latitude increased; increased as SST increased; a bimodal relationship between encounter rates and salinity; and higher encounter rates in depths

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

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

25-50 m. Similarly, Murray (2013) concluded, based on 2007-2011 data of loggerhead interactions in gillnet gear, that bycatch rates were associated with latitude, SST, and mesh size, with highest interaction rates in the southern Mid-Atlantic in warm SST and in large (>7") mesh. Based on the 2005-2008 data obtained on loggerhead interactions in bottom trawl gear, Warden (2011a) also found that latitude, depth and SST were associated with the interaction rate, with the rates being highest south of 37° N in waters <50 m deep and SST >15°C (Table 31).

Table 31 - Mid-Atlantic trawl bycatch rates

Latitude Zone	Depth	SST	Loggerheads/Day Fished
<37 °N	≤50 m	≤15° C	0.4
	≤50 m	≥15° C	2.06
	>50 m	≤15° C	0.07
	>50 m	>15° C	0.09
37 - 39 °N	≤50 m	≤15° C	0.04
	≤50 m	≥15° C	0.18
	>50 m	≤15° C	0.01
	>50 m	>15° C	0.07
>39 °N	≤50 m	≤15° C	<0.01
	≤50 m	≥15° C	0.03
	>50 m	≤15° C	<0.01
	>50 m	>15° C	0.01
Source: Warden (2011a).			

6.4.4.3 Atlantic Sturgeon

As in Section 6.4.3.5, the marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range, although genetic analyses suggests that the distribution of each varies within that range (Dunton, et al. 2010; King et al. 2001; Laney, et al. 2007; O'Leary, et al. 2014; Waldman, et al. 2013; Wirgin et al. 2012a). Three separate publications using different information sources reached the same conclusion; Atlantic sturgeon occur primarily in waters <50 m (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (Dunton, et al. 2010; Erickson, et al. 2011; Stein, et al. 2004a). These characteristics of Atlantic sturgeon occurrence and distribution result in Atlantic sturgeon occupying many of the same ocean areas utilized for commercial fishing and therefore, occupying areas in which interactions with fishing gear are possible.

There are three documents, covering three time periods, that use data collected by the NEFOP to describe bycatch of Atlantic sturgeon: Stein et al. (2004a) for 1989-2000; ASMFC (2007) for 2001-2006; and Miller and Shepard (2011) for 2006-2010. None of these provide estimates of Atlantic sturgeon bycatch by DPS. Information in all three documents indicate that sturgeon bycatch occurs in gillnet and trawl gear, with the most recent document estimating, based on NEFOP and VTR data from 2006-2010, that annual bycatch of Atlantic sturgeon was 1,342 and 1,239, respectively. Specifically, Miller and Shepard (2011) observed Atlantic sturgeon interactions in trawl gear with small (<5.5 in) and large (≥5.5 in) mesh sizes, as well as gillnet gear with small (<5.5 in), large (5.5-8 in), and extra-large mesh (>8 in) sizes. Although Atlantic sturgeon were observed to interact with trawl and gillnet gear with various mesh sizes, based on NEFOP data, they concluded that gillnet gear, in general, posed a greater risk of mortality to Atlantic sturgeon than did trawl gear. Estimated mortality rates in gillnet gear were 20.0%, while those in otter trawl gear were 5.0%. Similar conclusions were reached in Stein et al. (2004a) and

ASMFC (2007) reports, in which both studies also concluded, after review of NEFOP data from 1989-2000 and 2001-2006, that observed mortality is much higher in gillnet gear than in trawl gear. Based on the information presented in these three documents, factors thought to increase the risk of Atlantic sturgeon bycatch, and therefore death, in gillnet gear include:

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

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

6.4.4.4 Atlantic Salmon

As in Section 6.4.3.6, the marine range of the GOM DPS extends from the GOM (primarily northern portion), to the coast of Greenland (Fay, et al. 2006; NMFS & USFWS 2005). Although the marine distribution of Atlantic salmon likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. According to the Biological Opinion issued by GARFO on December 16, 2013, NMFS NEFOP and At-Sea Monitoring Programs documented 15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (Kocik et al. 2014; NMFS 2013a). Atlantic salmon were observed in gillnet (11/15) and bottom otter trawl gear (4/15), with ten listed as “discarded” and five as mortalities (Kocik pers. comm. 2013 in NMFS 2013a). The genetic identity of these captured salmon is unknown; however, all 15 fish are considered to be part of the GOM DPS, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

The above information suggests that interactions with Atlantic salmon are rare events (Kocik, et al. 2014; NMFS 2013a). However, it is important to recognize that observer program coverage is not 100%. As a result, it is likely that some interactions with Atlantic salmon have occurred, but have not been observed or reported.

6.5 HUMAN COMMUNITIES

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

This section reviews the Northeast multispecies fishery and describes the human communities potentially impacted by the management alternatives. This includes a description of the sector, common pool, and recreational participants and the important port communities in the fishery. Social, economic and fishery information presented in this section are useful in describing the response of the fishery to past management actions and predicting how the present action may affect the multispecies fishery. Additionally, this section establishes a descriptive baseline for the fishery with which to compare actual and predicted future changes that result from management actions. The focus here is on changes since the adoption of Amendment 16 in FY 2010. A more complete discussion of prior management actions is in Section 3.1.

Table 32 and Table 33 contain a summary of major trends in the groundfish fishery. Additional information may be found in the FY 2010, FY 2011, FY 2012, and FY 2013 performance reports for this fishery by the NEFSC (Kitts et al. 2011; Murphy, et al. 2015; Murphy et al. 2014; Murphy et al. 2012).

Table 32 - Summary of major trends in the Northeast multispecies fishery, FY 2010 – FY 2011

	FY 2010			FY 2011		
	Total	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**
Groundfish gross nominal revenue	$83,212,207	$81,165,969	$2,046,238	$88,821,349	$87,982,963	$838,386
Non-groundfish gross nominal revenue	$210,068,225	$115,537,375	$94,530,850	$235,565,188	$141,895,314	$93,669,874
Total gross nominal revenue	$293,280,432	$196,703,344	$96,577,088	$324,386,537	$229,878,277	$94,508,260
Groundfish average price	$1.42	$1.41	$1.58	$1.43	$1.42	$1.58
Non-groundfish average price	$1.21	$1.18	$1.24	$1.11	$1.11	$1.11
Number of active vessels	855	437	418	777	443	334
Number of active vessels that took a groundfish trip	446	304	142	418	302	116
Number of groundfish trips	13,859	11,575	2,284	16,138	13,858	2,280
Number of non-groundfish trips	38,507	16,547	21,960	33,727	16,814	16,913
Number of days absent on groundfish trips	18,737	17,131	1,605	21,895	20,393	1,503
Number of days absent on non-groundfish trip	31,354	16,023	15,331	28,032	15,485	12,547
Total crew positions	2,268			2,166		
Total crew-trips	125,033			122,785		
Total crew-days	171,278			171,342		

Notes: Data include all vessels with a valid limited access multispecies permit. Sector plus common pool vessel counts may exceed the total vessel count because vessels may switch between sector and common pool eligibilities during the fishing year. Revenue and price reported in 2010 dollars. “Trips" refer to commercial trips in the northeast Exclusive Economic Zone (EEZ). Past reports included party/charter trips. FY 2009 data from Murphy et al. (2014); FY 2010-2013 data from Murphy et al. (2015).

Table 33 - Summary of major trends in the Northeast multispecies fishery, FY 2012 – FY 2013

	FY 2012			FY 2013		
	Total	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**
Groundfish gross nominal revenue	$67,815,297	$67,209,195	$606,102	$55,220,469	$54,211,824	$1,008,645
Non-groundfish gross nominal revenue	$228,136,612	$135,359,399	$92,777,213	$214,665,116	$129,680,139	$84,984,976
Total gross nominal revenue	$295,951,909	$202,568,594	$93,383,315	$269,885,585	$183,891,963	$85,993,622
Groundfish average price	$1.43	$1.43	$1.71	$1.31	$1.30	$1.59
Non-groundfish average price	$1.07	$1.03	$1.13	$1.00	$0.95	$1.10
Number of active vessels	763	445	318	735	419	316
Number of active vessels that took a groundfish trip	400	303	97	327	245	82
Number of groundfish trips	14,328	12,990	1,338	10,056	9,125	911
Number of non-groundfish trips	33,024	17,172	15,852	33,317	17,900	15,417
Number of days absent on groundfish trips	19,839	18,998	842	17,013	16,356	657
Number of days absent on non-groundfish trip	29,151	16,341	12,811	29,439	16,916	12,523
Total crew positions	2,135			2,039		
Total crew-trips	117,118			106,700		
Total crew-days	169,129			157,600		

Notes: Data include all vessels with a valid limited access multispecies permit. Sector plus common pool vessel counts may exceed the total vessel count because vessels may switch between sector and common pool eligibilities during the fishing year. Revenue and price reported in 2010 dollars. “Trips" refer to commercial trips in the northeast Exclusive Economic Zone (EEZ). Past reports included party/charter trips. From Murphy et al. (2015).

6.5.1 Northeast Groundfish Fishery Overview

Groundfish fishing has been integral to New England's industry and culture for over 400 years (Bolster 2008). Broadly, 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 fishery focused on cod and haddock. Today, the Northeast Multispecies FMP (large-mesh and small-mesh) includes a total of 13 species of groundfish harvested from three geographic areas representing 19 distinct stocks (Section 6.1).

Prior to the Industrial Revolution, the groundfish fishery focused primarily on cod. The salt cod industry, which preserved fish by salting while still at sea, supported a hook and line fishery that included hundreds of sailing vessels and shoreside industries including salt mining, ice harvesting, and boat building. Late in the 19th century, the fleet also began to focus on Atlantic halibut, with landings peaking in 1896 at around 4,445 mt (NEFSC 2013h).

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 (NEFSC 2013h).

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 589,670 mt. However, by the 1970's, landings decreased sharply to between 181,437 and 272,155 mt as the previously virgin GB stocks were exploited (NEFSC 2013h).

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 181,437 mt to about 90,718 mt through the mid 1980's (NEFSC 2013h).

In 1986, the NEFMC implemented the Northeast Multispecies FMP, the history of which is contained in Section 3.1.1.

6.5.2 Fishing Communities

There are over 300 communities that are a homeport or landing port to one or more Northeast groundfish fishing vessels. These ports occur throughout the New England and Mid-Atlantic. Consideration of the economic and social impacts on these communities from proposed fishery regulations is required by the National Environmental Policy Act (NEPA 1970) and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA 2007). Before any agency of the federal government may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). National Standard 8 of the MSA stipulates that "conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(a)(8)).

A "fishing community" is defined in the Magnuson-Stevens Act, as amended in 1996, as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802(17)). Determining which fishing communities are "substantially dependent" on and "substantially engaged" in the groundfish fishery can be difficult. Although it is useful to narrow the focus to individual communities in the analysis of fishing dependence, there are a number of potential issues with the confidential nature of the information. There are privacy concerns with presenting the data in such a way that proprietary information (landings, revenue, etc.) can be attributed to an individual vessel or a small group of vessels. This is particularly difficult when presenting information on ports that may only have a small number of active vessels.

6.5.2.1 Primary and Secondary Fishing Ports

Communities dependent on the groundfish resource have been categorized into primary and secondary port groups, so that community data can be cross-referenced with other demographic information (Table 34). Both the regional quotient (port groundfish revenue/regional groundfish revenue) and local quotient (port groundfish revenue/port all species revenue) were calculated to provide an objective measure of the level of involvement in groundfishing for each port. All metrics were calculated using the annual average over the most recent five years for which landings data are available (FY 2009-FY 2013).

Primary ports are those communities that are substantially engaged in the groundfish fishery, and which are likely to be the most impacted by groundfish management measures. Primary ports are selected based on the following characteristics:

1. Three or more permits reporting groundfish landings.
2. At least $100,000 average annual revenue (for all species, not just groundfish).[18]
3. Top 10 ranking in regional quotient or local quotient.

Secondary ports are those communities that may not be as dependent or engaged in the groundfish fishery as the primary ports, but are involved in the groundfish fishery to a lesser extent. Because of the size and diversity of the groundfish fishery, it is not practical to examine each secondary port individually. However, they are listed here to provide a broader scope of potential communities impacted by groundfish management measures. Secondary ports are selected based on the following characteristics:

1. At least $100,000 average annual revenue (for all species, not just groundfish).
2. Top 11-30 ranking in regional quotient or local quotient.

[18] There are 22 communities that have >$100,000 average annual groundfish revenue, including all of the primary ports identified with this method.

Using the above method identifies place-based fishing communities based on level of engagement. Because significant geographical shifts in the distribution of groundfish fishing activity have occurred, the characterization of some ports as “primary” or “secondary” may not reflect their historical participation in and dependence on the groundfish fishery. Descriptions of communities involved in the multispecies fishery, and further descriptions of Northeast fishing communities in general, can be found on Northeast Fisheries Science Center’s website (NEFSC 2013g).

Table 34 - Primary and secondary multispecies port communities

State	Multispecies Port Community	
	Primary	**Secondary**
Maine	Portland	Saco
		Cape Porpoise
		Port Clyde
		Cundy's Harbor
		Sprucehead
		Kennebunkport
		Boothbay Harbor
New Hampshire	Portsmouth	Hampton
	Seabrook	
	Rye	
Massachusetts	Gloucester	Plymouth
	New Bedford	Dennis
	Boston	Provincetown
	Chatham	Harwichport
	Scituate	Sandwich
		Newburyport
		Barnstable
		Woods Hole
		Marshfield
		Rockport
		Nantucket
Rhode Island	Point Judith	Newport
Connecticut		Stonington
New York		Montauk

6.5.2.2 Primary Port Descriptions

Information in this section is largely based on demographic data collected by the 2010 US Census and fishery data collected by NMFS, much of which are available on the NEFSC website (NEFSC 2012c). While these data describe a community’s dependence on the groundfish fishery, it is important to remember that at least some of the individual groundfish vessels therein are even more dependent on groundfish.

Portland, Maine. In 2013, Portland had a population 66,318, which is a 0.2% increase from the year 2010 (64,194) (Census 2015). In FY 2013, 14 vessels that hail from Portland landed groundfish (Table 35). The value of groundfish landings from these vessels was \$9.8M in FY 2013, whether they landed in Portland or elsewhere. The value of all groundfish revenue in Portland was \$5.4M in FY 2013, indicating that several of the vessels based in Portland landed in other ports, likely in Massachusetts. Since FY 2009, the value of landings in Portland has been less than the value of landings by Portland-based vessels. In 2013, about 20% of total fisheries revenues of species landed Portland came from groundfish.

Portland has several dealers, processors, and other shore-side infrastructure that support the groundfish fishery. Opening in 1986, the Portland Fish Exchange is America's first all-display seafood auction. In 2013, the Exchange sold 4.7M pounds of seafood, about 75% of which was groundfish (www.pfex.org). Processors include Bristol Seafood, Channel Fish Processing, Cozy Harbor Seafood, Inc., and North Atlantic, Inc. The Salt and Sea is a community supported fishery is based in Portland.

Portsmouth, New Hampshire. In 2013, Portsmouth had a population of 21,440, which is a 1.0% increase from the year 2010 (21,233) (Census 2015). In FY 2013, 8 vessels that hail from Portsmouth landed groundfish, down from 13 in FY 2009 (Table 36). The value of groundfish landings from these vessels was \$1.1M in FY 2013, whether they landed in Portsmouth or elsewhere. The value of all groundfish revenue in Portsmouth was \$0.9M in FY 2013, indicating that some vessels based in Portsmouth landed in other ports, likely in Massachusetts or Maine. Since at least FY 2009, the value of landings in Portsmouth has been less than the value of landings by Portsmouth-based vessels. In 2013, about 18% of total fisheries revenues of species landed Portsmouth came from groundfish.

In terms of shore-side infrastructure, the Portsmouth Fishermen's Cooperative closed in September 2007. Since then, several Portsmouth fishermen have been landing fish in other ports, though some offloading of groundfish has continued at the State Pier through dealers such as Seaport Fish and through private trucking to dealers out of state. Recently, a local commercial fisherman obtained a dealer's license to help sustain Portsmouth as a landing port. New Hampshire Community Seafood is a community supported fishery based in Portsmouth which was launched in 2012.

Seabrook, New Hampshire. In 2013, Seabrook had a population of 8,749, which is a 0.6% increase from 2010 (8,693) (Census 2015). In FY 2013, 5 vessels that hail from Seabrook landed groundfish (Table 37). The value of these landings was \$0.4M, down from \$ 1.2M in FY 2009 (a 200% decline). Groundfish landings in Seabrook, regardless of the homeport of the vessel were down from \$1.4M in 2009 to \$1.0M in 2013. In 2013, about 89% of total fisheries revenues of species landed in Seabrook came from groundfish.

Most of the local vessels are day-boats that land at the Yankee Fisherman's Cooperative, a wholesale and processing facility. The co-op was founded in 1990 by 60 members who fish groundfish, lobster, tuna or shrimp. The co-op also houses a retail market where fresh seafood is sold to the local community.

Rye, New Hampshire. In 2013, Rye had a population of 5,329 which is a 0.6% increase from 2010 (5,298) (Census 2015). In FY 2013, 7 vessels that hail from Rye landed groundfish, down from 11 boats in FY 2009 (Table 38). The value of these landings was \$0.6M, a 36% decrease from \$1.5M in FY 2009. Groundfish landings in Rye, regardless of the homeport of the vessel were down to just under $2,000 in FY 2013. This is a drastic decline from landings of almost $800,000 in 2012 and $1.3M in 2011. In 2013, around 1% of total fisheries revenues of species landed in Rye came from groundfish.

The Division of Ports and Harbors (DPH) has jurisdiction over a commercial fishing pier in Rye. Due to physical limitations of the pier, the DPH does not allow long-term or overnight berthing. Commercial fishermen must acquire a "Pier Use" permit to use the facility (http://www.portofnh.org/fishing.html).

Gloucester, Massachusetts. In 2013, Gloucester had a population of 29,393, which is a 2.1% increase from the year 2010 (28,789) (Census 2015). In FY 2012, 61 vessels that hail from Gloucester landed groundfish, down from 95 in FY 2007 (Table 39). The value of groundfish landings from these vessels was $14M in FY 2012, whether they landed in Gloucester or elsewhere. The value of all groundfish revenue in Gloucester was $21M in FY 2012, indicating that vessels based in other ports landed in Gloucester. Since at least FY 2007, the value of landings in Gloucester has been greater than the value of landings by Gloucester-based vessels. In 2013, about 42% of total fisheries revenues of species landed Gloucester came from groundfish.

The significant amount of landings and revenues, as well as the number of shoreside facilities, indicate that Gloucester is an important port of landing for multispecies vessels. The Cape Ann Seafood Exchange is a wholesale fish auction that employs about 20 people. Processors of groundfish include Channel Fish Processing. Cape Ann Fresh Catch is a community supported fishery is based in Gloucester. Cape Pond Ice Company has provided ice for many Gloucester fishing boats, however recent reductions in fishing effort have reduced demand for large quantities of ice and the company has diversified adding tours and t-shirt sales in an attempt to stay in business. Gloucester has gained some business from Maine vessels which land here due to tightening restrictions at the statewide level in Maine. The Gloucester Fishermen's Wives Association has been active in this community since 1969, with a goal "to help promote a healthy environment and a just economy that allows local and family-owned businesses to survive in a changing world" (GFWA 2014).

Boston, Massachusetts. In 2013, Boston had a population of 645,966, which is a 4.6% increase from the year 2010 (617,720) (Census 2015). In FY 2013, 25 vessels that hail from Boston landed groundfish, down from 44 in FY 2009 (Table 40). The value of groundfish landings from these vessels was $10.7M in FY 2013, whether they landed in Boston or elsewhere. The value of all groundfish revenue in Boston was $9.3M in FY 2013, indicating that some vessels based in Boston landed in other ports. Since at least FY 2007, the value of landings in Boston has been less than the value of landings by Boston-based vessels. In 2013, about 81% of total fisheries revenues of species landed Boston came from groundfish.

These landings as well as the historical importance of Boston as a provider of fishing-related support services for smaller communities indicate that Boston is an important primary community. The high cost of real estate in Boston means that fishermen and other maritime users of waterfront areas face displacement issues. Groups such as the Boston Harbor Association are working to prevent this from happening. There are now only two areas for commercial fishermen to tie-up and unload their catch – Boston Fish Pier and the Cardinal Medeiros docks (used almost exclusively by lobstermen). The New England Seafood is located at the Fish Pier. Groundfish processing facilities in Boston include Channel Fish Processing, Foley Fish, and Pier Fish, Co.

Chatham, Massachusetts. In 2013, Chatham had a population of 6,131, which is a 0.1% increase from the year 2010 (6,125) (Census 2015). In FY 2012, 23 vessels that hail from Chatham landed groundfish, unchanged from FY 2007 (Table 41). The value of groundfish landings from these vessels was \$0.94M in FY 2012, whether they landed in Chatham or elsewhere. In FY 2010 and FY 2011, the value of landings in Chatham was been less than the value of landings by Chatham-based vessels. In 2013, about 5% of total fisheries revenues of species landed Chatham came from groundfish. The Chatham Fish Pier is an active offloading facility in Chatham. The Cape Cod Community Supported Fishery is based in West Chatham. Also on the Cape, the Lobster Trap Co., Inc. purchases groundfish from Chatham-based vessels.

New Bedford, Massachusetts. In 2013, New Bedford had a population of 95,078, which has remained fairly steady since 2010 (95,072) (Census 2015). In FY 2013, 31 vessels that hail from New Bedford landed groundfish, down from 52 in FY 2009 (Table 42). The value of groundfish landings from these vessels was \$12.7M in FY 2012, whether they landed in New Bedford or elsewhere. Since at least FY 2007, the value of landings in New Bedford has been greater than the value of landings by New Bedford-based vessels. In 2013, a little over 5% of total fisheries revenues of species landed New Bedford came from groundfish.

New Bedford is also an important port of landing for scallop vessels, and its dependence on the scallop fishery for revenues reduces its overall dependence on the multispecies fishery, although many individual vessels may be more dependent on groundfish. New Bedford, as a fishing community, is less dependent on groundfish for its overall fisheries revenues. Some impacted vessels may have the ability to offset losses in groundfish revenues with revenues from other fisheries. New Bedford has several dealers, processors, and other shore-side infrastructure that support the groundfish fishery. Opening in 1994, the Whaling City Seafood Display Auction is the only seafood auction in Southern New England. Groundfish processors include American Pride Seafoods, Foley Fish, Marder Trawling, Inc., and Pier Fish, Co.

Scituate, Massachusetts. In 2013, Scituate had a population of 18,297, which is a 0.9% increase from 2010 (18,135) (Census 2015). In FY 2013, 8 vessels that hail from Scituate landed groundfish, down from 14 in FY 2009. The value of groundfish landings from these vessels whether they landed in Scituate or elsewhere was \$0.3M in FY 2013, down from \$1.6M in FY09 (Table 43). The value of groundfish landings in Scituate since FY 2011 has been greater than the value of landings from Scituate based vessels. In 2013, 29% of total fisheries revenues of species landed Scituate came from groundfish.

The Scituate Town Pier, is owned and operated by the town but primarily used by commercial fishermen. There is berthing available for 15, 40-80 foot commercial fishing vessels. The Pier is also used for loading and offloading supplies, and fuel, ice and bait are trucked to the pier (http://www.scituatema.gov/sites/scituatema/files/file/file/harbor_management_plan.pdf). The South Shore Seafood Exchange, or Sossexi, a community supported fishery, was started in Scituate in 2012. The CSF offers pickup locations as well as home deliveries and sells filleted fish to individuals, families and restaurants.

Point Judith/Narragansett, Rhode Island. Point Judith is considered a village in the town of Narragansett and does not have Census data as it is not incorporated on its own. It is also not a residential town, and fishermen working out of the port live in surrounding communities and all across Rhode Island. In 2013, Narragansett had a population of 15,706, which is a 1.0% decrease from the year 2010 (15,870) (Census 2015).

In FY 2013, 30 vessels that hail from Point Judith landed groundfish, down from 43 in FY 2007 (Table 44). The value of groundfish landings from these vessels was $1.9M in FY 2012, whether they landed in Point Judith or elsewhere. In 2013, over 5% of total fisheries revenues of species landed Point Judith came from groundfish.

Groundfish landings and revenues in this community have increased considerably since the 1994 fishing year, suggesting that Point Judith is becoming a more important port of landing for multispecies vessels. Point Judith, as a fishing community, is less dependent on groundfish for its overall fisheries revenues. Some impacted vessels may have the ability to offset losses in groundfish revenues with revenues from other fisheries. Many of Point Judith's vessels are actively involved in fisheries in the Mid-Atlantic region (squid, fluke, etc.). However, increasing reliance on groundfish in recent years suggests that vessels may have more difficulty shifting effort as restrictions in these other fisheries increase and opportunities decrease. Groundfish processors located in Warwick likely serve fishermen offloading in Point Judith, including Gardner's Wharf Seafood and Great Northern Products, Ltd.

Table 35 - Groundfish fishery in Portland, ME

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	14	14	15	16	14
Value of landings of groundfish by home port ($M)	8.3	10.6	10.1	9.3	9.8
Value of landings of groundfish by port of landing ($M) [B]	5.1	3.5	4.8	6.8	5.4
Value of landings of all species by groundfish vessels by home port ($M)	10.5	12.9	12.7	12.2	12.9
Value of landings of all species by groundfish vessels by port of landing ($M)	7.4	6.2	7.2	9.5	8.6

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Portland.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 36 - Groundfish fishery in Portsmouth, NH

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	13	9	9	8	8
Value of landings of groundfish by home port ($M)	2.0	1.2	1.4	1.4	1.1
Value of landings of groundfish by port of landing ($M) [B]	1.4	1.2	1.6	1.4	0.9
Value of landings of all species by groundfish vessels by home port ($M)	3.2	2.6	2.8	2.6	2.3
Value of landings of all species by groundfish vessels by port of landing ($M)	3.1	3.2	3.3	3.1	2.6

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Portsmouth.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 37 - Groundfish fishery in Seabrook, NH

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	6	5	5	4	5
Value of landings of groundfish by home port ($M)	1.2	0.9	1.1	0.5	0.4
Value of landings of groundfish by port of landing ($M) [B]	1.4	1.1	1.4	1.1	1.0
Value of landings of all species by groundfish vessels by home port ($M)	1.6	1.4	1.5	1.0	0.6
Value of landings of all species by groundfish vessels by port of landing ($M)	2.1	1.8	2.1	1.8	1.6

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Seabrook.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 38 - Groundfish fishery in Rye, NH

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	11	9	9	9	7
Value of landings of groundfish by home port ($M)	1.5	1.0	1.4	1.2	0.6
Value of landings of groundfish by port of landing ($M) [B]	1.3	0.9	1.3	0.8	0.0
Value of landings of all species by groundfish vessels by home port ($M)	2.4	2.0	2.2	2.4	1.5
Value of landings of all species by groundfish vessels by port of landing ($M)	1.9	1.6	1.8	1.2	0.2

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Rye.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 39 - Groundfish fishery in Gloucester, MA

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	96	75	69	61	53
Value of landings of groundfish by home port ($M)	16.9	16.8	16.6	13.6	9.4
Value of landings of groundfish by port of landing ($M) [B]	30.0	27.6	29.5	20.6	14.6
Value of landings of all species by groundfish vessels by home port ($M)	23.8	25.0	25.8	21.6	17.1
Value of landings of all species by groundfish vessels by port of landing ($M)	39.6	39.9	42.4	31.1	25.2

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Gloucester.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 40 - Groundfish fishery in Boston, MA

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	44	35	30	28	25
Value of landings of groundfish by home port ($M)	13.8	14.4	17.0	12.6	10.7
Value of landings of groundfish by port of landing ($M) [B]	8.9	11.3	11.5	10.0	9.3
Value of landings of all species by groundfish vessels by home port ($M)	26.8	27.8	30.9	26.4	25.1
Value of landings of all species by groundfish vessels by port of landing ($M)	11.2	13.8	14.0	12.0	12.0

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Boston.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 41 - Groundfish fishery in Chatham, MA

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	28	26	25	23	20
Value of landings of groundfish by home port ($M)	2.8	2.4	2.5	0.9	0.8
Value of landings of groundfish by port of landing ($M) [B]	3.2	2.2	2.3	1.0	0.7
Value of landings of all species by groundfish vessels by home port ($M)	6.4	6.5	8.8	6.6	8.1
Value of landings of all species by groundfish vessels by port of landing ($M)	8.0	7.5	9.0	7.2	8.1

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Chatham.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 42 - Groundfish fishery in New Bedford, MA

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	52	33	37	36	31
Value of landings of groundfish by home port ($M)	16.3	18.6	20.7	14.9	12.7
Value of landings of groundfish by port of landing ($M) [B]	23.7	29.1	29.9	20.7	18.7
Value of landings of all species by groundfish vessels by home port ($M)	59.5	65.4	76.5	67.9	58.1
Value of landings of all species by groundfish vessels by port of landing ($M)	83.8	93.9	105.2	99.8	87.8

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in New Bedford.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 43 - Groundfish fishery in Scituate, MA

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	14	8	9	9	8
Value of landings of groundfish by home port ($M)	1.6	0.9	0.9	0.9	0.3
Value of landings of groundfish by port of landing ($M) [B]	2.3	0.8	1.1	1.3	0.8
Value of landings of all species by groundfish vessels by home port ($M)	2.5	1.8	1.6	2.4	1.5
Value of landings of all species by groundfish vessels by port of landing ($M)	3.2	1.8	1.8	2.5	1.4

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Scituate.
Source: Murphy (2015), all landings are reported in 2010 dollars.

Table 44 - Groundfish fishery in Point Judith, RI

	FY09	FY10	FY11	FY12	FY13
Active groundfish vessels in this homeport(#) [A]	32	31	28	33	30
Value of landings of groundfish by home port ($M)	2.3	2.4	2.0	1.8	1.9
Value of landings of groundfish by port of landing ($M) [B]	2.3	2.1	2.1	1.8	2.1
Value of landings of all species by groundfish vessels by home port ($M)	19.6	22.8	27.8	24.9	26.0
Value of landings of all species by groundfish vessels by port of landing ($M)	21.2	24.7	30.4	26.0	30.0

[A] "Active" defined as revenue from at least one groundfish trip from this homeport.
[B] Revenue includes all vessels landing in Point Judith.
Source: Murphy (2015), all landings are reported in 2010 dollars.

6.5.2.3 Employment

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

Throughout the Northeast, many communities benefit indirectly from the multispecies fishery, but these benefits are often difficult to attribute. The direct benefit from employment in the fishery can be estimated by the number of crew positions.[19] However, crew positions do not equate to the number of jobs in the fishery and do not make the distinction between full and part-

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

time positions. In FY 2013, vessels with limited access groundfish permits provided 2,046 crew positions, with 48% coming from vessels with homeports in Massachusetts (Table 45). Since at least FY 2009, the total number of crew positions provided by limited access groundfish vessels has declined by 15.6%. Changes in crew positions vary across homeport states. Overall, most states lost crew positions in FY 2013, although New Jersey added a few positions.

A crew day[20] is a measure of employment that incorporates information about the time spent at sea earning a share of the revenue. Conversely, crew days can be viewed as an indicator of time invested in the pursuit of "crew share" (the share of trip revenues received at the end of a trip). The time spent at sea has an opportunity cost. For example, if crew earnings remain constant, a decline in crew days would reveal a benefit to crew in that less time was forgone for the same amount of earnings. In FY 2013, vessels with limited access groundfish permits used 157,601 crew days, with 47% coming from vessels with homeports in Massachusetts (Table 45). Since at least FY 2009, the total number of crew days used by limited access groundfish vessels across the Northeast has declined, though Rhode Island had an increase in crew days in FY 2013. 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.

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

Home Port State		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
CT	Total crew positions	40	37	42	39	39
	Total crew days	3,700	4,020	3,002	4,478	3,551
MA	Total crew positions	1,231	1,140	1,071	1,050	987
	Total crew days	95,685	83,235	85,747	81,696	73,518
ME	Total crew positions	266	244	222	242	228
	Total crew days	15,539	15,596	14,910	16,524	15,237
NH	Total crew positions	110	108	106	95	86
	Total crew days	5,407	3,929	4,987	5,166	4,487
NJ	Total crew positions	162	150	144	149	153
	Total crew days	10,865	10,093	9,893	10,349	9,564
NY	Total crew positions	219	208	217	208	191
	Total crew days	16,997	15,763	16,046	15,028	14,372
RI	Total crew positions	267	256	247	232	226
	Total crew days	26,411	26,822	25,147	24,247	25,645
Other Northeast	Total crew positions	131	129	131	136	131
	Total crew days	12,615	11,818	11,610	11,640	11,227
Total	**Total crew positions**	**2,424**	**2,275**	**2,179**	**2,145**	**2,046**
	Total crew days	**187,219**	**171,277**	**171,343**	**169,128**	**157,601**

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

6.5.3 Commercial Permit Categories

Since the implementation of Amendment 5 in 1994, all vessels that land regulated groundfish for commercial sale have been required to have a permit. Moratorium - commonly called limited access - permits were granted to vessels based on fishing history during a defined period. Limited access permit holders land most regulated groundfish. The only new limited access permits granted since 1994 have been to a small number of handgear vessels in FY 2004, but the ownership of many vessels issued permits has changed. Most limited access permits are restricted in the number of DAS that may be fished. In addition, there have been open access permit categories. Open access permits may be requested at any time, with the limitation that a vessel may not have a limited access and open access permit at the same time. Permits are issued in different categories, depending on the activity and history of the vessel. There have been several changes in the defined permit categories, as Amendment 5, Amendment 7, and Amendment 13 all changed the category definitions. For this reason, when examining fishing activity based on permit category, care must be taken to make comparisons to similar permits. Many groundfish vessels have permits for, and participate in, other fisheries. For some vessels groundfish revenues are only a small part of total fishing revenues.

Adopted in 1996, Amendment 7 implemented several different limited and open access permit categories in the multispecies fishery that were in effect through FY 2003. Limited access multispecies permit categories are described in CFR 648.82, while open access multispecies permit categories are described in CFR 648.88.

6.5.3.1 Limited Access Permit Categories

(A) Individual DAS. Individual DAS vessels are subject to DAS restrictions. Any vessel issued a valid Individual DAS permit as of July 1, 1996 (except those that were issued a gillnet permit) was assigned to the Individual DAS category in Amendment 7.

(C) Small Vessel Exemption. Small vessel category vessels may retain up to 300 lb (136.1 kg) of cod, haddock, and yellowtail flounder, combined, and one Atlantic halibut per trip without being subject to DAS restrictions. These vessels are not subject to possession limits for other NE multispecies. Any vessel that has a valid limited access multispecies permit, was fishing with a small vessel category permit (≤45 ft (13.7 m)) as of July 1, 1996, and is 20 ft (6.1 m) or less in length as determined by the vessel’s last application for a permit, was assigned to the small vessel category in Amendment 7.

(D) Hook Gear. Hook gear vessels are subject to DAS restrictions. Each hook-gear vessel is limited to 4,500 rigged hooks and is prohibited from possessing gear other than hook gear on board.

(E) Combination Vessel. Combination vessels are scallop dredge vessels that qualified for a multispecies permit because of groundfish landings using trawls. These vessels are subject to DAS restrictions. A vessel issued a valid limited access multispecies permit and qualified to fish as a combination vessel as of July 1, 1996 was assigned to the Combination vessel category in Amendment 7.

(F) Large Mesh Individual DAS. Large mesh individual DAS vessels are subject to DAS restrictions. Large Mesh Individual vessels are required to fish for the entire year with either trawl gear with a minimum size of 8.5-inch (21.59 cm) diamond or square mesh.

(HA) Handgear A. A vessel with a valid open access multispecies handgear permit is allowed to possess and land up to 300 lb (136.1 kg) of cod, one Atlantic halibut per trip, and the daily possession limit for other regulated NE multispecies, provided that the vessel did not use or possess on board gear other than rod and reel or handlines while in possession of, fishing for, or landing NE multispecies, and provided it has at least one standard tote on board. A handgear permit vessel may not fish for, possess, or land regulated species from March 1 - 20 of each year.

6.5.3.2 Open Access Permit Categories

(HB) Handgear B. The vessel may possess and land up to 75 lb of cod and up to the landing and possession limit restrictions for other NE multispecies. The vessel may not use or possess on board gear other than handgear while in possession of, fishing for, or landing NE multispecies, and must have at least one standard tote on board; The vessel may not fish for, possess, or land regulated species from March 1 through March 20 of each year; and the vessel, if fishing with tub-trawl gear, may not fish with more than a maximum of 250 hooks.

(I) Charter/Party. Any charter/party permit category vessel is subject to restrictions on gear, recreational minimum fish sizes, possession limits, and specified prohibitions on sale.

(J) Scallop Multispecies Possession Limit. A vessel that has been issued a valid open access scallop multispecies possession limit permit may possess and land up to 300 lb (136.1 kg) of regulated species when fishing under a scallop DAS, provided the vessel does not fish for, possess, or land haddock from January 1 through June 30 and provided the vessel has at least one standard tote on board.

(K) Non-Regulated Multispecies. A vessel issued a valid open access, non-regulated multispecies permit may possess and land one Atlantic halibut and an unlimited quantity of the other non-regulated multispecies. The vessel is subject to restrictions on gear, area, and time and other restrictions.

6.5.4 Commercial Fishery Holdings

Goal #4 of this action is to "Prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges." Information on the groundfish fishery holdings of individuals and entities is included here as background for this action.

6.5.4.1 Data Caveats

Since June 2013, the PDT has worked with the Analysis and Program Support Division (APSD) at the NMFS Greater Atlantic Fisheries Office (GARFO) to improve queries of holdings data at the individual level. The DRAFT data in this document are the PDT's current best estimate of PSC holdings by an individual or permit bank for each stock in the fishery. The issue is complex and competes for human resources with a number of concurrent issues of varying priority for both NMFS and Council. There continues to be forward progress on improving the data provided. Much effort has been spent to troubleshoot queries and provide the Council with robust data. Absolute determinations of PSC holdings are ultimately the responsibility of the

APSD at the GARFO. Just as limited entry programs estimate potential permit qualifications, until those records are scrutinized after final action, often including a multiphase appeals process, there are changes in the data. The PDT is confident that the data herein portray the holdings in the fishery to within 1-2% of the true values.

Because the alternatives considered in this action would apply an accumulation limit to individuals or permit banks (Section 4.1), the fishery holdings data in this section are presented at that level. In these data, each permit bank (state and nonprofit) is considered a person. NMFS does not have data on percent interest in fishery permits of the individuals associated with them. Here, it is assumed that each individual has 100% interest in a given MRI.

State-operated permit banks were defined in Amendment 17. There is no regulatory definition of a private/nonprofit permit bank. The permit banks characterized in this section include: the Maine State Permit Bank, New Hampshire State Permit Bank, Boston Sustainable Fishing Community Preservation Fund, Cape Cod Fisheries Trust, Gloucester Fishing Community Preservation Fund, NEFS XI Permit Bank, Penobscot East Permit Bank, South Shore Fishing Community Preservation Fund, and The Nature Conservancy/Island Institute Community Permit Bank. The alternatives (Section 4.1) could apply to other permit banks that form in the future.

6.5.4.2 Permit/MRI Holdings

A Moratorium Right Identifier (MRI) is a unique identifying number that is attached to a Northeast multispecies permit. Each permit has its own MRI, and a given MRI is attached to only one permit. Potential Sector Contribution (PSC) is allocated to MRIs. Within the current NMFS data systems, holdings of MRIs are simpler to track. A plain language description of MRIs and PSC calculation has been published by GARFO (NMFS 2010b).

There have been ~1,400 MRIs in the fishery since FY 2010 (Table 46). In FY 2013, the highest number of MRIs held by an individual or permit bank is 55, which equates to ~4% of the MRIs in the fishery. This entity is a private/nonprofit permit bank. As of January 2014, permit banks collectively hold 104 MRIs, which represent about 7% of the holdings of the entire groundfish fishery (Table 47).

Table 46 - Number of Northeast multispecies permits/MRIs

	April 7, 2011	FY 2011	FY 2012	FY 2013
Limited Access Permits/MRIs on Vessels	1,257	*1,320	*1,222	*1,129
Total Limited Access Permits/MRIs	1,422	**1,421	**1,407	**1,380
Limited Access Permits/MRIs with PSC	1,262	**1,210	**1,255	**1,247

Notes:
* at any time during the fishing year.
** on May 1 of fishing year.
Source: NMFS GARFO, 8/6/2013.

Table 47 - Multispecies MRIs held by permit banks, as of January 28, 2014

		# of GF MRIs held *	% of fishery **
State-operated	New Hampshire State Permit Bank	4	0.3%
	State of Maine Permit Bank	11	0.8%
	Total state	**15**	**1%**
Private/ Nonprofit	Boston Sustainable Fishing Community Preservation Fund, Inc.	2	0.1%
	Cape Cod Fisheries Trust	23	2%
	Gloucester Fishing Community Preservation Fund	49	4%
	NEFS XI Permit Bank	2	0.1%
	Penobscot East Permit Bank	2	0.1%
	South Shore Fishing Community Preservation Fund	8	0.6%
	The Nature Conservancy/Island Institute Community Permit Bank	3	0.2%
	Total private/nonprofit	**89**	**6%**
Grand Total		**104**	**~7%**

Notes:
* The MRI data were downloaded on January 28, 2014, from the NMFS Sector Information Portal.
** Assumes ~1,400 MRIs in the fishery.

6.5.4.3 PSC Holdings

6.5.4.3.1 Fishery-wide PSC holdings

Table 48 and Table 49 summarize the PSC shares of all groundfish stocks held by individuals and permit banks at the beginning of FY 2010, the control date for this action (April 7, 2011), and the beginning of FY 2013 and FY 2014. The data in Table 48 were calculated by averaging the PSC held by an individual or permit bank across all stocks and then identifying the individuals with the maximum, mean, and median fishery-wide holdings. For example, if an individual holds a PSC of 3.000 of stock A and 1.000 of stock B, the average holdings would be 2.000. For FY 2010, the individual with the highest average PSC held 7.316, while the mean individual held 0.128, and median held 0.010. The data in Table 49 were calculated by summing the PSC held by an individual or permit bank across all stocks and then identifying the individuals with the maximum, mean, and median fishery-wide holdings. For FY 2010, the individual with the highest total PSC held 102.423, while the mean individual held 1.797, and median held 0.146. Note that SNE/MA winter flounder was not allocated until FY 2012. Data for FY 2013 with and without this stock are shown. Either way, the PSC holdings increased during this time series (average and total) for the individual (person or permit bank) holding the highest average PSC.

Table 48 - Average PSC shares of individuals and permit banks

	FY 2010*	April 7, 2011*	FY 2013*	FY 2014**
Maximum	7.316	7.316	8.894	9.358
Mean	0.128	0.129	0.144	0.146
Median	0.010	0.011	0.015	0.018

Notes: This data average the PSC of all stocks for each individual and permit bank (n≈1,460 in FY 2010 and the control date and ~1,500 for FY 2013). PSC holdings data are accurate to nine decimal places.
* Does not include SNE/MA winter flounder.
** Includes SNE/MA winter flounder.

Table 49 - Total PSC shares of individuals and permit banks

	FY 2010*	April 7, 2011*	FY 2013*	FY 2014**
Maximum	102.423	102.423	124.514	140.366
Mean	1.797	1.806	2.031	2.189
Median	0.146	0.147	0.263	0.264

Notes: This data sums the PSC of all stocks for each individual and permit bank (n ≈ 1,460 in FY 2010 and the control date and ~1,500 for FY 2013). PSC holdings data are accurate to nine decimal places.
* Does not include SNE/MA winter flounder.
** Includes SNE/MA winter flounder.

6.5.4.3.2 Stock-specific PSC holdings

Table 50 to Table 55 summarize the PSC shares of all groundfish stocks held by individuals and permit banks at several points in time from the beginning of FY 2010 to the beginning of FY 2014. The tables also detail the maximum held by a permit bank and by an individual, and the number of individuals and permit banks with PSC>0 for a stock. The most concentrated stocks are GB winter flounder, GB yellowtail flounder, and SNE/MA winter flounder, while SNE/MA yellowtail flounder and pollock are the least concentrated stocks. The PSC holdings increased during this time series for the individual (person or permit bank) holding the highest average PSC. For some stocks, an individual has the highest holdings (e.g., GB cod), and in other cases, a permit bank does (e.g., GOM cod). In FY 2013, pollock and GB cod are the stocks with some amount of PSC held by the largest number of individuals or permit banks (~1,080), and redfish PSC is held by the least (754).

Table 50 - Stock-specific PSC holdings by individuals and permit banks, as of FY 2010

Stock	All individuals and permit banks			Permit banks	Individuals
	Max	Mean	Median	Max	Max
GB cod	9.944	0.135	0.001	4.195	9.944
GOM cod	7.451	0.102	0.001	7.451	2.518
GB haddock	14.594	0.150	0.000	5.389	14.594
GOM haddock	7.153	0.112	0.000	5.773	7.153
GB yellowtail flounder	14.030	0.160	*0.000	2.159	14.030
SNE/MA yellowtail	5.028	0.124	0.000	2.678	5.028
CC/GOM yellowtail	7.967	0.121	0.000	6.189	7.967
Plaice	8.989	0.129	0.000	8.989	6.295
Witch flounder	8.502	0.129	0.001	8.502	6.568
GB winter flounder	22.681	0.159	0.000	0.707	22.681
GOM winter flounder	6.576	0.114	0.000	6.576	5.423
Redfish	9.650	0.133	*0.000	6.302	9.650
White hake	7.662	0.120	0.000	7.662	6.506
Pollock	5.895	0.116	0.000	5.490	5.895
SNE/MA winter flounder	13.811	0.153	0.000	1.357	13.811

Notes: There are about 1,460 individuals and permit banks in the data. PSC holdings data are accurate to nine decimal places.

* Value is equal to zero exactly. Other zero values represent a small fraction beyond four decimal places.

Table 51 - Stock-specific PSC holdings by individuals and permit banks, as of April 7, 2011

Stock	All individuals and permit banks			Permit banks	Individuals
	Max	Mean	Median	Max	Max
GB cod	9.944	0.135	0.001	4.195	9.944
GOM cod	7.451	0.102	0.001	7.451	2.518
GB haddock	14.594	0.151	0.000	5.389	14.594
GOM haddock	7.153	0.113	0.000	5.773	7.153
GB yellowtail flounder	14.030	0.160	*0.000	2.159	14.030
SNE/MA yellowtail	5.028	0.124	0.000	2.678	5.028
CC/GOM yellowtail	7.967	0.122	0.000	6.187	7.967
Plaice	8.989	0.130	0.000	8.989	6.295
Witch flounder	8.502	0.130	0.001	8.502	6.568
GB winter flounder	22.681	0.160	0.000	0.707	22.681
GOM winter flounder	6.576	0.115	0.000	6.576	5.423
Redfish	9.650	0.134	*0.000	6.302	9.650
White hake	7.662	0.121	0.000	7.662	6.506
Pollock	5.895	0.116	0.000	5.490	5.895
SNE/MA winter flounder	13.811	0.153	0.000	1.357	13.811

Notes: There are about 1,460 individuals and permit banks in the data. PSC holdings data are accurate to nine decimal places.

* Value is equal to zero exactly. Other zero values represent a small fraction beyond four decimal places.

Table 52 - Stock-specific PSC holdings by individuals and permit banks, as of FY 2013 (May 1, 2013).

Stock	All individuals and permit banks			Permit banks	Individuals	*Total holders
	Max	Mean	Median	Max	Max	PSC >0
GB cod	11.955	0.149	0.001	6.226	11.955	1,082
GOM cod	9.512	0.119	0.001	9.512	2.628	1,018
GB haddock	14.788	0.165	0.000	2.352	14.788	827
GOM haddock	8.137	0.128	0.000	8.137	6.906	787
GB yellowtail	16.818	0.182	0.000	1.990	16.818	762
SNE/MA yellowtail	6.197	0.144	0.000	2.719	6.197	865
CC/GOM yellowtail	8.804	0.132	0.000	6.441	8.804	883
Plaice	8.871	0.143	0.001	8.871	8.492	878
Witch flounder	8.736	0.143	0.001	8.073	8.736	993
GB winter flounder	26.031	0.183	0.000	0.524	26.031	842
GOM winter flounder	9.138	0.122	0.000	7.467	9.138	901
Redfish	9.673	0.144	0.000	4.660	9.673	754
White hake	7.200	0.136	0.000	7.200	6.540	968
Pollock	5.881	0.130	0.001	4.943	5.881	1,080
SNE/MA winter flounder	15.853	0.159	0.000	1.489	15.853	1,016

Notes: There are about 1,500 individuals and permit banks in the data. Zero values represent a small fraction beyond four decimal places, but do not equal zero exactly. PSC holdings data are accurate to nine decimal places.

* The total number of individuals and permit banks with PSC >0 for the given stock.

Table 53 - Stock-specific PSC holdings by individuals and permit banks, as of FY 2014 (May 1, 2014).

Stock	All individuals and permit banks			Permit banks	Individuals	*Total holders
	Max	Mean	Median	Max	Max	PSC >0
GB cod	11.733	0.154	0.001	6.571	11.733	1083
GOM cod	9.509	0.126	0.001	9.509	3.066	1019
GB haddock	14.788	0.170	0.000	2.140	14.788	834
GOM haddock	8.126	0.136	0.000	8.126	6.906	803
GB yellowtail	16.607	0.189	0.000	1.865	16.607	765
SNE/MA yellowtail	6.201	0.151	0.000	2.522	6.201	868
CC/GOM yellowtail	8.805	0.138	0.000	6.441	8.805	892
Plaice	8.818	0.150	0.001	8.818	8.401	877
Witch flounder	8.659	0.148	0.002	7.981	8.659	991
GB winter flounder	26.020	0.190	0.000	0.397	26.020	846
GOM winter flounder	9.138	0.125	0.000	7.467	9.138	923
Redfish	9.673	0.147	0.000	4.657	9.673	767
White hake	7.133	0.142	0.001	7.133	6.541	979
Pollock	5.879	0.135	0.001	4.920	5.879	1070
SNE/MA winter flounder	15.889	0.165	0.001	1.422	15.889	1021

Notes: There are about 1,480 individuals and permit banks in the data. Zero values represent a small fraction beyond four decimal places, but do not equal zero exactly. PSC holdings data are accurate to nine decimal places.

* The total number of individuals and permit banks with PSC >0 for the given stock.

Table 54 - Maximum stock-specific PSC holdings by individuals and permit banks from start of catch share program to most recent estimates

Stock	5/1/2010	4/7/2011 (Control Date)	5/1/2013	5/1/2014	Change from 5/1/2010 to 5/1/2014
GB cod	9.944	9.944	11.955	11.733	1.789
GOM cod	7.451	7.451	9.512	9.509	2.058
GB haddock	14.594	14.594	14.788	14.788	0.194
GOM haddock	7.153	7.153	8.137	8.126	0.973
GB yellowtail flounder	14.03	14.03	16.818	16.607	2.577
SNE/MA yellowtail	5.028	5.028	6.197	6.201	1.173
CC/GOM yellowtail	7.967	7.967	8.804	8.805	0.838
Plaice	8.989	8.989	8.871	8.818	-0.171
Witch flounder	8.502	8.502	8.736	8.659	0.157
GB winter flounder	22.681	22.681	26.031	26.02	3.339
GOM winter flounder	6.576	6.576	9.138	9.138	2.562
Redfish	9.65	9.65	9.673	9.673	0.023
White hake	7.662	7.662	7.2	7.133	-0.529
Pollock	5.895	5.895	5.881	5.879	-0.016
SNE/MA winter flounder	13.811	13.811	15.853	15.889	2.837

Permit Banks. The Council considered whether to apply an accumulation limit to all permit banks collectively (Section 5.3.2). Table 55 identifies the PSC held by permit banks for each allocated stock in the fishery. The maximum, mean, and median held by a permit bank are listed, as well as the total held by all permit banks. Permit banks included in the data are listed in the table.

Permit banks collectively hold the most PSC for GOM cod, white hake, plaice and pollock. Individually, a permit bank holds the most PSC for GOM cod, plaice, GOM haddock, and witch flounder.

Note: The data in Table 55 vary slightly from the permit bank data in Table 52. The data in Table 55 are provided directly by the ASPD at GARFO and thus should not have any error associated with data queries (as described in Section 6.5.4.1). Data discrepancies may be attributable to differences in actual permit/MRI holdings between the dates queried (~9 months).

Table 55 - FY 2013 PSC held by all permit banks (state and private/nonprofit), as of January 28, 2014

Stock	Maximum	Mean	Median	Total
GB cod	5.438	1.104	0.088	9.777
GOM cod	9.343	1.678	0.678	15.091
GB haddock	4.992	0.712	0.044	6.380
GOM haddock	8.314	1.249	0.092	11.237
GB yellowtail	1.692	0.242	*0.000	2.177
SNE/MA yellowtail	2.334	0.323	0.025	2.813
CC/GOM yellowtail	4.815	0.973	0.318	8.755
Plaice	8.788	1.444	0.288	12.996
Witch flounder	8.065	1.296	0.399	11.666
GB winter flounder	0.550	0.078	*0.000	0.704
GOM winter flounder	5.636	1.177	0.214	10.594
Redfish	6.3585	1.033	0.186	9.296
White hake	7.896	1.654	0.304	14.885
Pollock	6.048	1.304	0.140	12.053
SNE/MA winter flounder	1.203	0.227	0.018	1.622

Notes: The PSC data were downloaded on January 28, 2014, from the NMFS Sector Information Portal. PSC holdings data are accurate to nine decimal places.

Permit banks included: the Maine State Permit Bank, New Hampshire State Permit Bank, Boston Sustainable Fishing Community Preservation Fund, Cape Cod Fisheries Trust, Gloucester Fishing Community Preservation Fund, NEFS XI Permit Bank, Penobscot East Permit Bank, South Shore Fishing Community Preservation Fund, and The Nature Conservancy/Island Institute Community Permit Bank.

* Value is >0.

6.5.4.3.3 Distribution of PSC from Canceled Permits

The accumulation limit alternatives in Section 4.1 refer to the policy adopted through Framework Adjustment 45 to the Northeast Multispecies FMP on how PSC from cancelled permits would be redistributed to the remaining permits in the fishery. The method is included here.

When permits are permanently canceled or surrendered, the PSC associated with such permits is redistributed across all permits that remain in the fishery (whether fishing in the common pool or sectors). The following formula will apply to all remaining permits, where year 0 is the year in which calculations are performed and PSC_{exited} is the total PSC that was attached to all permits leaving the fishery:

$$PSC_{year\ 1} = PSC_{year\ 0} * 1 / (1 - PSC_{exited})$$

This calculation is performed on an annual basis for each stock at a date determined by NMFS (NEFMC 2011, Section 4.2.4, p. 41-2).

6.5.4.4 Excessive Shares

Compass Lexecon. Goal #4 of this action is to "Prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges." During the course of developing this action, it was determined that additional expertise from an external contractor would be needed to help the Council determine whether excessive shares exist in the Northeast multispecies fishery today and to recommend an appropriate excessive shares limit in the fishery. In July 2013, Compass Lexecon was asked to provide such analysis.

The Council provided the following Terms of Reference to Compass Lexecon for their analysis:

1. Describe a theoretically sound method to specify the maximum possible allowable percentage share of the market for the fishery access privileges (permits, PSC) and/or the quota leasing (ACE trading) that would prevent an entity from obtaining an excessive share of the access privileges allocated under the Northeast Multispecies Fishery. Use the Herfindahl-Hirschman Index (HHI) prescribed within the "U.S. Department of Justice Horizontal Merger Guidelines" or other accepted rule as appropriate.
2. Apply the process or rule developed under Number 1 to determine if excessive shares already exist in this fishery. If excessive shares do not exist today, describe potential constraints that could prevent excessive shares from existing in the future. Alternatively, if excessive shares do exist, describe a process or rule that will allow for a theoretically sound procedure to prevent future increase.
3. If the rule cannot be applied because of incomplete data, provide suggestions of how to apply the rule in the best way possible that is consistent with the theoretical underpinnings of the rule. Also, identify data that would be necessary to apply the rule.
4. Identify conditions where entities, could exert "inordinate control" of quota as outlined in the National Standard 4 Guidelines. Such entities could include business entities holding permits, sectors, or organizations of sectors.
5. Alternate approaches to achieving the Amendment 18 goals (other than accumulation caps) may be proposed.

The analysis involved four phases: 1) securing appropriate NMFS economic and fishery data and pertinent background reports that would help meet the Terms of Reference, 2) seeking input from stakeholder informants via individual or small-group interviews and through a public webinar, facilitated by NEFMC staff, 3) preparing a draft report for the NEFMC that addresses the Terms of Reference that was presented at a Groundfish Committee meeting, and 4) preparing a final report for the NEFMC.

Compass Lexecon received input from ~50 fishery stakeholders via surveys, interviews, and a webinar. They also analyzed NMFS fishery data, including fishery holdings at the business entity level. They assessed available models for evaluating the presence of market power and for their appropriateness for setting excessive share limits. They looked for evidence of market power in the market for fish, leasing of ACE at sector and individual levels, and in permit acquisition.

The Compass Lexecon report was completed in December 2013 (Mitchell & Peterson 2013). Compass Lexecon defined "excessive share" as:

> *"…a share of access rights that would allow a permit owner [holder] or sector to influence to its advantage the prices of the fishery's output…" (Mitchell & Peterson 2013, p. 2)*

They also linked the concepts of excessive shares and market power:

> *"The ability to manipulate prices to one's advantage based on the share of participation in a market is a typical example of what economists call market power." (Mitchell & Peterson 2013, p. 2)*

Compass Lexecon concluded:

- The relevant markets are in ACE leasing and the final product (seafood production).
- The appropriate unit of regulation is individual permit holders and/or groups of holders.
- Defined in terms of market power, excessive shares do not exist in the Northeast multispecies fishery today through:
  - The withholding of ACE in any part of the groundfish fishery,
  - In the sales of fish (a highly competitive market), or
  - In the transfers of permits.
- Fishery permit and PSC holdings are currently unconcentrated (The HHI for Group IDs[21] <800 for each stock in 2012).
- Allocation of ACE to sectors is highly concentrated for a few stocks, but there is no need for an excessive share cap on sector-affiliated ACE, as sectors are not the relevant nexus of control of how ACE is used. If sectors develop institutional structures that allowed them to exercise control over how vessel operators used ACE, it would be necessary to reexamine this conclusion.
- There is no need for an excessive share cap on landings or on permit holdings (Mitchell & Peterson 2013).

The report included recommendations for how excessive shares may be prevented in the future. Compass Lexecon felt that it would be unlikely for an entity to exert market power in the fishery if an excessive share cap was set at 15.5% of stock-specific PSC. Caps may not be an effective means to achieve Goals 1-3 of Amendment 18. However, caps can co-exist with other measures to achieve these goals.

---

[21] Group ID combines all individuals with overlapping interests. Section 7.6.2 has additional discussion on the use of HHIs for this fishery.

Peer Review. The report was peer reviewed in June 2014, by three reviewers from the Center for Independent Experts and one contracted by the NEFMC (Thunberg, et al. 2014). Generally the panel agreed with Compass Lexecon that there is no evidence of market power in the fishery, but wished for more rigorous analysis. The panel felt that the 15.5% PSC cap recommendation is somewhat arbitrary and it may reduce efficiency. As an alternate approach, the panel recommended maintaining the HHI at <1,500. The panel expressed some concern about the potential for sector-level coordination and wished that this issue be investigated further.

6.5.5 Commercial Fleet Diversity

Goal #1 of Amendment 18 is to "Promote a diverse groundfish fishery, including different gear types, vessel sizes, ownership patterns, geographic locations, and levels of participation through sectors and permit banks." Section 3.2 reviews how fleet diversity came to be an issue of management concern. Information on the groundfish fleet diversity is included here as background for this action.

6.5.5.1 Vessels Participating in the Fishery

The overall trend since the mid-1990s has been a decline in the number of active groundfish vessels, from >1,000 in 1996 to ~750 in 2004. This trend continued with the expansion of the catch share program in 2010 (Table 56). Those vessels with revenue from at least one groundfish trip have declined to around 400 in FY 2012.

The proportion of vessels affiliated with a sector has increased each year since FY 2010. A key aspect of Amendment 16 is the ability of a sector to jointly decide how its ACE will be harvested, through redistribution within a sector and/or transferring ACE between sectors. Because inactive sector vessels may benefit if other sector vessels harvest their allocation, changes in the number of inactive vessels may result from a transfer of allocation and not necessarily vessels exiting the fishery. Since FY 2010, 35-37% of the vessels were inactive (no landings). Of the inactive vessels, 64-69% were affiliated with sectors.

6.5.5.1 Measuring Fleet Diversity

With the decline in active vessels, the diversity of the groundfish fleet has also been impacted, though the magnitude of this impact is not easily quantifiable, and a systematic approach for measuring fleet diversity over time has been lacking. This section summarizes such a measure developed by Dr. Eric Thunberg of NOAA Fisheries Office of Science and Technology and Steven Correia of Massachusetts DMF (Thunberg & Correia 2014).

The analysis identified vessel "species," defined by unique combinations of gear type, vessel size, and primary landing port county. The Shannon Index, Shannon Effective Diversity, and Gini coefficient were then used as measures of the diversity of species, and how diversity has changed since 1996. The analysis does not include dependency on groundfish as a species attribute or whether they fished primarily inshore or offshore, but this could be included in future work.

Table 56 - Number of vessels by fishing year

	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
As of May 1 each Fishing Year:					
Total groundfish limited access eligibilities	1,464	1,441	1,422	1,408	1,380
Eligibilities held as CPH	81	94	168	228	273
During any part of the fishing year*:					
Total eligible vessels	1,459	1,409	1,321	1,223	1,154
Eligible vessels that did not renew a limited access groundfish permit	28	26	42	46	35
Vessels with a limited access groundfish permit	1,431	1,383	1,279	1,177	1,119
While under a limited access groundfish permit:					
... those with revenue from any species**	916	855	777	763	735
... those with revenue from at least one groundfish trip	566	446	418	400	327
... those with no landings	515	529	502	414	384
Percent of inactive (no landings) vessels	(36%)	(38%)	(39%)	(35%)	(34%)

Source: FY 2009: Murphy et al. (2014, Table 10). FY 2010-2013: Murphy et al. (2015, Table 10).

* On May 1st of the fishing year the number of vessels will equal to the number of eligibilities not in Confirmation of Permit History (CPH). Over time the number of vessels will differ from the number of eligibilities because these eligibilities may be transferred from vessel to vessel during the fishing year. These numbers exclude groundfish limited access eligibilities held as CPH. Starting in 2010, Amendment 16 authorized CPH owners to join Sectors and to lease DAS. For purposes of comparison, CPH vessels are not included in the data for either Sector or Common Pool.

**Active vessels in this report received revenue from any species while fishing under a limited access groundfish permit.

Methods. Vessel species were identified by gear type, vessel size, and port-group. Gear type was defined as the type of gear that accounted for the majority of total pounds of all species on groundfish trips and included gillnet, hook and line, longline, and trawl. Vessel length was defined by the four size ranges in the permit application data: <30’, 30 – 50’, 50 – 75’, and >75’. Port region was defined as the county where landings occurred based on the Vessel Trip Report (VTR), resulting in 23 unique ports. Vessel data were compiled using VTRs from FY 1996 - 2012 for limited access permit holders. Hand-gear limited access permits, implemented in 2004, were not included for the purpose of having consistent permit categories throughout the dataset.

To measure groundfish fleet diversity from FY 1996-2012, the Shannon Biodiversity Index (SH) was applied. The Shannon index is an equation that factors in the number of species, the abundance of vessels in each species, and the total number of vessels in the fleet to arrive at a diversity measure. The result can then be converted into a more workable number, the Shannon Effective Diversity, equal to e^{SH}.

The rationale behind calculating the Shannon index and effective diversity rather than simply counting the number of species in the fleet has to do with the abundance of vessels in each species. When counting the number of species, also known as richness, there is no difference between a species with 100 vessels and a species with a single vessel. Consequently, in a relatively large fleet such as groundfish, species which have few vessels are overrepresented when measuring richness. The Shannon diversity measure does not have such an issue.

Results. In total, there were 95 different vessel species in FY 1996, declining by 46% to 51 in FY 2012 (Table 57). The number of different vessel species is often referred to as "richness," that is to say, the richness of the groundfish fleet decreased by 46% during the focus period. The Shannon Effective Diversity declined from 51 vessel species in FY 1996 to 32 in FY 2012, a 37% decline (Table 58). The difference between these two percentages is a result of an unequal abundance of different species. For example, 20 different species contain only a single vessel. Meanwhile, the most abundant species contains 73 vessels. The Gini coefficient was used to describe the variation in abundance, or "evenness." A Gini coefficient of 0 indicates perfect evenness (equal abundance) and a coefficient of 1 indicates complete dominance by one vessel species.

Across FY 1996 - 2012, there were 132 unique vessel species that appeared in at least one fishing year. Of these, 40 vessel species appeared in every fishing year during this time. These may be considered the "core" vessel species of the groundfish fishery. In terms of fleet size share, groundfish landings share, and Shannon index share, these 40 "core" vessel species have seen steady increases from FY 1996 - 2012 (Table 58).

Table 57 - Groundfish fleet size, richness and effective diversity, FY 1996 - 2012

Fishing Year	Limited Access Permits (#)	Active Groundfish Permits (#)	Vessel Species (#)	Shannon Index	Shannon Effective Diversity	Gini Coefficient
1996	1,772	1,098	95	3.92	51	0.60
1997	1,806	1,072	92	3.89	49	0.60
1998	1,669	1,049	91	3.88	48	0.60
1999	1,685	1,013	89	3.86	47	0.60
2000	1,669	1,015	89	3.83	46	0.61
2001	1,673	1,019	92	3.84	46	0.62
2002	1,439	918	89	3.77	43	0.63
2003	1,427	855	81	3.75	42	0.62
2004	1,473	750	74	3.69	40	0.59
2005	1,413	693	75	3.70	40	0.60
2006	1,398	621	63	3.62	37	0.56
2007	1,380	564	58	3.53	34	0.55
2008	1,328	523	56	3.49	33	0.56
2009	1,290	462	62	3.49	33	0.60
2010	1,248	356	56	3.44	31	0.58
2011	1,153	344	56	3.51	33	0.55
2012	1,063	337	51	3.46	32	0.53

When applying the Shannon Index by gear type, there has been a steady increase in the share of vessels using gillnets (18% - 28%) and trawls (58% - 66%) and a decrease in the use of hooks (8.4% - 4.6%) and longlines (16% - 2.3%). In terms of vessel size, the smallest class, <30ft., has seen its Shannon Index share fall from 7.6% in 1996 to 2.0% by 2012. The mid-size vessels of 30 - 75 ft. have had relatively little change in their shares during the study period. The largest vessels, >75ft., have seen an increase from 12% to 16%.

In terms of landing port state, Maine has seen the largest absolute decrease in its Shannon Index share, falling from 17% to 13% in the study period. Rhode Island has seen the largest increase from 8.8% to 14%. New Hampshire, Massachusetts, New York, and New Jersey all had more moderate changes. Connecticut had its index fall to 0.5% by 2012; however its high was only 3.0% in 1996. While port region data were not included in the 2014 publication, data were made available by Dr. Thunberg. Gloucester and the North Shore of Massachusetts, which include all towns in Essex county, saw the largest increase in Shannon Index share of all port regions, from 15.1% to 21.1%. The entire state of Rhode Island was grouped by port region and a sizable increase as well, from 8.9% to 13.8%. Cape Cod and the Islands of Massachusetts, which included Barnstable, Dukes, and Nantucket counties, saw the largest decrease from 15.4% to 9.8%. Lower Mid Coast, Maine, which included the counties of Androscoggin, Cumberland, Kennebec, Lincoln, and Sagadahoc also saw a significant decrease, from 12% to 8.4%.

The size of the active groundfish fleet, number of vessel species, and effective diversity all declined at similar average annual rates of 1-2% from 1996 - 2001. Since 2001, the active fleet declined by an average annual rate of almost 11% through 2009, then declined at a more modest rate of 2-3% per year. The number of vessel species and effective diversity declined less rapidly than fleet size through 2007, averaging 7.2% and 4.9% respectively. However, since 2008, the number of vessels species and effective diversity have leveled off somewhat. The total number of vessel species was 56 species in 3 of 6 years from 2008 - 2012 and effective diversity ranged from 31 - 33 vessel species in every year since 2008.

Table 58 - Share of total fleet size, groundfish landings, and Shannon Index for vessel species present in all years FY 1996 - 2012

Fishing Year	Fleet Size Share	Groundfish Landings Share	Shannon Index Share
1996	79%	88%	73.8%
1997	81%	89%	76.0%
1998	80%	91%	75.3%
1999	81%	91%	76.0%
2000	81%	92%	75.9%
2001	82%	93%	76.0%
2002	86%	92%	80.2%
2003	86%	93%	80.6%
2004	89%	93%	84.5%
2005	90%	92%	84.5%
2006	92%	94%	87.5%
2007	94%	95%	90.3%
2008	95%	100%	91.5%
2009	95%	99%	88.3%
2010	92%	99%	91.6%
2011	94%	99%	90.4%
2012	96%	99%	93.4%

Conclusions. Overall, there are some clear trends for the composition of the groundfish fleet from FY 1996 - 2012. First and foremost, the size of the fleet decreased from over 1,000 active vessels in 1996 to fewer than 400 by 2012. Not surprisingly, the diversity of the fleet has also decreased, with Shannon effective diversity declining from 51 vessels in 1996 to 32 in 2012.

During this same period, a "core" group of vessel species that appeared in every fishing year and have become an ever larger proportion of the fishery in terms of fleet size, groundfish landings, and Shannon index share. Since 2008, the rate of fleet size decline has outpaced the rate of fishermen species decline, meaning diversity is declining, but the fishery has not redistributed to favor a particular niche, with two exceptions: 1) since 2005, there has been a drop in the proportion of Maine-based species; and 2) in 2009, there was a slight uptick in the proportion of large vessel species.

6.5.6 Commercial Fishery Activity

Amendment 16, implemented in May of 2010, divided the commercial groundfish fishery into the sector and the common pool. Since then, many of the active vessels taking groundfish trips have been enrolled in sectors and are responsible for an overwhelming majority of groundfish revenue (Table 32, Table 33). This management shift also coincided with sizable reductions of the Total Allowable Catch in FY 2009 to the Annual Catch Limits in FY 2010 for many stocks, and many of these reductions have continued (Table 59).

6.5.6.1 Sector Fishery

Since FY 2010, the sector vessels landed the vast majority of the groundfish ACL. Each sector receives Annual Catch Entitlement (ACE) for each stock. Since the ACE is dependent on the total ACL in a given fishing year, the ACE may be higher or lower from year to year even if the sector membership remains the same. There has been a decrease in trips, and catch for sector vessels, and there has been a shift in effort out of the groundfish fishery into other fisheries. However, these changes may correlate to a certain extent with the decrease in ACL.

Combined, 142.3 million (live) pounds of ACE were allotted to the sectors in 2013 but only 47.3 million (live) pounds were landed. Of the 16 ACEs allocated to sectors in 2013, 6 stocks approached the catch limit (>80% conversion) set by the total allocated ACE (Table 60). This represents a sizeable improvement from 2012 when the fleet caught over 80% of the allocation for only 1 stock. Overall, the fleet landed 33% of the total allocated ACE in 2013. As has been the case in previous years, Georges Bank haddock accounted for a majority of the unrealized landings. Collectively, East and West GB haddock, comprises almost 41% of total allocated ACE, yet only 14% of total catch. In general, total allocations have decreased since 2010 and total catch has never been above 41% of the allocation.

6.5.6.1.1 ACE Trading

Starting with allocations in FY 2010, each sector was given an initial ACE determined by the pooled potential sector contribution (PSC) from each entity joining that sector. Every limited access groundfish permit also has a tracking identification number called a Moratorium Right Identifier (MRI). PSC is technically allocated to MRIs, which are subsequently linked to vessels through Northeast Multispecies limited access fishing permits. A vessel's PSC is a percentage share of the total allocation for each allocated groundfish stock based on that vessel's fishing history. Once a sector roster and associated PSC is set at the beginning of a fishing year, each sector is then able to distribute its ACE among its members. By regulation, ACE is pooled within sectors, however most sectors seem to follow the practice of assigning catch allowances to member vessels based on PSC allocations. This is an important assumption because vessels catching more than their allocation of PSC must have leased additional quota, either as PSC from within the sector or as ACE from another sector.

During FY 2010, 282 sector-affiliated MRIs had catch that exceeded their individual PSC allocations for at least one stock. These vessels are then assumed to have leased in an additional 22M pounds of ACE and/or PSC with an approximate value of $13.5M. In FY 2011, 256 sector-affiliated vessels had catch that exceeded their individual PSC allocations. These vessels are then assumed to have leased in 31M pounds of quota. Although the number of vessels leasing ACE fell by 9% the estimated number of pounds leased was almost 41% greater in FY 2011 than in FY 2010 (Murphy, et al. 2012). There were 241 sector-affiliated MRIs had catch that exceeded individual PSC allocations for at least one stock. These MRIs leased in >23M pounds of ACE and/or PSC in FY 2012 (Murphy, et al. 2014). In FY 2013, these numbers decreased to 224 sector-affiliated MRIs, leasing in nearly 21 million pounds of ACE and/or PSC. Of all the major home ports, Gloucester, Massachusetts had the largest number of lessees, with 41 at the vessel level. The largest percentage of the 224 lessees identified (46%) were attached to vessels in the 30’ to <50’ vessel length category. Additionally, while the largest vessel size category (≥75’) was allocated 37% of all ACE in 2013, this size category caught 53% of total catch, indicating a broad shift of ACE/PSC from smaller to larger vessels (Murphy, et al. 2015).

Table 59 - Commercial groundfish catch limits, FY 2009 - FY 2013

STOCK	FY 2009 TAC (mt)*	Sub-ACL FY 2010 (mt)	Change FY 2009 - FY 2010	Sub-ACL FY 2011 (mt)	Change FY 2010 - FY 2011	Sub-ACL FY 2012 (mt)	Change FY 2011 - FY 2012	Sub-ACL FY 2013 (mt)	Change FY 2012 - FY 2013	Change FY 2009 -FY 2013
GB Cod East	527	338	-35.9%	200	-40.8%	162	-19.0%	92	-43.2%	-82.5%
GB Cod	4,974	3,430	-31.0%	4,301	25.4%	4,605	7.1%	1,807	-60.8%	-63.7%
GOM Cod	10,724	4,567	-57.4%	4,825	5.6%	3,699	-23.3%	830	-77.6%	-92.3%
GB Haddock East	11,100	11,988	8.0%	9,640	-19.6%	6,880	-28.6%	3,754	-45.4%	-66.2%
GB Haddock	77,956	40,440	-48.1%	30,580	-24.4%	27,438	-10.3%	26,196	-4.5%	-66.4%
GOM Haddock	1,564	825	-47.3%	778	-5.7%	653	-16.1%	187	-71.4%	-88.0%
GB Yellowtail Flounder	1,617	823	-49.1%	1,142	38.8%	368	-67.7%	155	-58.1%	-90.4%
SNE/MA Yellowtail Flounder	389	310	-20.3%	524	69.0%	760	45.0%	586	-22.9%	50.6%
CC/GOM Yellowtail Flounder	860	779	-9.4%	940	20.7%	1,046	11.3%	479	-54.2%	-44.3%
Plaice	3,214	2,848	-11.4%	3,108	9.1%	3,278	5.5%	1,420	-56.7%	-55.8%
Witch Flounder	1,129	852	-24.5%	1,236	45.1%	1,448	17.2%	610	-57.9%	-46.0%
GB Winter Flounder	2,004	1,852	-7.6%	2,007	8.4%	3,387	68.8%	3,528	4.2%	76.0%
GOM Winter Flounder	379	158	-58.3%	329	108.2%	715	117.3%	715	0.0%	88.7%
SNE Winter Flounder				726		303	-58.3%	1,210	299.3%	
Redfish	8,614	6,846	-20.5%	7,541	10.2%	8,325	10.4%	10,132	21.7%	17.6%
White Hake	2,376	2,556	7.6%	2,974	16.4%	3,283	10.4%	3,849	17.2%	62.0%
Pollock	6,346	16,553	160.8%	13,952	-15.7%	12,612	-9.6%	12,893	2.2%	103.2%
Northern Windowpane*				110		129	17.3%	98	-24.0%	
Southern Windowpane*				154		72	-53.2%	102	41.7%	
Halibut*				33		36	9.1%	52	44.4%	
Wolffish*				73		73	0.0%	62	-15.1%	

Sub-ACLs do not include Sector Carryover. GB Cod and GB Haddock include GB Cod East and GB Haddock East respectively.

Source: http://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html

**Non-allocated groundfish stock.

Table 60 - Stock level catch, ACE and utilization

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

*includes sector carryover

Table 60 cont.

	2012			2013		
	Allocated ACE*	**Catch**	**% caught**	**Allocated ACE***	**Catch**	**% caught**
Cod, GB East	349,326	146,887	42%	199,323	73,389	37%
Cod, GB West	0,320,365	3,331,816	32%	3,752,891	3,316,562	88%
Cod, GOM	8,761,312	4,699,621	54%	1,804,615	1,582,637	88%
Haddock, GB East	5,074,308	777,622	5%	8,249,383	1,276,136	15%
Haddock, GB West	9,398,411	1,808,495	4%	49,856,979	5,225,246	10%
Haddock, GOM	1,784,067	522,917	29%	412,428	368,570	89%
Plaice	7,400,614	3,426,646	46%	3,102,789	3,062,787	99%
Pollock	9,305,283	13,688,091	47%	28,481,182	10,569,073	37%
Redfish	19,052,388	9,096,051	48%	22,454,069	8,782,342	39%
White hake	7,365,297	5,294,489	72%	8,500,901	4,469,611	53%
Winter flounder, GB	7,695,773	4,237,884	55%	7,805,363	3,796,436	49%
Winter flounder, GOM	1,561,490	562,334	36%	1,531,079	367,701	24%
Winter flounder, SNE	Not allocated			2,367,913	1,477,896	62%
Witch flounder	3,291,703	2,122,567	64%	1,333,163	1,398,494	105%
Yellowtail flounder, CC/GOM	2,433,611	2,067,901	85%	1,035,799	823,535	80%
Yellowtail flounder, GB	798,315	474,236	59%	336,532	122,911	37%
Yellowtail flounder, SNE	1,342,708	938,303	70%	1,084,646	621,470	57%
Grand Total	**165,934,970**	**53,195,859**	**32%**	**142,309,054**	**47,334,794**	**33%**

6.5.6.1.2 Permit Banks

6.5.6.1.2.1 State-operated Permit Banks

Amendment 17 to the Northeast Multispecies FMP defined a NOAA-sponsored, state-operated permit bank as a:

> *"...partnership between NOAA and one or more states in which Federal grant funds are used by the state(s) to establish a bank of Federal fishing vessel permits and to obtain Federal fishing vessel permits so that the fishing access privileges associated with those permits may be allocated by the state(s) to qualifying commercial fishermen and sectors according to criteria to which NOAA and the state(s) have agreed."*

These permit banks are:

> *"...subject to U.S. Department of Commerce regulations regarding program income, such that any revenue generated by the permit banks may only be used to defray the program costs of operating the permit bank, or must be returned to the Federal Government to reduce the amount of the initial grant award."*

For FY 2011, there were no official state-operated permit banks, because Amendment 17 had not been finalized, and the State of Maine had permits enrolled in a sector. For FY 2012, there were two state-operated permit banks, in Maine and New Hampshire. These permit banks continue to operate today.

6.5.6.1.2.2 Nonprofit Permit Banks

There is no standard definition of "nonprofit permit bank," though this term has generally been used to refer to organizations with nonprofit status (e.g., 501(c)3) that hold Federal Northeast Multispecies Permits for the purpose of leasing ACE to active fishermen. The existing regulations to not distinguish between private permit banks and commercial business entities that lease ACE, though this is a topic that has been considered in Amendment 18. All entities must enroll permits in sectors to receive the Annual Catch Entitlement (ACE) allocation (state-operated permit banks excepted).

6.5.6.1.2.3 Permit Bank Activity

During the development of Amendment 18, the PDT queried the state and nonprofit permit banks, to help the Groundfish Committee answer the question:

> *In the absence of accumulation limits and fleet diversity measures today, how are permit banks helping foster diversity in the fishery?*

A brief and voluntary questionnaire was developed, which was then reviewed by and sent on behalf of the Committee Chairman to representatives of nine state and nonprofit permit banks with Federal Northeast Multispecies permits. For some, their primary focus is to acquire and hold permits to provide allocation to active fishermen. For others, operating the permit bank is just one of a suite of activities for the organization. The representatives were asked to provide short responses (NEFMC 2013), which are summarized here.

Permit banks have formed primarily in response to concerns and evidence that the catch share management system poses challenges for smaller-scale fishing businesses to remain viable. Each permit bank has a unique mission, but they generally exist to help provide fishing opportunities for specific segments of the industry (e.g., specific ports, gear types, vessel sizes), with a larger aim of providing stability for the industry and fishing communities. Some permit banks also specifically assist new entrants to the fishery or provide business planning services. In total, the permit banks own more than 95 Federal Northeast Multispecies Permits. The state-operated permit banks have acquired permits primarily using federal dollars. Nonprofit organizations have financed permits through grants and loans.

ACE is distributed according to the mission of each permit bank. Some permit banks are established to lease ACE to fishermen in a particular sector, community, or state. For others, a set group has priority for the ACE, but if unused by the priority group, then the ACE is distributed on the open market. Some permit banks offer an equal share of ACE to all qualifying participants. Others identify needs through informal networks or more structured application processes. In total, the permit banks reported leasing ACE used by at least 170 sector vessels, though duplicates are unknown. Across all the permit banks, ACE is distributed to a diverse range of groundfish sector members in terms of gear types, vessel sizes, and fishing ports. Lease price determinations vary across the permit banks, but for the most part, ACE is offered to eligible buyers at prices lower than market value. Rates of groundfish ACE leased out by the permit banks has varied with the specific allocation portfolio and demands for quota within target segments of the industry. Some fishermen use the revenue from permit bank ACE landings as capital to enter the open leasing market. Fishermen have been able to harvest more of the allocation associated with their own permits by using permit bank ACE for the low-allocation “choke” stocks (NEFMC 2013).

6.5.6.2 Common Pool Fishery

With the adoption of Amendment 16, most commercial groundfish fishing activity occurs under sector management regulations. There are, however, a few vessels that are not members of sectors and continue to fish under the effort control system. Collectively, this part of the fishery is referred to as the “common pool.” These vessels fish under both limited access and open access groundfish fishing permits. Common pool vessels accounted for only a small amount of groundfish activity in FY 2013, making only 9% of total groundfish trips and landing just 2% of total groundfish revenue (Table 32, Table 33).

Common pool vessels with limited access permits landed almost 1.3M lbs. (landed lbs.) of regulated groundfish in FY 2010, worth over $2M in ex-vessel revenues (Table 61, Table 62). Landings declined to 530K lbs., worth about $840,000 in FY 2011and declined again in FY 2012 to 355K lbs., worth $606,000. In FY 2013, groundfish landings and revenue from common pool vessels rose to 636 K lbs., worth just over $1M. Groundfish revenue makes accounts for a small and decline portion of total revenue for common pool vessels. Most common pool vessel groundfish fishing activity takes place in the state of Massachusetts. From FY 2010 to FY 2013, the activity from Maine, Massachusetts and New Hampshire ports declined dramatically (Table 63). The primary port for this activity over the last 4 years (FY 2010-2013) is Gloucester, although the ports of Portland, New Bedford, Point Judith and Montauk have also been involved to varying degrees (Table 64).

Table 61 - Common pool landings by fishing year

All Trips	2010	2011	2012	2013
Groundfish Gross Revenue	$2,046,238	$838,386	$606,102	$1,008,645
Non-groundfish Gross Revenue	$94,530,850	$93,669,874	$92,777,213	$84,984,976
Total Gross Revenue	$96,577,088	$94,508,260	$93,383,315	$85,993,622
Groundfish Landed	1,296,835	529,883	354,699	635,968
Non-groundfish landed	76,497,646	84,455,968	81,876,291	77,136,496
Total Pounds Landed	77,794,481	84,985,851	82,230,990	77,772,463
Groundfish Trips				
Groundfish Gross Revenue	$2,035,934	$776,238	$567,606	$947,679
Non-groundfish Gross Revenue	$4,416,742	$5,570,486	$3,089,055	$1,440,920
Total Gross Revenue	$6,452,676	$6,346,725	$3,656,661	$2,388,599
Groundfish Landed	1,289,380	482,696	333,808	590,007
Non-groundfish landed	4,770,095	5,022,273	3,066,950	1,782,623
Total Pounds Landed	6,059,475	5,504,969	3,400,758	2,372,630
Note: All revenue listed in 2010 constant dollars. Landings are in landed pounds.				

Table 62 - Common pool permits landing groundfish

Year	A	C	D	E	HA	Total
FY 2010	78	4	6	5	33	**126**
FY 2011	61	6	3	12	31	**114**
FY 2012	58	6		8	25	**99**
FY 2013	59	5		10	29	**106**
Note: Confidential data excluded.						

Table 63 - Common pool groundfish landings by state of trip (landed lbs.)

State	FY 2010	FY 2011	FY 2012	FY 2013
MA	809,233	381,606	163,846	94,358
ME	344,961	49,559	48,860	34,628
NH	6,546	25,912	28,448	6,537
NJ	13,128	19,060	20,628	56,271
NY	95,426	38,843	58,594	64,941
RI	24,712	12,248	31,944	287,011
Note: Confidential data removed				

Table 64 - Common pool groundfish landings by port (landed lbs.)

Port	FY 2010	FY 2011	FY 2012	FY 2013
Gloucester, MA	372,483	269,671	144,615	50,166
Point Judith, RI	3,478	4,708	13,161	270,684
Montauk, NY	75,460	19,622	54,475	61,857
Portland, ME	333,852	40,520	34,054	c
New Bedford, MA	278,221	39,884	c	c
Note: c = confidential				

The composition of stocks landed by common pool vessels has shifted over the past four years. In FY 2010 and FY 2011, GOM cod was the primary groundfish stock landed in both pounds and value, followed by GB cod and GB haddock. GOM cod catch declined in FY 2012 and more drastically in FY 2013 (this coincided with sharp cuts in GOM cod sub-ACL). In FY 2013, the primary stocks for the common pool shifted to SNE winter flounder and SNE yellowtail flounder (Table 65).

Table 65 - Common pool revenue, catch (landed lbs.) and portion of total groundfish catch (common pool and sector landed lbs.)

	2010			2011			2012			2013		
Stock	**lbs.**	**%**	**value**	**lbs**	**%**	**value**	**lbs**	**%**	**value**	**lbs**	**%**	**value**
Cod, GB East												
Cod, GB West	118,223	2%	$ 249,784	122,297	2%	$ 238,290	47,033	1%	$ 128,692	54,752	2%	$ 141,224
Cod, GOM	368,651	4%	$ 783,309	130,511	1%	$ 313,935	44,924	1%	$ 136,465	13,352	1%	$ 34,262
Haddock, GB East										13,782	1%	$ 24,671
Haddock, GB West	177,245	1%	$ 156,849	33,181	1%	$ 31,404	13,029	1%	$ 27,146	29,057	1%	$ 34,470
Haddock, GOM	13,340	2%	$ 25,973	2,862	0%	$ 7,538	2,043	0%	$ 4,946	2,453	1%	$ 6,930
Plaice	48,766	1%	$ 60,607	10,858	0%	$ 12,209	5,574	0%	$ 9,923	6,038	0%	$ 8,661
Pollock	275,659	2%	$ 274,064	103,354	1%	$ 87,894	104,987	1%	$ 110,109	34,455	0%	$ 46,513
Redfish	14,777	0%	$ 11,217	7,167	0%	$ 5,251	11,896	0%	$ 9,826	7,680	0%	$ 5,529
White hake	68,894	1%	$ 92,830	30,831	0%	$ 34,577	31,009	1%	$ 55,893	9,210	0%	$ 17,872
Winter flounder, GB	13,011	0%	$ 24,533	2,664	0%	$ 4,527	1,500	0%	$ 2,630		0%	
Winter flounder, GOM	45,638	20%	$ 89,857	5,628	2%	$ 10,503	2,699	0%	$ 5,242	948	0%	$ 2,820
Winter flounder, SNE	4,719		$ 9,774	960		$ 1,248	509		$ 709	250,386	14%	$ 392,613
Witch flounder	57,153	4%	$ 147,218	10,471	0%	$ 23,586	4,551	0%	$ 10,469	6,356	0%	$ 17,018
Yellowtail flounder, CC/GOM	36,177	3%	$ 48,289	23,500	1%	$ 27,480	2,820	0%	$ 3,954	6,739	1%	$ 8,098
Yellowtail flounder, GB	17,260	1%	$ 22,364	5,468	0%	$ 7,221	2,317	0%	$ 3,113	398	0%	$ 534
Yellowtail flounder, SNE	33,314	9%	$ 53,582	26,132	3%	$ 33,074	78,306	8%	$ 122,145	199,729	24%	$ 326,901

6.5.6.2.1 Trimesters

Amendment 16 established that in FY 2012, the common pool would be managed with a trimester sub-ACL versus an annual one for all stocks except SNE/MA winter flounder, windowpane flounder, ocean pout, Atlantic wolffish, and Atlantic halibut. Table 66 shows the common pool sub-ACL and cumulative catch since FY 2010, broken down by trimesters. Given that the trimester approach was instituted in FY 2012, the percent of total catch in the trimesters for FY 2010 and FY 2011 are estimates.

Table 66 - Common pool sub-ACL and catch

	Annual sub-ACL (mt)	Trimester 1 (5/1–8/31)		Trimester 2 (9/1-12/30)		Trimester 3 (1/1-4/30)		Annual Catch	
		sub-ACL	Catch (% total or mt)	sub-ACL	Catch (% total or mt)	sub-ACL	Catch (% total or mt)	Total	% of annual sub-ACL
FY 2010									
GOM cod	240	n/a	97%	n/a	2%	n/a	1%	226.0	94%
GOM haddock	26	n/a	83%	n/a	3%	n/a	14%	7.1	27%
Pollock	375	n/a	n.d.	n/a	n.d.	n/a	n.d.	151.2	40%
FY 2011									
GOM cod	104	n/a	64%	n/a	20%	n/a	16%	93.4	90%
GOM haddock	8	n/a	48%	n/a	5%	n/a	48%	1.9	24%
Pollock	104	n/a	n.d.	n/a	n.d.	n/a	n.d.	69.2	67%
FY 2012									
GOM cod	80.0	21.6	*22.0	29.9	6.1	28.5	1.8	29.9	37%
GOM haddock	5.0	1.2	0.8	1.7	0.1	2.1	0	0.9	18%
Pollock	82.0	22.9	18.9	33.4	*40.0	25.7	8.9	67.8	82%
FY 2013									
GOM cod	18	4.9	3.2	8.3	0.3	4.8	*5.0	8.5	47%
GOM haddock	2	0.5	*2.0	0.5	0.1	1.0	0.1	2.2	*110%
Pollock	91	23.4	12.7	44.7	5.5	23	17.6	35.8	39%

Notes:
* A sub-ACL was exceeded.
Source:
NOAA Fisheries Northeast Multispecies Monitoring Reports.
http://www.nero.noaa.gov/ro/fso/MultiMonReports.htm. FY 2010 and FY 2011 trimester catch are estimates of the % of total annual catch. "n.d." = Estimate was not available in time for this memo. FY 2013 data as of 10/9/13. These data are the best available to NMFS when this report was compiled. Data for this report may be supplied to NMFS from the following sources: (1) vessels via Vessel Monitoring System; (2) Vessel Trip Reports; (3) fish dealer purchase reports; and the (4) NOAA Fisheries Service Observer Program, through audited observer reports submitted by the NEFSC. Data in this report are for landings made through September 04 2013 and may be preliminary. Differences with data from previous reports are due to corrections made to the database and updates to observer data.

In FY 2010 and FY 2011, most of the common pool effort occurred within the first three months of the fishing year. This could be due to a preference for fishing in seasonable weather, but there could also be a "race to fish" factor in play. The annual sub-ACLs were not exceeded.

Since the implementation of trimesters, the common pool has exceeded its trimester sub-ACL in a few cases (noted in red, Table 2). Both the annual and the trimester Gulf of Maine haddock sub-ACL was exceeded during the first trimester of FY 2013. NMFS published a notice on July 16, 2013 that the GOM Haddock Trimester Total Allowable Catch (TAC) Area would be closed for the remainder of the first trimester (through August 31), because the common pool had caught 147% of its Trimester 1 TAC for this stock. NMFS cited that "because there are relatively few common pool vessels, and the Trimester 1 TAC for GOM haddock is so small, it was difficult to project when 90% of the Trimester TAC would be reached" (NOAA 2013b). Then, based on data reported through August 21, 2013, the common pool fishery caught 96% of its annual Gulf of Maine haddock allocation of 2 mt, despite the closure. NMFS projected that the annual allocation would likely be exceeded, so the GOM haddock trip limit was reduced to zero for all common pool vessels, effective August 28, 2013 through the remainder of the fishing year (NOAA 2013a).

There are a number of convergent factors that cause managing the common pool quotas by trimesters challenging. For quotas that are as small as those for the common pool trimesters, the current data delivery systems make it difficult to estimate in-season when 90% of the TAC (and total TAC) is projected to be reached. For GOM haddock in FY 2013, the trimester sub-ACLs are particularly small. When the common pool fleet was alerted that this TAC was approaching full utilization, rather than slowing or stopping fishing, some continued to fish. Following the closure, additional landings data from prior weeks were submitted to the NMFS Greater Atlantic Regional Office (GARFO) and processed. These exceeded the quota.

6.5.6.3 Handgear A Fishing Activity

The alternatives in Section 1.1 propose revisions to regulations for fishing with a Handgear A (HA) permits. This section provides related background information.

The *Handgear A Permit Information Sheet* issued by GARFO defines a Handgear A permit as "a limited access Northeast multispecies permit that allows vessels to target groundfish using handgear" (NMFS). Handgear A permits operating in the common pool are restricted to using only handgear or a limited amount of tub trawl gear (250 hooks). Amendment 16 allowed HA permits to be enrolled in sectors, and thus, the ACE associated with these permits could then be leased and harvested using other gear types.

Most Handgear A groundfish are landed in Massachusetts. The top landing port for groundfish caught with HA permits for the past five years was Gloucester, MA, though other important ports include Yarmouth, Chatham and New Bedford, MA and Hampton Bays, NY (Table 67).

6.5.6.3.1 Active HA Permits

Since 2009, the number of active HA permits has steadily declined (Table 68). In FY 2013, there were 103 HA permits renewed. This includes 20 HA permits enrolled in seven unique sectors, of which one was actively fished. The ACE associated with the other 19 HA permits in sectors was leased, potentially for use by vessels fishing with other gear types. There were 83 HA permits enrolled in the common pool. Only 29 permits were actively used to fish in FY 2013. For FY 2014, there are 111 HA permits renewed, but the distribution between sectors and the common pool has not been finalized.

Table 67 - Top five landing ports for groundfish caught under HA permits

Rank	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
1	Gloucester MA	Gloucester MA	Gloucester MA	Gloucester MA	Gloucester MA
2	Addison ME	Portsmouth NH	Yarmouth MA	Yarmouth MA	Yarmouth MA
3	Nahant MA	Hampton Bays NY	Hyannisport MA	Rye NH	Chatham MA
4	Boston MA	Chatham MA	Addison ME	Portsmouth NH	Hampton Bays NY
5	Chatham MA	Rye NH	Portsmouth NH	Hampton Bays NY	New Bedford MA

Table 68 - Number of active HA permits

2009	2010	2011	2012	2013
41	33	31	25	29

HA permits account for a small fraction of the total groundfish fishery. Landings and revenue from harvests with HA permits account for <0.2% of the fishery-wide totals (Table 69).

Table 69 - Contribution of HA permits to the commercial groundfish fishery

		HA permits	Total Common Pool[2]	Total Fishery[2]
FY 2010	Groundfish Pounds Landed	35,374	1,296,835	58,712,494
	Groundfish Revenues	$64,102	$2,046,238	$83,212,207
FY 2011	Groundfish Pounds Landed	80,419	529,883	62,284,826
	Groundfish Revenues	$175,883	$838,386	$88,821,349
FY 2012	Groundfish Pounds Landed	22,298	354,699	47,424,690
	Groundfish Revenues	$51,994	$606,102	$67,815,297
FY 2013	Groundfish Pounds Landed	21,843	635,968	42,247,934
	Groundfish Revenues	$47,841	$1,008,645	$55,220,469

[2] *Source:* All trips

Table 70 shows, by stock, the estimate of the FY 2013 Annual Catch Entitlement (ACE) distribution between sectors and the common pool. The majority (62.9%) of ACE is associated with sectors, though for Gulf of Maine cod, the split is about even. Technically, these data are "potential" ACE, because permits enrolled in the common pool do not have ACE calculated. PSC is not turned into ACE in the common pool (i.e., they are not constrained to anything but the total common pool sub-ACL/trip limit/trimester TAC for any given stock). Confidentiality rules prohibit reporting the split of sector ACE associated with HA permits between ACE actively harvested vs. leased, because only one HA permit is being actively harvested in a sector.

Table 70 - Estimate of FY 2013 potential ACE contribution of allocated stocks held by HA permits

Stock	Total HA (lbs)	% Sector	% Common Pool
GB Cod East	350	9.8%	90.2%
GB Cod West	6,516	9.8%	90.2%
GOM Cod	13,428	48.0%	52.0%
GB Haddock East	1,366	9.9%	90.1%
GB Haddock West	8,167	9.9%	90.1%
GOM Haddock	464	7.3%	92.7%
GB Yellowtail Flounder	36	52.3%	47.7%
SNE/MA Yellowtail Flounder	108	12.5%	87.5%
CC/GOM Yellowtail Flounder	249	21.0%	79.0%
Plaice	555	8.6%	91.4%
Witch Flounder	123	11.4%	88.6%
GB Winter Flounder	632	0.7%	99.3%
GOM Winter Flounder	177	22.5%	77.5%
Redfish	16,809	93.2%	6.8%
White Hake	14,309	86.1%	13.9%
Pollock	59,968	69.1%	30.9%
SNE/MA Winter Flounder	250	1.3%	98.7%
Total	**123,505**	**62.9%**	**37.1%**

Note: Data from NMFS GARFO, updated September 30, 2013.

6.5.6.3.2 HA Permit Kept Catch and Discards

The alternatives in this action consider creating a new HA sub-ACL for the five stocks primarily landed by vessels fishing with HA permits (GOM cod, GOM haddock, GOM haddock, GB haddock, pollock) and accounting for the catch of nontarget stocks under the other sub-components sub-ACL (Section 1.1). To understand what the potential catch (kept catch and discards) by vessels fishing in the HA sub-ACL would be, information about recent HA effort on these stocks is provided here. Table 71 illustrates the magnitude of the HA ACE, catch, and discards for HA permits for FY 2010-2013. HA discards are also shown as a percent of the commercial sub-ACL and of the commercial discards. For the stocks for which a HA sub-ACL is not being considered in this action, the discards by HA vessels are <0.04%% of the total commercial sub-ACL and <0.11% of the commercial discards.

Table 71 - Handgear A ACE, kept catch, and discards for all stocks (weight in lb.), FY 2010-2013.

	FY 2010	FY 2011	FY 2012	FY 2013
Stocks for which a HA sub-ACL is being considered				
GOM cod				
ACE	82,810	81,230	65,357	13,450
Kept catch	19,873	67,523	11,030	11,030
Discards	795	4,509	3,382	146
Discards wrt comm. ACL*	0.005%	0.027%	0.024%	0.005%
Discards wrt comm. discards**	0.326%	1.209%	0.135%	n.d.
GB cod				
ACE	18,189	19,143	19,843	6,901
Kept catch	6,639	923	10,671	10,001
Discards	3,914	923	211	11
Discards wrt comm. ACL*	0.052%	0.010%	0.002%	0.000%
Discards wrt comm. discards**	1.301%	0.238%	0.072%	n.d.
GOM haddock				
ACE	1,789	1,961	1,639	464
Kept catch	1,133	1,304	859	3,361
Discards	11	73	32	140
Discards wrt comm. ACL*	0.000%	0.003%	0.002%	0.024%
Discards wrt comm. discards**	0.172%	0.441%	0.043%	n.d.
GB haddock				
ACE	22,751	11,164	10,017	9,533
Kept catch	231	97	30	116
Discards	5	73	20	1
Discards wrt comm. ACL*	0.000%	0.000%	0.000%	0.000%
Discards wrt comm. discards**	0.006%	0.040%	0.003%	n.d.
Pollock				
ACE	82,085	65,421	58,944	59,972
Kept catch	10,357	10,319	5,163	9,014
Discards	33,	595	620	681
Discards wrt comm. ACL*	0.001%	0.002%	0.002%	0.002%
Discards wrt comm. discards**	0.177%	0.238%	0.274%	n.d.
Other stocks				
GB yellowtail flounder				
ACE	624	347	112	47
Kept catch	0	0	0	0
Discards	0	0	0	0
Discards wrt comm. ACL*	0.000%	0.000%	0.000%	0.000%
Discards wrt comm. discards**	0.000%	0.000%	0.000%	n.d.
SNE/MA yellowtail flounder				
ACE	120	99	144	111
Kept catch	0	0	0	0
Discards	9	60	47	37
Discards wrt comm. ACL*	0.001%	0.005%	0.003%	0.003%
Discards wrt comm. discards**	0.043%	0.140%	0.049%	n.d.

Table 71 – Cont.

	FY 2010	FY 2011	FY 2012	FY 2013
Other stocks cont.				
CC/GOM yellowtail flounder				
ACE	4,708	490	544	249
Kept catch	247	0	1	0
Discards	459	782	324	309
Discards wrt comm. ACL*	0.027%	0.038%	0.014%	0.029%
Discards wrt comm. discards**	0.266%	0.411%	0.131%	n.d.
Plaice				
ACE	4,051	1,215	1,281	555
Kept catch	112	0	3	0
Discards	80	366	14	53
Discards wrt comm. ACL*	0.001%	0.005%	0.000%	0.001%
Discards wrt comm. discards**	0.020%	0.085%	0.003%	n.d.
Witch flounder				
ACE	1,714	245	292	123
Kept catch	0	0	1	0
Discards	34	140	11	20
Discards wrt comm. ACL*	0.002%	0.005%	0.000%	0.001%
Discards wrt comm. discards**	0.025%	0.102%	0.008%	n.d.
GB winter flounder				
ACE	494	360	607	632
Kept catch	0	0	0	0
Discards	0	0	0	0
Discards wrt comm. ACL*	0.000%	0.000%	0.000%	0.000%
Discards wrt comm. discards**	0.000%	0.000%	0.000%	n.d.
GOM winter flounder				
ACE	310	82	177	177
Kept catch	253	0	0	9
Discards	84	121	0	6
Discards wrt comm. ACL*	0.024%	0.017%	0.000%	0.000%
Discards wrt comm. discards**	0.794%	1.076%	0.000%	n.d.
Redfish				
ACE	13,152	12,543	13,849	16,809
Kept catch	763	160	79	100
Discards	11	68	18	34
Discards wrt comm. ACL*	0.000%	0.000%	0.000%	0.000%
Discards wrt comm. discards**	0.003%	0.017%	0.003%	n.d.
White Hake				
ACE	9,778	11,034	12,204	14,309
Kept catch	186	244	218	65
Discards	46	374	450	44
Discards wrt comm. ACL*	0.001%	0.006%	0.006%	0.001%
Discards wrt comm. discards**	0.058%	0.505%	0.534%	n.d.

Table 71 – cont.

SNE/MA winter flounder* **				
ACE**	n/a	n/a	n/a	250
Kept catch	n/a	n/a	n/a	0
Discards	0	88	1381	155
Discards wrt comm. ACL*	0.000%	0.005%	0.207%	0.006%
Discards wrt comm. discards**	0.000%	0.044%	0.595%	n.d.

Notes: Discard data for the common pool are calculated based on observed discards using trawl and gillnet gear, not handgear. Thus, discard data presented here may be higher than actual. Catch data include common pool and sector catch.

n.d. = Final discard data for FY 2013 not available yet.
* "Discards wrt comm. ACL" = HA discards as a percent of the total commercial sub-ACL.
** "Discards wrt comm. discards" = HA discards as a percent of the total commercial discards.
*** SNE/MA winter flounder was not allocated until FY 2013.

Source: GARFO, March 2014.

6.5.6.3.3 Standard Fish Tote Requirement

In 1994, through an Emergency Rule and subsequently in Amendment 5, standard totes were required of all vessels. At the time, it was intended to enforce a haddock trip limit in the groundfish fishery (500 pounds for large-mesh vessels), or in other fisheries, enforce the allowed retention of a small amount of groundfish (e.g., July-December for the scallop fishery). The premise was that the standard totes help keep fish separate and could be used as a volumetric benchmark by the Coast Guard.

In 1996, through Amendment 7, a DAS limit for haddock was created, and NMFS specifically required a standard tote for all multispecies trips, as well as for handgear vessels that were allowed cod, haddock, and/or yellowtail. In other words, totes were required of everyone, not just a specific permit category.

Subsequently, NMFS published possession limits for cod, pollock, winter flounder, etc., but did not specify the tote requirement in each case. NMFS has intended to keep the requirement for all permit types, but in fact, the requirement now only applies in a few instances, including vessels fishing with a Handgear A multispecies permit.

6.5.6.4 Commercial Effort

The groundfish fishery has traditionally been made up of a diverse fleet, comprised of a range of vessels sizes and gear types. Over the years, as vessels entered and exited the fishery, the typical characteristics defining the fleet changed as well. The number of active vessels has declined each year since at least FY 2009. This decline has occurred across all vessel size categories (Table 72). Since FY 2009, the 30' to < 50' vessel size category, which has the largest number of active groundfish vessels, experienced a 32% decline (305 to 206 active vessels). The <30' vessel size category, containing the least number of active groundfish vessels, experienced the largest (53%) reduction since FY 2009 (34 to 16 vessels). The vessels in the largest (≥75') vessel size category experienced the least reduction (9%) since FY 2009.

Table 72 - Vessel activity by size class

	FY 2009	FY 2010	FY 2011	FY 2012
Vessels with landings from any species				
<30	73	65	51	48
30 to <50	478	455	398	396
50 to <75	236	217	211	205
≥75	129	117	116	115
Total	**916**	**854**	**776**	**764**
Vessels with at least one groundfish trip				
<30	34	24	20	16
30 to <50	305	240	216	206
50 to <75	157	118	117	115
≥75	70	63	66	64
Total	**566**	**445**	**419**	**401**
Source: Murphy et al. (2014, Tables 13 and 14).				

Some of the proposed benefits of a catch share system of management are the potential efficiency gains associated with increasing operational flexibility (NOAA 2010). Being released from the former effort controls, but being held to ACLs, sector vessels were expected to increase their catch per unit effort by decreasing effort. Between 2009 and FY 2010, the number of groundfish fishing trips[22] and total days absent on groundfish trips declined by 48% and 27%, respectively (Table 73).[23] During the second year of sector management, 2011, the number of groundfish fishing trips and total days absent on groundfish trips increased. Effort on groundfish trips generally decreased in FY 2012. Vessels took fewer groundfish trips, with fewer total days absent of groundfish trips, though average trip length increased slightly over FY 2011.

The groundfish fleet overall took fewer non-groundfish trips in FY 2012 than they did in FY 2009-FY 2011, but those trips are longer than they were in FY 2010 and FY 2011 (Table 73). The total number of non-groundfish trips taken by the fleet in FY 2012 was 32,523 trips, a four year low and 3.4% lower than in FY 2011. However, for the fleet overall, the total number of days absent on non-groundfish trips in FY 2012 was higher than it was in 2011, with 635 (2.3%) more days absent. Furthermore, although the total number of days absent was 9.4% fewer than 2009, the average trip length in 2012 was the same as 2009 (0.92 days per trip) and higher than in 2010 and 2011 (0.86 days per trip).

[22] "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.
[23] The data are taken from different source materials (VMS, etc.) than other data in this document, and thus, may be slightly different than.

Table 73 - Effort by active vessels

	FY 2009	FY 2010	FY 2011	FY 2012
Number of trips				
groundfish	25,897	13,474	15,958	14,496
non-groundfish	37,173	38,489	33,675	32,523
Number of days absent on trips				
groundfish	24,605	18,401	21,465	19,935
non-groundfish	31,606	31,352	27,997	28,632
Average trip length*				
groundfish	0.96	1.37	1.35	1.38
(std. dev.)	(1.74)	(2.14)	(2.20)	(2.19)
non-groundfish	0.92	0.86	0.86	0.92
(std. dev.)	(1.66)	(1.56)	(1.52)	(1.62)

Source: Murphy et al. (2014, Table 15).

*This is the average trip length of all individual trips that have non-missing values for days absent. Since some trip records have missing values for days absent, average trip length reported here may be higher than what is obtained by dividing the overall number of days absent by the overall number of trips.

6.5.6.5 Groundfish Catch

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

Table 74 to Table 76 describe FY 2013 catches. As shown in Table 75, catches exceed ACLs for a few stocks. Table 76 summarizes catches by non-groundfish components of the ACLs. Assignment of these catches to a specific FMP is difficult unless the FMP uses a specific gear (e.g., the scallop fishery) or has a trip activity declaration (e.g., groundfish and monkfish trips). For this reason, the assignment of catch to FMP should be viewed with caution.

Table 74 - FY 2013 catches of regulated groundfish stocks (metric tons, live weight)

Stock	Components with ACLs, sub-ACLs, and AMs								Components w/ no AMs	
	Total Groundfish	Groundfish Fishery	Sector	Common Pool	Rec.*	Midwater Trawl Herring Fishery**	Scallop Fishery	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
GB Cod	1,616.3	1,572.9	1,540.6	32.3					9.2	34.2
GOM Cod	1,418.8	1,380.1	732.0	8.8	639.3				35.8	2.9
GB Haddock	3,330.1	2,977.5	2,977.1	0.4		290.0			6.1	56.5
GOM Haddock	405.7	402.9	169.2	2.2	231.5	0.0			1.3	1.6
GB Yellowtail Flounder	93.3	55.8	55.8	0.0			37.5	2.5	0.0	0.0
SNE/MA Yellowtail Flounder	466.1	373.3	281.9	91.4			48.6		14.5	29.8
CC/GOM Yellowtail Flounder	453.1	380.5	376.5	4.1					42.8	29.7
Plaice	1,444.6	1,395.2	1,391.6	3.6					19.6	29.8
Witch Flounder	745.2	6423	638.9	3.4					27.1	75.8
GB Winter Flounder	1,763.1	1,722.0	1,722.0	0.0					0.0	41.0
GOM Winter Flounder	245.6	169.3	167.6	1.7					67.4	8.9
SNE/MA Winter Flounder	1,025.9	788.6	670.4	118.3					55.7	181.6
Redfish	4,023.5	4,000.6	3,996.2	4.4					19.0	3.9
White Hake	2,056.3	2,045.6	2,039.8	5.8					2.3	8.3
Pollock	7,029.1	4,915.0	4,878.4	36.5					981.7	1,132.4
Northern Windowpane	280.1	237.5	237.3	0.2					0.9	41.6
Southern Windowpane	554.7	115.9	86.0	30.0			129.1		37.3	272.4
Ocean Pout	59.3	33.2	27.3	5.9					1.5	24.6
Halibut	79.0	54.7	53.8	0.9					22.8	1.5
Wolffish	19.1	17.1	17.1	0.0					1.3	0.7

Notes: Catch includes any FY 2012 carryover caught by sectors in FY 2013. Data as of Oct. 20, 2014, GARFO. Values for a non-allocated species may include landings of that stock; misreporting of species and/or stock area; and/or estimated landings (in lieu of missing reports) based on vessel histories.
*Recreational estimates based on Marine Recreational Information Program (MRIP) data.
**Landings extrapolated from observer data.

Table 75 - FY 2013 Catches as percent of Catch Limit (%)

Stock	Components with ACLs, sub-ACLs, and AMs								Components w/ no AMs	
	Total Groundfish	Groundfish Fishery	Sector	Common Pool	Rec.*	Midwater Trawl Herring Fishery	Scallop Fishery	Small Mesh Fisheries	State Water	Other
GB Cod	84.8	87.0	86.8	101.0					46.0	42.8
GOM Cod	96.5	104.9	90.2	48.9	131.5				34.7	5.7
GB Haddock	11.9	11.4	11.4	0.5		106.2			2.1	4.8
GOM Haddock	147.9	154.4	91.2	108.9	312.2	-			30.4	25.3
GB Yellowtail Flounder	44.7	36.1	36.5	0.4			90.3	63.7	n/a	0.6
SNE Yellowtail Flounder	70.1	63.7	57.8	93.1			114.4		206.5	106.3
CC/GOM YTF	86.7	79.4	80.9	31.5					130.2	271.3
Plaice	97.5	98.3	99.8	14.3					63.0	95.7
Witch Flounder	99.2	105.3	106.6	30.6					115.5	64.5
GB Winter Flounder	48.4	48.8	49.1	0.0					n/a	36.5
GOM Winter Flounder	23.6	23.7	24.4	6.6					24.8	16.5
SNE/MA Winter Flounder	63.6	65.2	62.4	87.0					23.7	108.1
Redfish	38.5	39.5	39.6	10.9					17.3	1.8
White Hake	51.7	53.1	53.4	21.6					5.5	9.9
Pollock	47.1	38.1	38.1	40.2					104.9	103.7
Northern Windowpane	195.0	242.4	n/a	n/a					62.2	95.0
Southern Windowpane	105.3	113.7	n/a	n/a			70.5		67.9	146.4
Ocean Pout	26.9	16.9	n/a	n/a					62.9	116.4
Halibut	82.1	105.2	n/a	n/a					57.5	31.0
Wolffish	29.3	27.6	n/a	n/a					185.0	26.3

Notes: Data as of Oct. 20, 2014, GARFO.
* To determine if recreational AM is triggered, the Regional Administrator must use the 3-year average catch compared to the 3-year average of the recreational sub-ACL for a stock.

Table 76 - FY 2013 Northeast multispecies Other-Subcomponent catch detail (metric tons, live weight)

Stock	Total Catch	Scallop[1]	Fluke	Hagfish	Herring	Lobster/ Crab	Menhaden	Monkfish	Research	Scup	Shrimp
GB Cod	34.2	4.9	0.3	0.0	1.4	0.8	0.3	0.2	14.5	0.1	0.0
GOM Cod	2.9	0.2	-	0.0	1.3	0.3	-	-	0.1	-	-
GB Haddock	56.5	3.5	0.1	0.0	5.2*	0.0	0.0	0.0	0.5	0.1	0.0
GOM Haddock	1.6	0.0	-	-	0.3*	-	-	-	0.0	-	-
GB Yellowtail Flounder	0.0	-*	-	-	-*	-	-	-	-	0.0	-
SNE Yellowtail Flounder	29.8	-*	5.7	-	1.3	0.0	0.0	0.0	1.3	5.6	0.0
CC/GOM Yellowtail Flounder	29.7	23.2	-	-	1.3	-	-	-	2.1	-	-
Plaice	29.8	13.5	0.7	-	1.3	0.0	0.0	0.0	0.8	0.8	0.0
Witch Flounder	75.8	26.7	5.7	0.0	3.3	0.1	0.1	0.0	0.6	4.7	0.0
GB Winter Flounder	41.0	25.0	-	-	1.5	-	-	-	-	0.1	-
GOM Winter Flounder	8.9	6.0	-	0.0	0.2	0.0	-	-	0.1	-	-
SNE Winter Flounder	181.6	78.2	10.8	-	4.7	0.0	0.1	0.0	19.9	9.7	0.0
Redfish	3.9	0.0	0.0	0.0	1.0	0.4	0.1	0.0	0.0	0.0	0.0
White Hake	8.3	1.0	0.1	0.0	2.0	1.0	0.3	0.1	0.1	0.2	0.0
Pollock	1,132.4	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.1	0.0	0.0
Northern Windowpane	41.6	40.7	-	0.0	0.2	0.0	-	-	0.0	0.0	-
Southern Windowpane	272.4	-*	66.9	-	3.0	0.1	0.5	0.0	0.0	69.6	0.0
Ocean Pout	24.6	2.9	0.5	0.0	2.0	0.0	0.0	0.0	0.0	0.5	0.0
Halibut	1.5	0.2	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0
Wolffish	0.7	0.5	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Data as of Oct. 20, 2014, GARFO.
[1]Based on scallop fishing year March, 2013 through February, 2014.
2Some Canadian landings of this stock are included in the most recent assessment for Atlantic halibut (2010 Assessment Update). However, Canadian landings for 2013 have not yet been reported to the Northwest Atlantic Fisheries Organization, and as a result, are not included here.
*Some or all catch attributed to separate sub-ACL, so not included here.

Table 76– Cont.

Stock	Total Catch	Squid	Squid/ Whiting	Surfclam	Tilefish	Whelk/ Conch	Whiting	Unknown	Recreational
GB Cod	34.2	0.6	0.6	0.0	0.0	0.1	0.0	2.5	8.0
GOM Cod	2.9	-	0.2	-	-	0.0	0.4	0.5	-*
GB Haddock	56.5	14.8	15.5	0.0	0.0	0.0	0.0	16.7	-
GOM Haddock	1.6	-	0.3	-	-	-	0.5	0.5	-*
GB Yellowtail Flounder	0.0	-*	0.0*	-	-	-	-	0.0*	
SNE Yellowtail Flounder	29.8	2.0	2.2	-	-	-	0.0	11.7	
CC/GOM Yellowtail Flounder	29.7	-	0.6	-	-	-	1.3	1.3	
Plaice	29.8	3.6	3.9	-	-	-	0.1	5.1	
Witch Flounder	75.8	8.7	9.9	0.0	0.0	0.0	0.2	15.8	
GB Winter Flounder	41.0	0.5	12.7	-	-	-	-	1.3	
GOM Winter Flounder	8.9	-	0.1	-	-	0.0	0.2	2.3	0.1
SNE Winter Flounder	181.6	14.5	11.2	-	-	-	0.0	32.4	0.0
Redfish	3.9	0.6	0.7	0.0	0.0	0.0	0.0	0.9	
White Hake	8.3	0.6	1.3	0.0	0.0	0.1	0.0	1.5	
Pollock	1,132.4	1.0	1.0	0.0	0.0	0.0	0.0	1.3	1,128.0
Northern Windowpane	41.6	0.0	0.6	0.0	-	0.0	0.0	0.1	
Southern Windowpane	272.4	12.3	19.0	0.0	0.0	0.0	0.0	100.9	
Ocean Pout	24.6	5.6	5.9	0.0	0.0	0.0	0.1	6.9	
Halibut	1.5	0.1	0.2	0.0	0.0	0.0	0.0	0.3	
Wolffish	0.7	0.0	0.0	-	-	-	0.0	0.1	

6.5.6.6 Groundfish Landings and Revenue

Total groundfish landings on trips made by vessels possessing a limited access groundfish permit in FY 2012 were 46.3M pounds, which is the lowest landings since at least FY 2009 (Table 77, Table 78). Because only 16 groundfish stocks are limited by sector allocations, it is important to consider the landings of non-groundfish species and groundfish species separately as a means of describing any possible shift in effort to other fisheries. Non-groundfish landings made by limited access vessels increased from 178.1M pounds in FY 2010 to 213.8M pounds in FY 2011, and remained fairly steady at 212.0M pounds in FY 2012. Total landings of all species made by limited access vessels in the Northeast multispecies fishery was 258.3M pounds in FY 2012. This compares to landings ranging from 236.4M – 272.9M pounds in the 2009–2011 fishing years. In FY 2012, sector vessels accounted for 68% of all landings, 99% of groundfish landings, and 62% of non-groundfish landings.

Groundfish revenues from vessels with limited access groundfish permits in FY 2010, were $83.2M (Table 77, Table 78). This was slightly lower than FY 2009 revenues. In FY 2011, the groundfish revenues from vessels with limited access groundfish permits were $90.4M. Groundfish revenue in FY 2012 decreased to a four-year low of $69.8 million (22.9% lower than in 2011). Non-groundfish revenue decreased to $235.7 million (2% lower than in FY 2011), but was still higher than in FY 2009 and FY 2010. In FY 2012, sector vessels accounted for about 69% of all revenue earned by limited access permitted vessels. Sector vessels also earned 99% of revenue from groundfish landings and 59% of non-groundfish revenue.

Table 77 - Total landings and revenue from all trips by fishing year

	FY 2009	FY 2010	FY 2011	FY 2012
Landed Pounds				
Groundfish	68,416,222	58,178,065	61,661,450	46,295,753
Non-Groundfish	185,631,323	174,269,060	211,226,012	211,983,492
Total Pounds	254,047,546	232,447,125	272,887,462	258,279,245
Gross Revenue				
Groundfish	$82,510,132	$83,177,330	$90,453,455	$69,778,174
(in 2010 dollars*)	($83,386,467)	($83,177,330)	($88,658,472)	($67,252,170)
Non-Groundfish	$180,396,477	$210,631,484	$240,364,488	$235,730,686
(in 2010 dollars*)	($182,312,457)	($210,631,484)	($235,594,629)	($227,197,123)
Total Revenue	$262,906,608	$293,808,814	$330,817,943	$305,508,860
(in 2010 dollars*)	($265,698,924)	($293,808,814)	($324,253,101)	($294,449,293)

Source: Murphy et al. (2014, Table 2). * Deflated by the CY2010 Q2 GDP Implicit Price Deflator.

Table 78 - Total landings and nominal revenue from groundfish trips by fishing year

	FY 2009	FY 2010	FY 2011	FY 2012
Landed Pounds				
Groundfish	68,362,567	58,067,026	61,520,629	46,238,230
Non-Groundfish	30,965,367	23,147,600	28,781,804	27,527,755
Total Pounds	99,327,934	81,214,627	90,302,433	73,765,985
Gross Revenue				
Groundfish	$82,456,833	$82,964,771	$90,237,532	$69,669,582
Non-Groundfish	$25,862,188	$22,339,660	$31,826,744	$25,768,848
Total Revenue	$108,319,021	$105,304,431	$122,064,276	$95,438,430

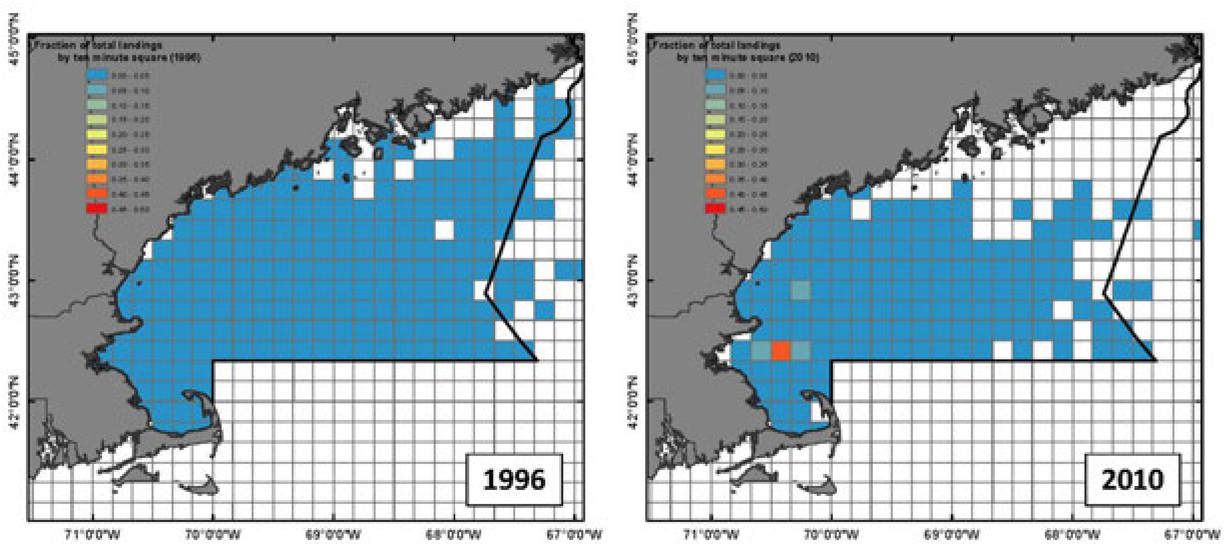
Source: Murphy et al. (2014, Table 3). * Deflated by the CY 2010 Q2 GDP Implicit Price Deflator.

6.5.6.7 Gulf of Maine Cod Landings and Effort

Measures are considered in this action that may create an inshore/offshore boundary within the GOM BSA (Figure 5) and create a sub-ACL and other measures specific to each sub-area (Section 4.4).

Comparison of ten minute square landings patterns from the mid 1990's to the late 2000's show two noticeable patterns: (1) cod were being caught in fewer ten minute squares, particularly along coastal Maine, and (2) in the 1990's, landings were evenly distributed across the Gulf of Maine, whereas in the late 2000's, landings were dominated by only a few ten minute squares in the western Gulf of Maine (Figure 19) (NEFSC 2013a, p. 43).

Figure 19 - Comparison of the fraction of annual GOM cod landings per ten minute square, 1996 and 2010.



Source: NEFSC (2013a, p. 236).

The remainder of this section summarizes trends in landings and number of trips by vessel class in SRAs from 1994 to 2012 (NEFMC 2014b), particularly SRA 514. The data are from commercial fishing VTRs from FY 1994-2012 and preliminary data from FY 2013.

Trips. Total number of trips reporting keeping cod and fishing within the GOM in 2012 was approximately half of the total trips reported in 1994 (Table 79). Small vessels (30'-<50') accounted for the largest proportion (77%) of trips in the time series. Mid-size vessels (50'-<75') accounted for 21%, and the largest vessels (≥75') accounted for <3%. However, the proportions vary fishing years. The frequency of trips is not independent of fishing year and vessel class. Within SRA 514, the number of trips for small vessels decreased since FY 2010 (Figure 20). The number of trips for larger vessels was low from the late 1990s-2009 relative to the early and late years in the time series. This pattern likely developed in response to Frameworks 26 and 27, which were implemented in 1999 (Section 3.1.1). Since many of the management input control measures implemented prior to 2010 have been removed, it appears as if the proportion of trips by vessel class has returned to the pre-Framework 25 period (NEFMC 2014b).

Landings. Since 1994, there appears to have been increased landings of GOM cod in SRA 514 relative to other GOM areas (Figure 21). In 2010, nearly 77% of cod landings were taken in 514. This is well above the time series median of 45%. The small vessel category has landed the highest proportion of cod landings throughout the time series. The cause of the shift in distribution of the landings is likely multi-factorial and includes a contraction in the distribution of cod as evidence in the NEFSC spring survey time series and consistent with distribution of cod as determined by the Industry Based cod survey (2003-2007). Other factors include effects from management actions that produced seasonal and year round closures within the GOM. Environmental conditions can also influence the distribution of cod and the distribution of fishing effort (NEFMC 2014b).

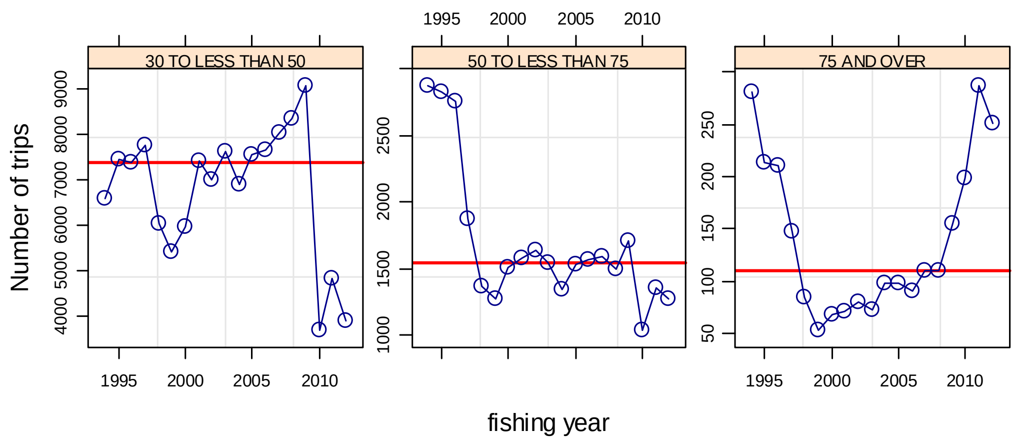
Table 79 - Number of trips in GOM that reported keeping cod by vessel class and the percent of trips by vessel class, 1994-2012

Fishing year	Number of trips				% of total trips in fishing year		
	30' - <50'	**50' - <75'**	**≥75'**	**Total**	**30' - <50'**	**50' - <75'**	**≥75'**
1994	11,350	4,564	793	16,707	68%	27%	5%
1995	12,864	4,476	679	18,019	71%	25%	4%
1996	11,947	4,242	701	16,890	71%	25%	4%
1997	11,705	3,144	382	15,231	77%	21%	3%
1998	9,348	2,532	279	12,159	77%	21%	2%
1999	7,973	2,466	166	10,605	75%	23%	2%
2000	10,063	2,778	199	13,040	77%	21%	2%
2001	12,170	2,815	192	15,177	80%	19%	1%
2002	10,732	2,534	171	13,437	80%	19%	1%
2003	11,350	2,554	222	14,126	80%	18%	2%
2004	10,355	2,482	272	13,109	79%	19%	2%
2005	10,919	2,629	258	13,806	79%	19%	2%
2006	10,561	2,353	227	13,141	80%	18%	2%
2007	10,708	2,385	250	13,343	80%	18%	2%
2008	11,044	2,243	255	13,542	82%	17%	2%
2009	12,112	2,407	310	14,829	82%	16%	2%
2010	5,393	1,536	433	7,362	73%	21%	6%
2011	7,222	1,954	622	9,798	74%	20%	6%
2012	6,085	1,951	669	8,705	70%	22%	8%
Total	**193,901**	**52,045**	**7,080**	**253,026**	**77%**	**21%**	**<3%**
Source: NEFMC (2014b).							

Catch Per Unit Effort. Mean cod kept per trip was relatively low in 1994 for all three vessel classes (Figure 22). As might be expected, larger vessels have higher catch per trip than smaller vessels. In 1994, the medium vessel class mean landings per trip was 1.15 times the small class. The largest vessel class mean landings per trip was 3.17 times the small class. Landings per trip has been generally higher since 1994 for all vessel classes, with a peak in 2009 for all vessel groups. The period of 1998 through 2009 marks an era of management via input controls. The larger size vessels have higher productivity, and measures such as trip limits became more constraining compared with smaller vessels with smaller production capacity. Sectors became exempt from DAS and trip limits in 2010. This allowed the largest vessels to utilize higher productivity to land more cod per trip in fishing years 2010 and 2011. Relative landings per trip declined for all vessel groups in 2012 (NEFMC 2014b).

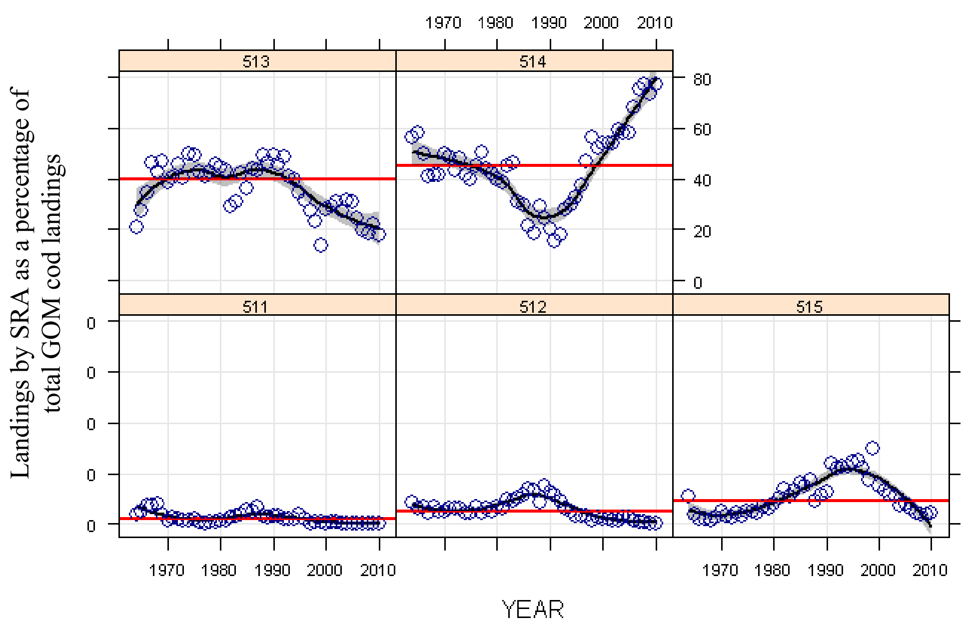
Mean cod landings relative to trends in SSB. Mean cod landings by vessel class were regressed on spawning stock biomass (SSB) from SARC (most recent) from 1994 – 2011 (Figure 23). The regressions were significant for the 30 to < 50' class (P<0.01) and the 50 to < 75 class (<0.001), but not for the 75+ class (P=0.064). This suggests that 1998-2009 management measures constrained production capacity of the large vessel class. These analyses indicate that the mean cod landing rates for two smaller vessel categories may be susceptible to decline in exploitable biomass. The precipitous drop in mean landings per trip for all three vessel classes in 2012 may be related to declining cod biomass as indicated in declines in various fishery independent trawl surveys and a series of poor year-classes (NEFMC 2014b).

Figure 20 - Number of trips landing cod from SRA 514 by vessel class, FY 1994-2012.



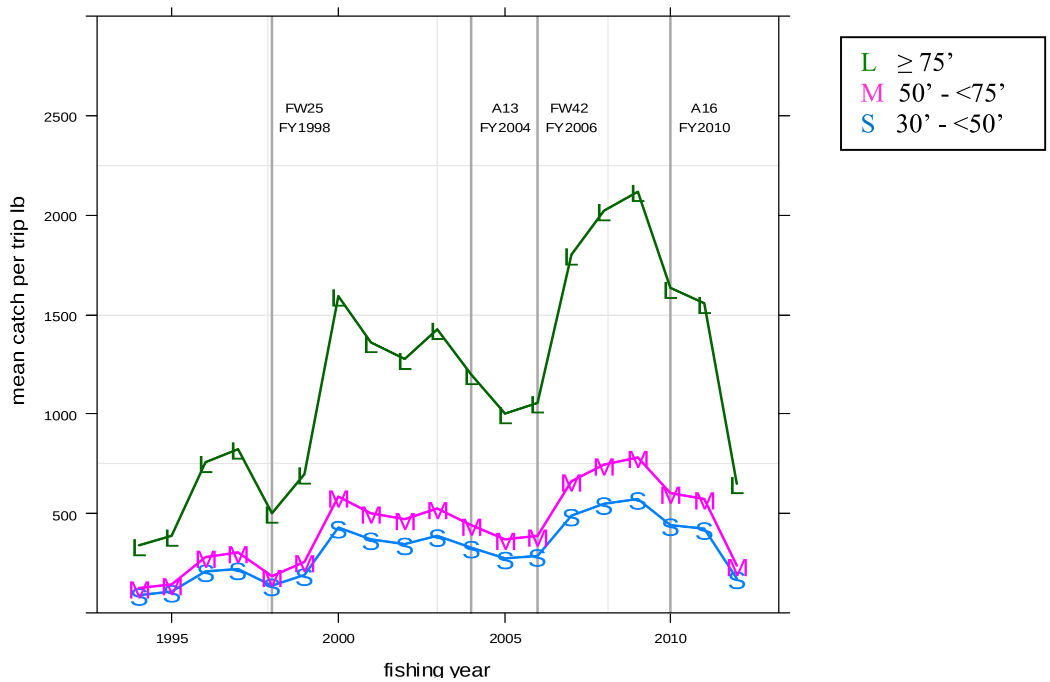
Note: Red line is time series median within vessel class. *Source:* NEFMC (2014b).

Figure 21 - Cod landings by SRA as a proportion of annual landings, CY 1964-2010



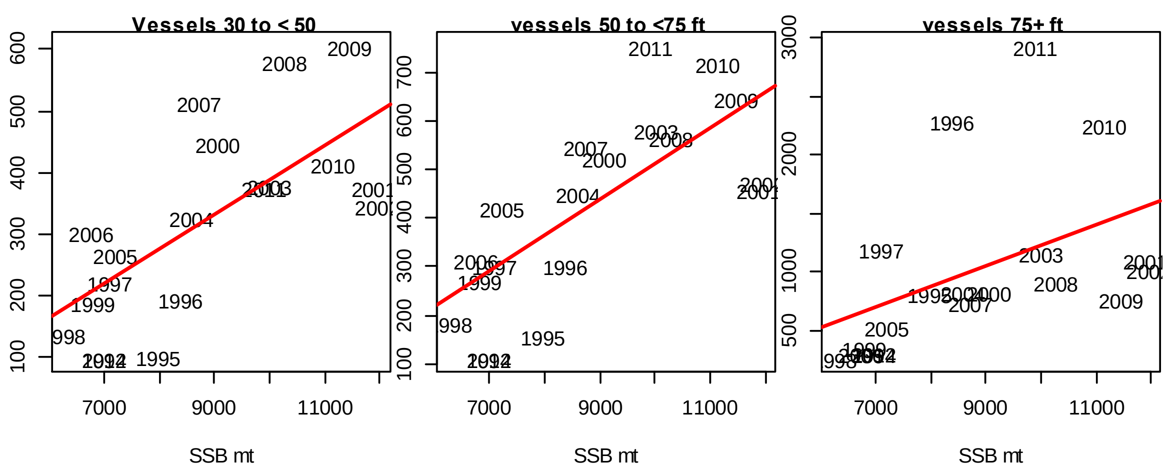
Note: Red line is time series median. Smooth black line is a general additive model. Gray polygon is the 95% confidence interval on the smooth fit. *Source:* NEFMC (2014b).

Figure 22 - Mean cod kept per trip by vessel category, FY,1994-2012



Note: Mean based on back-transformed fitted values from the linear model conducted on log transformed data. Gray vertical lines represent approximate date of implementation of major groundfish management actions.
Source: NEFMC (2014b).

Figure 23 - Scatterplot of mean cod kept per trip against SSB by vessel class for trips within SRA 514, 1994-2011



Note: Red line is regression fit.
Source: NEFMC (2014b).

6.5.7 Groundfish Trade and Processing

6.5.7.1 Groundfish Dealers

All Federally permitted groundfish vessels are required to sell to a federally permitted dealer. Federally permitted dealers are required to report all purchases of seafood, regardless of whether the vessels held a Federal or state-waters only permit. Dealers may obtain product from many other sources, so the groundfish activity levels are likely to capture only a portion of business activity by seafood wholesalers. Given dealer reporting requirements, dealer records account for 99% of reported sales of groundfish in the Northeast region. Issued on a calendar year basis, the number of groundfish permitted dealers has increased by about 14% from 391 in 2009 to 447 in 2014 (Table 80). This increase has mainly occurred in Massachusetts and Maine.

Table 80 - Number of federally permitted groundfish dealers (calendar year)

State	2009	2010	2011	2012	2013	2014
CT	6	6	5	4	3	6
DE	1	2	1	2	2	3
MA	117	131	134	139	136	130
MD	7	8	6	6	7	7
ME	44	50	45	46	44	62
NC	21	21	23	24	22	22
NH	10	9	9	10	9	9
NJ	51	55	56	58	60	59
NY	78	85	86	89	91	91
RI	36	40	43	45	42	36
VA	17	15	15	16	16	17
Other	3	6	4	5	5	5
Total	**391**	**428**	**427**	**444**	**437**	**447**

While the number of permitted dealers has increased, the numbers of dealers reporting buying groundfish has decreased slightly from 2009 to 2014, although total numbers rose in 2011-2013 (Table 81). In most states, the number of dealers reporting purchases of groundfish is too small to report detailed statistics due to confidentiality restrictions. The states with sufficient numbers of participating dealers include Massachusetts, Maine, New York, New Jersey, and Rhode Island. The number of permits reported includes dealer permits issued to seafood auctions (e.g., Portland Fish Exchange, Whaling City Display Auction, Gloucester Fish Exchange, and New England Fish Exchange). Thus, the total number of entities involved in seafood wholesale trade is likely to be larger than what official dealer records may suggest.

Auctions function as clearinghouses, where member dealers purchase seafood, but do not necessarily possess a Federal dealer permit, since the auction itself is the dealer of record. Three of the four auction markets are located in Massachusetts while the Portland Fish Exchange is located in Maine. Including auction markets, seafood dealers in Massachusetts alone account for over 80% of the value of groundfish purchased, and the combined purchases by Maine and Massachusetts dealers accounted for over 90% of total groundfish purchased. A substantial proportion of groundfish have been purchased through the four auctions located in New England, although this percentage has declined steadily from 60% in 2009 to just under 40% in 2014 (Table 82).

Groundfish are also sold through cooperatives, such as the Yankee Fishermen's Cooperative in Seabrook, NH. Member fishermen can pool resources to increase bargaining and purchase power, market access and profitability. Cooperatives can participate in purchasing marketing, transportation, and fish processing.

Table 81 - Number of federally permitted groundfish dealers reporting buying groundfish

State	2009	2010	2011	2012	2013	2014
CT	3	3	3	2	2	3
DE	0	0	0	0	1	1
MA	47	54	54	54	52	47
MD	2	2	2	3	3	2
ME	13	12	16	14	13	15
NC	4	5	2	2	4	4
NH	4	1	4	4	3	4
NJ	10	8	11	9	9	8
NY	36	30	33	33	35	34
RI	15	16	19	18	19	12
VA	4	5	5	4	5	2
Total	**138**	**136**	**149**	**143**	**146**	**133**

Table 82 - Share of groundfish purchased by federally permitted dealers including auctions

State	2009	2010	2011	2012	2013	2014
CT	0%	0%	0%	0%	0%	0%
DE	0%	0%	0%	0%	0%	0%
MA	84%	91%	87%	87%	81%	80%
MD	0%	0%	0%	0%	0%	0%
ME	9%	7%	7%	8%	11%	13%
NC	0%	0%	0%	0%	0%	0%
NH	4%	0%	3%	3%	2%	2%
NJ	0%	0%	0%	0%	0%	0%
NY	1%	0%	0%	0%	1%	1%
RI	2%	1%	2%	2%	4%	4%
VA	0%	0%	0%	0%	0%	0%
Auctions	**60%**	**59%**	**55%**	**55%**	**46%**	**39%**

6.5.7.2 Groundfish Processors

Studies of the processing sector suggest that it is less susceptible than the harvesting sector to fluctuations in the availability of domestic sources of wild-caught fish, as processors are able to find alternative sources of supply or use substitute species to maintain product lines (Dirlam & Georgianna 1994; Jin et al. 2005). This does not necessarily mean that all segments of the processing industry are readily able to find alternatives, as some processors may be more reliant on local sources of seafood to meet customer demand. Groundfish processors are located in communities such as New Bedford, Boston, Gloucester, Fall River, Melrose and Bourne MA; Portland, MM; and Wickford and Warwick, RI.

The processing sector was characterized by using County Business Patterns (CBP) data. County Business Patterns is an annual survey of establishments to ascertain numbers of employees and wages paid. Although the survey is conducted annually, the data are not released until about two calendar years afterward. This means that the most recent data include calendar year 2011.The survey is conducted by the U.S. Bureau of the Census where the unit of observation is an establishment, which is defined as being a single physical location or place of business. In cases where multiple activities are carried out under the same ownership, all activities are classified under a single establishment. The industrial classification for that multi-activity establishment is based on its major activity. This means that the reported number of establishments may underestimate the total number of establishments that may be engaged in a particular kind of activity. For example, seafood businesses may process fish or shellfish and may also act as wholesale distributors or buyers/sellers of unprocessed seafood. Any such establishment would be assigned to a single industrial classification (either processing or wholesale trade) depending on which activity was the larger source of revenue. For this reason, the CBP data will underestimate the total number of establishments that may be engaged in some level of processing activity. Nevertheless, the survey should reflect establishments that specialize in seafood processing.

Region-wide, the number of processing establishments has been declining in consecutive years from 201 in 2007 to 166 in 2011. Since availability of groundfish is most likely to affect states in New England, the focus is on these states. The number of processing establishments has remained relatively stable from 2007-2011 in Connecticut, Maine, and New Hampshire (Table 83). In Rhode Island the number has decreased to 4 from a peak of 8 in 2008. The largest decline in processing facilities is seen in Massachusetts which has stayed steady at 44 since 2008 although that is a drop from 52 in 2007.

Table 83 - Number of seafood processing establishments

Year	CT	DE	ME	MD	MA	NH	NJ	NY	NC	RI	VA	Total
2006	4	1	27	19	47	10	16	15	18	7	33	**197**
2007	3	1	27	22	52	7	16	15	22	6	30	**201**
2008	3	1	29	22	44	7	14	17	18	8	26	**189**
2009	2	1	25	19	44	8	13	15	16	7	25	**175**
2010	2	1	27	18	44	8	11	15	16	5	23	**170**
2011	2	1	28	17	44	8	12	18	14	4	18	**166**

Processing employment also declined for Connecticut, Maine and Massachusetts (Table 84). Although the number of processors declined in Rhode Island, employment has not declined at the same rate. That is, employment per establishment was 33 in 2007 in Rhode Island but had risen to 45 in 2011. This suggests that at least some of the processing employment associated with a decline in establishments has been absorbed by the establishments that remain. This was also the case in New Hampshire where from 2009 to 2011 the employees per establishment in rose from 14.3 to 28.9.

Table 84 - Seafood processing employment, mid-March

Year	CT	DE	ME	MD	MA	NH	NJ	NY	NC	RI	VA	Total
2007	20 - 99	100 – 249	536	1,296	2,684	100 - 249	628	294	250 – 499	196	955	6,589
2008	59	100 – 249	490	1,003	2,355	100 - 249	566	379	232	270	490	5,844
2009	0 - 19	20 - 99	545	245	2,396	115	661	250 – 499	170	275	941	5,348
2010	0 - 19	20 - 99	594	273	2,159	292	482	272	171	193	961	5,397
2011	0 - 19	20 - 99	500	264	2,214	231	518	299	100 - 249	178	899	5,103

6.5.7.3 Community-Supported Fisheries

A community-supported fishery (CSF) is a program where fish consumers pre-pay and organization of member fishermen for a weekly or bi-weekly allotment of fish over the course of a season. Within the past few years, at least eight CSFs have formed throughout New England by fishermen and their communities. Currently, there are CSFs based in Port Clyde and Portland, Maine; coastal New Hampshire; Gloucester, Scituate, and Chatham, Massachusetts; and Newport, Rhode Island. These are distributing fresh local product to surrounding communities (Local Catch 2014).

6.5.8 Recreational Harvesting Component

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

Recreational removals of GOM cod declined by 25% from FY 2012 to FY 2013, and declined again by 19% in FY 2014. Removals of GOM haddock were more equivalent through the time series, increasing slightly in both FY 2013 and FY 2014. The number of angler trips remained relatively stable in FY 2012 and FY 2013 then declining by 7% in FY 2014 (Table 85). There were 122 active party or charter vessels catching cod or haddock in the Gulf of Maine in 2013, down from of 188-195 vessels in 2004-2010 (Table 86).

Table 85 - Recreational fishing activity for GOM cod and GOM haddock

	FY 2012	FY 2013	FY 2014[2]
Angler Trips[1]	194,589	194,912	181,622
Cod Catch (numbers, a+b1+b2)	957,497	729,541	680,445
Cod Kept (numbers, a+b1)	367,485	273,181	183,477
Cod Released (numbers, b2)	590,012	456,360	496,968
Cod Removals (numbers, a+b1+(0.3*b2))	544,489	410,089	332,567
Cod Removals (weight[4], mt)	758	610	561
Haddock Catch (numbers, a+b1+b2)	455,898	601,846	810,643
Haddock Kept (numbers, a+b1)	215,458	121,863	129,978
Haddock Released (numbers, b2)	240,440	479,983	680,665
Haddock Removals (numbers, a+b1+(0.5*b2))	335,678	361,855	470,311
Haddock Removals (weight[4], mt)	420	422	505

Source: Available MRIP data as of Jan. 2, 2015 (from NEFSC SSB).

[1]Angler trips=number of trips that targeted and/or caught cod or haddock.

[2]Data available for wave's 3, 4, and 5 in FY 2014. Data from wave 2, 2014 and wave 6, 2013 used as proxies.

Note: All weights are based on round weights calculated from MRIP length frequencies and length to weight equations used in the assessments.

Table 86 - Recreational vessels catching cod or haddock from the Gulf of Maine

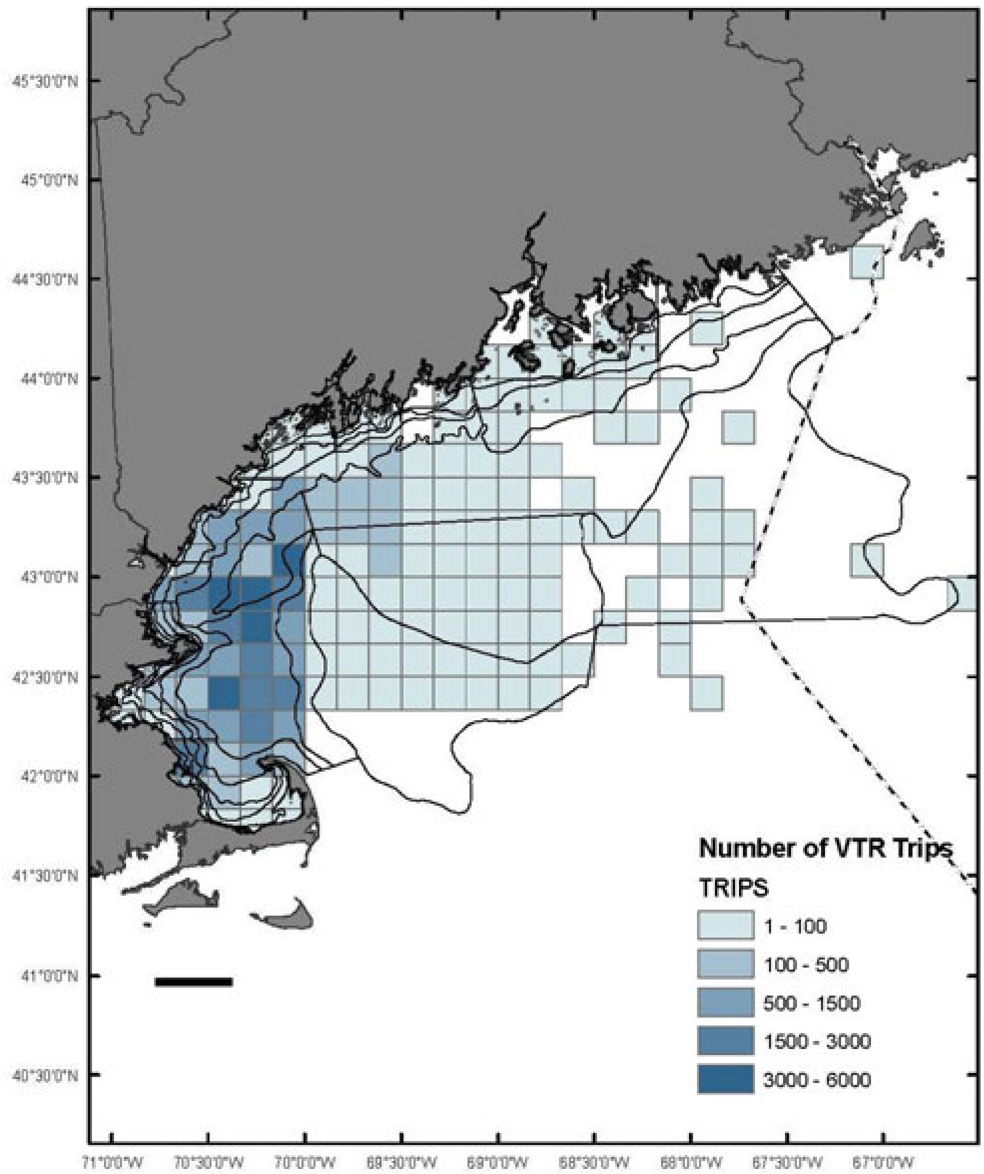
Calendar Year	Party	Charter	Total
1999	53	100	153
2000	48	103	151
2001	59	116	175
2002	43	130	173
2003	53	128	181
2004	64	124	188
2005	60	135	195
2006	62	126	188
2007	52	133	185
2008	54	128	182
2009	48	131	179
2010	60	135	195
2011	47	128	175
2012	44	108	152
2013	31	89	120

Notes: Includes catch (kept and discarded) from any of the Gulf of Maine statistical areas.

Source: NERO, January 2014.

Measures are considered in this action that may create an inshore/offshore boundary within the GOM BSA (Figure 5) and create a sub-ACL and other measures specific to each sub-area. Unlike the commercial trawl fishery, the recreational fishery has always been relatively concentrated in the western Gulf of Maine. There have been no large-scale changes in the center of recreational effort over time. The majority of VTR-reported recreational landings (by charter/party vessels) come almost exclusively from SRAs 513, 514, and 515, with most recreational activity located to the west of 70° W (Figure 24).

Figure 24 - Map of the distribution of recreational effort on trips reported catching GOM cod, 1994-2011.



Notes: VTR-based recreational effort is been binned to ten minute squares and overlaid on the NEFSC bottom trawl survey sampling strata. The data include party and charter effort.
Source: NEFSC (2013a, p. 273).

7.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

7.1 ANALYTIC APPROACH AND LIMITATIONS

The Council is proposing changes to address several broad issues related to accumulation limits and fleet diversity. Where possible, quantitative impacts are estimated, but the Council has limited ability to quantify the impacts of some of the management measures proposed in this action. As a result, most alternatives are a combination of quantitative and qualitative analysis.

7.1.1 Valued Ecosystem Components

The environmental impacts of the management alternatives are described here based on valued ecosystem components (VECs), including:

- **Target Species:** the effect on fishing mortality, bycatch and bycatch mortality
- **Nontarget Species:** the effect on fishing mortality, bycatch and bycatch mortality
- **Physical environment and Essential Fish Habitat (EFH):** the effect on and the extent to which they will minimize the adverse effects of fishing on essential fish habitat
- **Protected Resources**, the effect on fishing mortality, bycatch and bycatch mortality
- **Human Communities:** the effect on revenues and costs in the fishery, and the impacts of those changes on other entities and fishery participants in coastal communities, as well as non-economic social impacts.

7.1.2 Evaluation Criteria

This EIS evaluates the potential impacts using the criteria defined in Table 87. Impacts of all alternatives, including no action, are judged relative to baseline conditions, as described in Section 6.0, and compared to each other.

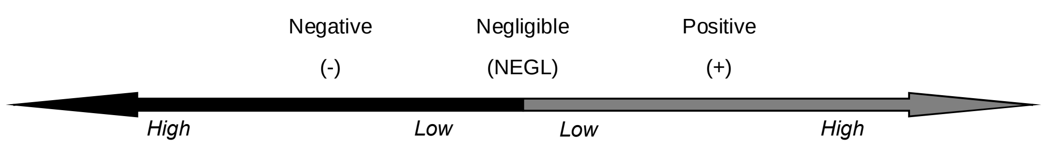
7.1.3 Analytical Limitations

Analysis of the impacts of the management alternatives is complicated by the following factors:

- The range of proposals and the interaction between management measures precludes analysis of the components on both large and small scales.
- Many of the management measures interact with each other. Whenever possible, the impacts of each alternative are analyzed as a combination of measures. When estimates of fishing mortality reductions are obtained from different analytic techniques, they cannot be summed to obtain an estimate of the overall impacts. This is partly because the measures interact with each other, even if analyzed separately.
- The impacts of some measures in the alternatives cannot be quantified. When possible, impacts are expressed in a combination of quantitative and qualitative terms.
- There is limited ability to model long-range economic impacts. Any attempt to model economic impacts into the future assumes no changes in the structure of the economy in the interim. This is an unrealistic assumption over the time periods associated with the rebuilding plans.

Table 87 - Description of Valued Ecosystem Components analyzed in Environmental Consequences

	Direction		
VEC	**Positive (+)**	**Negative (-)**	**Negligible/Neutral**
Allocated target species, other landed species, and protected resources	Actions that increase stock/population size	Actions that decrease stock/population size	Actions that have little or no positive or negative impacts to stocks/populations
Physical environment/ Habitat/EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Human communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
Impact Qualifiers for all VECs			
Mixed	Both positive and negative		
Low (as in low positive or low negative)	To a lesser degree		
High (in high positive or high negative)	To a substantial degree (not significant)		
Likely	Some degree of uncertainty associated with the impact		
Uncertain	The direction of impact (positive or negative) is unknown		



7.2 IMPACTS ON TARGET SPECIES

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies (groundfish) stocks that the fishery targets. Changes in fishing mortality may result in changes in stock size. The impacts associated with the measures are anticipated to be minor and not significant. Section 6.1 contains background information on the target species.

7.2.1 Accumulation Limits

7.2.1.1 Provisions

7.2.1.1.1 Entities to Which Accumulation Limit Would Apply

The alternatives in Section 4.1 would apply to individuals, permit banks, and other entities.

The impacts of this provision on regulated groundfish species are expected to be neutral. This is an administrative provision that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.1.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

The impacts of this provision on regulated groundfish species are expected to be neutral. This is an administrative provision that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.1.2 Limit the Holdings of PSC

7.2.1.2.1 Alternative 1: No Action

There would be no limit on the PSC holdings by individuals, permit banks, and other entities.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternatives 2-6. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.1.2.2 Alternatives 2-6

Current and Future PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected in Section 4.1.2.2, there are cases where the current PSC held by an individual or entity exceeds the accumulation limit (Table 89). The Council considered how to treat these excess holdings, as well as whether an individual or entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock.

The impacts of the options in this section on regulated groundfish species are expected to be neutral, as catch would not be expected to exceed the ACLs. Where PSC may be redistributed within the fishery, the direction (positive or negative) of any impact resulting from fishing effort shifts is uncertain but expected to be minor. Under Option B (*NON-PREFERRED ALTERNATIVE*) in which permits must be divested in "Disposition of Current Holdings in Excess of what is Allowed" in the short-term, there may be a low positive impact on regulated groundfish species until permits with PSC in excess of the accumulation limit are divested, because PSC holding in excess of the cap could not be fished or leased during that time. However, Option B is expected to not have a direct impact on regulated groundfish species once permits were divested, because it would not, in and of itself, change total fishing effort.

Alternatives 2-6

(Alternative 6 is *PREFERRED ALTERNATIVE*) The impacts of Alternatives 2-6 on regulated groundfish species are expected to be neutral relative to No Action and to each other, as catch would not be expected to exceed the ACLs. Accumulation limit Alternatives 2-6 are expected to impact the potential holdings of an individual, permit bank, or other entity and are separate and distinct from stock-specific ABCs and ACLs that limit fishing mortality and may constrain fishing effort (would not change total fishing effort). Limits on PSC holdings are expected to not impose restrictions on the in-season lease of fish (ACE, if the PSC holder joined a sector) between sectors, such that the overall number of sector vessels prosecuting the fishery would not necessarily be limited by PSC caps, nor would PSC caps place any restrictions on how the fishery is prosecuted (i.e., when, where, or with what gear). The PSC of vessels fishing in the common pool is aggregated into a common pool sub-ACL, and distributed across trimesters. For some of the alternatives, excess PSC would be redistributed within the groundfish fishery, and the direction (positive or negative) of any impact resulting from fishing effort shifts is uncertain but expected to be minor.

7.2.1.3 Limit the Holdings of Permits

7.2.1.3.1 Alternative 1: No Action

There would be no limit on the holdings of permits by individuals, permit banks, or other entities.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternative 2. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.1.3.2 Alternative 2: Limiting the Holdings of Permits

(PREFERRED ALTERNATIVE) For any single fishing year, no individual, permit bank, or other entity shall hold > 5% of the limited access Northeast Multispecies permits. This includes permits issued to vessels and eligibilities in Confirmation of Permit History. If an individual, permit bank or other entity held >5% of the permits on the control date (April 7, 2011), they would be restricted to holding no more than the number of permits they held as of the control date.

The impacts of Alternative 2 on regulated groundfish species are expected to be neutral relative to No Action. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.2 Handgear A Permit Measures

7.2.2.1 Establish a Handgear A Permit sub-ACL

7.2.2.1.1 Alternative 1: No Action

Holders of Handgear A multispecies permits would continue to have the choice of enrolling in the common pool or a groundfish sector (including forming a sector) and be subject to current regulations accordingly. The discard rate for vessels fishing with HA permits in the common pool is calculated based on observed trips using trawls or gillnets, not handgear.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternative 2. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.2.1.2 Alternative 2: Establish a Handgear A Permit sub-ACL

(PREFERRED ALTERNATIVE) A new groundfish fishery component sub-ACL would be created, which would be distinct from the common pool or sectors. A sub-ACL would be created for HA permits, allocating the catch history (i.e., PSC) of the enrolled HA permits for Gulf of Maine cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, and pollock. The catch history qualification years would remain consistent with current PSC calculation methods. This sub-ACL would only be used by HA fishermen. The HA sub-ACL would be managed with an annual sub-ACL. Unused HA sub-ACL would be carried over from one fishing year to the following fishing year, up to a limit of 10% of the unused sub-ACL, consistent with sector carryover as adopted in Framework 53.

The impacts of Alternative 2 on regulated groundfish species are expected to be neutral relative to No Action. This is an administrative measure, since establishing a sub-ACL for Handgear A permits would not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

Discards

Stocks that would not have a specific HA permit sub-ACL, but are caught using a HA permit, would be accounted for under the Other Sub-components sub-ACLs.

> **Option A:** ***(PREFERRED ALTERNATIVE)*** Calculate an annual discard rate based on available data for longline and hook gear. At the beginning of the fishing year, estimated discards would be subtracted from the HA sub-ACL (for GOM cod, GB cod, GOM haddock, GB haddock, and pollock) and the Other sub-Components sub-ACL (for all other stocks) accordingly.

The impacts of Option A on regulated groundfish species are expected to be low positive relative to Option B, since discards would be based on stratified fishery dependent data rather than a *de minimus* amount, as in Option B. However, Option A may or may not more accurately account for discards relative to Option B. Due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

> **Option B:** Assume all discards from trips fishing within the HA sub-ACL to be *de minimus*. Only landings would count against the sub-ACLs.

The impacts of Option B on regulated groundfish species are expected to be low negative relative to Option A, since discards would not be explicitly accounted for. Option B would not use the most current information to calculate an estimated discard rate. However, Option B may or may not more accurately account for discards relative to Option A. Due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

In-season accountability measures

An in-season accountability measure (AM) would be established for the HA sub-ACL. To prevent overages in-season, trip limits for each stock with a HA sub-ACL would be set in specifications by the Regional Administrator to prevent overage.

> **Option A:** When 100% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

In general, the impacts on regulated groundfish species of having an in-season AM are positive, as it ensures that catch stays within the ACLs. The impacts of Option A on regulated groundfish species are expected to be negligible relative to Option B and would depend on the timing of the implementation of an in-season AM (i.e., beginning, middle, or end of the fishing year). Currently, Handgear A permit holders in the common pool are subject to trimester ACLs and associated AMs, which restrict fishing in-season. The biological impacts on regulated groundfish would likely be low negative if the sub-ACL was exceeded and discards continued. Relative to Option B, which has a lower AM trigger threshold at 90%, Option A may be more negative. However, due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

> **Option B:** ***(PREFERRED ALTERNATIVE)*** When 90% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

In general, the impacts on regulated groundfish species of having an in-season AM are positive, as it ensures that catch stays within the ACLs. The impacts of Option B on regulated groundfish species are expected to be negligible relative to Option A and would depend on the timing of the implementation of an in-season AM (i.e., beginning, middle, or end of the fishing year). Currently, Handgear A permit holders in the common pool are subject to trimester ACLs and associated AMs, which would restrict fishing in-season. The biological impacts on regulated groundfish would likely be low negative if the sub-ACL was exceeded and discards continued. Relative to Option A, which has a higher AM trigger threshold at 100%, Option B may be less negative. However, due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

Reactive accountability measures

A reactive accountability measure (AM) would be established for the HA sub-ACL. Reactively, an overage in the sub-ACL for a stock would be subtracted from the sub-ACL in the fishing year following notification of the overage.

Option A: ***(PREFERRED ALTERNATIVE)*** Reactive AMs would be triggered if the HA sub-ACL is exceeded.

The impacts of Option A on regulated groundfish species are expected to be similar relative to the status quo (which is low positive for the species) and would be low positive relative to Option B, since the overage would be deducted in a subsequent year if the sub-ACL alone is exceeded. However, due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

Option B: Reactive AMs would be triggered if the HA sub-ACL and the total ACL are exceeded.

The impacts of Option B on regulated groundfish species are expected to be less positive relative to Option A, since the overage would be deducted in a subsequent year if the sub-ACL and total ACL are both exceeded. However, due to the small anticipated HA permit sub-ACLs if created (Table 10), the differences in impacts between these options may be negligible.

7.2.2.2 Removal of March 1-20 HA Closure

7.2.2.2.1 Alternative 1: No Action

No Action. Handgear A vessels enrolled in the common pool are required to take a mandatory spawning block out of the fishery and may not fish for, possess, or land regulated multispecies from March 1 – 20 of each year. Vessels enrolled in sectors are exempt from this closure.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral and low positive relative to Alternative 2. Regulated groundfish that spawn in March in the Gulf of Maine that may be protected from fishing by Handgear A permit holders in the common pool include American plaice, cod, halibut, haddock, windowpane flounder, winter flounder, and yellowtail flounder (see Framework Adjustment 53, Appendix II, pp. 43 for a table of spawning periods for regulated groundfish in the Gulf of Maine).

7.2.2.2.2 Alternative 2: Removal of the March 1-20 HA closure

(PREFERRED ALTERNATIVE) The March 1-20 fishing closure would be removed for all Handgear A vessels, regardless of which sub-ACL their permits are enrolled in.

The impacts of Alternative 2 on regulated groundfish species are expected to be low negative relative to No Action. Although the Handgear A effort would be small (Table 10), regulated groundfish that spawn in March in the Gulf of Maine may be impacted by allowing fishing by Handgear A permit holders. Species include American plaice, cod, halibut, haddock, windowpane flounder, winter flounder, and yellowtail flounder (see Framework Adjustment 53, Appendix II, pp. 43 for a table of spawning periods for regulated groundfish in the Gulf of Maine).

7.2.2.3 Removal of Standard Fish Tote Requirement

7.2.2.3.1 Alternative 1: No Action

No Action. Vessels fishing with a Handgear A permit are required to have at least one standard tote on board.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternative 2, since the standard fish tote is not currently used as an enforcement tool (Section 6.5.6.3.3). Having a fish tote on board a HA vessel (or not) does not impact the quantity or composition of catch.

7.2.2.3.2 Alternative 2: Removal of the Standard Fish Tote Requirement

(PREFERRED ALTERNATIVE) Vessels operating under a HA permit would no longer be required to carry a standard fish tote on board.

The impacts of Alternative 2 on regulated groundfish species are expected to be negligible relative to No Action, since the standard fish tote is not currently used as an enforcement tool (Section 6.5.6.3.3). Having a fish tote on board a HA vessel (or not) does not impact the quantity or composition of catch.

7.2.2.4 Sector Exemption from VMS Requirements

7.2.2.4.1 Alternative 1: No Action

No Action. All vessels fishing in a groundfish sector, including those with Handgear A permits, are required to use the Vessel Monitoring System (VMS).

The impacts of Alternative 1 (No Action) on regulated groundfish species are expected to continue to be positive, and low positive relative to Alternative 2, since VMS can be used for accurate catch attribution (e.g., by stock area, fishing locations relative to closed areas), which should improve catch monitoring, enforcement, and stock assessments.

7.2.2.4.2 Alternative 2: Sector Exemption from VMS Requirements

(PREFERRED ALTERNATIVE) A sector may request through its annual operations plans that vessels fishing with handgear in the sector may be exempt from the requirement to use the Vessel Monitoring System (VMS). Vessels fishing with handgear in a sector must declare trips through the Interactive Voice Response (IVR) system.

The impacts of Alternative 2 on regulated groundfish species are expected to be low negative relative to No Action if Handgear A permit holders currently enrolled in a sector continue to do so, but choose to not use VMS and instead use IVR. VMS can be used for more accurate catch attribution (e.g., by stock area, fishing locations relative to closed areas) than IVR, which should improve catch monitoring, enforcement, and stock assessments.

7.2.3 Data Confidentiality

The action alternative to make ACE value data public are expected to improve transparency, but both the existing confidentiality requirements ***(No Action; PREFERRED ALTERNATIVE)*** and the changes (Alternative 2) are considered administrative measures that are expected to not have any impacts on regulated groundfish species, because they would not, in and of themselves, allow catch to exceed the ACLs or affect fishing behavior.

7.2.4 Inshore/Offshore Gulf of Maine

7.2.4.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Impacts of alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 5) are identified in this section.

7.2.4.1.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A new inshore/offshore boundary line in the Gulf of Maine would not be established.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternative 2. Alternative 2 is considered administrative, since establishing a line would not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.4.1.2 Alternative 2: Establish an Inshore/Offshore Boundary

A new sub-area boundary (Option A, B, or C below) would be established within the Gulf of Maine Management Area to distinguish between inshore and offshore fishing practices. This boundary may be adjusted through subsequent framework action and would not apply to vessels with only state-water groundfish permits (Figure 2).

Option A. Establish an inshore/offshore Gulf of Maine boundary at 70°W longitude.

Option B. Establish an inshore/offshore Gulf of Maine boundary at 70°15'W longitude.

Option C. Establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50'W, runs north along 69°50'W to the 12 nm territorial sea line, then follows Maine's 12 nm territorial sea line northeast to the Hague Line.

The impacts of Alternative 2 (and all options therein) on regulated groundfish species are expected to be neutral relative to No Action and each other. Alternative 2 is considered administrative, since establishing a line are expected to not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.4.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

7.2.4.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A sub-ACL would not be established within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

The impacts of Alternative 1 on regulated groundfish species are expected to be neutral, and neutral relative to Alternative 2, since establishing sub-ACLs for GOM cod are expected to not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.2.4.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This alternative would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. Provisions for a sub-ACL control rule, commercial allocation, and catch monitoring are outlined below. This alternative would not change catch attribution methods for federally-permitted vessels fishing in state waters. The distribution of allocation within the commercial fishery would remain unchanged.

The impacts of Alternative 2 on regulated groundfish species are expected to be neutral relative to No Action, since establishing sub-ACLs for GOM cod are expected to not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

Determining the GOM cod sub-ACLs

Option A. During each GOM cod specifications process, the Council would determine the control rule to be used at the time to determine the split between the inshore and offshore sub-ACLs. The control rules could be based on cod distribution, catch, different time periods, etc.

Option B. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of commercial catch in each sub-area. Two sub-options for the fishing years used to determine the level of catch are considered.

Sub-Option A. The last 10 fishing years prior to the year in which the specifications are developed.

Sub-Option B. The last 20 fishing years prior to the year in which the specifications are developed.

Option C. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of GOM cod distribution in each area. Two sub-options for the calendar years used to determine the level of fish distribution are considered.

Sub-Option A. The last 10 calendar years prior to the year in which the specifications are developed.

Sub-Option B. The last 20 calendar years prior to the year in which the specifications are developed.

The direction of impact (positive or negative) of Options A-C and the sub-Options on regulated groundfish species are uncertain relative to each other for reasons outlined below, but minor as catch is not expected to exceed total ACLs.

To explore potential biological impacts, methods for determining inshore and offshore GOM cod sub-ACLs were examined (Appendix I). Briefly, inshore and offshore proportions were determined using commercial vessel trip report (VTR) data and NEFSC bottom trawl surveys for the three boundary lines (Options A-C) using a 10-year and 20-year average prior to the year in which the specifications are developed (see Alternatives in Sections 4.4.1 and 4.4.2). Depending on which approach and line option is selected to calculate sub-ACLs for GOM cod, the proportion of the GOM cod ACL that would be assigned west (inshore) of the line ranges from 35-95% (Tables 1, 2, and 3 in Appendix I). Examples of possible inshore and offshore sub-ACLs along that range using the proposed FY 2015 commercial sub-ACL (207 mt) for GOM cod in Framework Adjustment 53 are provided (Table 4 in Appendix I), in which 72 - 197 mt for the inshore area would have been assigned depending on the approach.

Generally, both the VTR and surveys data show an increasing proportion of the stock inshore more recently (10-year vs. 20-year average). Similar trends were also seen in the recent stock assessment for GOM cod (Palmer 2014). VTR stock proportions are a function of the cod population distribution, fishery effort and groundfish stock targeting behavior. If sub-ACLs can be accurately assigned inshore and offshore consistent with the true cod biomass distributions, then these measures would potentially have low to negligible biological effect on GOM cod, since mortality would not be expected to change much between the components. However, if GOM cod rebounds and/or the distribution changes (i.e., shifting to the east or populating the east and west in different proportions), the impacts on the GOM cod stock could potentially change from being negligible to potentially negative (e.g., fishing activity leads to localized depletion and increases the risk to the GOM cod stock). Therefore, it is difficult to determine if these measures (Options A, B, and C and related sub-options) would result in a positive or negative biological impact on the GOM cod stock and other regulated groundfish species.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can correctly attribute catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Declarations would be made to the sector manager via the Trip Start Hail. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

To the extent that there would be additional reporting requirements for vessels conducting fishing activity without at-sea observers on board, there may be improved information regarding GOM cod and other regulated groundfish species. However, Alternative 2 has the capability to invalidate the unbiased nature of the discard estimation procedures currently in use. The catch monitoring provision increases the likelihood that the sample of vessels covered by observers would have a different spatial distribution from unobserved vessels. For example, consider a sector that traditionally fishes broadly throughout the Gulf of Maine and Georges Bank regions (i.e., many of the trips declare into multiple BSAs). If high discards of GOM cod occur west of 70°15’ W, then the discards rates from observed trips would be higher than those of unobserved trips, resulting in the sample not being representative of the population.

This provision it is intended to reduce the misreporting of inshore catches (such as those for GOM cod). Unfortunately, it would potentially bias discard estimates for trips that intend to fish in multiple BSAs. This approach is expected to result in an increased potential for observer bias, thus having a negative impact on all groundfish species relative to No Action.

7.2.4.3 GOM/GB Inshore Restricted Roller Gear Area

7.2.4.3.1 Alternative 1: No Action
(PREFERRED ALTERNATIVE)

No Action. Do not revise the current GOM/GB Inshore Restricted Roller Gear Area. In Figure 3, the polygon in aqua is the current trawl roller area (12” max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp).

Potential No Action. Pending Habitat OA2 approval and implementation, the 12” roller gear restriction would be applied to all bottom trawl gear.

The impacts of Alternative 1 (No Action) on regulated groundfish species are expected to be neutral. Alternative 1 would not change fishery behavior. Therefore, the potential positive impact of the roller gear restriction on regulated groundfish species is expected to continue. The impacts of the Potential No Action on regulated groundfish species are expected to be low positive relative to No Action, because the requirement would apply to more fisheries (i.e., all bottom trawl gear). Relative to Alternative 2, the impacts of No Action and the Potential No Action are expected to be uncertain depending on which inshore/offshore boundary line is selected, but minor as catch is not expected to exceed the ACLs.

7.2.4.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area
The GOM/GB Inshore Restricted Roller Gear Area would be revised to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2.

The impacts of Alternative 2 on regulated groundfish species are expected to vary depending on the boundary line chosen. Assuming that the roller gear restriction has positive impacts on regulated groundfish species generally, Options A and B, particularly B, would roll back that restriction in some areas, and therefore, these options are expected to have negative impacts to regulated groundfish species that would be more vulnerable to gear without these restrictions in place. Option C would increase the footprint of the roller gear area, and therefore, are expected to have positive impacts on regulated groundfish species.

7.2.4.4 Declaration Time Periods for the Commercial Fishery
Declaration time periods influence the time steps over which a vessel might have to decide whether they wanted to fish in the inshore versus offshore areas. Under the alternatives in this section, vessels could lease ACE associated with area they were not declared into. These alternatives are expected to not impact regulated groundfish species in the inshore or offshore areas and their associated sub-ACLs, because sub-ACL allocations by area remain the same on a fishing year basis (total effort would not change). Therefore, impacts of all of the time period alternatives (Alternatives 2-4) on regulated groundfish species co-caught with regulated groundfish species are expected to be neutral relative to No Action **(Alternative 1, *PREFERRED ALTERNATIVE*)** and each other.

7.2.5 Redfish Exemption Area

7.2.5.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5" minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption published in the FY 2015-2016 Sector Rule regarding redfish is as follows. Allow commercial vessels fishing in sectors to use a 5.5" codend (or larger) within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015c). In general, some considerations of the Status Quo include:

- If switching between mesh sizes is permitted, monitoring would be difficult,
- Smaller fish may be targeted as a result of using the smaller mesh, which may potentially lead to changes in selectivity in stock assessments, and
- Therefore, ABCs could be set too high in the near-term (e.g., redfish) if a shift in selectivity actually occurs, but this will be unknown until future stock assessments.

The impacts of Alternative 1 on regulated groundfish species could be either positive or negative, depending on what the particulars of the sector exemption are in any given fishing year. Because the sector exemptions are specified annually, No Action creates greater uncertainty in the direction and magnitude of potential impacts relative to Alternative 2, though impacts are expected to be minor, as total catch is not expected to exceed the ACLs. An exemption area offshore in deeper water (Status Quo and Alternative 2) should focus effort on larger redfish and help avoid impacts to juvenile redfish further inshore (see Habitat impacts).

The FY 2014 and FY 2015-2016 Sector EAs (NMFS 2014b; 2015b) analyzed the results from recent sector exemptions for redfish and the REDNET research program and determined that the overall impacts of the exemption to target species are expected to be low negative relative to No Action (The EA considered impacts to this exemption through FY 2021). The exemption could result in greater retention of sub-legal regulated groundfish species. The FY 2015-2016 Sector Rule modified the exemption area (NMFS 2015c) to reduce potential negative impacts on GOM cod.

7.2.5.2 Alternative 2: Establish a Redfish Exemption Area within the FMP

(PREFERRED ALTERNATIVE) Establish in the FMP that commercial vessels fishing in sectors may use a 5.5" (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4), with several stipulations as listed. Approval through the annual (or biennial) sector operations plan approval process would not be necessary. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage levels are considered. Sectors may continue to request other exemptions related to redfish.

The same general considerations of the Status Quo apply to Alternative 2 as well:

- If switching between mesh sizes is permitted, monitoring would be difficult,
- Smaller fish may be targeted as a result of using the smaller mesh, which may potentially lead to changes in selectivity in stock assessments, and
- Therefore, ABCs could be set too high in the near-term (e.g., redfish) if a shift in selectivity actually occurs, but this will be unknown until future stock assessments.

The FY 2014 and FY 2015-2016 Sector EAs (NMFS 2014b; 2015b) analyzed the results from recent sector exemptions for redfish and the REDNET research program and determined that the overall impacts of the exemption to target species are expected to be low negative relative to No Action. The exemption could result in greater retention of sub-legal regulated groundfish species (The EA considered impacts to this exemption through FY 2021).

Commercial Catch Monitoring

> **Option A.** Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

The impacts of Option A on regulated groundfish species are expected to be neutral relative to the Status Quo, as there would be no change in monitoring rates for the fishery. The impacts are expected to be positive relative to Option B, because Option B has not been adequately designed as a separate stratum with a dedicated monitoring program. Without such a design, Option B may produce biases in the estimate removals at length and age for all regulated groundfish stocks.

> **Option B.** Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

The impacts of Option B on regulated groundfish species are expected to be negative relative to the Status Quo and Option A, because Option B has not been adequately designed as a separate stratum with a dedicated monitoring program. Without such a design, Option B may produce biases in the estimate removals at length and age for all regulated groundfish stocks.

7.3 IMPACTS ON NONTARGET SPECIES

This section summarizes the possible impacts of the alternatives under consideration on nontarget species, including the nonallocated groundfish stocks and species in areas adjacent to the authority of the NEFMC. These impacts are discussed in a general nature given the complexity of the alternatives under consideration and the difficulty in predicting behavioral reactions to those measures. The ability to move between fisheries is constrained in part by the permits held by individual vessels and in part by the fisheries that are available in the area that the vessel typically fishes. While vessels operators could choose to relocate to take advantage of other fishing opportunities there are disincentives to do so: difficulty arranging dock space, unfamiliarity with fishing grounds, etc. Section 6.2 contains background information on the target species.

7.3.1 Accumulation Limits

7.3.1.1 Provisions

7.3.1.1.1 Entities to Which Accumulation Limit Would Apply

The alternatives in Section 4.1 would apply to individuals, permit banks, and other entities.

The impacts of this provision on nontarget species are expected to be neutral. This is an administrative provision that would not have any impacts on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.1.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

The impacts of this provision on nontarget species are expected to be neutral. This is an administrative provision that would not have any impacts on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.1.2 Limit the Holdings of PSC

7.3.1.2.1 Alternative 1: No Action

There would be no limit on the PSC holdings by individuals, permit banks, and other entities.

The impacts on nontarget species are expected to be neutral, and neutral relative to Alternatives 2-6. This is an administrative measure that is expected to not have any impacts on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.1.2.2 Alternatives 2-6

Current and Future PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected in Section 4.1.2.2, there are cases where the current PSC held by an individual, permit bank, or entity exceeds the accumulation limit (Table 89). The Council considered how to treat these excess holdings, as well as whether an individual, permit bank, or other entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock.

The impacts of the options in this section on nontarget species are expected to be neutral, as they would not, in and of themselves, allow catch to exceed the ACLs. Where PSC may be redistributed within the fishery, the direction (positive or negative) of any impact resulting from effort shifts is uncertain. Under Option B *(NON-PREFERRED ALTERNATIVE)* in which permits must be divested in "Disposition of Current Holdings in Excess of what is Allowed" in the short-term, there may be low positive impacts on nontarget species co-caught (e.g., monkfish, skates, and dogfish) with regulated groundfish species, until permits with PSC in excess of the accumulation limit are divested, because PSC holding in excess of the cap would not be able to be fished or leased. However, Option B is expected to not have a direct impact on nontarget species co-caught with regulated groundfish species once permits were divested, because it would not, in and of itself, change total fishing effort.

Alternatives 2-6

(Alternative 6 is *PREFERRED ALTERNATIVE*) The impacts of Alternatives 2-6 on nontarget groundfish species are expected to be neutral relative to No Action and to each other, as they would not, in and of themselves, allow catch to exceed the ACLs. Accumulation limit Alternatives 2-6 are expected to impact the potential holdings of an individual, permit bank, and other entity, and are separate and distinct from stock-specific ABCs and ACLs that limit fishing mortality and may constrain fishing effort (would not change total fishing effort). Limits on PSC holdings would not impose restrictions on the in-season lease of fish (ACE, if the PSC holder joined a sector) between sectors, such that the overall number of sector vessels prosecuting the fishery would not be limited by PSC caps, nor would PSC caps place any restrictions on how the fishery is prosecuted (i.e. when, where, or with what gear). The PSC of vessels fishing in the common pool is aggregated into a common pool sub-ACL, and distributed across trimesters. For some of the alternatives, excess PSC would be redistributed within the groundfish fishery, and the direction (positive or negative) of any impact resulting from effort shifts is uncertain.

7.3.1.3 Limit the Holdings of Permits

7.3.1.3.1 Alternative 1: No Action

There would be no limit on the holdings of permits by individuals, permit banks, or other entities.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and neutral relative to Alternative 2. This is an administrative measure that is expected to not have any impacts on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.1.3.2 Alternative 2: Limiting the Holdings of Permits

(PREFERRED ALTERNATIVE) For any single fishing year, no individual, permit bank, or other entity shall hold > 5% of the limited access Northeast Multispecies permits. This includes permits issued to vessels and eligibilities in Confirmation of Permit History. If an individual or entity held > 5% of the permits on the control date (April 7, 2011), they would be restricted to holding no more than the number of permits they held as of the control date.

The impacts of Alternative 2 on nontarget species are expected to be neutral relative to No Action. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.2 Handgear A Permit Measures

7.3.2.1 Establish a Handgear A Permit sub-ACL

7.3.2.1.1 Alternative 1: No Action

Holders of Handgear A multispecies permits would continue to have the choice of enrolling in the common pool or a groundfish sector (including forming a sector) and be subject to current regulations accordingly. The discard rate for vessels fishing with HA permits in the common pool is calculated based on observed trips using trawls or gillnets, not handgear.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and neutral relative to Alternative 2. This is an administrative measure that would not have any impacts on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.2.1.2 Alternative 2: Establish a Handgear A Permit sub-ACL

(PREFERRED ALTERNATIVE) A new groundfish fishery component sub-ACL would be created, which would be distinct from the common pool or sectors. A sub-ACL would be created for HA permits, allocating the catch history (i.e., PSC) of the enrolled HA permits for Gulf of Maine cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, and pollock. The catch history qualification years would remain consistent with current PSC calculation methods. This sub-ACL would only be used by HA fishermen. The HA fishery would be managed with an annual sub-ACL. Unused HA fishery sub-ACL would be carried over from one fishing year to the following fishing year, up to a limit of 10% of the unused sub-ACL, consistent with sector carryover as adopted in Framework 53.

The impacts of Alternative 2 on regulated groundfish species are expected to be neutral relative to No Action. This is an administrative measure, since establishing a fishery for Handgear A permits would not have a direct impact on regulated groundfish species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

Discards

Stocks that would not have a specific HA permit sub-ACL, but are caught using a HA permit, would be accounted for under the Other Sub-components sub-ACLs.

> **Option A:** ***(PREFERRED ALTERNATIVE)*** Calculate an annual discard rate based on available data for longline and hook gear. At the beginning of the fishing year, estimated discards would be subtracted from the HA fishery sub-ACL (for GOM cod, GB cod, GOM haddock, GB haddock, and pollock) and the Other Sub- Components sub-ACL (for all other stocks) accordingly.

The impacts of Option A on nontarget species are expected to be low positive relative to Option B, since discards would be based on stratified fishery dependent data rather than a de minimus amount, as in Option B which may or may not accurately account for discards. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

Option B: Assume all discards from trips fishing within the HA sub-ACL to be *de minimus*. Only landings would count against the sub-ACLs.

The impacts of Option B on nontarget groundfish species are expected to be low negative relative to Option A, since discards would not be explicitly accounted for. Option B has the potential to be incorrect, because it would not use the most current information to calculate an estimated discard rate, rather apply a specified rate regardless of new information received during the fishing year. However, Option B which may or may not more accurately account for discards relative with Option A. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

In-season accountability measures

An in-season accountability measure (AM) would be established for the HA fishery. To prevent overages in-season, trip limits for each stock with a HA fishery sub-ACL would be set in specifications by the Regional Administrator to prevent overage.

Option A: When 100% of the HA sub-ACL is reached for a stock, the HA fishery for that stock would close and all vessels fishing under the HA fishery would be subject to a zero possession limit for that stock for the remainder of the fishing year.

In general, the impacts on nontarget species of having an in-season AM are positive. The impacts of Option A on nontarget species are expected to depend on the timing of the implementation of an in-season AM (i.e., beginning, middle, or end of the fishing year). Currently, Handgear A permit holders in the common pool are subject to trimester ACLs and associated AMs, which would restrict fishing in-season. The impacts on nontarget species are expected to likely be low negative if the sub-ACL was exceeded and discards continued for regulated groundfish species and associated nontarget stocks (e.g., wolffish, halibut, dogfish). Relative to Option B, which has a lower AM trigger threshold at 90%, Option A may be more negative. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

Option B: ***(PREFERRED ALTERNATIVE)*** When 90% of the HA sub-ACL is reached for a stock, the HA fishery for that stock would close and all vessels fishing under the HA fishery would be subject to a zero possession limit for that stock for the remainder of the fishing year.

In general, the impacts on nontarget species of having an in-season AM are positive. The impacts of Option B on nontarget species are expected to depend on the timing of the implementation of an in-season AM (i.e., beginning, middle, or end of the fishing year). Currently, Handgear A permit holders in the common pool are subject to trimester ACLs and associated AMs, which would restrict fishing in-season. The impacts on regulated groundfish are expected to likely be low negative if the sub-ACL was exceeded and discards continued for regulated groundfish species and associated nontarget stocks (e.g., wolffish, halibut, dogfish). Relative to Option A, which has a higher AM trigger threshold at 100%, Option B may be less negative. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

Reactive accountability measures

A reactive accountability measure (AM) would be established for the HA fishery. Reactively, an overage in the sub-ACL for a stock would be subtracted from the sub-ACL in the fishing year following notification of the overage.

> **Option A:** ***(PREFERRED ALTERNATIVE)*** Reactive AMs would be triggered if the HA fishery sub-ACL is exceeded.

The impacts of Option A on nontarget species are expected to be similar relative to the status quo (which is low positive for the species) and would be low positive relative to Option B, since the overage would be deducted in a subsequent year if the sub-ACL alone is exceeded and therefore fisheries interactions with nontarget species may potentially be reduced. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

> **Option B:** Reactive AMs would be triggered if the HA fishery sub-ACL and the total ACL are exceeded.

The impacts of Option B on nontarget species are expected to be less positive relative to Option A, since the overage would be deducted in a subsequent year if the sub-ACL and total ACL are both exceeded. Fisheries interactions with nontarget species may potentially be reduced, but are less likely under Option B than Option A. However, due to the small anticipated sub-ACLs for the Handgear A fishery if created (Table 10), the differences in impacts between these options may be negligible.

7.3.2.2 Removal of March 1-20 HA Closure

7.3.2.2.1 Alternative 1: No Action

No Action. Handgear A vessels enrolled in the common pool are required to take a mandatory spawning block out of the fishery and may not fish for, possess, or land regulated multispecies from March 1 – 20 of each year. Vessels enrolled in sectors are exempt from this closure.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and low positive relative to Alternative 2. Nontarget groundfish that spawn in March in the Gulf of Maine that may be protected from fishing by Handgear A permit holders in the common pool include halibut and windowpane flounder (see Framework Adjustment 53, Appendix II, pp. 43 for a table of spawning periods for regulated groundfish in the Gulf of Maine). Relative to spawning of nontarget species (e.g., for monkfish higher spawning concentrations occur in the GOM in May compared to March and April (Richards et al. 2008) and for Atlantic herring spawning occurs in the late summer and fall). Negligible nontarget species discards are expected to be expected on the low anticipated ACLs for regulated species.

7.3.2.2.2 Alternative 2: Removal of the March 1-20 HA closure

(PREFERRED ALTERNATIVE) The March 1-20 fishing closure would be removed for all Handgear A vessels, regardless of which sub-ACL their permits are enrolled in.

The impacts of Alternative 2 on nontarget species are expected to be low negative to neutral relative to No Action. Negligible interaction with nontarget spawning fish is expected to occur in March (e.g., higher monkfish spawning concentrations occur in the GOM in May compared to

March and April (Richards, et al. 2008), and for Atlantic herring spawning occurs in the late summer and fall). Negligible nontarget species discards would be expected on the low anticipated ACLs for regulated species. Although Handgear A effort would be small (Table 10), nontarget groundfish that spawn in March in the Gulf of Maine that may be impacted by reopening fishing to Handgear A permit holders include halibut and windowpane flounder (see Framework Adjustment 53, Appendix II, pp. 43 for a table of spawning periods for regulated groundfish in the Gulf of Maine).

7.3.2.3 Removal of Standard Fish Tote Requirement

7.3.2.3.1 Alternative 1: No Action

No Action. Vessels fishing with a Handgear A permit are required to have at least one standard tote on board.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and neutral relative to Alternative 2, since the standard fish tote is not currently used as an enforcement tool. Having a fish tote on board a HA vessel (or not) does not impact the quantity or composition of catch.

7.3.2.3.2 Alternative 2: Removal of the Standard Fish Tote Requirement

(PREFERRED ALTERNATIVE) Vessels operating under a HA permit would no longer be required to carry a standard fish tote on board.

The impacts of Alternative 2 on nontarget species are expected to be neutral relative to No Action, since the standard fish tote is not currently used as an enforcement tool. Having a fish tote on board a HA vessel (or not) does not impact the quantity or composition of catch.

7.3.2.4 Sector Exemption from VMS Requirements

7.3.2.4.1 Alternative 1: No Action

No Action. All vessels fishing in a groundfish sector, including those with Handgear A permits, are required to use the Vessel Monitoring System (VMS).

The impacts of Alternative 1 on regulated groundfish species are expected to continue to be positive and low positive relative to Alternative 2, since VMS can be used for accurate catch attribution (e.g., by stock area, fishing locations relative to closed areas), which should improve catch monitoring, enforcement, and stock assessments.

7.3.2.4.2 Alternative 2: Sector Exemption from VMS Requirements

(*PREFERRED ALTERNATIVE)* A sector may request through its annual operations plans that vessels fishing with handgear in the sector may be exempt from the requirement to use VMS. Vessels fishing with handgear in a sector must declare trips through the Interactive Voice Response (IVR) system.

The impacts of Alternative 2 on nontarget species are expected to be low negative relative to No Action if Handgear A permit holders already in a sector choose to not use VMS and instead use IVR. VMS can be used for more accurate catch attribution (e.g., by stock area, fishing locations relative to closed areas) than IVR, which should improve catch monitoring, enforcement, and stock assessments.

7.3.3 Data Confidentiality

The action alternative to make ACE value data public is expected to improve transparency, but both the existing confidentiality requirements **(No Action, *PREFERRED ALTERNATIVE*)** and the changes (Alternative 2) are considered administrative measures that are expected to not have any impacts on regulated groundfish species, because they would not, in and of themselves, allow catch to exceed the ACLs or affect fishing behavior.

7.3.4 Inshore/Offshore Gulf of Maine

7.3.4.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Impacts of alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 6) are identified in this section.

7.3.4.1.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A new inshore/offshore boundary line in the Gulf of Maine would not be established.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and neutral relative to Alternative 2. Alternative 2 is considered administrative, since establishing a line would not have a direct impact on nontarget species because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.4.1.2 Alternative 2: Establish an Inshore/Offshore Boundary

A new sub-area boundary (Option A, B, or C below) would be established within the Gulf of Maine Management Area to distinguish between inshore and offshore fishing practices. This boundary may be adjusted through subsequent framework action and would not apply to vessels with only state-water groundfish permits (Figure 2).

Option A. Establish an inshore/offshore Gulf of Maine boundary at 70°W longitude).

Option B. Establish an inshore/offshore Gulf of Maine boundary at 70°15’W longitude.

Option C. Establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50’W, runs north along 69°50’W to the 12 nm territorial sea line, then follows Maine’s 12 nm territorial sea line northeast to the Hague Line.

The impacts of Alternative 2 (and all options therein) on nontarget species are expected to be neutral relative to No Action and each other. Alternative 2 is considered administrative, since establishing a line would not have a direct impact on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.4.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

7.3.4.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A sub-ACL would not be established within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

The impacts of Alternative 1 on nontarget species are expected to be neutral, and neutral relative to Alternative 2, since establishing sub-ACLs for GOM cod would not have a direct impact on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

7.3.4.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This alternative would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. Provisions for a sub-ACL control rule, commercial allocation, and catch monitoring are outlined below. This alternative would not change catch attribution methods for federally-permitted vessels fishing in state waters. The distribution of allocation within the commercial fishery would remain unchanged.

The impacts of Alternative 2 on nontarget species are expected to be neutral relative to No Action, since establishing sub-ACLs for GOM cod would not have a direct impact on nontarget species, because it would not, in and of itself, allow catch to exceed the ACLs or affect fishing behavior.

Determining the GOM cod sub-ACLs

Option A. During each GOM cod specifications process, the Council would determine the control rule to be used at the time to determine the split between the inshore and offshore sub-ACLs. The control rules could be based on cod distribution, catch, different time periods, etc.

Option B. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of commercial catch in each sub-area. Two sub-options for the fishing years used to determine the level of catch are considered.

Sub-Option A. The last 10 fishing years prior to the year in which the specifications are developed.

Sub-Option B. The last 20 fishing years prior to the year in which the specifications are developed.

Option C. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of GOM cod distribution in each area. Two sub-options for the calendar years used to determine the level of fish distribution are considered.

Sub-Option A. The last 10 calendar years prior to the year in which the specifications are developed.

Sub-Option B. The last 20 calendar years prior to the year in which the specifications are developed.

The impacts of Options A-C and the sub-Options on nontarget species are minor relative to each other, as they would not, in and of themselves, allow catch to exceed the ACLs, though the direction of any impact is uncertain. It is difficult to determine if Options A, B, and C and related sub-options are expected to result in a positive or negative impact on the nontarget species.

Fishing activity may shift based on how sub-ACLs for GOM cod would be assigned inshore or offshore. Increased effort inshore may negatively impact nontarget species co-caught with GOM cod, and vice versa.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can correctly attribute catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Declarations would be made to the sector manager via the Trip Start Hail. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

The No Action alternative would make no changes to regulations, and reporting requirements that are currently in place for all limited access groundfish vessels. No Action would not change behavior in the fishery, in and of itself, and therefore is expected to have neutral impacts on nontarget species.

To the extent that there would be additional reporting requirements for vessels conducting fishing activity without at-sea observers on board, there may be improved information regarding GOM cod and other regulated groundfish species. However, this measure has the capability to invalidate the unbiased nature of the discard estimation procedures currently in use. The provision increases the likelihood that the sample of vessels covered by observers would have a different spatial distribution from unobserved vessels. It would potentially bias discard estimates for trips that intend to fish in multiple BSAs. This approach would result in an increased potential for observer bias, thus having a negative impact on nontarget species relative to No Action.

7.3.4.3 GOM/GB Inshore Restricted Roller Gear Area

7.3.4.3.1 Alternative 1: No Action

No Action. (PREFERRED ALTERNATIVE). Do not revise the current GOM/GB Inshore Restricted Roller Gear Area. In Figure 3, the polygon in aqua is the current trawl roller area (12” max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp).

Potential No Action. Pending Habitat OA2 approval and implementation, the 12” roller gear restriction would be applied to all bottom trawl gear.

The impacts of Alternative 1 (No Action) on nontarget species are expected to be neutral. Alternative 1 would not, in and of itself, change behavior in the fishery. Therefore, the potential positive impact on the roller gear restriction on nontarget species would continue. The impacts of the Potential No Action on nontarget species are expected to be low positive relative to No Action, because the requirement would apply to more fisheries (i.e., all bottom trawl gear). Relative to Alternative 2, the direction of impact (positive or negative) of No Action and the

Potential No Action is expected to be uncertain, depending on which inshore/offshore boundary line is selected. However, the impact is expected to be minor, since Alternative 1 would not, in and of itself, allow catch to exceed the ACLs.

7.3.4.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area

The GOM/GB Inshore Restricted Roller Gear Area would be revised to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2.

The impacts of Alternative 2 on nontarget species are likely vary depending on the boundary line chosen. Assuming that the roller gear restriction has positive impacts on nontarget species generally, Options A and B, particularly B, would roll back that restriction in some areas, and therefore, these options would have negative impacts to nontarget species that would be more vulnerable to gear without these restrictions in place. Option C would increase the footprint of the roller gear area, and therefore, is expected to have positive impacts on nontarget species.

7.3.4.4 Declaration Time Periods for the Commercial Fishery

(Alternative 1: No Action, *PREFERRED ALTERNATIVE*) Declaration time periods influence the time steps over which a vessel might have to decide whether they wanted to fish in the inshore versus offshore areas. Under the alternatives in this section, vessels could lease ACE associated with area they were not declared into. These alternatives would not impact regulated groundfish species in the inshore or offshore areas and their associated sub-ACLs, because sub-ACL allocations by area remain the same on a fishing year basis (total effort would not change). Therefore, impacts of all of the time period alternatives (Alternatives 2-4) on nontarget species co-caught with regulated groundfish species are expected to be neutral relative to No Action and each other.

7.3.5 Redfish Exemption Area

7.3.5.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5” minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption in the FY 2015-2016 Sector Rule on redfish is as follows. Allow commercial sector vessels to use a 5.5” codend mesh (or larger) within the Redfish Exemption Area (Table 12, Figure 4). Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015b).

The impacts of Alternative 1 on nontarget species (i.e., dogfish) could be either positive or negative, depending on what the particulars of the sector exemption are in any given fishing year. Because the sector exemptions are specified annually, No Action creates greater uncertainty in the direction and magnitude of potential impacts relative to Alternative 2. However, impacts are likely minor; catch is not expected to exceed the ACLs as a result.

Under the Status Quo, the Sector EAs (NMFS 2015b) analyzed the recent results from prior sector exemptions and the REDNET program, determining that the impacts to nontarget species are likely low negative, particularly for dogfish. The exemption could result in greater retention of sub-legal nontarget species (The EA considered impacts to this exemption through FY 2021).

7.3.5.2 Alternative 2: Establish a Redfish Exemption Area within the FMP

(PREFERRED ALTERNATIVE) Establish in the FMP that commercial sector vessels may use a ≥5.5" codend mesh within the Redfish Exemption Area (Table 12, Figure 4), with several stipulations. Approval through the annual (or biennial) sector operations plan approval process would be unnecessary. When declared into the Redfish Exemption Area, the allocated groundfish kept must be ≥50% redfish, and on observed trips, ≤5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage are considered. Sectors may request other redfish exemptions. The general considerations of the Status Quo apply to Alternative 2:

- If switching between mesh sizes is permitted, monitoring would be difficult,
- Smaller fish may be targeted as a result of using the smaller mesh, which may potentially lead to changes in selectivity in stock assessments, and
- Therefore, ABCs could be set too high in the near-term (e.g., redfish) if a shift in selectivity actually occurs, but this will be unknown until future stock assessments.

The FY 2014 and FY 2015-2016 Sector EAs (NMFS 2014b; 2015b) analyzed the results from recent sector exemptions for redfish and the REDNET research program and determined that the overall impacts of the exemption to nontarget species are expected to be low negative relative to No Action, particularly for dogfish (which is the principle bycatch species from the REDNET project). The exemption could result in greater retention of sub-legal nontarget species (The EA considered impacts to this exemption through FY 2021).

Commercial Catch Monitoring

Option A. Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

The impacts of Option A on nontarget species are expected to be neutral relative to the Status Quo, as there would be no change in monitoring rates for the fishery. The impacts are expected to be positive relative to Option B, because Option B has not been adequately designed as a separate stratum with a dedicated monitoring program. Without such a design, Option B may produce biases in the estimate removals at length and age for all regulated groundfish stocks.

Option B. Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

The impacts of Option B on nontarget species are expected to be negative relative to the Status Quo and Option A, because Option B has not been adequately designed as a separate stratum with a dedicated monitoring program. Without such a design, Option B may produce biases in the estimate removals at length and age for all discarded species.

7.4 IMPACTS ON PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

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

The area that is potentially affected by the proposed alternatives includes EFH for species managed under the following FMPs: NE Multispecies; Atlantic Sea Scallop; Monkfish; Atlantic Herring; Summer Flounder, Scup and Black Sea Bass; Atlantic Mackerel, Squid, and Butterfish; Spiny Dogfish; Tilefish; Deep-Sea Red Crab; Atlantic Surfclam and Ocean Quahog; Atlantic Bluefish; Northeast Skates; and Atlantic Highly Migratory Species. EFH is defined for four life stages of all managed species in the Omnibus Habitat Amendment (NEFMC 1998a). Adverse effects from fishing under the Northeast Multispecies FMP are possible for any species with EFH overlapping the footprint of this fishery. Adverse effects from fishing under all other FMPs are also possible if the footprint of those fisheries overlaps with areas designated as EFH for the species in the management unit for this FMP. Sections 6.1.5 and 6.1.6 detail the species with EFH that are vulnerable to mobile bottom tending gears and discuss the effects of fishing on habitat.

7.4.1 Accumulation Limits

In general, some of the accumulation limit measures could constrain PSC or permits. To the extent that PSC for individual stocks or the PSC associated with a permit as a whole is then fished by another vessel (redistributed to the fleet), this could shift the location of fishing effort in the groundfish fishery. However, it is difficult to determine how gear and area fished may change as a result of accumulation limits as sectors – not individuals – hold allocation as a collective. Additionally, there are no restrictions on quota transfers between sectors with different gear types.

Because habitat vulnerability is heterogeneous across space, shifts in the location of fishing activity could change the magnitude of adverse impacts to EFH associated with groundfish fishing effort. Similarly, if PSC is shifted to fishing businesses that use gears with fewer habitat impacts, i.e., fixed gears like gillnets and longlines vs. bottom trawls, habitat impacts could decrease; if PSC shifts were away from fishing businesses that use fixed gears and to businesses that use mobile gears, adverse effects would increase. Furthermore, PSC that is converted into ACE through enrollment in a sector may be fished by any gear type. Thus, impacts could be positive or negative, depending on how the distribution of fishing effort changes as a result of accumulation limit alternatives.

Various factors influence the magnitude of these potential impacts, and the most important of these is the fairly low level of redistribution would result from these alternatives in general. Additionally, vessels may lease back PSC, such that patterns of effort are maintained. The alternatives would each constrain four entities or less, which is a small percentage of groundfish entities overall. Because of the small number of entities affected, the impacts of the accumulation limit alternatives on EFH are expected to be neutral, with minimal changes to the existing distribution of fishing effort across the fleet.

7.4.1.1 Provisions

7.4.1.1.1 Entities to Which Accumulation Limit would apply

The alternatives in Section 4.1 would apply to individuals, permit banks, and other entities.

The impacts of this provision on EFH are expected to be neutral. This is an administrative provision that would not have any impacts on EFH, because it would not, in and of itself, change the geographic distribution of fishing effort or fishing behavior.

7.4.1.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

The impacts of this provision on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain for reasons discussed above. The magnitude is very difficult to predict, given that it is not known at this time how many permits would be bought back, and whether adjustments to accumulation limits would be designed to reduce the likelihood of divestiture. If accumulation limits are raised during a buyback to allow permit holders remaining in the fishery to keep their PSC, limited changes in fishing patterns of those vessels would be expected, and therefore neutral impacts to EFH. However, a buyback could reduce effort in the fishery overall, which would likely have a larger influence on impacts to EFH in the groundfish fishery than any associated accumulation limit changes.

7.4.1.2 Limit the Holdings of PSC

7.4.1.2.1 Alternative 1: No Action

There would be no limit on the PSC holdings by individuals, permit banks, and other entities.

The impacts of Alternative 1 on EFH are expected to be neutral, and neutral relative to Alternatives 2-6. Redistribution of PSC would not be required, and therefore patterns of fishing by gear type and across space would remain similar to what they are currently.

7.4.1.2.2 Alternatives 2-6

Current PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected in Section 4.1.2.2, there are cases where the current PSC held by an individual, permit bank, or entity exceeds the accumulation limit (Table 89). The Council considered how to treat these excess holdings, as well as whether an individual or entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock.

Grandfathering Current Holdings as of the Control Date. If an individual or entity held more PSC on the control date (April 7, 2011) than the accumulation limit alternative selected through this action, they would be exempt from the accumulation limit, but would be restricted to holding no more PSC than they held as of the control date. The grandfathered holdings may be fished or leased by the individual. The grandfathered status of an individual or entity is not transferrable and is not attached to the holdings itself.

Grandfathering of current holdings are expected to have neutral impacts on EFH in the short-term, because redistribution of PSC would not be required, and therefore, patterns of fishing by gear type and across space would remain similar to what they are currently. In the long-term, as circumstances change, very slight impacts to EFH would be expected when the relatively small amount of PSC is redistributed throughout the fishery. It is not possible to determine whether these slight impacts would be positive or negative.

Disposition of Current Holdings in Excess of what is Allowed. This section pertains to how to treat holdings at the implementation of this action that are in excess of the accumulation limit alternative selected and which are not grandfathered as described above. The following three options are considered for how to treat these holdings.

> **Option A. May hold permits, but not use excess PSC.** ***(PREFERRED ALTERNATIVE)*** A permit holder could retain and renew permits with PSC in excess of the identified accumulation limit. For stocks in excess of the limit, that holder would not be allowed to contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of a cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45. The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full allocation is retained with it.

The impacts of Option A on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain, when the relatively small amount of PSC is redistributed throughout the fishery. It is not possible to determine whether these slight impacts would be positive or negative relative to Option B. Impacts are expected to be neutral relative to Option C, as the same amount of PSC would be redistributed.

> **Option B. Must divest permits with excess PSC.** A permit holder could retain permits with PSC in excess of the identified accumulation limit. In the event that a permit holder is required to divest permits as a result of this action, adequate time would be provided to do so. In the interim, the PSC holdings in excess of the cap may not be fished or leased.

The impacts of Option B on EFH are expected to be slightly positive relative to Options A and C while the PSC holdings are out of circulation. Once the permits are divested and the PSC is redistributed throughout the fishery, slightly positive or slightly negative impacts (i.e., uncertain) could result from shifts in fishing effort associated with the redistribution.

> **Option C. May hold permits, but must divest excess PSC.** A permit holder could retain and renew a permit with PSC that would result in exceeding the identified accumulation limit; however, the excess PSC must be permanently removed from the permit. The PSC would be redistributed to the rest of the groundfish fishery in the manner described in Framework 45. It would not be used by the purchaser and would no longer be attached to that permit when it is sold.

The impacts of Option C on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain, when the relatively small amount of PSC is redistributed throughout the fishery. It is not possible to determine whether these slight impacts would be positive or negative. Impacts are expected to be neutral relative to Option A, as the same amount of PSC would be redistributed.

Acquisition of Future Holdings. Two options are considered pertaining to acquisition of future holdings. See also Section 4.1.1.2 regarding future federal permit buyouts and buybacks.

> **Option A. May hold permits, but not use excess PSC.** ***(PREFERRED ALTERNATIVE)*** Subsequent to the implementation of this action, a permit may be purchased with PSC that would result in exceeding the identified accumulation limit. For stocks in excess of the limit, that holder would not be allowed to contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of the cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45. The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full allocation is retained with it.

The impacts of Option A on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain, when the relatively small amount of PSC is redistributed throughout the fishery. It is not possible to determine whether these slight impacts would be positive or negative. Impacts are expected to be neutral relative to Option B, as the same amount of PSC would be redistributed.

> **Option B. May hold permits, but must divest excess PSC.** Subsequent to the implementation of this action, a permit holder may purchase a permit with PSC that would result in exceeding the identified accumulation limit. However, the PSC holdings in excess of the cap (which are not grandfathered) would be permanently split off that permit and PSC would be redistributed to the rest of the groundfish fishery in the manner described in Framework 45. It would not be used by the purchaser and would no longer be attached to that permit when it is sold.

The impacts of Option B on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain, when the relatively small amount of PSC is redistributed throughout the fishery. It is not possible to determine whether these slight impacts would be positive or negative. Impacts are expected to be neutral relative to Option A, as the same amount of PSC would be redistributed.

7.4.1.2.2.1 Alternative 2: Limit Holdings of Stock-specific PSC at the Maximum Held by an Individual or Permit Bank as of the Control Date

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the maximum stock-specific PSC that was held by an individual or permit bank as of the control date for Amendment 18 (April 7, 2011), rounded up to the nearest whole number (Table 8).

The impacts of Alternative 2 on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain relative to No Action and Alternatives 3-6. The redistribution of the small amount of excess PSCs would result in minimal changes to the existing distribution of fishing effort across the fleet. It is unknown how effort would redistribute within the fishery, which may result in slight positive or negative impacts on EFH. The accumulation limits in Alternative 2 are the lowest relative to Alternatives 3-6, so Alternative 2 has the greatest potential for redistribution of PSC.

7.4.1.2.2.2 Alternative 3: Limit Holdings of Stock-Specific PSC to the Same Level for each Stock in the Fishery

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than 15.5 of the PSC for a single allocated stock. *The Council may select Option A in conjunction with Alternative 3.*

The impacts of Alternative 3 on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain relative to No Action and Alternatives 2 and 4-6. The redistribution of the small amount of excess PSCs would result in minimal changes to the existing distribution of fishing effort across the fleet. It is unknown how effort would redistribute within the fishery, which may result in slightly positive or negative impacts to EFH. The accumulation limits in Alternative 3 are higher than in Alternative 2, but are less than Alternatives 4-6. Thus, Alternative 3 has less potential for redistribution of PSC relative to Alternative 2, but more relative to Alternatives 4-6.

Option A: Individuals, permit banks, and other entities who have PSC holdings for a stock at 15.5 may acquire PSC for other stocks up to 15.5. Any PSC acquired that exceeds 15.5 would be split off a permit and redistributed to the fleet in the manner described in Framework Adjustment 45.

The impacts of Option A on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain. It would facilitate acquisition of new permits, because PSC in excess of the accumulation limit could be divested after purchase of the permit, rather than preventing purchase of the permit. It is unknown how effort would redistribute within the fishery, which may result in slightly positive or negative impacts to EFH.

7.4.1.2.2.3 Alternative 4: Limit Holdings of Stock-Specific PSC by Stock Type

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC.

Option A: Limit the PSC holdings at 15 for the Gulf of Maine, Cape Cod, Southern New England, and Mid-Atlantic stocks, at 20 for the unit stocks, and at 30 for the Georges Bank stocks (Table 9).

The impacts of Alternative 4, Option A on EFH are expected to be minor, though the direction of impact (positive or negative) is uncertain relative to No Action and Alternatives 2, 3, 4B, 5, and 6. The redistribution of the small amount of excess PSCs would result in minimal changes to the existing distribution of fishing effort across the fleet. It is unknown how effort would redistribute within the fishery, which may result in slightly positive or negative impacts to EFH. The accumulation limits in Alternative 4 are higher than in Alternatives 2 and 3, but are less than Alternatives 5 and 6. Thus, Alternative 4A has less potential for of PSC relative to Alternatives 2 and 3, but more relative to Alternatives 4B, 5, and 6.

Option B: Limit the PSC holdings of GB cod at 30, GOM cod at 15, and pollock at 20.

The impacts of Alternative 4, Option B to EFH are expected to neutral. Redistribution of PSC would not be required, and therefore, patterns of fishing by gear type and across space would remain similar to what they are currently.

7.4.1.2.2.4 Alternative 5: Limit Holdings of Stock-Specific PSC

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC: 30 of Georges Bank winter flounder and 20 for all other allocated stocks in the fishery.

The impacts of Alternative 5 to EFH are expected to neutral. Redistribution of PSC would not be required, and therefore, patterns of fishing by gear type and across space are expected to remain similar to what they are currently.

7.4.1.2.2.5 Alternative 6: Limit Collective Holdings of PSC

(PREFERRED ALTERNATIVE) For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than 15.5 of the PSC of all the allocated stocks in aggregate.

The impacts of Alternative 6 to EFH would neutral. Redistribution of PSC would not be required, and therefore, patterns of fishing by gear type and across space would remain similar to what they are currently.

7.4.1.3 Limit the Holdings of Permits

7.4.1.3.1 Alternative 1: No Action

There would be no limit on the holdings of permits by individuals, permit banks, and other entities.

The impacts of Alternative 1 to EFH are expected to neutral, and neutral relative to Alternative 2. Divestment of permits (and thus PSC) would not be required, and therefore, patterns of fishing by gear type and across space would remain similar to what they are currently.

7.4.1.3.2 Alternative 2: Limit the Holdings of Permits

(PREFERRED ALTERNATIVE) For any single fishing year, no individuals, permit banks, and other entities shall hold more than 5% of the limited access Northeast Multispecies permits. This includes permits issued to vessels and eligibilities in Confirmation of Permit History. If an individual or entity held more than 5% of the permits on the control date (April 7, 2011), they would be restricted to holding no more than the number of permits they held as of the control date.

The impacts of Alternative 2 to EFH are expected to neutral relative to Alternative 1. Divestment of permits (and thus PSC) would not be required, and therefore, patterns of fishing by gear type and across space would remain similar to what they are currently.

7.4.2 Handgear A Permit Measures

Handgear does not generate adverse impacts to EFH in general. Because all of these alternatives adjust measures for the Handgear A fishery, the impacts of all of these alternatives on EFH are expected to be neutral.

7.4.3 Data Confidentiality

The action alternative to make ACE value data public would improve transparency, but both the existing confidentiality requirements **(No Action, *PREFERRED ALTERNATIVE*)** and the changes (Alternative 2) are expected to not, in and of themselves, impact EFH.

7.4.4 Inshore/Offshore Gulf of Maine

7.4.4.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Impacts of alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 5) are identified in this section.

It is difficult to assess the impacts of the boundary designation absent the specification of management measures for the inshore versus offshore areas. If the boundary is designated without sub-dividing the ACL, or discriminating in other ways between vessels permitted to fish inshore or offshore of the line, then no change in fishery impacts to EFH is expected. Alternative 2 Options A, B, and C below acknowledge the neutral impacts associated with the designations themselves, but also describe the distribution of habitat types inshore and offshore of each boundary line. This information is used to describe potential impacts in the cod sub-ACL and declaration time periods sections.

7.4.4.1.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A new inshore/offshore boundary line in the Gulf of Maine would not be established. The impacts to EFH of Alternative are expected to be neutral, and neutral relative to Alternative 2.

7.4.4.1.2 Alternative 2: Establish an Inshore/Offshore Boundary

A new sub-area boundary (Option A, B, or C below) would be established within the Gulf of Maine Management Area to distinguish between inshore and offshore fishing practices. This boundary may be adjusted through subsequent framework action and would not apply to vessels with only state-water groundfish permits.

> **Option A.** Establish an inshore/offshore Gulf of Maine boundary at 70°W longitude (Figure 2). The inshore area of Option A encompasses Jeffreys Ledge and Stellwagen Bank, as well as the diverse inshore habitat types of Cape Cod Bay, Massachusetts Bay, the New Hampshire coast, and the southern Maine coast.

The impacts of Option A on EFH are expected to be neutral relative to Options B and D. Designation of the boundary line, in and of itself, would not change the distribution of fishing effort inshore and offshore of the boundary.

> **Option B.** Establish an inshore/offshore Gulf of Maine boundary at 70°15’W longitude (Figure 2). The inshore area of Option B is smaller than for Option A because the boundary is further west. Therefore, while similar coastal habitats are still within the inshore zone, large portions of Jeffreys Ledge and Stellwagen Bank are in the offshore area.

The impacts of Option B on EFH are expected to be neutral relative to Options A and C. Designation of the boundary line in and of itself would not change the distribution of fishing effort inshore and offshore of the boundary.

Option C. Establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50'W, runs north along 69°50'W to the 12 nm territorial sea line, then follows Maine's 12 nm territorial sea line northeast to the Hague Line (Figure 2). The inshore area of Option C encompasses many of the complex habitats of the U.S. waters of the GOM, including coastal and nearshore habitats all the way to the Canadian border. Similar to Option A, Option C includes all of Jeffreys Ledge and Stellwagen Bank. For all options A, B, and C, Cashes and Fippennies Ledges, and Platts and Jeffreys Banks are in the offshore zone.

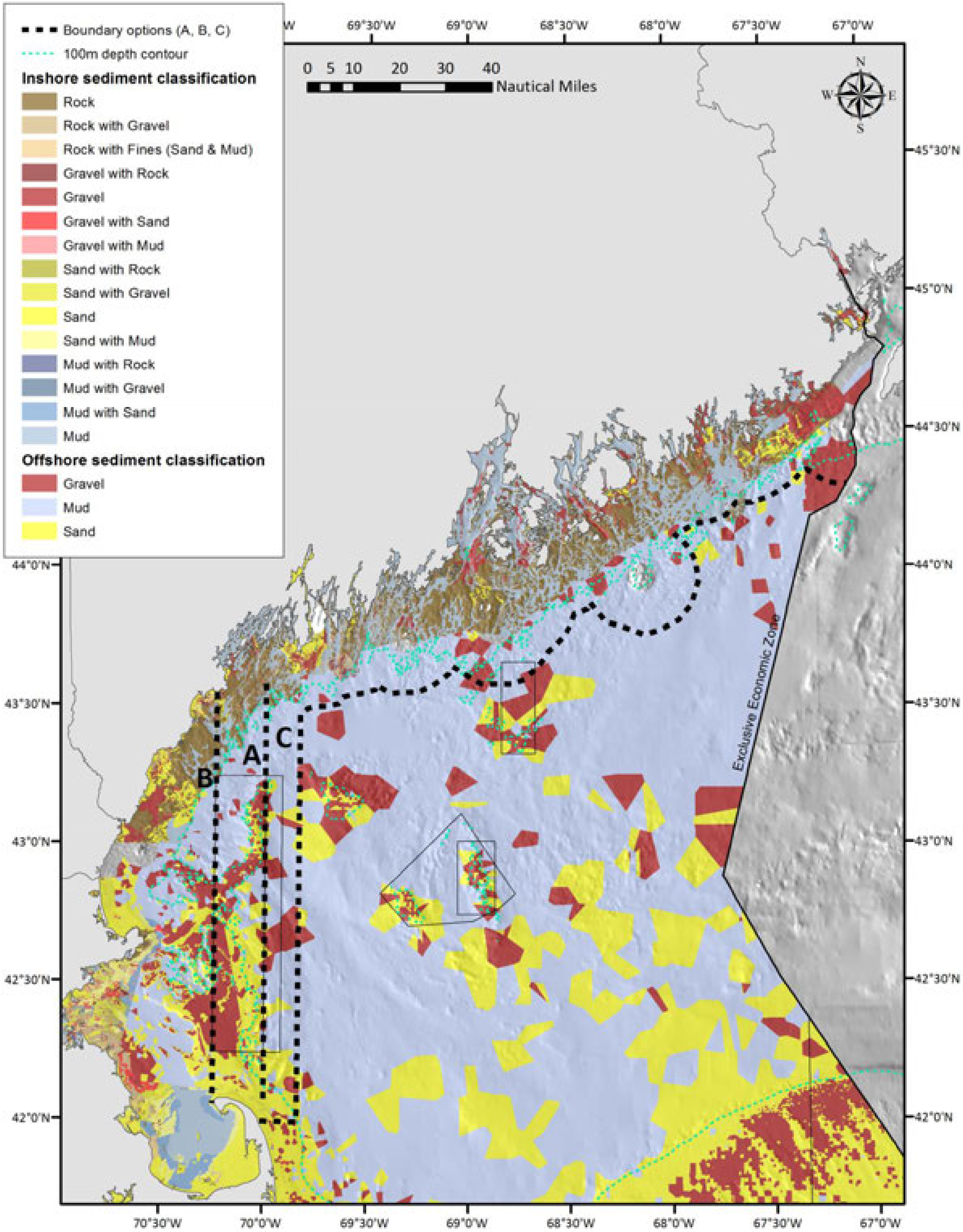
The impacts of Option C on EFH are expected to be neutral relative to Options A and B. Designation of the boundary line, in and of itself, would not change the distribution of fishing effort inshore and offshore of the boundary. However, given that Option C comprehensively encompasses inshore habitats, which may be particularly important for juvenile fish, it has the most potential to have positive impacts to EFH, depending on the measures applied to the inshore vs. offshore zones.

Figure 25 shows the distribution of bottom substrates in the Gulf of Maine, relative to the three inshore-offshore boundary options. The figure is a composite of four different substrate maps: Barnhardt et al. (Maine coastal areas, 1998), Massachusetts CZM-USGS (Massachusetts coastal areas)[24], USGS multibeam (Stellwagen Bank, Valentine & Baker 2005), and a layer combining USGS usSEABED data and SMAST video survey data developed for use in the Swept Area Seabed Impact model (NEFMC 2014d). Coastal areas offshore Massachusetts and Maine are mapped as a main substrate type and secondary substrate type, while offshore areas (Stellwagen and SASI domain) are mapped as dominant substrate type. The three SASI gravel categories, granule-pebble, cobble, and boulder, are collapsed into a single category here to comport better with the classifications used in the other data sources.

There is an abundance of rocky habitat in the coastal areas, interspersed with other sediment types. Offshore habitats in the Gulf of Maine have coarser sediments in shallow areas atop ledges and banks, with muddy basins in surrounding areas. An important caveat when viewing this substrate map is that the coastal areas are more accurately depicted, given the higher resolution of data points. The tessellation approach used to compile the usSEABED and SMAST data in the SASI model sometimes infers coarse sediments over large areas given how far apart some of the individual data points are. On the other hand, the offshore substrate map may miss localized areas of hard substrate due to low sampling rates. Despite this limitation, the map generally shows the relative complexity of coastal habitats and of the major shallow features further offshore compared to the deeper and more uniform mud basins.

[24] Massachusetts has developed a sediment map for their state waters as part of their ocean planning efforts. An initial plan was released in 2009, and an updated map has been developed subsequently, based on recent sampling efforts undertaken by the Coastal Zone Management-U.S. Geological Survey (USGS) Seafloor Mapping Cooperative (RSRMW 2014).

Figure 25 - Sediment classification in the Gulf of Maine overlaid with three inshore-offshore boundary options.



Sources: See text above.

7.4.4.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

Dividing the GOM cod allocation into inshore and offshore sub-ACLs could shift fishing effort between the inshore and offshore areas. Shifting effort offshore and away from highly structured inshore habitats where young juvenile groundfish are more abundant could have positive impacts on inshore habitats and the fish they support. The actual direction, and magnitude, of these benefits would depend on the boundary line selected, the ACL redistribution approach selected, and many other factors, including the specific habitat types fished, the gear types used, and catch efficiency.

The potential impacts to EFH by the boundary and sub-ACL alternatives are summarized in Table 88.

Table 88 - Impacts of inshore/offshore GOM cod sub-ACL alternatives on EFH

	Sub-ACL Alternative					
	Alt. 1	Alt.2				
			B – commercial effort distribution		C – fish distribution	
Boundary Option	No action	A – ad hoc	10-year history	20-year history	10-year history	20-year history
A – moderate potential for positive impacts due to position of boundary line	Neutral	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
B – least potential for positive impacts due to position of boundary line	Neutral	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
C – greatest potential for positive impacts due to position of boundary line	Neutral	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain

7.4.4.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A sub-ACL would not be established within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

The impacts of Alternative 1 on EFH are expected to be neutral. There would be no sub-ACL defined that could influence the distribution of fishing effort inshore vs. offshore.

7.4.4.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This alternative would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. Provisions for a sub-ACL control rule, commercial allocation, and catch monitoring are outlined below. This alternative would not change catch attribution methods for federally-permitted vessels fishing in state waters. The distribution of allocation within the commercial fishery would remain unchanged.

The impacts of Alternative 2 on EFH could be either positive or negative, depending on the option selected below and the resulting effects on fishing behavior including changes in fishing location, gear types used, and fishing efficiency.

Determining the GOM cod inshore/offshore split

> **Option A.** During each GOM cod specifications process, the Council would determine the control rule to be used at the time to determine the split between the inshore and offshore sub-ACLs. The control rules could be based on cod distribution, catch, different time periods, etc.

The impacts of Option A on EFH are expected to be uncertain but minor relative to Options B and C. It is not possible to determine the direction of impacts associated with Option A, because Option A does not specify a particular allocation method. Impacts could be positive, if the ACL division limits effort in some way on inshore habitats. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

> **Option B.** The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of commercial catch in each sub-area. Two sub-options for the fishing years used to determine the level of catch are considered.

The impacts of Option B on EFH are expected to be uncertain but minor relative to Options A and C, as the direction of impacts could be positive or negative depending on the current distribution of the stock relative to the historical commercial catch distribution. It is not possible to evaluate how fishing effort would redistribute under either of the sub-options. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

> > **Sub-Option A.** The last 10 fishing years prior to the year in which the specifications are developed.

The impacts of sub-Option A on EFH are expected to be uncertain but minor relative to sub-Option B, and could be positive or negative. Because more recent commercial catches are likely to more closely represent the current stock distribution, sub-Option A is potentially more positive than sub-Option B, in that the sub-ACL would be allocated in a way that better reflects historic catch in the inshore and offshore GOM. This would help avoid relatively inefficient fishing that leads to higher swept area and bottom impact time per unit of catch. On the other hand, given that the GOM cod resource has contracted inshore in recent years, sub-Option A could allocate more ACL to the inshore region, which could lead to more fishing activity in important and vulnerable inshore habitat areas. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

> > **Sub-Option B.** The last 20 fishing years prior to the year in which the specifications are developed.

The impacts of sub-Option B on EFH are expected to be uncertain but minor relative to sub-Option A, and could be positive or negative. Because a longer history of commercial catches is less likely to represent the current stock distribution, sub-Option B is potentially more negative than sub-Option A, in that the sub-ACL would be allocated in a way that does not reflect current trends in abundance. This could generate relatively inefficient fishing that leads to higher swept area and bottom impact time per unit of catch. On the other hand, given that the GOM cod resource has contracted inshore in recent years, sub-Option B could allocate more ACL to the offshore region, which could lead to less fishing activity in important and vulnerable inshore habitat areas. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

Option C. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of GOM cod distribution in each area. Two sub-options for the calendar years used to determine the level of fish distribution are considered.

The impacts of Option C on EFH are expected to be uncertain but minor relative to Options A and B. Impacts could be positive or negative depending on the current distribution of the stock relative to the historical biomass distribution. Impacts are very uncertain because it is not possible to evaluate how fishing effort would redistribute given either of the sub-options. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

Sub-Option A. The last 10 calendar years prior to the year in which the specifications are developed.

The impacts of sub-Option A on EFH are expected to be uncertain but minor relative to sub-Option B, and could be positive or negative. Because more recent survey catches are likely going to more closely represent the current stock distribution, sub-Option A is potentially more positive than sub-Option B, in that the sub-ACL would be allocated in a way that better reflects current trends in abundance. This would help avoid relatively inefficient fishing that leads to higher swept area and bottom impact time per unit of catch. On the other hand, given that the GOM cod resource has contracted inshore in recent years, sub-Option A could allocate more ACL to the inshore region, which could lead to more fishing activity in important and vulnerable inshore habitat areas. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

Sub-Option B. The last 20 calendar years prior to the year in which the specifications are developed.

The impacts of sub-Option B on EFH are expected to be uncertain but minor relative to sub-Option A, and could be positive or negative. Because a longer history of survey catches is less likely to represent the current stock distribution, sub-Option B is potentially more negative than sub-option B, in that sub-ACL would be allocated in a way that does not reflect current trends in abundance. This could generate relatively inefficient fishing that leads to higher swept area and bottom impact time per unit of catch. On the other hand, given that the GOM cod resource has contracted inshore in recent years, sub-Option B could allocate more ACL to the offshore region, which could lead to less fishing activity in important and vulnerable inshore habitat areas. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can correctly attribute catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Declarations would be made to the sector manager via the Trip Start Hail. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

The impacts of this provision on EFH are expected to be indirectly positive, in that it would allow the Council to know with more certainty how much catch is coming out of the inshore vs. offshore area. This would help inform future management decisions about measures for these areas.

7.4.4.3 GOM/GB Inshore Restricted Roller Gear Area

In theory, limiting roller size to 12 in. would limit the seabed types in which bottom trawl vessels may fish to areas dominated by smaller substrates and less complex attached biota, and thus, this type of restriction can be viewed as a habitat conservation measure. Unfortunately, given the spatial resolution of seabed data and fishing effort data, it is challenging to evaluate conclusively whether or not limiting roller size to 12 in. affects the distribution of fishing effort with respect to habitat type. The multi-beam backscatter and boulder ridge data in the vicinity of Stellwagen Bank is of sufficient resolution for comparison with observed hauls, but there is not a comparable substrate distribution data set outside the GOM/GB Inshore Restricted Roller Gear Area. Nonetheless, patterns of trawl effort can be examined relative to these data. Based on straight line tow paths (an oversimplification of how fishing effort is actually distributed), it appears that trawls avoid boulder ridge areas. Given the lack of high resolution substrate data to compare outside the roller gear area, it isn't clear that the roller size limit itself is responsible for this avoidance, although it is a possible contributing factor. It could be that these same spatial patterns (i.e., avoidance of the most complex seabed habitats) would be observed even in areas where roller size is not restricted.

7.4.4.3.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No Action. Do not revise the current GOM/GB Inshore Restricted Roller Gear Area. In Figure 3, the polygon in aqua is the current trawl roller area (12" max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp). If Alternative 1 is selected, the potential positive impacts of the roller gear restriction on EFH would continue.

Potential No Action. Pending Habitat OA2 approval and implementation, the 12" roller gear restriction would be applied to all bottom trawl gear.

The impacts of Alternative 1 on EFH are expected to be neutral, and uncertain but minor relative to Alternative 2, depending on which inshore/offshore boundary line is selected (total mortality is not expected to increase). Under Alternative 1, the potential positive impacts of the roller gear restriction on EFH would continue. The Potential No Action would have slightly positive benefits relative to No Action (see Omnibus EFH Amendment 2 DEIS), because the requirement would apply to all bottom trawl vessels.

7.4.4.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area

The GOM/GB Inshore Restricted Roller Gear Area would be revised to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2.

If Alternative 2 is selected, the impacts to EFH would depend on the boundary option chosen. Assuming that the roller gear restriction has positive impacts to EFH generally, Options A and B, particularly B, would roll back that restriction in some areas. Therefore, Options A and B are expected to have negative impacts on EFH. Option C would increase the footprint of the roller gear area, and therefore, is expected to have positive impacts on EFH.

7.4.4.4 Declaration Time Periods for the Commercial Fishery

Declaration time periods influence the time steps over which a vessel might have to decide whether they wanted to fish in the inshore versus offshore areas. Under the alternatives in this section, vessels could lease ACE associated with area they were not declared into. The alternatives are expected to not impact EFH in the inshore or offshore areas and their associated sub-ACLs, because sub-ACL allocations by area remain the same on a fishing year basis (total effort would not change). Therefore, impacts of all of the time period alternatives (Alternatives 2-4) on EFH are expected to be neutral relative to No Action ***(Alternative 1, PREFERRED ALTERNATIVE)*** and each other.

7.4.5 Redfish Exemption Area

7.4.5.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5” minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption published in the FY 2015-2016 Sector Rule regarding redfish is as follows. Allow commercial vessels fishing in sectors to use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015c).

The impacts of Alternative 1 to EFH could be either positive or negative, depending on what the particulars of the sector exemption are in any given fishing year. Because the sector exemptions are specified annually, No Action creates greater uncertainty in the direction and magnitude of potential impacts relative to Alternative 2. An exemption area further offshore in deeper water (Status quo and Alternative 2) should focus effort on larger redfish and help avoid impacts to juvenile redfish habitats further inshore. Because total mortality is not expected to increase, the impacts to EFH are likely to be minor.

7.4.5.2 Alternative 2: Establish a Redfish Exemption Area within the FMP

(PREFERRED ALTERNATIVE) Establish in the fishery management plan that commercial vessels fishing in sectors may use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4), with several stipulations as listed. Approval through the annual (or biennial) sector operations plan approval process would not be necessary. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage levels are considered. Sectors may continue to request other exemptions related to redfish.

The impacts to EFH are expected to be positive relative to No Action, as having an exemption area offshore should focus effort on larger redfish and help avoid impacts to juvenile redfish habitats further inshore. Relative to the Status Quo, the impacts are expected to be neutral, as there would be no differences in geographic boundary and timing.

Commercial Catch Monitoring

Option A. Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

The impacts of Option A on EFH are expected to be negative relative to Option B. Under Option A, it is possible that more vessels would choose to fish under the exemption, given that they are not burdened with additional monitoring costs. Option A could increase effort, and therefore bottom contact and habitat impacts, in redfish habitats, relative to Option B.

Option B. Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

The impacts of Option B on EFH are expected to be positive relative to Option A, because it would likely lead to fewer impacts to EFH within redfish habitat. Option B, could decrease the likelihood that vessels would fish using the exemption due to increased monitoring costs, relative to Option A.

7.5 IMPACTS ON PROTECTED RESOURCES

The alternatives are evaluated for their impacts on species protected under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA). Section 6.4.1 contains a complete list of protected species (i.e., ESA and non-ESA listed species) that inhabit the areas of operation for the Northeast multispecies fishery (Table 17).

The impacts of the alternatives on protected species are difficult to predict with great precision, because fishermen and fishing businesses would need to adapt to new restrictions on some activities, and increased opportunities in other areas. The impacts analysis qualitatively discusses the expected direction of protected species impacts. It considers how the fishery may overlap with protected species in time and space, as well as records of protected species interaction with particular gear types.

7.5.1 Accumulation Limits

7.5.1.1 Provisions

7.5.1.1.1 Entities to Which Accumulation Limit Would Apply

The alternatives in Section 4.1 would apply to individuals, permit banks, and other entities.

The impacts of this provision on protected species are expected to be neutral. This is an administrative provision that would not have any impacts on protected species, because it would not, in and of itself, change total fishing effort or fishing behavior.

7.5.1.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

The impacts of this provision on protected species are expected to be neutral. This is an administrative provision that would not have any impacts on protected species, because it would not, in and of itself, change total fishing effort or fishing behavior.

7.5.1.2 Limit the Holdings of PSC

7.5.1.2.1 Alternative 1: No Action

There would be no limit on the PSC holdings by individuals, permit banks, and other entities.

The impacts of Alternative 1 on protected species are expected to be neutral, and neutral relative to Alternatives 2-6. This is an administrative provision that would not have any impacts on protected species, because it would not, in and of itself, change total fishing effort or fishing behavior.

7.5.1.2.2 Alternatives 2-6

Current and Future PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected in Section 4.1.2.2, there are cases where the current PSC held by an individual, permit bank, or other entity exceeds the accumulation limit (Table 89). The Council considered how to treat these excess holdings, as well as whether an individual or entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock. The impacts of the options in this section on protected species would be neutral relative to each other, because there would be no change in total fishing effort.

Alternatives 2-6 (Alternative 6 is *PREFERRED ALTERNATIVE*)

The impacts of Alternatives 2-6 on protected species are expected to be neutral relative to No Action and to each other. Accumulation limit Alternatives 2-6 would impact the potential holdings of an individual or permit bank, and are separate and distinct from stock-specific ABCs and ACLs that limit fishing mortality and may constrain fishing effort. Limits on PSC holdings would not impose restrictions on the in-season lease of fish (ACE, if the PSC holder joined a sector) between sectors, such that the overall number of sector vessels prosecuting the fishery would not be limited by PSC caps, nor would PSC caps place any restrictions on how the fishery is prosecuted (i.e., when, where, or with what gear). The PSC of vessels fishing in the common pool is aggregated into a common pool sub-ACL, and distributed across trimesters, as determined in A16. Limits on holdings of PSC are expected to not have a direct impact on protected species because they would not, in and of themselves, change fishing effort or behavior, and therefore, would not introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013b; Waring, et al. 2014). As a result, Alternatives 2-6, which effect how current and future excess holdings would be treated, are expected to have neutral impacts on protected resources relative to the No Action and to each other.

7.5.1.3 Limit the Holdings of Permits

The alternatives included in this section regard limits on the number of permits that individuals, permit banks, and other entities may hold in the fishery. Specifically, caps proposed under **Alternative 2 *(PREFERRED ALTERNATIVE)*** would impact the potential permit holdings of an individual, permit bank, or other entity, and are separate and distinct from stock-specific ABCs and ACLs that limit fishing mortality and may constrain total fishing effort. Under Alternative 2, the limited access permit cap (5%) would not impose any additional restrictions on how the fishery is prosecuted (i.e., when, where, or with what gear).

For all alternatives in this section, whether limits or no limits on permit holdings are established, direct impacts on protected species are not expected because neither alternative would , in and of themselves, change total fishing effort or behavior and therefore, would not introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013b; Waring, et al. 2014). As a result, the impacts of these alternatives on protected species are expected to be neutral relative to each other.

7.5.2 Handgear A Permit Measures

Handgear A permit holders primarily fish with hook gear (i.e., rod and reel). As noted in Section 6.4.4, of the gear types used to prosecute the Northeast multispecies fishery, gillnet and trawl gear, not hook gear, pose the greatest risk to protected species. In fact, protected species interactions with hook gear, in general, are rare (NMFS 2013a; Waring, et al. 2014), and therefore, this gear type is expected to pose minimal to no risk to protected species. Based on this information, all of the alternatives included in this section are expected to have neutral impacts on protected species relative to each other.

7.5.3 Data Confidentiality

Data confidentiality provisions are administrative, and separate and distinct from stock-specific ABCs and ACLs that limit fishing mortality and may constrain fishing effort. Tracking the price of ACE traded between sectors and the movement of ACE within sectors is expected to not have any impacts on protected species because it would not, in and of itself, change fishing effort or behavior. Thus, the alternatives in this section would have neutral impacts on protected species relative to each other.

7.5.4 Inshore/Offshore Gulf of Maine

7.5.4.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Impacts of alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 5) are identified in this section.

The creation of an inshore/offshore boundary in the Gulf of Maine is an administrative measure that would not, in and of itself, impact protected species. While delineating and adopting a management boundary would not directly change fishing effort or behavior, management measures in this section that utilize the delineated boundary may impact protected species, and therefore, are analyzed accordingly.

For reference, Option A would establish an inshore/offshore Gulf of Maine boundary at 70°W longitude, and Option B would establish an inshore/offshore Gulf of Maine boundary at 70°15’W longitude (Figure 2). Option C would establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50’W, runs north along 69°50’W to the 12 nm territorial sea line, then follows Maine’s 12 nm territorial sea line northeast to the Hague Line (Figure 2).

7.5.4.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

7.5.4.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A sub-ACL would not be established within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

The impacts of Alternative 1 on protected species are expected to be neutral. Under Alternative 1, fishing effort and distribution (by trawl and gillnet vessels) in the Gulf of Maine would not change from how the fishery currently operates. As Alternative 1 would not result in a change in fishing behavior in the GOM broad stock area, increased protected species interactions with gillnet or trawl gear and therefore, increased incidences of serious injury or mortality, are not expected. Specifically, since the adoption of Amendment 16 on October 16, 2009, to the present, the Northeast multispecies fishery has not introduced any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NEFMC 2015; NMFS 2013a; Waring, et al. 2014). In fact, since the adoption of Amendment 16, the multispecies fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species, or resulted in levels of take that threaten the continued existence of non-ESA listed marine mammal populations and therefore, jeopardize the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle (NMFS 2013; Waring et al.

2014; see Framework 53 for additional details). In addition, the No Action Alternative would still require compliance with protected species take reduction plans (e.g., Atlantic Large Whale Take Reduction Plan (ALWTRP), Harbor Porpoise Take Reduction Plan (HPTRP)) and sea turtle resuscitation guidelines. For these reasons, Alternative 1 is expected to have neutral impacts on protected species relative to the status quo.

Relative to the establishment of an inshore/offshore commercial GOM cod sub-ACL, the overall impacts of the No Action are expected to be low positive because the options in Alternative 2 would result in the allocation of GOM cod to inshore and offshore areas, thereby potentially constricting effort into inshore areas where interactions with protected species are more likely to occur based on historic take data (Section 6.4.4).

7.5.4.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This alternative would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. Alternative 2 would not change catch attribution methods for federally-permitted vessels fishing in state waters. The distribution of allocation within the commercial fishery would remain unchanged.

The impacts of Option A, B, or C of Alternative 2 on protected resources are expected to be neutral. Under Option A, B, or C of Alternative 2, inshore and offshore fishing effort may change, depending on the level of GOM cod sub-ACL that is allocated to each area. Specifically, area specific sub-ACLs could result in fishing effort being constricted in either inshore or offshore areas. This could equate to a potential increase in protected species interactions, particularly if the area of constrained effort overlaps in time and space with protected species. This; however, is unlikely to occur. While Options A, B, and C may result in effort shifts, overall effort has declined in recent fishing years, as have the number of vessels participating in the fishery (Table 72) and the number of groundfish trips (Table 73). Additionally, steep declines in the GOM cod ACL (Table 59) are expected to reduce overall effort in the GOM stock area. Specifically, the GOM cod commercial sub-ACL has declined by 92% from 2009 to 2013 (Table 59). Catch limits proposed in FW53 are expected to result in an even further decline in fishing effort in the GOM (NEFMC 2015). Although effort could shift geographically, establishing a GOM cod sub-ACL for inshore or offshore waters is not expected to result in an increase in effort, in either area, above and beyond what has already been experienced in the GOM by this fishery. As a result, establishing a GOM cod sub-ACL for inshore or offshore waters is not expected to introduce any new risks to protected species that have not already been considered and assessed by NMFS (NMFS 2013a; Waring, et al. 2014) and therefore, is not expected to result in a level of ESA-listed species take above that which has been authorized, or result in levels of take that threaten the continued existence of non-ESA listed marine mammal populations. As such, the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle are not expected to be jeopardized by any of the Options under Alternative 2 under these fishing conditions. Thus, adoption of Option A, B, or C of Alternative 2 under these fishing conditions is expected to result in a neutral impact to protected resources.

It is important, however, to consider the effects of Option A, B, or C of Alternative 2 should these fishing conditions (e.g., a decline in ACL and fishing effort) not exist over the long-term. Specifically, in the long-term, this measure could lead to an impact on protected species if stock status improves for key target species (e.g. GOM cod). If vessels have larger quotas to fish under, but are not able to redirect their fishing activity to the other management area, interaction risks with protected species have the potential to increase, particularly in those areas where interactions have commonly been observed (e.g., inshore waters) and/or where fishery overlaps in time and space with high protected species abundance. However, even under this scenario, larger quota, even with the inability to redirect fishing activity, may not necessarily equate to increases in protected species interactions. With healthier stocks, quotas can be attained at a much faster rate. What this equates to is gear being present in the water for less time. As the duration of time that gear is in the water significantly influences the risk of protected species interaction with fishing gear, the reduction in time that gear would be present in the water may reduce the risk of an interaction. At this time, it cannot be predicted when or if stocks would rebuild to such levels that fishing effort could increase to levels above and beyond that which the fishery has been operating under over last several years and thus, the degree of risk to protected species; however, even in the face of this uncertainty, it is important to recognize the potential for significant changes in the fishery and take into consideration the potential effects to protected species from these changes under this option. Based on this information, and the fact that, regardless of whether the impacts of this option are considered over the short or long-term, all vessel would still have to be compliant with HPTRP and ALWTRP regulations, this option may have low negative/negative (long-term consideration) to neutral (short-term consideration) impacts to protected species.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas. This provision would not change fishing effort distribution by trawl and gillnet vessels in the GOM. As this provision would not result in a change in fishing behavior by these gear types in the GOM broad stock area, increased protected species interactions with gillnet or trawl gear and therefore, increased incidences of serious injury or mortality, are not expected. Specifically, since the adoption of Amendment 16 on October 16, 2009, to the present, the Northeast multispecies fishery has not introduced any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013b; Waring, et al. 2014). In fact, since the adoption of Amendment 16, the multispecies fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species, or resulted in levels of take that threaten the continued existence of non-ESA listed marine mammal populations and therefore, jeopardize the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle (NEFMC 2015; NMFS 2013a; Waring, et al. 2014). Fishing with an observer would still require compliance with protected species take reduction plans (e.g., Atlantic Large Whale Take Reduction Plan (ALWTRP), Harbor Porpoise Take Reduction Plan (HPTRP)) and sea turtle resuscitation guidelines.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can assist in the accurate attribution of catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

Restrictions on where a vessel may fish without an observer (i.e., inshore or offshore) would impact inshore and offshore fishing effort, depending on which area the vessel declares into. This in turn, could result in impacts to protected species, particularly if more vessels declare into one area over the other, thereby increasing effort, and thus the potential for an interaction in that area. However, as both ACLs and effort have declined in the GOM in recent years (Table 59), regardless of where a vessel declares into, effort would not increase in the near future in either inshore or offshore waters. As a result, additional interaction risks with protected species would not increase in inshore or offshore areas and thus, authorized takes of ESA-listed species would not be exceeded (NMFS 2013a), nor is the take of non-ESA listed species (marine mammals) expected to reach levels that would result in the inability of each species population to sustain itself (Waring, et al. 2014). Based on this, the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle are not expected to be jeopardized by this provision under these fishing conditions (NMFS 2013a; Waring, et al. 2014).

It is important, however, to consider the effects of this provision should these fishing conditions (e.g., a decline in ACL and fishing effort) not exist over the long-term. Specifically, in the long-term, this measure could lead to an impact on protected species if stock status improves for key target species (e.g., GOM cod). If vessels have a larger ACL to fish under, but are not able to redirect their fishing activity to the other management area, interaction risks with protected species have the potential to increase, particularly in those areas where interactions have commonly been observed (e.g., inshore waters) and/or where fishery overlaps in time and space with high protected species abundance. However, even under this scenario, larger quota, even with the inability to redirect fishing activity, may not necessarily equate to increases in protected species interactions. With healthier stocks, quotas can be attained at a much faster rate. What this equates to is gear being present in the water for less time. As the duration of time that gear is in the water significantly influences the risk of protected species interaction with fishing gear, the reduction in time that gear would be present in the water may reduce the risk of an interaction. At this time, it cannot be predicted when or if stocks would rebuild to such levels that fishing effort could increase to levels above and beyond that which the fishery has been operating under over last several years and thus, the degree of risk to protected species; however, even in the face of this uncertainty, it is important to recognize the potential for significant changes in the fishery and take into consideration the potential effects to protected species from these changes under this provision.

Based on this information, and the fact that, regardless of whether the impacts of this provision are considered over the short or long-term, all vessel would have to be compliant with HPTRP and ALWTRP regulations, this provision may have low negative/negative (long-term consideration) to neutral (short-term consideration) impacts to protected species.

7.5.4.3 GOM/GB Inshore Restricted Roller Gear Area

7.5.4.3.1 Alternative 1: No Action
(PREFERRED ALTERNATIVE)

No Action. Do not revise the current GOM/GB Inshore Restricted Roller Gear Area. In Figure 3, the polygon in aqua is the current trawl roller area (12" max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp).

Under No Action, status quo conditions would remain, and as a result, shifts in existing fishing effort by trawl vessels in the GOM is not expected. As the No Action is not expected to result in a change in fishing behavior by trawl vessels in the GOM, and therefore, would not introduce any new risks to protected species, the potential for protected species interactions with trawl gear and therefore, incidences of serious injury or mortality to increase, is not expected. Specifically, since the adoption of Amendment 16 on October 16, 2009, to the present, the Northeast multispecies fishery has not introduced any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013b; Waring, et al. 2014). In fact, since the adoption of Amendment 16, the multispecies fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species, or resulted in levels of take that threaten the continued existence of non-ESA listed marine mammal populations and therefore, jeopardize the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle (NEFMC 2015; NMFS 2013a; Waring, et al. 2014).

Relative to the Potential No Action, No Action is expected to have a neutral impact on protected species, because both alternatives would not result in a change in fishing effort or access to areas by trawl vessels in the GOM that have not already been considered by NMFS.

Potential No Action. Pending Habitat OA2 approval and implementation, the 12" roller gear restriction would be applied to all bottom trawl gear.

Under the Potential No Action, the area and boundaries of the existing GOM/GB Inshore Restricted Roller Gear Area would not be changed, though 12" roller gear restriction would apply to all bottom trawl fishing in the area. While the Potential No Action expands the range of fisheries that the 12" roller gear would apply to, the Potential No Action is not expected to result in a change in fishing behavior by trawl vessels in the GOM, and therefore, would not introduce any new risks to protected species. Irrespective of whether roller gear is or is not required, protected species have been exposed to bottom trawl effort (with or without roller gear) in the western GOM. Interactions in trawl gear have not been observed in the western GOM for any ESA listed species of large whales or sea turtles; however, several interactions have been observed with Atlantic salmon and Atlantic sturgeon (Kocik, et al. 2014; NMFS 2013a). Non-ESA listed marine mammal species have also been observed incidentally taken in the western GOM, including the gear restricted area, by trawl gear (Figure 15). There has been no indication; however, that takes of these ESA-listed or non-ESA listed species in commercial trawl fisheries has gone above and beyond levels which would jeopardize the continued existence of any species of marine mammal or fish (NMFS 2013a; Waring, et al. 2014).

Based on the above information, the Potential No Action constitutes an area that is already subject to fishing by bottom trawls in the western GOM and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species (ESA and non-ESA listed species), and have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized. In addition, changes or shifts in effort are not expected, and therefore, no new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date are expected (NMFS 2013a; Waring, et al. 2014). For these reasons, and the fact that that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), the Potential No Action is expected to have low negative to neutral effects to protected species.

Relative to No Action, the Potential No Action is likely to have neutral impacts to protected species.

7.5.4.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area

The GOM/GB Inshore Restricted Roller Gear Area would be revised to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2. That is, to the west of either boundary, the existing gear restriction area would remain; everything to the east of the boundary would no longer be restricted to roller gear. Risks to protected species would be similar to those described under Alternative 1, even with the small portion of the gear restriction opening up to the east of either inshore/offshore boundary (see above for supporting rationale). Based on this information, Alternative 2 is expected to have neutral effects on protected species.

Relative to Alternative 1, the impacts of Alternative 2 to protected species are expected to be neutral, because the selection of a new GOM/GB Inshore Restricted Roller Gear Area would not in a change in fishing effort or access to areas by trawl vessels in the GOM that have not already been considered by NMFS.

7.5.4.4 Declaration Time Periods for the Commercial Fishery

7.5.4.4.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) Time periods would not be specified for which a commercial vessel must declare into or out of one of the Gulf of Maine management sub-areas, as defined in Section 4.4.1.2. As a result, fishing effort distribution by trawl and gillnet vessels in the Gulf of Maine would not change. As this alternative is not expected to result in a change in fishing behavior by these gear types in the GOM broad stock area, increased protected species interactions with gillnet or trawl gear and therefore, increased incidences of serious injury or mortality, are not expected. Specifically, since the adoption of Amendment 16 on October 16, 2009, to the present, the Northeast multispecies fishery has not introduced any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013b; Waring, et al. 2014). In fact, since the adoption of Amendment 16, the multispecies fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species, or resulted in levels of take that threaten the continued existence of non-ESA listed marine mammal populations and therefore, jeopardize the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle (NEFMC 2015; NMFS 2013a; Waring, et al. 2014). As this provision would not result in a change in fishing behavior by these gear types in the GOM broad stock area, the potential for protected species interactions with gillnet or trawl gear and therefore, serious injury or mortality, is expected to remain neutral. This alternative would still require compliance with protected species take reduction plans (e.g., Atlantic Large Whale Take Reduction Plan (ALWTRP), Harbor Porpoise Take Reduction Plan (HPTRP)) and sea turtle resuscitation guidelines.

In the short-term, the impacts of the No Action (Alternative 1) and all alternatives are expected to be neutral in and of themselves, and with respect to each other. In the long-term, relative to Alternative 2 (Annual Declaration), the impacts of Alternative 1 are expected to be low positive on protected species, as it provides flexibility for vessels to fish in both areas throughout the fishing year. Relative to Alternative 3 (Seasonal Declaration), impacts of Alternative 1 are expected to be low positive on protected species because Alternative 3 affords vessels less flexibility and would limit their activity to inshore or offshore management areas by season. Relative to Alternative 4 (Trip Declaration), Alternative 1 is expected to have neutral impacts on protected species because in practice, both alternatives may impact fishing effort on a trip by trip basis.

7.5.4.4.2 Alternatives 2, 3, 4: Annual, Seasonal, and Trip Declaration

Under Alternatives 2, 3 & 4 of Section 4.4.4, commercial vessels must declare their intent to fish in either the inshore or the offshore Gulf of Maine management sub-area for a given time period. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. Under Alternative 2, vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given fishing year. Overall, Alternative 2 is expected to eliminate the flexibility for vessels to fish in both areas over the course of a FY. Under Alternative 3, vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given season (e.g., common pool trimesters). Under Alternative 4, vessels would need to choose whether they would fish in either the inshore or offshore GOM on a trip by trip basis.

Declaring (i.e., annually, seasonally, or by trip) where a vessel intends to fish (i.e., inshore or offshore) is expected to impact inshore and offshore fishing effort. This in turn, could result in impacts to protected species, particularly if more vessels declare into one area over the other, thereby constraining, and potentially increasing effort in one area, and thus, increasing the potential risk for an interaction in that area. However, fishing activity by trawl and gillnet vessels in the Gulf of Maine would be restricted by ACLs, which have declined in recent fishing years (Table 73). Specifically, with GOM cod catch limits at a fraction of what they have been at in recent years (Table 59), an inshore/offshore split of the GOM cod sub-ACL would lead to an across the board reduction in effort, even if <50% of the ACL was assigned to a given management area. As a result, regardless of where a vessel declares into, be it annually, seasonally, or by trip, effort is expected to not increase in the near future in either inshore or offshore waters and thus, additional interaction risks with protected species is expected to not increase in inshore or offshore areas. Based on this, over the short-term, authorized takes of ESA-listed species would not be exceeded (NMFS 2013a), nor is the take of non-ESA listed species (marine mammals) expected to reach levels that would result in the inability of each species population to sustain itself (Waring, et al. 2014) and thus, the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle are not likely jeopardized by any of these alternatives under these fishing conditions (NMFS 2013a; Waring, et al. 2014).

It is important, however, to consider the effects of these alternatives should these fishing conditions (e.g., a decline in ACL and fishing effort) not exist over the long-term. These alternatives could impact protected species if stock status improves for key target species (e.g., GOM cod). If vessels have larger quotas to fish under, but are not able to redirect their fishing activity to the other management area, interaction risks with protected species have the potential to increase, particularly in those areas where interactions have commonly been observed (e.g., inshore waters) and/or where fishery overlaps in time and space with high protected species abundance. However, even under this scenario, larger quota, even with the inability to redirect fishing activity, may not necessarily equate to increases in protected species interactions. With healthier stocks, quotas can be attained at a much faster rate. What this equates to is gear being present in the water for less time. As the duration of time that gear is in the water significantly influences the risk of protected species interaction with fishing gear, the reduction in time that gear would be present in the water may reduce the risk of an interaction. At this time, it cannot be predicted when or if stocks would rebuild to such levels that fishing effort could increase to levels above and beyond that which the fishery has been operating under over last several years and thus, the degree of risk to protected species; however, even in the face of this uncertainty, it is important to recognize the potential for significant changes in the fishery and take into consideration the potential effects to protected species from these changes under any of these alternatives.

Based on this information, and the fact that, regardless of whether the impacts of either of these alternatives are considered over the short or long-term, all vessel would still have to be compliant with HPTRP and ALWTRP regulation's, all of these alternatives may have low negative/negative (long-term consideration) to neutral (short-term consideration) impacts to protected species.

Alternative 2 impacts. In the short-term, the impacts of Alternative 2 on protected species are expected to be neutral given the low-ACLs in the fishery and year-over-year reductions in fishing effort (see above discussion). In the long-term, relative to Alternative 1 (No Action), Alternative 2 is expected to have a low negative impact on protected species, as it prohibits vessels from fishing in both areas throughout the fishing year. Relative to Alternative 3 (Seasonal Declaration), Alternative 2 is expected to have a neutral impact on protected species because both provisions constrain a fishing vessel's ability to avoid interactions with protected species through extended declaration periods (season & year). Relative to Alternative 4 (Trip Declaration), Alternative 2 is expected to have low negative impacts on protected species because it would restrict a vessel's ability to modify their fishing area on a trip-by-trip basis which may allow them to avoid interactions with protected species by shifting fishing effort to the other management area.

Alternative 3 impacts. In the short-term, the impacts of Alternative 3 on protected species are expected to be neutral given the low-ACLs in the fishery and year-over-year reductions in fishing effort (see above discussion). In the long-term, if the status of GOM cod improves, relative to Alternative 1, Alternative 3 is expected to have a low negative impact, because it would eliminate the ability for vessels to fish in both GOM management areas on a seasonal basis. Alternative 3 is expected to have a neutral impact relative to Alternative 2, because both provisions constrain a fishing vessel's ability to avoid interactions with protected species through extended declaration periods (season & year). Relative to Alternative 4, Alternative 3 is expected to have a low negative impact on protected species, because it would afford vessel's less flexibility to modify they fishing behavior during a set season in order to avoid interactions with protected species by shifting fishing effort to the other management area.

Alternative 4 impacts. In the short-term, the impacts of Alternative 4 on protected species are expected to be neutral given the low-ACLs in the fishery and year-over-year reductions in fishing effort (see above discussion). In the long-term, if the status of GOM cod improves, relative to Alternative 1, Alternative 4 is expected to have a neutral impact on protected species, because both alternatives would allow fishing vessels to fish in both GOM management areas over the course of the fishing year. Alternative 4 is expected to have a low positive impact relative to Alternative 2, because Alternative 2 would constrain a fishing vessel's ability to avoid interactions with protected species through extended declaration periods (year). Relative to Alternative 3, Alternative 4 is expected to have a low positive impact on protected species because it would afford vessel's the flexibility to modify their fishing area on a trip-by-trip basis which may allow them to avoid interactions with protected species by shifting fishing effort to the other management area.

7.5.5 Redfish Exemption Area

General interactions between trawl gear and protected species are described in Section 6.4.4 Affected Environment. Since the adoption of Amendment 16, the fishery has not introduced any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS (NEFMC 2015; NMFS 2013a; Waring, et al. 2014), and the fishery has not exceeded NMFS authorized take of any ESA listed species, or resulted in levels of take that threaten the continued existence of non-ESA listed marine mammal populations and therefore, jeopardize the continued existence of any ESA listed or non-listed species of marine mammal, fish, or sea turtle (NMFS 2013a; Waring, et al. 2014).

7.5.5.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5" minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption published in the FY 2015-2016 Sector Rule regarding redfish is as follows. Allow commercial vessels fishing in sectors to use a 5.5" (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015c).

The impacts of No Action and the current sector exemption on protected species are expected to be neutral relative to each other. If no redfish exemption area is established (No Action), fishing effort and distribution in the GOM would not be expected change from how the fishery currently operates. Thus, No action would not introduce any new risks or additional takes to protected species that have not been considered and/or authorized by NMFS to date (NEFMC 2015; NMFS 2013a; Waring, et al. 2014). Status quo conditions are also expected to result in neutral impacts to protected resources, as similar redfish exemption areas have been established under sector operational plans since FY 2012. The redfish exemption area under Status Quo is essentially the same as previously authorized, with a few minor modifications. As such, protected species have been exposed to trawl effort in the portion of the GOM delineated as the redfish exemption area since 2012. There has been no indication that the redfish exemption has introduced any new risks to protected species such that the continued existence of any species is being jeopardized (Section 7.5.4). Based on this, and the fact that trawl interactions with protected species is relatively low in this area (Figure 15), Alternative 1 is expected to result in neutral impacts to protected resources relative to the status quo and Alternative 2.

7.5.5.2 Alternative 2: Establish a Redfish Exemption Area

(PREFERRED ALTERNATIVE) Establish in the fishery management plan that commercial vessels fishing in sectors may use a 5.5" (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4), with several stipulations as listed. Approval through the annual (or biennial) sector operations plan approval process would not be necessary. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage levels are considered. Sectors may continue to request other exemptions related to redfish.

The impacts of Alternative 2 on protected resources are expected to be neutral relative to No Action. Alternative 2 is not expected to introduce any new risks to protected species that have not already been considered and assessed under Alternative 1. Risks to protected species would be similar to those under Alternative 1.

Commercial Catch Monitoring

> **Option A.** Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

The impacts of Option A on protected resources are expected to be neutral relative to Option B. Mobile gear interactions with protected species are already low in the proposed Redfish Exemption Area, and vessel's redfish fishing activity would not be constrained by the presence or absence of an observer.

> **Option B.** Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

The impacts of Option A on protected resources are expected to be neutral relative to Option B. While a vessel's directed redfish fishing activity may be restricted under this provision, mobile gear interactions with protected species are already low in the proposed Redfish Exemption Area, and vessel's redfish fishing activity would not be constrained by the presence or absence of an observer.

7.6 IMPACTS ON HUMAN COMMUNITIES

7.6.1 Analytic Approach

7.6.1.1 Economic Impact Analysis

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that before any federal agency may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). The MSA stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Act, Section 1010627, 109-47).

The extent to which fleet diversity and consolidation has been viewed as a management issue has changed over time. From 1996 - 2004, the effort control program became increasingly restrictive, leading to much discussion on matching fleet size with resource availability. Due to concerns over the economic viability of fishing operations, measures were implemented to promote consolidation, such as increasing the number of DAS that an entity could acquire, buybacks of vessels and latent permit, redefining DAS allocations based on demonstrated use, permit transfers, and DAS leasing. These measures were implemented between 1998 and 2003. Fleet diversity was an emerging management issue during the development of Amendment 13, as maintaining a diverse fleet was a management objective for this action (NEFMC 2003a). However, Amendment 13 did not include any specific measures that would achieve this objective. Fleet diversity was discussed by the Council at meetings in 2005, but no action was taken at that time. Amendment 16 to the Northeast Multispecies FMP expanded the use of sector management for stocks managed by the FMP, and also implemented ACLs and AMs for the fishery. In the specification process for FY 2010 (NEFMC 2010), catch limits for many multispecies stocks were set at very low levels, and several of these restrictions have remained in place.

The National Marine Fisheries Service (NMFS) provides guidelines to use when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007b). Where possible, cumulative effects of a regulation are identified and discussed. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. It is assumed throughout this analysis that changes in revenues would have downstream impacts on income levels and employment; however, these are only mentioned if directly quantifiable.

Inshore/Offshore Gulf of Maine. The following describes the analytical method used in the economic analysis (Section 7.6.5) of the measures pertaining to the Inshore/Offshore Gulf of Maine in Section 4.4. To quantify the impacts of the Gulf of Maine boundary line alternatives, all vessel trips catching groundfish during FY 2010-2013 were extracted from Data Matching Imputation System (DMIS). Trips were then matched up with VTRs by serial number, allowing

VTR coordinates to be assigned to each record. The entire catch corresponding to the given VTR coordinates was attributed to that location. For this reason, the data in Section 7.6.5 should be considered approximate. As an example, a vessel trip could have fishing activity that occurred in both inshore and offshore Gulf of Maine, but if only one VTR was submitted for the trip, and the coordinates corresponded to an inshore location, the entire catch and resulting revenue would be attributed inshore.

7.6.1.2 Social Impact Analysis

National Standard 8 (NS8) requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen would be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in forecasting social change relative to management alternatives, since communities or other societal groups are constantly evolving in response to external factors (e.g., market conditions, technology, alternate uses of waterfront, and tourism). Certainly, management regulations influence the direction and magnitude of economic and social change, but attribution is difficult with the tools and data available. While the focus here is on the economic and social impacts of the proposed fishing regulations, external factors may also influence change, both positive and negative, in the affected communities. External factors may also lead to unanticipated consequences of a regulation, due to cumulative impacts. These factors contribute to a community's ability to adapt to new regulations.

When examining potential social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); groundfish dealers and processors; final users of groundfish; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short-term negative impact on some communities, these should be weighed against potential long-term benefits to all communities which can be derived from a sustainable groundfish fishery.

Social Impact Factors. The social impact factors outlined below can be used to describe the Northeast multispecies fishery, its sociocultural and community context and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007a) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. While this analysis does not quantify the impacts of the management alternatives relative to the social impact factors, qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts.

The social impact factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.

2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The effects of the proposed action on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities, as well as effects on the community's social structure, politics, etc.
4. The *Non-Economic Social Aspects* of the proposed action; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007a).

7.6.2 Accumulation Limits

General socioeconomic impacts of accumulation limits

An accumulation limit is a management tool generally used to prevent consolidation within a fishery, thereby sustaining opportunities to participate in the fishery by a larger number of participants than market efficiency alone might enable. Limits on consolidation can be used to ensure adequate levels of market competition, facilitate entry to the fishery, protect labor markets, and ensure that the resource supports several participants. Even with an accumulation limit in place, which limits the amount of holdings by individuals or entities, consolidation of fishery holdings and effort may still occur up to the level of the cap and with the ability to lease ACE. Leasing would result in some consolidation as excess capital exits the fishery. Larger firms with more access to capital are generally able to access more of the leasing market (NRC 1999). It is typically the participation of smaller-scale, part-time, and/or entry-level fishermen that is reduced without restrictions designed to prevent too much quota from being held or used by only a few individuals or entities.

While consolidation might be favorable for economic efficiency (e.g., for exploiting economies of scale), concentration of share holdings by a relatively few individuals or entities can result in excessive market power. Exercising market power can affect working conditions, prices, and wages, and harm smaller-scale participants in a fishery. Although accumulation limits on holdings of shares are generally viewed as means to prevent excessive concentration, the level of the caps vary among fisheries depending on the particular nature of the fishery and the particular objectives of the cap.

Most catch share programs in the U.S. now have accumulation limits in place to, in part, prevent consolidation of fishery access privileges (NMFS 2015a). There are many social and economic studies around the world that can help provide a full picture of potential consequences from consolidation (See Olson 2011 for literature review). The primary social impacts that have been documented in empirical cases include employment loss, decreased income, decreased quality of life, changing relations of production, structural disadvantages to smaller vessels and firms, dependency and debt patronage, concentration of capital and market power, inequitable gains, reduced stewardship, decreased community stability, and loss of cultural values (e.g., Brandt & Ding 2008; Carothers et al. 2010; Copes & Charles 2004). Assuming that these impacts are negative, the social impacts of establishing accumulation limits are expected to generally be positive for the fishery as a whole, to the degree that the accumulation limit mitigates these impacts. Negative impacts may be acute to any larger-scale fishery participants that may be constrained by the specific accumulation limit established. The tradeoffs between social objectives and market efficiency are common dilemmas for fishery managers.

Discussion of Compass Lexecon report

The Compass Lexecon (CL) report (described in Section 6.5.4.4) concluded that market power is an appropriate measure in defining excessive shares. CL recommended a limit that would keep PSC holdings unconcentrated, with a Herfindahl-Hirschman Index (HHI) <1,500. This approach led to a recommended stock-specific PSC holdings limit of 15.5 (Mitchell & Peterson 2013). The report was peer reviewed by three reviewers from the Center for Independent Experts and one contracted by the NEFMC. The peer review agreed that defining excessive shares in terms of market power was appropriate; however, they did not agree with the process behind the 15.5 PSC recommendation (Thunberg, et al. 2014).

Before further discussing the merits of this recommendation, it should be mentioned that there are separate markets involved in the groundfish fishery, as described in the CL report. In the output market, the report found that landings across species are generally unconcentrated and market power is not being exerted. Even in a more concentrated market, the ability of an individual or entity to withhold supply in hopes of raising prices would face considerable challenges from substitute products and imports. Inverse demand analysis across groundfish species also point to a situation where market power could not be profitably exercised in the output market (Lee & Thunberg 2012). In the ACE lease market, CL concluded that no entity is currently exercising market power, and that it is highly unlikely that an individual or entity could profitably do so. This assertion was disputed by the peer review due to, among other things: a lack of public pricing to know how the lease market has changed, and a lack of forward thinking, especially considering that many individuals have exited the fishery in recent years. Furthermore, the peer review stated that the conditions that will allow market power to be exerted in a multiproduct ACE market have yet to be established in economic literature.

Market power could also theoretically be exercised with respect to PSC holdings in the groundfish fishery, as illustrated in the following example. One individual or entity accumulates a large share (e.g., 80%) of a certain stock (e.g., plaice). That individual only fishes 45% of the sub-ACL in a given fishing year and withholds the other 35%. The other members of the fishery would only have 20% of the sub-ACL for plaice, and because it is a unit stock, the groundfish season would be cut severely short. The short season would force many members to sell their permits, but these permits would be below market price, due to monopolistic practices that have constricted the opportunity for others to generate groundfish revenue. The monopolist would then be able to purchase these permits at below market prices and further continue the practice. This example will be referenced to in the discussion of a few of the accumulation limit alternatives below.

As discussed by the peer review, the HHI is a measure of how concentrated the market is and does not indicate whether market power is being exerted. Rather, the HHI can be interpreted as a warning that the potential for market power may exist where the HHI is over 1500. An HHI >2,500 would be considered a highly concentrated market and should enlist greater concern.

The Compass Lexecon analysis used the same approach as the RFA analyses, by analyzing holdings at the business identification level, which is a broad grouping of permit holders. Calculating an HHI requires that the holdings of all the entities equal 100%. For this fishery, aggregate PSC holdings at the individual level exceed 100, because people can be (and are) associated with multiple business ids. Thus, an HHI cannot be calculated for individual persons, which the accumulation limit alternatives would apply to. While the CL report states that their definition of ownership overstates the actual concentration of PSC holdings, it is important to consider that the maximum PSC holdings by any group for any stock equaled 12, by their definition. Throughout the history of the catch share program, there has been at least one individual exceeding 12 PSC for one or more stocks (Table 54). Finally, the CL report states that the 1500 HHI target "can be achieved without interfering with economies of scale." As noted by the peer review, the analytical basis for this conclusion is lacking and gaining a better understanding of the scale economics of the groundfish fishery would have required cost data at the vessel and ownership group level. Therefore, the economic impacts of the accumulation limit alternatives have a great deal of uncertainty regarding both the positive impacts (preventing market power from being exerted) and the negative impacts (interfering with economies of scale).

The multispecies fishery has been in a period of declining effort and revenue since 2009 (Murphy, et al. 2015), and one concern about accumulation limits raised during public comment in the development of this action is that the ability to exit the fishery may be restrained by an accumulation limit. The current participants with sufficient capital to purchase permits and/or vessels from potential exiters would be prevented from doing so, should the additional holdings be in excess of the limit. This could cause negative impacts to the potential exiters, should they be unable to be relieved of financial burdens. However, this would need to be weighed with the impacts of consolidation on the industry as whole.

Purpose of accumulation limits in Amendment 18

Accumulation limit alternatives are included in this action primarily to meet the following goal: to "prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges" (Section 3.3.2). The Council could consider what specific objective it wants to achieve with an accumulation limit, and then select as *Preferred* the alternative that may best achieve the objective. Objectives could include, but not be limited, to the following:

A. Prevention of market power that could be used to influence permit, ACE, or ex- vessel prices (If one, or a few permit holders are able to consolidate interests in the fisheries, it is possible that they would be able to withhold supply to drive up prices).
B. Influence the availability of shares in the market to facilitate entry to the fishery. (Consolidation of shares to a few entities could prevent the development of an active market for shares, which is necessary for effective entry into a fishery).
C. Prevention of the ability to facilitate control of the labor market by the participants in the market.
D. Ensure that the fishery supports a reasonable number of participants. Consolidation could result in the resource supporting the activities of few participants.

These considerations are not unique to this fishery or this action, but are in fact common issues for Regional Councils to consider when developing accumulation limits. For example, the NPFMC considered very similar issues when establishing a rationalization program for the Bering Sea and Aleutian Islands crab fisheries (NPFMC & NMFS 2004, p. 237-256).

Several factors could be considered to assess whether the alternatives in this section meet a particular objective, including, but no limited to the following:

1. The number of current permit holders (n≈1,500) and the number of individuals with PSC >0 for a given stock (n≈750-1,100; Table 53).
2. The minimum number of participants that could remain in a fishery if all participants buy shares up to a cap would illustrate the potential limit on concentration of shares.
3. The number of participants with current holdings at or above each cap alternative would illustrate how the current fishery would be constrained.

The analysis below is intended to provide the Council with a discussion of the alternatives and available data that might form the basis for a decision of an acceptable alternative.

7.6.2.1 Provisions

7.6.2.1.1 Entities to Which Accumulation Limit would apply

The alternatives in Section 4.1 would apply to individuals, permit banks, and other entities.

Socioeconomic. The socioeconomic impacts of this provision are expected to generally be positive. Establishing limits that apply to individuals as well as entities makes it less likely that ownership entities would be able to reorganize to avoid actual limits, thus increasing perceptions of fairness, a positive impact on the *Attitudes, Beliefs and Values* of fishery stakeholders. There may be negative impacts associated with the fact that the application at the individual level is a more conservative approach, as it assumes each individual has 100% interest in any MRI they hold, regardless of whether or not they share the holdings with other persons. This could artificially limit accumulation for persons who, in reality, have smaller percent interests in shared holdings. They would be prohibited from obtaining additional PSC. The direction of impacts of this are expected to be uncertain on the *Size and Demographic Characteristics* of the fishery. It could allow opportunities for more expanded participation in the fishery, but it could also force people if their small amount of holdings remains unviable. However, without data on individual percent interest levels, it would be impossible to develop successful accumulation limits at a less restrictive level. Additionally, this is how accumulation limits are applied in other fisheries. Maintaining this consistency across FMPs has a positive impact on the *Social Structure and Organization* of fisheries.

7.6.2.1.2 Future Adjustment of Accumulation Limit

If an accumulation limit is implemented through this action, it may be modified in a future framework due to a federal permit buyback or buyout.

Economic. The economic impacts of this provision are expected to be neutral, as the action would be taken at a later date, and the potential impacts would be evaluated at that time.

Social. The social impacts of this provision are expected to be positive relative to not having it in Amendment 18. Allowing this modification would provide some degree of flexibility in the options for distributing a federal permit buyback or buyout. Making this adjustment possible through a framework would be a simpler process than through an amendment, potentially improving the *Attitudes, Beliefs, and Values* of stakeholders of the management process.

7.6.2.2 Limit the Holdings of PSC

General socioeconomic impacts of a PSC holdings limit

Establishing PSC holdings cap would focus the accumulation limit on the contribution to sector ACE, and thus the ability to catch or lease fish. Thus, a PSC holdings cap may be more effective at preventing consolidation than a limit in the number of permits that may be held. There may still be consolidation in the number of permits held by an individual or entity, but with a PSC cap, opportunities to participate in the fishery would remain broad.

7.6.2.2.1 Alternative 1: No Action

There would be no limit on the PSC holdings by individuals, permit banks, and other entities.

Economic. The economic impacts of Alternative 1 are expected to be neutral in the short-term. All individuals and permit banks would continue to not be restrained in their ability to accumulate PSC. In the long-term, the economic impacts of Alternative 1 would likely be neutral to slightly positive relative to the status quo. Under Alternative 1, there are potential benefits from economies of scale that can be realized to a greater extent relative to Alternatives 2-6, the possibility of high negative impacts relative to Alternatives 2-6 exists. Alternative 1 does not implement any safeguard from the severely damaging market power scenario described in the above discussion of *General socioeconomic impacts of accumulation limits*. It is not easy to determine what level of accumulation could lead to market power being exerted, but if, for example, an individual controlled 50% of the PSC for a given stock, the HHI would be >2,500 (50^2=2,500; other market participants would raise this number). A market with an HHI >2,500 is considered highly concentrated according to the Department of Justice (USDOJ and FTC 2010), and such a market may have a relatively high potential for market power being exerted. It is probably fair to say that such a situation is unlikely, though if one were to occur, the negative impacts would likely be significant.

Social. The social impacts of Alternative 1 are expected to be neutral in the short-term. Without an accumulation limit, there may be negative social impacts in the long-term if the industry consolidates without restraint. The *Size and Demographic Characteristics* of the fishery-related workforce and fishing communities may change if permit holdings become more concentrated and the *Historical Dependence on and Participation* in the fishery may be reduced.

7.6.2.2.2 Alternatives 2-6

Current PSC Holdings in Excess of Accumulation Limit

If one of Alternatives 2-6 is selected in Section 4.1.2.2, there are cases where the current PSC held by an individual, permit bank, or entity exceeds the accumulation limit (Table 89). The Council considered how to treat these excess holdings, as well as whether an individual or entity may acquire permits in the future that may result in exceeding the PSC cap for a particular stock. It may be useful to understand how these issues have been handled in other U.S. catch share programs with accumulation limits in place (Table 90). Of the 11 U.S. catch share programs with accumulation limits in place, the cap was set higher than the maximum currently held in five programs, so grandfathering was not necessary and there was no divestiture. In six programs, the cap was set lower and various approaches to grandfathering and divestiture have been used (NMFS 2015a).

Table 89 - Number of individuals and permit banks that have holdings that would be grandfathered or have holdings over the limit as of FY 2014

PSC cap alternative	Those with holdings as of the control date > limit (would be grandfathered)	Those with holdings as of FY 2014 > limit (may need to divest, depending on options selected)
1	n/a	n/a
2	n/a	3 individuals, 1 permit bank
3	1 individual	1 individual
4A	0	1 individual
4B	0	0
5	0	0
6	0	0

Table 90 - Grandfathering and divestiture in other U.S. catch share fisheries

# of fisheries	Cap relative to current holdings	Grandfathering & divestiture measures implemented
4	Higher	n/a
1	Higher	Grandfathering allowed, with expiration date, and then allocation must be divested.
2	Lower	Grandfathering allowed, with expiration upon sale.
1	Lower	Grandfathering allowed, with expiration date, and then allocation must be divested.
1	Lower	Grandfathering allowed, with expiration upon inheritance.
1	Lower	Grandfathering allowed, with no expiration.
1	Lower	Grandfathering not allowed. Divestiture necessary.
Source: NEFMC (2014c).		

Grandfathering Current Holdings as of the Control Date. This provision would apply only if: 1) a PSC accumulation limit is selected in Section 4.1.2.2 (Alternatives 2-6), and 2) if an individual or other entity held more PSC on the control date (April 7, 2011) than the accumulation limit alternative selected through this action. In this case, they would be restricted to holding no more than the PSC they held as of the control date. The grandfathered holdings may be fished or leased by the individual or entity. The grandfathered status of an individual or entity is not transferrable and is not attached to the holdings itself.

There is only one alternative, Alternative 3 where an individual has holdings as of the control data that are greater than the caps (for one stock in this case; Table 89). Thus, the grandfathering provision would only apply to one individual and only if Alternative 3 is selected.

<u>Economic.</u> The economic impacts of this provision are expected to be positive for the one individual holding more PSC than the limit (of Alternative 3) on the control date and low positive for the fishery overall. The remainder of the ~1,500 individuals who do not exceed the control date limit would not be impacted by this provision. The groundfish fleet has been aware of the possibility of an accumulation limit being implemented for several years now, with the control date being April 7, 2011 (NOAA 2011). As such, some participants have likely adjusted business practices and have been aware that divesture may be required when Amendment 18 is implemented. However, this was not the case before the control date, and this is the reason that the economic impacts of this provision differ with the options in the section *Disposition of Current Holdings in Excess of what is Allowed* (below).

<u>Social.</u> The social impacts of this provision are expected to generally be positive relative to not having it in Amendment 18. This provision reduces fishery disruption that may be caused by an accumulation limit. Fishery participants have been on notice for a few years of the potential to be constrained by the control date and have been making business decisions accordingly. Having this provision are expected to be a positive impact on the *Attitudes, Beliefs, and Values* of fishery participants in keeping management decisions consistent with the control date as posted. Without this provision, there may be PSC that could be redistributed to the fishery, which would have negative impacts on the one individual (if Alternative 3 is selected), but positive impacts on the rest of the fishery. The positive impacts of this provision likely outweigh any negative impacts.

Disposition of Current Holdings in Excess of what is Allowed. The options in this section would apply only if a PSC accumulation limit is selected in Section 4.1.2.2 (Alternatives 2-6). This section pertains to how to treat holdings at the implementation of Amendment 18 that are in excess of the accumulation limit selected and which are not grandfathered under Section 4.1.3.1. Three options are considered. Table 89 identifies how many individuals and other entities have holdings as of FY 2014 that exceed the limits under each alternative. For Alternative 2, there are three individuals and one permit bank and for Alternatives 3 and 4A, there is one individual to which these options may pertain.

> **Option A. May hold permits, but not use excess PSC.** ***(PREFERRED ALTERNATIVE)*** A permit holder could retain and renew permits with PSC in excess of the identified accumulation limit. For stocks in excess of the limit, that holder would not be allowed to contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of a cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45. The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full allocation is retained with it.

<u>Economic.</u> The economic impacts of Option A are expected to be positive relative to Option B for permit holders that would be constrained. Under Option A, those permit holders could continue to generate revenue from the PSC associated with their permits that does not exceed the limit. Relative to Option C, the impacts to permit holders that would be constrained would be low positive. Under Option A, any PSC that is over the limit would not need to be divested,

though it could not be used. The permit holder with a PSC overage could benefit from the full value of the permit when it is sold, as compared to Option C.

For permit holders are not constrained by the limit, the economic impacts of Option A are expected to be low negative relative to Option B, as less PSC would be redistributed to the remainder of the fleet under Option A. When redistributed, the PSC increase that each permit holder would receive would likely be very small. Relative to Option C, the economic impacts of Option A are expected to be neutral, because the same amount of PSC would be redistributed.

The overall economic impacts of Option A relative to Options B and C are expected to be uncertain, as the impacts would depend on how much of the PSC that would be considered excess is being fished or leased by the current holder versus how much would be used once redistributed. Depending on which accumulation limit alternative is selected (Section 4.1.2.2), overall economic impacts of Option A relative to Options B and C would vary as well. Among the alternatives where no individual holds more than the limit (4B, 5, and 6), Option A are expected to have neutral impacts relative to Options B and C. Among the alternatives where an individual holds more than an accumulation limit (2, 3, and 4A), the more holdings that are in excess, the more Option A would have positive impacts to that individual relative to Options B and C. Cap Alternative 2 would result in the most excess holdings and would constrain the most individuals. In conclusion, the overall economic impacts of Option A compared to Options B and C would be uncertain when there are excess holdings. However, these impacts are considered minor, because only a few permit holders could potentially be constrained.

<u>Social.</u> The social impacts of Option A are expected to be low positive relative to Options B and C. Although the holder of the excess PSC would not be able to use it (a short-term negative impact for that individual or entity), they would benefit from the full amount of PSC associated with the permit when it is sold. In the interim, the remainder of the fishery would benefit from the additional PSC.

> **Option B. Must divest permits with excess PSC.** A permit holder could retain permits with PSC in excess of the identified accumulation limit. In the event that a permit holder is required to divest permits as a result of this action, adequate time would be provided to do so. In the interim, the PSC holdings in excess of the cap may not be fished or leased.

<u>Economic.</u> The economic impacts of Option B are expected to be negative relative to Options A and C for permit holders that would be constrained by the accumulation limit. Though they would benefit from the sale of their permit, they would potentially suffer loses in future revenue from all species they hold PSC for on the permit(s) that must be divested. Option B would be similar to the accumulation limit established in the Atlantic sea scallop fishery under Amendment 11, in which one entity was required to divest excess permits (NEFMC 2007). However, as the sea scallop fishery consists of a single species, the entity was not forced to give up quota for any other species. It is not clear what the impacts of the forced divesture were to the scallop fishery, but any negative impacts were minor in comparison to fishery-wide annual revenue generated. Option B may similarly affect the groundfish fishery.

Depending on which accumulation limit alternative is selected (Section 4.1.2.2), the impacts of Option B relative to Options A and C are expected to vary. Among the alternatives where no individual holds more than the limit (4B, 5, and 6), Option B would have neutral impacts relative to Options A and C. Among the alternatives where an individual holds more than a limit (2, 3, and 4A), the more holdings that are in excess, the Option B would have negative impacts relative to Options A and C. Cap Alternative 2 would result in the most excess holdings and would constrain the most individuals. For individuals that are not constrained by the limit, the economic impacts of Option B are expected to be low positive relative to Options A and C, because more PSC would be redistributed under Option B.

The overall economic impacts of Option B relative to Options A and C are expected to be uncertain, as the impacts would depend on how much of the PSC that would be considered excess is being fished or leased by the current holder versus how much would be used once redistributed. Depending on which accumulation limit alternative is selected (Section 4.1.2.2), the overall impacts of Option B relative to Options A and C would vary. Among the alternatives where no individual holds more than the limit (4B, 5, and 6), Option B would have neutral impacts relative to Options A and C. Among the alternatives where an individual holds more than a limit (2, 3, and 4A), the more holdings that are in excess, the Option B would have negative impacts to that individual relative to Options A and C. Cap Alternative 2 would result in the most excess holdings and would constrain the most individuals. In conclusion, the overall economic impacts of Option B compared to Options A and C are expected to be uncertain when there are excess holdings. However, these impacts are considered minor, because only a few permit holders could potentially be constrained.

Social. The social impacts of Option B are expected to be more negative relative to Option A or Option C. Before the permit is sold, the PSC may not be used by anyone in the fishery, so there would be no distribution of benefits from the PSC. Option B would force more divestiture than Option C, as the entire permit would need to be divested, including associated PSC for stocks under the accumulation limit. This would be a short- and long-term negative impact for the individual or entity, though the fishery would benefit from the redistribution. This option allows individuals and entities to increase their holdings of other stocks (up to their respective limits), a positive impact in terms of flexibility for fishing businesses (though there is less PSC available for others). Overall, the social impacts of Option B are negative.

Option C. May hold permits, but must divest excess PSC. A permit holder could retain and renew a permit with PSC that would result in exceeding the identified accumulation limit; however, the excess PSC must be permanently removed from the permit. The PSC would be redistributed to the rest of the groundfish fishery in the manner described in Framework 45. It would not be used by the purchaser and would no longer be attached to that permit when it is sold.

Economic. The economic impacts of Option C are expected to be low negative relative to Option A for permit holders with excess PSC. They are expected to not benefit from the full value of the permit when it is sold, as under Option A. The economic impacts of Option C are expected to be positive relative to Option B for permit holders with excess PSC. They could continue to generate revenue from all the PSC associated with their permits that is not in excess. For permit holders are not constrained by the limit, the economic impacts of Option C are expected to be neutral relative to Option A, because the same amount of excess PSC would be redistributed. Relative to Option B, Option C would have low negative impacts, as less PSC would be redistributed.

The overall economic impacts of Option C relative to Options A and B are expected to be uncertain, as the impacts would depend on how much of the PSC that would be considered excess is being fished or leased by the current holder versus how much would be used once redistributed. Depending on which accumulation limit alternative is selected (Section 4.1.2.2), the economic impacts of Option C relative to Options A and B would vary. Under the alternatives where no permit holder is in excess of the limit (4B, 5, and 6), Option C would have neutral impacts relative to Options A and B. Among the alternatives where an individual holds more than a limit (2, 3, and 4A), the more holdings that are in excess, the more Option C would have negative impacts relative to Option A and positive impacts relative to Option B and C. Cap Alternative 2 would result in the most excess holdings and would constrain the most individuals. In conclusion, the overall economic impacts of Option C compared to Options A and B are expected to be uncertain when there are excess holdings. However, these impacts are considered minor, because only a few permit holders could potentially be constrained.

<u>Social.</u> The social impacts of Option C are expected to be positive relative to Option B, but low positive relative to Option A. Although the holder of the excess PSC would be required to divest it, the benefits would be distributed to the remainder of the fishery. When a permit is sold, the seller and buyer would not benefit from the full amount of PSC associated with it. Overall, the social impacts of Option C are expected to be low positive.

Acquisition of Future Holdings. This section pertains to how to treat holdings acquired in the future, after the implementation of this action. Two options are considered. See also Section 4.1.1.2 regarding future federal permit buyouts and buybacks.

> **Option A. May hold permits, but not use excess PSC. *(PREFERRED ALTERNATIVE)*** Subsequent to the implementation of this action, a permit may be purchased with PSC that would result in exceeding the identified accumulation limit. For stocks in excess of the limit, that holder would not be allowed to contribute the excess PSC to a specific sector or to the common pool. PSC holdings in excess of the cap (which are not grandfathered) would have the associated ACE annually redistributed to the rest of the groundfish fishery in the manner described in Framework 45. The PSC associated with all permits would remain unchanged. Thus, when a permit is sold, the full allocation is retained with it.

<u>Economic.</u> The economic impacts of Option A are expected to be low positive relative to Option B for the permit holders with excess PSC. Under Option A, the permit holder with a PSC overage could benefit from the full value of the permit when it is sold. Like Option B, Option A allows some flexibility for individuals approaching the PSC limit for a certain stock to expand their portfolio of other stocks through permit acquisition. The impacts to the fishery would be neutral relative to Option B, as the same amount of PSC would be redistributed.

<u>Social.</u> The social impacts of Option A are expected to be low positive relative to Option B for the permit holders with excess PSC and neutral for the fishery. Although the holder of the excess PSC would not be able to use it, the near-term benefits would be distributed to the remainder of the fishery, and when a permit is sold, the seller and buyer would be compensated for the full amount of PSC associated with it. In addition, this option allows individuals and entities to increase their holdings of other stocks (up to their respective limits), a positive impact in terms of flexibility for fishing businesses.

> **Option B. May hold permits, but must divest excess PSC.** Subsequent to the implementation of this action, a permit holder may purchase a permit with PSC that would result in exceeding the identified accumulation limit. However, the PSC holdings in excess of the cap (which are not grandfathered) would be permanently split off that permit and PSC would be redistributed to the rest of the groundfish fishery in the manner described in

Framework 45. It would not be used by the purchaser and would no longer be attached to that permit when it is sold.

Economic. The economic impacts of Option B are expected to low negative relative to Option A for the permit holders with excess PSC. Under Option A, the permit holder with a PSC overage could not benefit from the full value of the permit when it is sold. Like Option A, Option B allows some flexibility for individuals approaching the PSC limit for a certain stock to expand their portfolio through permit acquisition. The impacts to the fishery are expected to be neutral relative to Option A, as the same amount of PSC would be redistributed.

Social. The social impacts of Option B are expected to be low negative relative to Option A for the permit holders with excess PSC and neutral for the fishery. Although the holder of the excess PSC would be required to divest it, the benefits would be distributed to the remainder of the fishery. When a permit is sold, the seller and buyer would not be compensated for the full amount of PSC associated with it. However, this option allows individuals and entities to increase their holdings of other stocks (up to their respective limits), a positive impact in terms of flexibility for fishing businesses (though there is less PSC available for others).

7.6.2.2.2.1 Alternative 2: Limit Holdings of Stock-specific PSC at the Maximum Held by an Individual or Permit Bank as of the Control Date

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the maximum stock-specific PSC that was held by an individual or permit bank as of the control date for Amendment 18 (April 7, 2011), rounded up to the nearest whole number (Table 8).

Economic. In the short-term, the economic impacts of Alternative 2 are expected to be low negative to negative relative to No Action. If Alternative 2 is selected, individuals and other entities would not be able to accumulate more PSC than the maximum held as of the control date for any stock. According to the draft data of PSC holdings,[25] PSC holdings for FY 2014 indicate that the current holdings of three individuals and one permit bank are greater than the maximum holdings as of the control date for some stocks (Table 51, Table 53, Table 89). The stocks include GB cod, GOM cod, GOM haddock, GB yellowtail flounder, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, GB winter flounder, and GOM winter flounder. The control date limits for each of these stocks were exceeded by roughly 1-3 PSC as of May 1, 2014. Alternative 2 would therefore be constraining, and the impacts would depend on the options selected in the section *Disposition of Current Holdings in Excess of what is Allowed,* as detailed above. Fishery-wide, there would be short-term low positive impacts, as excess PSC would be redistributed.

Fishery consolidation was a concern by some when the groundfish catch share program was implemented (Section 3.2). Table 54 compares the max PSC held by an individual or permit banks at different time periods since the catch share program was implemented, and shows that some consolidation has been taking place over time.

In the long-term, the overall economic impacts of Alternative 2 are expected to be low negative relative to No Action, but may be high positive. The PSC accumulation limits in Alternative 2

[25] Final data on PSC holdings would be provided by the Analysis and Program Support Division (ASPD) at the NMFS Greater Atlantic Regional Fisheries Office (GARFO).

are generally set below the 15.5 Compass Lexicon recommendation, meaning that the efficiency of the groundfish fleet may be unnecessarily harmed. However, Alternative 2 would prevent the severely damaging market power scenario described in the above discussion of "General socioeconomic impacts of accumulation limits." Relative to Alternatives 3-5, impacts are expected to likely be low negative, with economies of scale unable to be achieved to the same extent under Alternative 2. Relative to Alternative 6, Alternative 2 would likely have low negative long-term impacts, but impacts may be high positive with the prevention of market power. Significant accumulation of PSC for any given stock is possible under Alternative 6.

Social. The social impacts of Alternative 2 are expected to be positive for the fishery as a whole relative to No Action, because an accumulation limit would be established for the fishery, preventing excessive shares. This would help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. As noted in the economic impacts, there are three individuals and one permit bank with PSC holdings as of May 1, 2014 over the cap levels in this alternative that may be negatively impacted.

The stock with the lowest accumulation limit under this alternative is SNE/MA yellowtail flounder, a PSC limit of 5. Thus, in theory, the smallest number of permit holders in the fishery under Alternative 2 could be 20. Given that there are ~1,500 permit holders in the fishery today, Alternative 2 would potentially allow a great deal of consolidation to occur in the future, a negative long-term impacting on the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just 20 individuals each holding an equal amount of PSC for SNE/MA yellowtail flounder, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed under Alternative 2 may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management.

Relative to Alternatives 3-6, Alternative 2 would have more positive social impacts for the fishery as a whole, because the cap levels are the lowest. Thus, the fishery access privileges could be distributed to the most number of participants.

7.6.2.2.2.2 Alternative 3: Limit Holdings of Stock-Specific PSC to the Same Level for each Stock in the Fishery

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than 15.5 of the PSC for a single allocated stock. *The Council may select Option A in conjunction with Alternative 3.*

Economic. The economic impacts of Alternative 3 are expected to be low negative in the short-term relative to No Action. A PSC limit of 15.5 was recommended by Compass Lexecon, the contractor chosen for analysis of excessive shares in the groundfish fishery (Mitchell & Peterson 2013). This level was considered appropriate to prevent market power from being exerted over a particular stock, but at the same time, have minimal impacts to the efficiency of the groundfish fleet (Section 6.5.4.4).

As of the control date, there is one individual exceeding the 15.5 PSC limit for GB winter flounder (Table 51) and that individual would have excess PSC grandfathered, assuming the provision in Section 4.1.2.2 is adopted. However, the maximum PSC held of GB winter flounder has since increased (from the control date to May 1, 2014; Table 56), meaning that a portion of the excess PSC may not be grandfathered. The same individual also is over the 15.5 limit for GB yellowtail and SNE/MA winter flounder as of May 1, 2014 (Table 55). Alternative 3 would therefore be constraining, and the impacts would depend on the options selected in the section *Disposition of Current Holdings in Excess of what is Allowed,* as detailed above. Fishery-wide, there would be short-term low positive impacts, as excess PSC would be redistributed.

In the long-term, the overall economic impacts of Alternative 3 would likely be low negative relative to No Action, but impacts may be high positive. The accumulation limits under Alternative 3 will likely limit some individuals in their ability to acquire permits/PSC. Alternative 3 would, however, prevent the severely damaging market power scenario described in the above discussion of *General socioeconomic impacts of accumulation limits* from occurring. The long-term impacts of Alternative 3 would be low positive relative to Alternative 2 and neutral relative to Alternatives 4 and 5. While Compass Lexicon recommended the 15.5 PSC figure to strike the right balance between preventing market power from being exerted but not impacting the efficiency of the groundfish fleet, it is not clear how a slightly higher limit would impact the fishery. Concerns about the Compass Lexicon recommendation can be found in the section *General socioeconomic impacts of accumulation limits*. Relative to Alternative 6, Alternative 3 would likely have low negative long-term impacts, but impacts may be high positive with the prevention of market power. Significant accumulation of PSC for any given stock is possible under Alternative 6.

Social. The social impacts of Alternative 3 are expected to be positive for the fishery as a whole relative to No Action, because an accumulation limit would be established for the fishery, preventing excessive shares. This would help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. However, there is one individual with current PSC holdings (as of May 1, 2014) over the cap levels in this alternative that may be negatively impacted. With a PSC cap of 15.5 for each stock, in theory, the smallest number of permit holders in the fishery under Alternative 3 could be seven. Given that there are ~1,500 permit holders in the fishery today, Alternative 3 would potentially allow a great deal of consolidation to occur in the future, a negative long-term impacting on the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just seven individuals each holding an equal amount of PSC for a stock, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed under Alternative 3 may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management.

> **Option A:** Individuals, permit banks, and other entities who have PSC holdings for a stock at 15.5 may acquire PSC for other stocks up to 15.5. Any PSC acquired that exceeds 15.5 would be split off a permit and redistributed to the fleet in the manner described in Framework Adjustment 45.

Economic. The economic impacts of Option A are expected to be low negative in the short-term relative to No Action. Relative to Alternative 3, Option A would have uncertain economic impacts, with one individual having the grandfathering provision applied in Alternative 3 that may not be the case under Option A. The impacts of Option A relative to Alternative 3 would depend on how much of the PSC that would be considered excess is being fished or leased by the current holder versus how much would be used once redistributed. However, if the grandfathering provision is applied, Option 3 would have neutral impacts relative to Alternative 3. In the long-term, Option A would likely have low negative overall economic impacts relative to No Action, but impacts may be high positive. Relative to Alternative 3, Option A would have neutral long-term economic impacts, as the same PSC limit would be established under each. However, these impacts are considered minor because only a few permit holders could potentially be constrained.

Social. The social impacts of Option A are expected to be mixed for the industry as a whole relative to not selecting it, because those with holdings near the cap would be able to acquire additional permits (less PSC would be available to others), though the excess for stocks above the cap would be redistributed. Option A would but more positive for the individuals with holdings at the cap limit who would like to acquire more permits. There would be more flexibility for permit holders with holdings at or near the limit to acquire additional permits to increase their holdings of other stocks. Option A would result in more concentration of holdings by individuals than if Option A were not selected.

7.6.2.2.2.3 Alternative 4: Limit Holdings of Stock-Specific PSC by Stock Type

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC.

> **Option A:** Limit the PSC holdings at 15 for the Gulf of Maine, Cape Cod, Southern New England, and Mid-Atlantic stocks, at 20 for the unit stocks, and at 30 for the Georges Bank stocks (Table 9).

Economic. The economic impacts of Option A in the short-term are expected to be neutral to low negative relative to No Action. An individual exceeds the PSC limit of 15 for SNE/MA winter flounder as of May 1, 2014 (Table 53) who would be negatively impacted, but the impacts would depend on the options selected in the section *Disposition of Current Holdings in Excess of what is Allowed*. In the long-term, Option A would likely have low negative impacts relative to No Action, but impacts may be high positive. The accumulation limits under Option A could limit some individuals in their ability to acquire permits/PSC. Option A would, however prevent the severely damaging market power scenario described above in the discussion of *General socioeconomic impacts of accumulation limits.*

The long-term impacts of Option A are expected to be low positive relative to Alternative 2 and neutral relative to Alternatives 3 and 5. The accumulation limits for unit and GB stocks in Option A would exceed the 15.5 Compass Lexicon recommendations; however, in terms of promoting fleet diversity, preventing consolidation of GOM stock PSC is likely of greater importance than preventing consolidation of GB stock PSC. Furthermore, concerns about the Compass Lexicon recommendation can be found in the above discussion of *General socioeconomic impacts of accumulation limits.* Relative to Alternative 6, Option A would likely have neutral to low negative long-term impacts, but impacts may be high positive. Significant accumulation of PSC for any given stock is possible under Alternative 6.

Social. The social impacts of Option A are expected to be positive for the fishery as a whole relative to No Action, because an accumulation limit would be established for the fishery, preventing excessive shares. This would help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. However, there is one individual with current PSC holdings (as of May 1, 2014) over the cap levels in this alternative that may be negatively impacted. With a PSC cap of 15.5 for each stock, in theory, the smallest number of permit holders in the fishery under Option A could be seven. Relative to Option B, the social impacts are positive to the fishery as a whole, because there would be a cap on each stock. Given that there are ~1,500 permit holders in the fishery today, Option A would potentially allow a great deal of consolidation to occur in the future, negatively impacting the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just seven individuals each holding an equal amount of PSC for a stock, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed under Alternative 4A may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management.

Option B: Limit the PSC holdings of GB cod at 30, GOM cod at 15, and pollock at 20.

Economic. The economic impacts of Option B are expected to be neutral in the short-term. All individuals have current PSC holdings below the Option B limits. In the long-term, Option B would likely have neutral to low negative impacts relative to No Action, but impacts may be positive. The accumulation limits under Option B may limit some permit holders in their ability to acquire permits/PSC. Option B would prevent the severely damaging market power scenario as described in the above discussion of *General socioeconomic impacts of accumulation limit* from occurring, but only for the three stocks. Significant accumulation would be possible with all other stocks. Because only three stocks would be capped, the long-term impacts of Option B relative to Option A may be high negative, but are more likely to be neutral/low positive.

Social. The social impacts for the fishery as a whole are expected to be positive in the short-term relative to No Action, because an accumulation limit would be established for the fishery, preventing excessive shares. This would help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. Relative to Option A, the social impacts are expected to be negative. With a PSC cap of 15.5 for three stocks, in theory, the smallest number of permit holders for those stocks under Option B could be seven. There could be a small number of additional participants in the fishery relative to Option A, if they hold permits with no PSC for these stocks (unlikely as most permits have some amount of PSC for at least one of these stocks). Given that there are ~1,500 permit holders in the fishery today, Option B would potentially allow a great deal of consolidation to occur in the future, a negative long-term impacting on the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just seven individuals each holding an equal amount of PSC for a stock, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed under Alternative 4B may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management. There are no permit holders with PSC holdings that are currently higher than these levels (short-term neutral impact on individuals). The PSC holdings for other stocks may increase above these levels, potentially reducing the social benefits to the fishery as a whole from establishing an accumulation limit.

7.6.2.2.2.4 Alternative 5: Limit Holdings of Stock-Specific PSC

For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than the following PSC: 30% of Georges Bank winter flounder and 20% for all other allocated stocks in the fishery.

Economic. The economic impacts of Alternative 5 are expected to be neutral in the short-term. All individuals have current PSC holdings below the Alternative 5 limits. In the long-term, Alternative 5 would likely have low negative impacts relative to No Action, but impacts may be high positive. Under Alternative 5, some permit holders would be limited in their ability to acquire permits/PSC. Alternative 5 would, however, prevent the severely damaging market power scenario as described in in the above discussion of *General socioeconomic impacts of accumulation limits*.

The long-term economic impacts of Alternative 5 are expected to be low positive relative to Alternative 2. Relative to Alternatives 3 and 4, their direction (positive or negative) is uncertain, though minor due to the small differences in impacts these alternatives could have on the fishery. While the stock-specific PSC accumulation limits exceed the 15.5 recommendation in the Compass Lexicon report, Alternative 5 would prevent PSC consolidation, albeit to a lesser degree. Concerns about the Compass Lexicon recommendation can be found above in *General socioeconomic impacts of accumulation limits*. With a PSC cap of 20 on a given stock, the maximum level of market concentration would be an HHI of 2,000 (20*20*5), with five entities controlling 20% each. An HHI of 2,000 equates to a moderately concentrated market according to the Department of Justice (USDOJ and FTC 2010). There will certainly be more than five entities in the groundfish fishery moving forward, meaning the actual level of market concentration will likely be much lower than 2,000. If, for example, there was a competitive fringe of 30%, with all of these fishery members controlling PSC of 2% or less for a given stock, then the maximum potential HHI would equal 1,360 (20^2*3+10^2+30*2). This would constitute an unconcentrated market, in which there is limited concern about the exercising of market power. There would be opportunity for slightly more concentration with regards to GB winter flounder, the only stock that would have a PSC limit of 30 under Alternative 5.

Relative to Alternative 6, Alternative 5 would likely have neutral to low negative long-term impacts, but impacts may be high positive. Substantial accumulation of PSC for any given stock is possible under Alternative 6.

Social. The social impacts of Alternative 5 are expected to be low positive. The social impacts for the fishery as a whole would be positive relative to No Action, because an accumulation limit would be established for the fishery, preventing excessive shares. This would help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. With a PSC cap of 20 for most stocks, in theory, the smallest number of permit holders in the fishery under Alternative 5 could be five. Given that there are ~1,500 permit holders in the fishery today, Alternative 5 would potentially allow a great deal of consolidation to occur in the future, a negative long-term impacting on the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just seven individuals each holding an equal amount of PSC for a stock, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed under Alternative 5 may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management. There are no permit holders with PSC holdings that are currently higher than these levels (short-term neutral impact to individuals). Relative to Alternatives 2-4, Alternative 5 would have less positive social impacts, because the cap levels are the highest, thus the fishery access privileges could be distributed to the least number of participants. The impacts of Alternative 5 are expected to be positive relative to Alternative 6.

7.6.2.2.2.5 Alternative 6: Limit Collective Holdings of PSC

(PREFERRED ALTERNATIVE) For any single fishing year, individuals, permit banks, and other entities shall be assigned no more than 15.5 of the PSC of all the allocated stocks in aggregate.

Economic. The economic impacts of Alternative 6 are expected to be neutral in the short-term. All individuals have current PSC holdings below the Alternative 6 limits. According to the draft data of PSC holdings available to the Groundfish Plan Development Team, the highest aggregate PSC holdings for any individual are 139.7, well below the 232.5 limit that would exist with 15 allocated stocks. In the long-term, Alternative 6 would likely have neutral impacts relative to No Action, but impacts may be slightly positive to positive. The aggregate accumulation limit under Alternative 6 is unlikely to limit individuals in their ability to acquire permits/PSC. Alternative 6 may not prevent the severely damaging market power scenario described above in the *General socioeconomic impacts of accumulation limits*, as no specific stock would be capped. There would, however, be less ability for an individual to acquire large amounts of PSC for multiple stocks than under No Action.

Relative to Alternatives 2 and 3, Alternative 6 would likely have low positive long-term impacts, but impacts may be high negative. Relative to Alternatives 4 and 5, Alternative 6 would likely have neutral to low positive long-term impacts, but impacts may be high negative. Significant accumulation of PSC for any given stock is possible under Alternative 6. It is highly unlikely that market power could exist (causing a major disruption to the groundfish fishery) under Alternatives 2-5, but this possibility exists under Alternative 6. The ability of individuals to take advantage of economies of scale will almost certainly not be comprised under Alternative 6.

Social. The social impacts of Alternative 6 are low positive. The social impacts for the fishery as a whole expected to be low positive relative to No Action, because an accumulation limit would be established for the fishery. This may help retain the *Size and Demographic Characteristics*, as well as its *Historical Dependence on and Participation* in the fishery. However, with a collective PSC cap at this level, an individual or entity could obtain a very high amount of PSC for any given stock, potentially not preventing market power in the fishery. This would be contrary to Goal #4 of Amendment 18.

Relative to Alternatives 2-5, the social impacts are expected to be negative for the fishery overall. With a collective PSC cap of 15.5, in theory, the smallest number of permit holders in the fishery under Alternative 6 could be seven. Given that there are ~1,500 permit holders in the fishery today, Alternative 6 would potentially allow a great deal of consolidation to occur in the future, a negative long-term impacting on the *Size and Demographic Characteristics* of the fishery. Practically, it would be difficult, however, to consolidate down to just seven individuals each holding an equal amount of PSC for a stock, given that permits have varying levels of PSC associated with them and permit and PSC splitting is not allowed. The consolidation allowed by Alternative 6 may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management. There are no permit holders with aggregate PSC holdings that are currently higher than this level (short-term neutral impact to individuals).

Summary of Accumulation Limit Alternatives

There are three distinct components of each alternative that were considered in the analysis: 1) Will the PSC cap currently limit at least one individual? 2) Will the efficiency of the groundfish fleet be compromised? 3) Will the resulting environment be such that the exertion of market power is prevented?

The answer to the first question is relatively straightforward. Table 89 shows the number of current individuals as of FY 2014 that have PSC holdings in excess of the various PSC cap alternatives. Those individuals with excess holdings may be negatively impacted by being forced to divest. If the divested PSC ended up be more profitably used by the other members of the groundfish fleet, then the divesture would have positive economic impacts. If the divested PSC ended up being less profitably used, then impacts would be negative. As it is not clear what the end result of divesture would be, the first component of this analysis would yield uncertain economic impacts for the PSC cap alternatives that would limit at least one individual (2, 3 and 4A) relative to those that would not currently limit any individual (1, 4B, 5 and 6).

The second question is considerably more difficult to answer, and given the lack of relevant literature on scale economics in the groundfish fishery, there was no clear approach. The Compass Lexicon report on excessive shares stated that the recommended cap level (15.5 PSC for each stock) "could be achieved without interfering with economies of scale." The peer review of the report noted that the analytical basis for this conclusion was lacking and gaining a better understanding of the scale economics of the groundfish fishery would require cost data at the vessel and ownership group level. However, given the monumental task of gaining this understanding, the CL report is considered best available science and consequently, Alternative 3 is considered unlikely to interfere with economies of scale in the groundfish fishery. Accordingly, Alternatives 1, 4A, 4B, 5 and 6 were also considered unlikely to do so. Alternative 2, which would implement the lowest PSC caps for nearly all stocks, is considered the most likely to interfered with economies of scale.

The answer to the third question is aided by the results of the Compass Lexicon Report. CL defined excessive shares in terms of PSC ownership and concluded that a 15.5 stock-specific PSC cap would maintain an unconcentrated level of holdings corresponding to an HHI of 1500, and the resulting environment would be one in which it is difficult to exert market power. However, there were two major issues with this conclusion: 1) The HHI serves as a warning for the potential for market power to be exerted, but does not indicate that this is actually happening. 2) The Compass Lexecon analysis used the same approach as the RFA analyses, by analyzing holdings at the business identification level, which is a broad grouping of permit holders. Calculating an HHI requires that the holdings of all the entities equal 100%. For this fishery, aggregate PSC holdings at the individual level exceed 100, because people can be (and are) associated with multiple business ids. Thus, an HHI cannot be calculated for individual persons, which the accumulation limit alternatives would apply to.

Considering these issues, it was not possible to definitively state which alternatives might allow market power to be exerted. However, given that an individual controlling 15.5 PSC for a given stock is actually in control of less than15.5% of the aggregate PSC, it is reasonable to believe that a slightly higher cap than the CL recommendation may still yield an unconcentrated level of holdings. For this reason, PSC cap Alternative 3 limits are considered sufficient to prevent market power from being exerted, as were the generally lower limits of Alternative 2. The slightly higher limits of Alternatives 4 and 5 are considered likely to prevent market power in the groundfish fishery. Alternative 6, with a lack of a stock-specific PSC limit is considered a possible alternative to prevent market power from being exerted, though the situation would be more plausible than under Alternatives 2-5. Alternative 4B, which would only cap PSC for three of the groundfish stocks, probably would increase the likelihood for market power to be exerted than Alternatives 2, 3, and 4A. Even without a PSC cap (Alternative 1), it would be extremely difficult for an individual to exert market power in the groundfish fishery and even more difficult to do so profitably. If an individual did find a way to do so, however, the other members of the groundfish fleet would be severely impaired in their ability to lease in desired PSC. Table 91 summarizes the results of the three part analysis.

Table 91 - Summary of impacts of PSC cap alternatives on human communities

PSC Cap Alternative	Currently would limit at least one individual?	Would impact groundfish fleet efficiency?	Would prevent exertion of market power?
1	No	No	No
2	Yes	Possibly	Yes
3	Yes	Unlikely (according to CL)	Yes
4A	Yes	Less likely than 2-3	Likely
4B	No	Less likely than 2-3	Possibly
5	No	Less likely than 2-4	Likely
6	No	Less likely than 2-5	Possibly

7.6.2.3 Limit the Holdings of Permits

General socioeconomic impacts of a permit holdings limit

Implementing an accumulation limit of permit holdings, rather than PSC holdings, may be less effective at preventing consolidation in terms of opportunities to participate in the fishery. Participation in the groundfish fishery requires holding at least one permit, but it is the Potential Sector Contribution (PSC) assigned to each permit that is essential for providing fishery access privileges. Many permits confer very little to no PSC for a particular stock. As Compass Lexecon (2013, p. 46) describe:

> *What matters economically is the share of a stock that a single entity has rights to harvest, not the number of permits that have been combined to assemble that bundle of access rights.*

It is difficult to determine the social impacts of a cap on the number of permits, because it cannot be predicted what level of PSC would be held with a particular number of permits. Thus, it could not be estimated whether or how current or future fishery access would be constrained.

7.6.2.3.1 Alternative 1: No Action

There would be no limit on the permit holdings by individuals, permit banks, and other entities.

Economic. The economic impacts of Alternative 1 are expected to be neutral in the short-term and the long-term. All individuals and permit banks would continue to not be restrained in their ability to accumulate permits. However the possibility of high negative impacts exists in the long-term. Alternative 1 does not implement any safeguard from the severely damaging market power scenario described above in the discussion of *General socioeconomic impacts of accumulation limits*.

Social. The social impacts of Alternative 1 are expected to be neutral in the short-term, as it would maintain the status quo. Without an accumulation limit, there may be negative social impacts if the industry consolidates without restraint. The *Size and Demographic Characteristics* of the fishery-related workforce and fishing communities may change if permit holdings become more concentrated. Alternative 1 would not prevent excessive shares from occurring in the future.

7.6.2.3.2 Alternative 2: Limit the Holdings of Permits

(PREFERRED ALTERNATIVE) For any single fishing year, no individual, permit bank, and other entity shall hold more than 5% of the limited access Northeast Multispecies permits. This includes permits issued to vessels and eligibilities in Confirmation of Permit History. If an individual or entity held more than 5% of the permits on the control date (April 7, 2011), they would be restricted to holding no more than the number of permits they held as of the control date.

Economic. The economic impacts of Alternative 2 are expected to be neutral in the short-term, as divesture would not be required. There are currently 1,373 MRIs in the groundfish fishery, meaning a 5% cap would amount to 69 MRIs. As of May 1, 2014, the most MRIs held by an individual or permit bank is 55 (Table 47).

In the long-term, the economic impacts of Alternative 2 would likely be neutral relative to No Action. Alternative 2 does little to safeguard from the severely damaging market power scenario described in the discussion of *General socioeconomic impacts of accumulation limits*. Stock-specific PSC accumulations above 50 are theoretically possible with a 5% permit cap (Table 92), if the best permits (most amount of PSC) were held for a particular stock. While the holdings in Table 92 are highly unlikely to be obtained, accumulations that would result in a consolidated market where market power is more likely to be exerted are possible. As Alternative 1 places no limit on the number of permits that may be obtained, Alternative 2 does implement some measure to prevent market concentration. However, compared to Alternatives 2-5 in Section 4.1.2.2, a great deal more market concentration is possible. Compared to these alternatives, Alternative 2 may allow individuals to achieve better economies of scale, which could result in some positive impacts.

Social. The social impacts of Alternative 2 are expected to be neutral relative to No Action in the short-term. Alternative 2 would not restrain the current fishery, as the most number of MRIs held by an individual or entity is 55. Thus, there would be substantial opportunity for additional permit consolidation, which would eventually be limited by the cap. In theory, the smallest number of permit holders in the fishery under Alternative 2 could be 20. Given that there are ~1,500 permit holders in the fishery today, Alternative 2 would potentially allow a great deal of consolidation to occur in the future, negatively impacting the *Size and Demographic Characteristics* of the fishery. The consolidation allowed by Alternative 2 may be considered by some stakeholders to be excessive, negatively impacting the *Attitudes, Beliefs, and Values* of stakeholders towards management.

The rationale for a cap of 5% is to be consistent with the 5% permit cap in the Scallop Limited Access IFQ fishery, a fishery with ~200 individuals or entities holding permits. Thus, substantially more consolidation could occur in the groundfish fishery with a 5% permit cap than could in the scallop fishery.

As discussed above, a permit cap does not constrain the level of PSC held, and thus, the degree of fishery access privileges. Alternative 2 may not prevent market power in the PSC market from occurring in the future, a negative impact for the fishery in the long-term. This would be contrary to Goal #4 of Amendment 18.

Table 92 - Maximum PSC allocation acquirable for any particular stock with a 5% permit cap

Stock	PSC	Stock	PSC
GB cod	53	**GB winter flounder**	85
GOM cod	41	**GOM winter flounder**	64
GB haddock	65	**Plaice**	53
GOM haddock	62	**Witch flounder**	48
GB yellowtail flounder	72	**Redfish**	74
SNE/MA yellowtail flounder	65	**Pollock**	60
CC/GOM yellowtail flounder	50	**White hake**	65
SNE/MA winter flounder	69		

Notes: FY 2014 data include permits held in CPH. 1,373 MRIs in FY 2014, such that a 5% cap would limit holdings to 69 MRIs.

7.6.3 Handgear A Permit Measures

Fishing Communities Impacted. The Handgear A permit measures (Section 4.2) are expected to primarily affect the communities that are homeports or landing ports used by Handgear A fishermen. Most Handgear A groundfish are landed in Massachusetts. The top landing port for groundfish caught with HA permits for the past five years was Gloucester, MA, though other important ports include Yarmouth, Chatham and New Bedford, MA and Hampton Bays, NY (Section 6.5.6.3, Table 67).

7.6.3.1 Establish a Handgear A Permit sub-ACL

7.6.3.1.1 Alternative 1: No Action

Holders of Handgear A multispecies permits would continue to have the choice of enrolling in the common pool or a groundfish sector (including forming a sector) and be subject to current regulations accordingly. The discard rate for vessels fishing with HA permits in the common pool is calculated based on observed trips using trawls or gillnets, not handgear.

Economic. The economic impacts of Alternative 1 are expected to be neutral, and neutral to low negative relative to Alternative 2. Handgear A permit holders would continue to have a choice between joining a sector and the common pool, though the stock-associated PSC for many HA permit holders is not sufficiently large to join a sector. Under No Action, there would be no provision to guarantee HA permit holders a portion of the common pool catch. Discards by HA permit holders would likely continue to be overestimated, but given the low amounts of landings by these permit holders, the consequences of this overestimation are minor.

Social. The social impacts of Alternative 1 are expected to be neutral, and low negative relative to Alternative 2. Under the existing regulations, HA permit holders could form their own sector or join an existing sector. Some impediments or disincentives from doing so include administrative costs (e.g. sector fees, use of VMS). However, potential solutions include:

- At least two existing sectors have offered financial and technical assistance for HA permit holders if they want to join their sector;
- An exemption from at-sea monitoring could be requested, because relatively small amounts of fish are caught with HA permits;
- A HA sector could request an exemption from having ACE for species that they do not catch (e.g., yellowtail flounder, plaice, winter flounder);
- "Right of first refusal" operating agreements could be established to ensure that HA permit holders have priority in leasing their ACE; and
- A benefit to enrolling in sectors is not being subject to the trimester catch management of the common pool. There also would not be trip limits.

7.6.3.1.2 Alternative 2: Establish a Handgear A Permit sub-ACL

(PREFERRED ALTERNATIVE) A new groundfish fishery component sub-ACL would be created, which would be distinct from the common pool or sectors. A sub-ACL would be created for HA permits, allocating the catch history (i.e., PSC) of the enrolled HA permits for Gulf of Maine cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, and pollock. The catch history qualification years would remain consistent with current PSC calculation methods. This sub-ACL would only be used by HA fishermen. The HA sub-ACL would be managed with an annual sub-ACL. Unused HA sub-ACL would be carried over from one fishing year to the following fishing year, up to a limit of 10% of the unused sub-ACL, consistent with sector carryover as adopted in Framework 53.

Economic. The economic impacts of Alternative 2 are expected to be neutral to low positive. HA permit holders would be given increased flexibility. During FY 2013, there were 22 HA permit holders that had groundfish landings, with all of the permit holders operating in the common pool. Under Alternative 2, these common pool members may wish to enroll in the HA sub-ACL for increased security over their catch. The common pool trimester sub-ACL for a given stock has been exceeded on a few occasions in recent fishing years (Table 66). It is possible that those making the transition to the HA sub-ACL may experience some positive impacts, though the end result may simply end up being a transfer of catch from the common pool to the HA sub-ACL.

With an annual sub-ACL, HA permit holders would likely have greater flexibility in what part of the year they choose to fish. In the common pool, ACLs are broken up into trimesters, with all trimesters being allotted the same catch limits. Under an annual sub-ACL, landings would be more market-driven and HA permit holders, who tend to fish more during summer, would be not have the concern of a trimester ACL being reached. During FY 2013, HA permit holders had total groundfish revenue on all trips of $53,663, with $25,425 of the total coming from trips in June through September. From FY 2010-2013, average groundfish revenue from HA permit holders on all trips averaged $90,042 with just about half of the revenue coming in June through September, $45,417.

The carryover provision would also enable HA permit holders to better manage when they choose to fish. Given the large percentage of groundfish revenue that is received during the summer, there would be opportunity for HA permit holders to save some potential catch for the following fishing year rather than operating during inclement winter weather. Demand is also likely lower during winter months.

Social. The social impacts of Alternative 2 are expected to be low positive relative to No Action. Enrollment of HA permits in the new HA sub-ACL would be voluntary, and it would increase the choices for HA permit holders for how to participate in the sub-ACL. This would result in positive social impacts for HA permit holders.

Amendment 13 established the limited access HA permit category. To be eligible, a vessel must have fished, with an open-access handgear permit, 500 lbs. of cod, haddock, or pollock in any year from 1997-2001. The HA permit category was established to address the concern of latent effort in the fishery, with the intent that the HA permit was to be held by active fishermen using handgear (NEFMC 2003a, p. I-74). Amendment 16 allowed HA permits to be enrolled in sectors and the common pool, and thus, the PSC associated with these permits may ultimately be used as ACE in sectors or in the common pool by other gear types (NEFMC 2009a, p.104). Under Alternative 2, the permits enrolled in the new HA sub-ACL would only be fished using handgear. Thus, this alternative would retain one of the original intents of the HA permit category, and would be a positive impact on the *Attitudes, Beliefs, and Values* of HA fishermen towards management.

Removing PSC from either the sector or common pool sub-ACLs is expected to have a negative social impact on these fishery components, as there would be less opportunity to participate in the fishery. However, given that the PSC from HA permits constitutes <1% of the total PSC, removing this PSC available to sectors or the common pool would likely, in reality, have little impact to other vessels. The fishery permit holders who enroll their HA permits in this new sub-ACL would reap any social gains. However, the HA permit holders would not be able to harvest fish available from the PSC of other gear types as well.

Establishing a gear-specific sub-component would be a novel approach for managing the Northeast multispecies fishery, which warrants careful consideration. Creating a sub-ACL and distinct regulations for a specific gear type could set a precedent. In the future, there could be fishermen using other gear types that come forward with a similar proposal. The Council should consider whether Alternative 2 would be an exception or whether there is a desire to have more gear-specific regulations more broadly. Should this be an exception, there may be negative impacts in the *Attitudes, Beliefs, and Values* of fishermen of other gear types if they are denied gear-specific management in the future (perceptions of unfairness). However, Alternative 2 would be reinforcing the original purpose of designating a Handgear permit, access to the fishery by this specific gear type.

It is unclear how many of the ~100 HA permits would enroll in the HA sub-ACL, so determining specific impacts is difficult. Currently, PSC from HA permits enrolled in sectors or the common pool may be fished using other gear types. To the degree permits become enrolled in the HA sub-ACL, and to the degree that sub-ACLs are sufficient to sustain a viable fishery, fishing with Handgear would be preserved. Thus, Alternative 2 would help promote fleet diversity by preserving a component of the fishery that is currently very small. Positive impacts to the *Size and Demographic Characteristics* of the fishery are expected and the *Historical Dependence on and Participation in* the fishery would likely be sustained.

The social impacts of having an annual sub-ACL are expected to be positive relative to No Action for vessels currently enrolled in the common pool and neutral for vessels enrolled in sectors. With the current approach of managing the common pool sub-ACLs by trimesters, there are safety concerns with small vessels fishing in winter. An annual sub-ACL would decrease safety concerns and allow vessels more flexibility in choosing when to fish. While it is possible annual sub-ACLs could promote a derby fishery, any negative impacts associated with this are likely to be outweighed by the positive safety impacts. For current participants of the common pool, fishing under an annual sub-ACL may be seen as decreasing administrative burden, as it would decrease the frequency of catch accounting, a positive impact on the *Attitudes, Beliefs, and Values* of fishermen.

The social impacts of allowing carryover are expected to be positive for the HA sub-ACL participants. The common pool does not have a carryover allowance and sector participants are eligible to carryover up to 10% of unused ACE from the prior fishing year, except for stocks managed under the US/Canada Agreement and GOM cod. The total unused HA sub-ACL combined with sector sub-ACL carried forward for all sectors from the previous FY plus the total ACL could not exceed the ABC for the fishing year in which the carryover would be harvested. Allowing carryover is expected to be seen as an improvement over the common pool and as consistent with the sector program. Positive impacts on the *Attitudes, Beliefs, and Values* of the HA sub-ACL participants is expected, and having the ability to carryover unused sub-ACL would increase the flexibility of the fishery.

Overall, the social impacts of Alternative 2 are low positive.

Discards

Stocks that would not have a specific HA permit sub-ACL, but are caught using a HA permit, would be accounted for under the Other Sub-components sub-ACLs.

> **Option A:** ***(PREFERRED ALTERNATIVE)*** Calculate an annual discard rate based on available data for longline and hook gear. At the beginning of the fishing year, estimated discards would be subtracted from the HA permit sub-ACL (for GOM cod, GB cod, GOM haddock, GB haddock, and pollock) and the Other Sub- Components sub-ACL (for all other stocks) accordingly.

Economic. The economic impacts of Option A are expected to be neutral. Discard estimates for HA permit holders that choose to enroll in the sub-ACL should be more accurate than the status quo. In previous fishing years, discards from HA permit holders were based on discard rates from observed trawl and gillnet trips. The percentage of groundfish catch that was discarded on handgear trips was 3.7% in FY 2010 and 0.5% in FY 2011, and for longline trips, the percentages were 1.5% and 1.4% respectively. For gillnet trips the percentages were 1.2% in FY 2010 and 1.1% in FY 2011, and for otter trawl trips they were 1.4% and 1.7% respectively (Sun 2014). Due to the relatively small variation in discard rates across gear types, and the fact that HA permit holders represent a small percentage of total groundfish landings, the change in discard totals should be minor.

Social. The social impacts of Option A are expected to be negative for participants of the HA sub-ACL relative to Option B, as potential discards would be subtracted from their catch limit off the top. However, this would be a positive impact on the *Attitudes, Beliefs, and Values* of other stakeholders towards management, in terms of perceptions of fairness, because the HA sub-ACL would be explicitly accountable for its discards in the same way as other components of the fishery.

> **Option B:** ***(PREFERRED ALTERNATIVE)*** **Option B:** Assume all discards from trips fishing within the HA sub-ACL to be *de minimus*. Only landings would count against the sub-ACLs.

Economic. The economic impacts of Option B are expected to be neutral. The discards attributed to HA permit holders would be similar to the status quo and HA permit holders represent a small percentage of total groundfish landings.

Social. The social impacts of Option B are expected to be positive for participants of the HA sub-ACL relative to Option B, as they would not be constrained by their discards. The total catch of the HA sub-ACL would likely be smaller than the error associated with the discards of the entire fishery. Thus, Option B would have negligible impact on the rest of the fishery. There may be negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management, because the HA sub-ACL would not be explicitly accountable for its discards.

In-season accountability measures

An in-season accountability measure (AM) would be established for the HA sub-ACL. To prevent overages in-season, trip limits for each stock with a HA permit sub-ACL would be set in specifications by the Regional Administrator to prevent overage.

General Impacts. Under either option below, NMFS may impose trip limits to further ensure that HA permit sub-ACLs are not exceeded. However, where the sub-ACLs are so low, a challenge lies in setting reasonable trip limits. For example, what would be a reasonable trip limit for GOM haddock if the sub-ACL is 500 lbs per year, with ~100 HA permits enrolled? In FY 2013 for the common pool, the GOM haddock trip limit started out at 100 pounds, but when the TAC was exceeded, it became zero. The GOM cod trip limit was 100 pounds. Currently, there is no trip limit for pollock. One approach may be to set the GOM haddock trip limit at zero and monitor an assumed discard rate.

There is potential that NMFS may be unable to accurately predict when either 90% or 100% of the sub-ACL has been used. The current infrastructure and reporting system is not designed to support monitoring small catch numbers in a manner that would be timely enough to prevent overages. VTRs and dealer reports would be received weekly and NMFS would be responsible for calculating discards. If either option cannot prevent overages, there would be negative impacts on the *Attitudes, Beliefs, and Values* of fishery stakeholders towards management.

> **Option A:** When 100% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

Economic. The economic impacts of Option A are expected to be positive relative to Option B and No Action. Members of the HA sub-ACL would be able to generate revenue from any species in the broad stock area they are operating in throughout the fishing year, as long as the sub-ACL for the species has not been utilized 100%. In the common pool, if a sub-ACL is reached for a stock, the corresponding broad stock area closes. HA permit holders would therefore have a greater opportunity to utilize their catch portfolio. There are potentially minor, though likely negligible, long-term impacts from the lack of a buffer in utilizing the HA sub-ACL.

Social. The social impacts of Option A are expected to be positive for those enrolling in the HA permit sub-ACL relative to Option B, because they would be allowed to catch the full sub-ACL each year. Most handgear fishing occurs early in the fishing year (in summer), so NMFS may be able to know the total catch fairly accurately towards the end of the fishing year. However, if the HA sub-ACL is not subject to the March 1-20 handgear closure (Section 4.2.2.2), then fishing effort might increase later in the fishing year. Should Option A not prevent overages (if NMFS cannot track such small catches), there may be negative social impacts, in terms of the implementation of reactive accountability measures in the future.

The social impacts of Option A are also considered relative to No Action. Currently, sectors may harvest up to 100% of their ACE, though several elect to self-impose a buffer to ensure that they do not exceed their ACE. For the HA permit holders currently enrolled in sectors, the social impacts are expected to be neutral. Currently, the common pool sub-ACL is fished in trimesters. NMFS notifies the fishery when it is approaching full utilization, and despite closing the fishery early (e.g., GOM haddock in FY 2013) overages have not been prevented. It is unclear whether Option A would prevent overages better relative to No Action. Without the trimester system, the HA sub-ACL could reach 100% utilization earlier in the fishing year than the common pool. The direction of social impacts (positive or negative) of having an annual rather than a trimester sub-ACL is uncertain. There may be safety benefits, but it could be easier to exceed the sub-ACL, resulting in accountability measures in the future. However, due to the small size of the sub-ACL, the impacts to the fishery overall is minor.

> **Option B:** ***(PREFERRED ALTERNATIVE)*** When 90% of the HA sub-ACL is reached for a stock, the HA sub-ACL for that stock would close and all vessels fishing under the HA sub-ACL would be subject to a zero possession limit for that stock for the remainder of the fishing year.

Economic. The economic impacts of Option B are expected to be negative relative to Option A and uncertain relative to No Action. Fishermen enrolled in the HA sub-ACL would be able to generate revenue from any species in the broad stock area they are operating in throughout the fishing year, as long as 90% of the sub-ACL for the species has not been used. In the common pool, if a sub-ACL is reached for a stock, the corresponding broad stock area closes. However, in the common pool, stocks are allowed to reach 100% utilization before a broad stock area is closed, so Option B may give HA permit holders not as great of an opportunity to utilize their catch portfolio compared to the status quo. The 10% buffer compared to Option A may protect a small portion of a stock, which can then contribute to recruitment. However, due to the small size of the sub-ACL, the impacts to the fishery overall are minor.

Social. The social impacts of Option B are expected to be low positive, but would be negative for fishermen enrolled in the HA sub-ACL relative to Option A, because it would not be allowed to catch its full sub-ACL each year. Should Option B better prevent overages than Option A (if the 10% difference allows NMFS to better track catches), there may be less negative social impacts, in terms of the implementation of reactive accountability measures.

The social impacts of Option B are also considered relative to No Action. Currently, sectors may harvest up to 100% of their ACE, though several elect to self-impose a buffer to ensure that they do not exceed their ACE. For the HA permit holders currently enrolled in sectors, the social impacts are expected to be low negative. Currently, the common pool sub-ACL is fished in trimesters. NMFS notifies the fishery when it is approaching full utilization, and despite closing the fishery early (e.g., GOM haddock in FY 2013) overages have not been prevented. It is unclear whether Option B would prevent overages better relative to No Action. Without the trimester system, the HA sub-ACL could reach 100% utilization earlier in the fishing year than the common pool. There may be safety benefits, but it could be easier to exceed the sub-ACL, resulting in accountability measures in the future.

Reactive accountability measures

A reactive accountability measure (AM) would be established for the HA sub-ACL. Reactively, an overage in the sub-ACL for a stock would be subtracted from the sub-ACL in the fishing year following notification of the overage.

General Impacts. The economic and social impacts are uncertain, because the specific reactive AM is not defined in this action. In general, a reactive AM constrains a fishery, so negative economic and social impacts are expected in the near-term. However, the goal is to ensure that overages are prevented in the future. In the long-term, there would be positive economic and social impacts if fishing within specified catch limits promotes sustainable harvests. However, due to the small size of the sub-ACL, the impacts to the fishery overall is minor.

Option A: ***(PREFERRED ALTERNATIVE)*** Reactive AMs would be triggered if the HA permit sub-ACL is exceeded.

Economic. The economic impacts of Option A are expected to be low positive relative to No Action, but negative relative to Option B. Fishermen enrolled in the HA sub-ACL could generate revenue from any species in the broad stock area they are operating throughout a given fishing year. In the common pool, if a sub-ACL is reached for a stock, the corresponding broad stock area closes. Option A would therefore give HA permit holders a greater opportunity to use their catch portfolio throughout a given fishing year. However, the subtraction of any overages in the following fishing year would cause loses. It is not clear whether the in-season AMs or reactive AMs would offer greater benefits to HA permit holders.

Social. The social impacts of Option A for the fishermen enrolled in the HA permit sub-ACL are expected to be low negative relative to Option B. There may be more instances that a reactive AM would be triggered under Option A. By holding the fishery accountable to their catch, there would likely be positive impacts on the *Attitudes, Beliefs, and Values* of other stakeholders towards management, in terms of perceptions of fairness, though some may feel this option is unnecessarily punitive. Option A may also be perceived to be fairer than Option B, because it would be more consistent with reactive AMs for sectors and the common pool for the stocks in which there would be a HA permit sub-ACL.

Option B: Reactive AMs would be triggered if the HA permit sub-ACL and the total ACL are exceeded.

Economic. The economic impacts of Option B are expected to be positive relative to Option A and No Action. The fishermen enrolled in the HA permit sub-ACL would be able to generate revenue from any species in the broad stock area they are operating in throughout a given fishing year. In the common pool, if a sub-ACL is reached for a stock, the corresponding broad stock area closes. Option B would therefore give HA permit holders a greater opportunity to utilize their catch portfolio throughout a given fishing year. Furthermore, Option B is less restrictive to the HA sub-ACL than Option A. As the HA sub-ACL would comprise a very low percentage of the total ACL for any given species, Option B should have negligible impacts on overfishing.

Social. The social impacts for the HA sub-ACL are expected to be low positive relative to Option A, because the AMs would only be triggered if the total ACL is exceeded. There may be fewer instances that a reactive AM would be triggered under Option B. There may be negative impacts on the *Attitudes, Beliefs, and Values* of other stakeholders towards management, in terms of perceptions of fairness, relative to Option A, because it is would be inconsistent with reactive AMs for sectors and the common pool for the stocks in which there would be a HA sub-ACL.

7.6.3.2 Removal of March 1-20 HA Closure

7.6.3.2.1 Alternative 1: No Action

No Action. Handgear A vessels enrolled in the common pool are required to take a mandatory spawning block out of the fishery and may not fish for, possess, or land regulated multispecies from March 1 – 20 of each year. Vessels enrolled in sectors are exempt from this closure.

Economic. The economic impacts of Alternative 1 are expected to be neutral, and low negative relative to Alternative 2. HA permit holders in the common pool would continue to not be permitted to fish for groundfish with handgear during March 1-20.

Social. The social impacts are expected to be neutral, and low negative relative to Alternative 2.

7.6.3.2.2 Alternative 2: Removal of March 1-20 HA Closure

(PREFERRED ALTERNATIVE) The March 1-20 fishing closure would be removed for all Handgear A vessels, regardless of which sub-ACL their permits are enrolled in.

Economic. The economic impacts of Alternative 2 are expected to be low positive. HA permit holders that are not currently operating in a sector would be positively impacted; though it is unlikely many trips by HA permit holders would occur during this period. For FY 2013, out of 187 trips made by HA permit holders that had groundfish landings, only 6 (3.2%) of these trips occurred during Feb.-Apr. For FY 2012, 15/192 (7.8%) and FY 2011, 52/443 (11.7%) these numbers were slightly higher. Given these figures, it is unlikely that many trips would occur during March 1-20.

Social. The social impacts are expected to be low positive overall relative to No Action. Impacts are expected to be positive for vessels currently enrolled in the common pool and neutral for vessels enrolled in sectors. Not having this closure would improve the flexibility of the HA fishery and be consistent with the sector program. Sectors have been annually exempted from the 20-day spawning block as part of their operations plans. Prior to FY 2010, the Groundfish PDT reviewed the regulations requiring vessels to take 20-day blocks out of the fishery during the spring and agreed that there is no apparent biological benefit from this requirement. This rationale has been used by NMFS to allow sector vessels to be exempt from the 20-day block (see sector EAs). Should this alternative increase fishing on spawning stocks, there may be negative social impacts in the long-term if stock rebuilding is jeopardized.

7.6.3.3 Removal of Standard Fish Tote Requirement

7.6.3.3.1 Alternative 1: No Action

No Action. Vessels fishing with a Handgear A permit are required to have at least one standard tote on board.

Economic. The economic impacts of Alternative 1 are expected to be neutral to HA permit holders and the groundfish fleet. Relative to Alternative 2, Alternative 1 is expected to have low negative impacts to HA permit holders, as it would make deck operations more cumbersome, decreasing economic efficiency.

Social. The social impacts are expected to be neutral, and low negative relative to Alternative 2, as it would continue a regulation that is considered unnecessary by fishery participants.

7.6.3.3.2 Alternative 2: Removal of the Standard Fish Tote Requirement

(PREFERRED ALTERNATIVE) Vessels operating under a HA permit would no longer be required to carry a standard fish tote on board.

Economic. The economic impacts of Alternative 2 are expected to be low positive. HA permit holders are currently required to carry a standard tote onboard, though the U.S. Coast Guard does not currently use totes for at-sea enforcement. As such, there is little incentive for HA permit holders to comply and carry a tote. For those HA permit holders that currently comply, Alternative 2 would free up space onboard for more efficient operations.

Social. The social impacts are expected to be positive relative to No Action. Currently the U.S. Coast Guard does not use totes for at-sea enforcement on handgear vessels. NMFS General Counsel would have an extremely difficult time making a case for an overage on a possession limit, based solely on weight estimates made at sea. Weights measured dockside are the only ones considered official. Thus, this alternative would have a positive impact on the *Attitudes, Beliefs, and Values* of the HA fishery participants towards fishery administration, because it would be removing a regulation that is considered unnecessary. In addition, deck operations would be less cumbersome and safer, if this piece of equipment did not need to be onboard.

7.6.3.4 Sector Exemption from VMS Requirements

7.6.3.4.1 Alternative 1: No Action

No Action. All vessels fishing in a groundfish sector, including those with Handgear A permits, are required to use the Vessel Monitoring System (VMS).

Economic. The economic impacts of Alternative 1 are expected to be neutral for HA permit holders and the groundfish fleet, as it would maintain the status quo, but low negative relative to Alternative 2, as it would be more costly for HA vessels to participate sectors.

Social. The social impacts of Alternative 1 are expected to be neutral, and low negative relative to Alternative 2, as it would not incentivize enrolling in sectors. Many Handgear fishermen may continue viewing participation in the common pool as the only viable option for them

7.6.3.4.2 Alternative 2: Sector Exemption from VMS Requirements

(PREFERRED ALTERNATIVE) A sector may request through its annual operations plans that vessels fishing with handgear in the sector may be exempt from the requirement to use the VMS. Vessels fishing with handgear in a sector must declare trips through the IVR system.

Economic. The economic impacts of Alternative 2 are expected to be neutral to low positive relative to No Action. HA permit holders that are part of a sector would not be required to invest in VMS, though there were not any HA permit holders who made a trip during FY 2013 that were part of a sector. Alternative 2 may encourage HA permit holders to enroll in a sector by allowing them to cut their costs associated with VMS.

Social. The social impacts of Alternative 2 are expected to be positive relative to No Action, as this would reduce the costs to HA vessels enrolling in a sector. This option may incentivize more HA permit holders to enroll in sectors. For the one HA vessel that has already invested in a VMS system, Alternative 2 may increase frustration if the investment is now unnecessary.

7.6.4 Data Confidentiality

7.6.4.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No Action. The price of ACE traded between sectors and the movement of ACE within sectors would remain confidential. Other data on ACE trades between sectors (sectors, date of trade, stocks, amount of ACE) are currently posted to the GARFO website and included in the NEFSC fishery performance report.

Economic. The economic impacts of Alternative 1 are expected to be neutral, as ACE trading would not be affected. Relative to Alternative 2, the direction of economic impacts (positive or negative) would be uncertain, but minor and perhaps low negative (see below).

Social. The social impacts are expected to be neutral. Relative to Alternative 2, the social impacts would be low negative (see below).

7.6.4.2 Alternative 2: ACE Disposition Data Would be Exempt from the Confidentiality Requirement

The value associated with the movement of PSC-determined catch allocations (ACE) within and between sectors would be considered non-confidential and made available to the public. Consistent with current data submission timeframes, price data on trades made between sectors would be made available during the fishing year. Price data on the movement of ACE within sectors would be made available after the end of the fishing year.

Economic. The direction of economic impacts of Alternative 2 (positive or negative) is uncertain. Impacts may range from low positive to positive if sectors and individuals are able to lease more effectively. However, it is difficult to determine the extent to which current inefficiencies in the ACE lease market may be affecting fleet profitability. Furthermore, it is difficult to say how fishermen's leasing behavior would change with public data. For these reasons, the magnitude of the possible benefits associated with Alternative 2 is uncertain.

There may be situations where efficiency considerations would suggest that the lease price on a stock exceeds its ex-vessel price, as owning PSC for that stock would also enable an individual to fish other stocks in the same broad stock area. Holland (2013) found that there have been situations in the BC groundfish ITQ fishery where it would be efficient for the lease price of a stock to exceed its ex-vessel price, though this practice has not been occurring. Stocks with constraining catch limits however have generally exhibited higher lease prices in that fishery. It would not be surprising if similar market behavior occurred in the NE groundfish fishery, as charging a higher lease price than ex-vessel price would likely elicit strong criticism from others in the fishery. In a public lease market, it is still likely that intra-sector PSC leasing and inter-sector ACE leasing would occur more often between individuals that can trust one another through experience. If Alternative 2 is determined to be legal, it has some potential to dramatically change the nature of the ACE market.

Having accurate and complete price data would be very useful in understanding the economics of the fishery. However, requiring that all prices paid be submitted and posted could make the reporting of prices strategic (i.e., incentivize misreporting), and it would be very difficult to enforce accurate reporting of prices. Because multiple stocks are often bundled in a trade, determining the price for each stock in many trades would not be possible. Other trades are fish-for-fish, rather than fish-for-money. Also, some fish are given away or are shared among family members.

Social. The social impacts of Alternative 2 are expected to be low positive relative to No Action. Disclosure of price information may help fishermen involved with ACE transfers to better understand the ACE market when negotiating price. Using what is perceived to be a fair market price may improve the *Attitudes, Beliefs, and Values* of the fishermen. A more transparent market may help match sellers with buyers, such that both can reap the benefits of a trade. Alternative 2 may allow for more use of allocated ACE, which would help preserve the *Size and Demographic Characteristics* of fishing communities. Having this information public would improve public understanding of fishery performance, which may lead to the ability to better determine if the goals and objectives of fishery management are being met.

Alternatively, fishery participants may feel that this alternative would be an overreach into private business affairs. There may also be fishery participants who currently benefit from the private-nature of trading. Thus, Alternative 2 could result in negative impacts on the *Attitudes, Beliefs, and Values* of some stakeholders towards management. Additionally, there may be future negative social impacts if fishery management decisions are based on inaccurate data.

7.6.5 Inshore/Offshore Gulf of Maine

The economic analysis in this section assigns catch to areas considered inshore and offshore as defined by alternatives in Section 4.4.1. The catch attribution method is explained in Section 7.6.1.1.

7.6.5.1 Inshore/Offshore Gulf of Maine Boundary

Management area boundaries are key elements of the ACL distribution system. They may also be applied to other management measures. Impacts of alternatives to divide the existing Gulf of Maine broad stock management area (Figure 1, Figure 5) are identified in this section.

7.6.5.1.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A new inshore/offshore boundary line in the Gulf of Maine would not be established.

Economic. The economic impacts of Alternative 1 are expected to be neutral, and neutral relative to Alternative 2 in the short-term.

Social. The social impacts are expected to be neutral, and neutral relative to Alternative 2. Alternative 1 would have low positive impacts relative to selecting a boundary in Alternative 2 with no associated measures, which might increase uncertainty and consternation of stakeholders, a negative impact to the *Attitudes, Beliefs, and Values* of stakeholders towards management.

7.6.5.1.2 Alternative 2: Establish an Inshore/Offshore Boundary

A new sub-area boundary (Option A, B, or C below) would be established within the Gulf of Maine Management Area to distinguish between inshore and offshore fishing practices. This boundary may be adjusted through subsequent framework action and would not apply to vessels with only state-water groundfish permits (Figure 2).

Option A. Establish an inshore/offshore Gulf of Maine boundary at 70°W longitude.

Economic. The economic impacts to the groundfish fleet of Option A are expected to be neutral in the short-term. If, however, inshore/offshore GOM cod sub-ACLs (Section 4.4.2) were established in conjunction with the boundary line, the fleet would be impacted. Section 7.6.5.2.2 contains the impacts of the combined management actions. Option A could lead to future inshore/offshore Gulf of Maine management actions. As it is not known what these future actions would be, the direction and magnitude of long-term economic impacts of Option A are uncertain.

Social. The social impacts of Option A are expected to be neutral relative to No Action, because the option would just establish a boundary with no measures associated with it. Impacts would occur, however, if Option A is selected in conjunction with alternatives in later parts of this section. The boundary of Option A intersects state waters near Portland, Maine and the northern tip of Cape Cod, Massachusetts. Therefore, portions of the "offshore" area actually border the coastline. Using this line to distinguish between inshore and offshore fishing practices, but splitting the coast may cause negative social impacts in the future depending on what regulations are established relative to this line. If Option A is selected and no other action alternatives are selected in other sub-sections of Section 4.4, there could be negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management, if a boundary is drawn in the ocean with no purpose.

Option B. Establish an inshore/offshore Gulf of Maine boundary at 70°15'W longitude.

Economic. The economic impacts of Option B to the groundfish fleet are expected to be neutral in the short-term. If, however, inshore/offshore GOM cod sub-ACLs (Section 4.4.2) were established in conjunction with the boundary line, the fleet would be impacted. Section 7.6.5.2.2 contains the impacts of the combined management actions. Option B would result in a smaller inshore area than in Option A. Option B could lead to future inshore/offshore Gulf of Maine management actions. As it is not known what these future actions would be, the direction and magnitude of long-term economic impacts of Option B are uncertain.

Social. The social impacts of Option B are expected to be neutral relative to No Action, because the option would just establish a boundary with no measures associated with it. Impacts would occur, however, if this option is selected in conjunction with alternatives in later parts of this section. The boundary in Options B intersects state waters near Portland, Maine and the northern tip of Cape Cod, Massachusetts. Therefore, portions of the "offshore" area actually border the coastline. Using this line to distinguish between inshore and offshore fishing practices, but splitting the coast may cause negative social impacts in the future depending on what regulations are established relative to this line. Part of the rationale for Options B is to "create a distinction between the day-boat and trip boat fleets," but it is unclear how this would be accomplished or the purpose of this distinction. If Option B is selected, and no other action alternatives are selected in other sub-sections of Section 4.4, there could be negative impacts on the *Attitudes,* *Beliefs, and Values* of stakeholders towards management, if a boundary is drawn in the ocean with no purpose.

Option C. Establish an inshore/offshore Gulf of Maine boundary from where 42°N intersects Cape Cod, Massachusetts, runs east to 69°50'W, runs north along 69°50'W to the 12 nm territorial sea line, then follows Maine's 12 nm territorial sea line northeast to the Hague Line.

Economic. The economic impacts to the groundfish fleet are expected to be neutral in the short-term. If, however, inshore/offshore GOM cod sub-ACLs (Section 4.4.2) were established in conjunction with the boundary line, the fleet would be impacted. Section 7.6.5.2.2 contains the impacts of the combined management actions. Option C would result in a larger inshore area than in Options A and B. Option C could lead to future inshore/offshore Gulf of Maine management actions. As it is not known what these future actions would be, the direction and magnitude of long-term economic impacts of Option C are uncertain.

Social. The social impacts are expected to be neutral relative to No Action, because the alternative would just establish a boundary with no measures associated with it. Impacts would occur, however, if this alternative is selected in conjunction with alternatives in later parts of this section. Part of the rationale for Option C is to "create a distinction between the day-boat and trip boat fleets," but it is unclear how this would be accomplished or the purpose of this distinction. Relative to Options A and B, Option C may more likely accomplish that purpose, depending on accompanying measures, because Option C includes more of the coastal area. A portion of Option C that is "inshore GOM" actually lies within the GB Broad Stock Area. This could be a source of confusion for stakeholders. If Alternative 2 is selected, and no other action alternatives are selected in other sub-sections of Section 4.4, there could be negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management, if a boundary is drawn in the ocean with no purpose.

7.6.5.2 Inshore/Offshore Gulf of Maine Cod sub-ACLs

7.6.5.2.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) A sub-ACL would not be established within the commercial ACL for Gulf of Maine cod in the Gulf of Maine management sub-areas (identified in Section 4.4.1.2). No new strata for observer coverage would be created.

Economic. The economic impacts of Alternative 1 are expected to be neutral in the short-term. There would still be an inshore/offshore boundary line established, and it is possible that other spatial management measures could be taken in the future. Alternative 1 is expected to have positive economic impacts relative to Alternative 2 (see below).

Social. The social impacts of Alternative 1 are expected to be neutral in the short-term, and positive relative to Alternative 2 (see below). If the Council selects an inshore/offshore boundary alternative in Section 4.4.1.2, and then selects this alternative, there could be negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management, because the purpose of establishing the boundary would be unclear.

7.6.5.2.2 Alternative 2: Establish Inshore/Offshore Commercial GOM Cod sub-ACL

Within the commercial ACL for GOM cod, establish a sub-ACL for the inshore and offshore Gulf of Maine management sub-areas, as identified in Section 4.4.1.2. This alternative would change neither the GOM cod ACL setting process nor the ACL distribution between the commercial and recreational fishery. The commercial sub-ACL would be set during each specifications process. Provisions for a sub-ACL control rule, commercial allocation, and catch monitoring are outlined below. This alternative would not change catch attribution methods for federally-permitted vessels fishing in state waters. The distribution of allocation within the commercial fishery would remain unchanged.

Economic. The economic impacts of Alternative 2 are expected to be negative under inshore/offshore GOM boundary Options A, B, and C (Section 4.4.1.2) relative to No Action. Fishing behavior for many vessels in the GOM would likely be impacted. As there would be no reallocation of PSC at the permit level, there would likely a discrepancy between the resulting inshore/offshore PSC allocation and the ideal catch composition at the vessel level. For instance, some smaller vessels are not capable of fishing far offshore and would be unable to use the associated PSC. As a result, these vessels would have to lease in inshore GOM cod quota to have the same harvesting opportunities as they would under No Action. A more detailed example is provided later in this section.

The creation of inshore/offshore GOM cod PSC would likely increase reliance on the ACE leasing market. Sector managers would be faced with the challenge of determining appropriate lease prices for inshore/offshore GOM cod (with the likelihood of low GOM cod ACLs in the near term, the lease prices are likely to remain high). Vessel owners would also experience difficulties in matching PSC with their resulting inshore/offshore catch. The challenges that would face sector managers and vessel owners increase transaction costs in the ACE leasing market.

The catch reporting provision of Alternative 2 would have uncertain economic impacts (in direction and magnitude) on the groundfish fishery, as details are not developed in this action. The inshore/offshore areas under this alternative do not correspond to existing statistical areas, meaning VTRs alone could not be used to attribute catch to one area or another. Modifications to catch reporting may not necessarily result in a cost to the industry, but there is an overall cost to the nation and likely an opportunity cost associated with time spent developing and implementing a new system of catch reporting.

The majority of GOM cod caught from FY 2010-2013 was caught inshore under all three boundary options, though the percentage of inshore GOM cod catch decreased over time (Table 93). Alternative 2 would likely allocate a large portion of the GOM cod ACL to the inshore sub-ACL, giving assurance that vessels fishing offshore would not be able to impact the inshore GOM sub-ACL. The vast majority of GOM cod caught by vessels >75’ was offshore during FY 2013 under Options A and B (Table 94). Vessels in the 50-75’ range were evenly split in their GOM cod catch under Options A or B, but had the majority of their catch inshore under Option C during FY 2013. Vessels in the 30-<50’ range had around 75% of their GOM cod catch occur inshore under Options A and B during FY 2013, and around 84% occurred inshore under Option C (Table 93). Under all three options, the 30-<50 vessels comprised over 60% of the total inshore GOM cod catch during FY 2013 (Table 95).

As mentioned, the percentage of GOM cod caught inshore has been decreasing. Around 80% of GOM cod was caught inshore during FY 2011 and FY 2012, but the number dropped to below 60% in FY 2013 (Table 93). Furthermore, the percentage of inshore groundfish catch that was GOM cod was approximately cut in half from FY 2011 to FY 2013 (Table 96). During the same time period, the percentage of offshore catch that was GOM cod decreased from 8.5% to 2.6% (Table 97). These percentages are similar for Options A and Option B, as much of the increased inshore area in Option A is in the WGOM closure area.

Option C would create a larger inshore area than Options A and B by extending farther east in blocks 513 and 514 and continuing along Maine territorial waters in blocks 513, 512, and 511. The larger area does have a fairly significant impact on how GOM catch broke down in FY 2013. Around 75% of GOM cod catch in FY 2013 was inshore under Option C vs. <60% for Options A and B (Table 93). Vessels in the 30-50' category also comprised a smaller percentage of inshore GOM cod catch vs. other size classes under Option C in FY 2013. However, under the Option C boundary, the 30-50' vessels still landed >60% of the inshore GOM cod in FY 2013, though they still landed the majority vs. other size classes (Table 95).

Establishing sub-ACLs would likely harm the groundfish fleet and the inshore vessels in particular. The method of distributing allocation would not change, meaning an individual's inshore and offshore PSC could effectively lose value. For example, if an individual that is only capable has 2 PSC of GOM cod and the ACL was 200 mt, they would have the opportunity to catch 4 mt of GOM cod. Now, if 80% of the GOM cod ACL was allocated to the inshore sub-ACL, the inshore sub-ACL would be 160 mt and the offshore sub-ACL would be 40 mt. That same individual would have 2 PSC for both sub-ACLs, but will only have 3.6 mt (2% of 180) of inshore GOM cod to catch and will be unable to fish the offshore allocation. Given this example, sub-ACLs would be particularly harmful to vessels that are limited in their operational flexibility. The impacts of establishing sub-ACLs for GOM cod will also depend on what the method of allocation is between inshore and offshore (discussed below) and what declaration time period is chosen (Section 7.6.5.4).

The GOM cod ACL will be severely constricting in FY 2015 and possibly beyond. Given this reality, it is imperative that the ACL is used in a manner that would offer the greatest benefits to the groundfish fleet. Alternative 2 would essentially be forcing the groundfish fleet to use the ACL in a pre-determined manner. It is possible that the allocation between inshore and offshore would be close to the catch distribution that would have occurred otherwise under Alternative 1. However, this is likely a best case scenario for Alternative 2 and would offer no fishery benefits.

Social. The social impacts of Alternative 2 are expected to be negative relative to No Action, particularly on smaller vessels with a limited fishing range, because it would reduce their fishable GOM cod PSC. There would be more reliance on the leasing market, as the inshore vessels would be incentivized to lease out offshore GOM cod, and lease in inshore GOM cod. However, sectors could choose to divide allocations of inshore and offshore GOM cod between their members in a way that reduces the burden of trading, assuming membership is diverse enough to do so (i.e., not all inshore or offshore vessels). Likewise, sectors with vessels that may fish in the offshore subarea would likely lease more (offshore) quota or transfer it within the sector to those vessels, but all of their original PSC is still available to them to fish (unlike inshore vessels that may not fish their offshore portion). Small vessels with offshore GOM cod PSC, may be incentivized to fish offshore in unsafe conditions, a negative impact on the *Non-Economic Social Aspects* of the fishery. For larger vessels, a portion of their PSC they may only fish inshore. There would be less flexibility to fish throughout the GOM as fish distribution and markets determine. However, this alternative would likely have more negative impacts on smaller vessels.

The social impacts of the commercial allocation provision are expected to be neutral, because the allocation would not change. As noted above, this may cause an increased reliance on the leasing ACE lease where there are discrepancies between what a fisherman holds and what is needed. Alternative 2 is not expected to promote fleet diversity.

The social impacts of the catch reporting provision are unknown. Details are not developed in this action. Creating the sub-ACLs would create new strata for observer coverage. This may change the observer coverage needed to achieve monitoring requirements, during a time when there are less available funds for observers. This could have negative social impacts on the fishery. It would be difficult to delineate catch between the inshore and offshore areas, because they are not contiguous with statistical areas. VTRs cannot be used alone, or would need to be modified, to monitor these sub-ACLs. This would create an exception, and thus a complication, to using VTRs to monitor which ACL to charge for a groundfish stock. These complications may have negative impacts on the *Attitudes, Beliefs, and Values* of fishermen towards the administration of these measures.

Table 93 - Inshore and offshore GOM cod catch (lbs) on all trips by fishing year

	2010			2011			2012			2013		
Option	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore
A	5,828,816	1,165,561	83.3%	6,804,634	1,083,022	86.3%	2,842,540	653,923	81.3%	641,762	433,863	59.7%
B	5,340,611	1,653,767	76.4%	6,421,279	1,466,376	81.4%	2,802,252	694,212	80.1%	628,461	447,165	58.4%
C	6,451,496	515,932	92.6%	7,358,700	504,507	93.6%	3,205,559	275,562	92.1%	798,549	265,141	75.1%

Table 94 - Inshore and offshore GOM catch by vessel size on all trips in FY 2013

	<30'			30-<50'			50-<75'			>75'		
Option	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore	Inshore	Offshore	% Inshore
A	3,578	241	93.7%	443,679	145,011	75.4%	168,049	171,309	49.5%	26,456	117,302	18.4%
B	2,740	1,079	71.7%	431,554	157,136	73.3%	167,799	171,559	49.4%	26,368	117,390	18.3%
C	3,721	98	97.4%	490,710	92,798	84.1%	240,773	94,022	71.9%	63,345	78,223	44.7%

Table 95 - Percentage of inshore and offshore GOM cod catch by vessel size on all trips in FY 2013

	<30'		30-<50'		50-<75'		>75'	
Option	Inshore	Offshore	Inshore	Offshore	Inshore	Offshore	Inshore	Offshore
A	0.6%	0.1%	69.1%	33.4%	26.2%	39.5%	4.1%	27.0%
B	0.4%	0.2%	68.7%	35.1%	26.7%	38.4%	4.2%	26.3%
C	0.5%	0.0%	61.5%	35.0%	30.2%	35.5%	7.9%	29.5%

Table 96 - Percentage that is cod of inshore GOM groundfish catch on all trips by fishing year

Option	2010	2011	2012	2013
A	59.2%	50.9%	39.9%	25.9%
B	61.5%	51.8%	40.3%	26.5%
C	49.7%	43.2%	29.5%	14.8%

Table 97 - Percentage that is cod of offshore GOM groundfish catch on all trips by fishing year

Option	2010	2011	2012	2013
A	8.8%	6.7%	3.4%	2.6%
B	11.5%	8.5%	3.6%	2.6%
C	5.4%	4.2%	2.0%	2.1%

Determining the GOM cod inshore/offshore split

Option A. During each GOM cod specifications process, the Council would determine the control rule to be used at the time to determine the split between the inshore and offshore sub-ACLs. The control rules could be based on cod distribution, catch, different time periods, etc.

Economic. The economic impacts of Option A are expected to be low negative relative to Options B and C. There would be increased flexibility in setting the sub-ACLs for GOM cod compared to Options B and C. However, without rigid criterion, the sub-ACLs could very well be set at inappropriate levels.

Social. The social impacts of Option A are expected to be negative relative to No Action and negative relative to Options B and C, where at least the basis for determining the split would be known. Under Option A, the decision on the split would be subject to future Council action. This option may create a sense of uncertainty within the fishery and inhibit business planning, both negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders.

Option B. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of commercial catch in each sub-area. Two sub-options for the fishing years used to determine the level of catch are considered.

Economic. The economic impacts of Option B are expected to be low negative, but low positive relative to Option A. Under Option B, the allocation of the sub-ACL would be made in accordance with the catch history between the two areas. Vessels fishing inshore in the GOM comprised a decreasing percentage of GOM cod catch from 2010-2013 (Table 93). The vessels fishing inshore would receive the majority of the GOM cod sub-ACL under Option B and may receive a larger proportion of the GOM cod sub-ACL than the proportion of the ACL they have caught in recent fishing years. If this is the case, vessels fishing inshore may be positively impacted by Option B relative to Option C and vessels fishing offshore may be negatively impacted.

Social. The social impacts of Option B are expected to be positive relative to Option A, in terms of the *Attitudes, Beliefs, and Values* of the industry towards management, because basis for determining the split would be known, allowing more certainty for the future and business planning. Catches are an artifact of the management boundaries in place at the time. There would likely be less fishery disruption if the sub-ACL is set according to catch history rather than fish distribution. Thus, there may be more impacts from Option B than C.

Sub-Option A. The last 10 fishing years prior to the year in which the specifications are developed.

Economic. The economic impacts of sub-Option A are expected to be low positive relative to sub-Option B. Under sub-Option A, the allocation of the sub-ACL would be made in accordance with the catch history between the two areas over the last 10 fishing years. As the population of GOM cod has undergone major changes over the last 10 fishing years and would continue to do so, sub-Option A would capture these changes, but would not weigh recent fishing years more heavily. The long-term economic impacts of such an approach are uncertain but likely minor.

Social. The social impacts of sub-Option A are expected to be positive relative to sub-Option B. Fishing is more concentrated in the GOM today than it was 20 years ago, and sub-Option A would more closely reflect the distribution of fishing today; so there would be less fishery disruption than under sub-option B. There are data quality issues to consider as well. VMS started to be used fishery-wide in 2007 and provides more fine-scale position information than VTRs, which assign one point to each trip. Data prior to 2007 would be based entirely on VTRs. Thus, the quality of the data would be better under sub-Option A than B. However, VMS cannot distinguish between fishing and transiting, so VMS data are less than ideal for this purpose.

Sub-Option B. The last 20 fishing years prior to the year in which the specifications are developed.

Economic. The economic impacts of sub-Option B are expected to be low negative relative to sub-Option A. Under sub-Option B, the allocation of the sub-ACL would be made in accordance with the catch history between the two areas over the last 20 fishing years. As the population of GOM cod has undergone major changes over the last 20 fishing years and would continue to do so, sub-Option B would capture these changes, but would not weigh recent fishing years more heavily. The long-term economic impacts of such an approach are uncertain but likely minor, but including 10 additional fishing years relative to sub-Option A may include data that is of little relevance to the current fishery.

Social. The social impacts of sub-Option B are expected to be negative relative to sub-Option A. Fishing is more concentrated in the GOM today than it was 20 years ago, and sub-Option A would more closely reflect the distribution of fishing today; so there would be more fishery disruption than under sub-option B. Under sub-Option B, there may be more offshore sub-ACL assigned than is currently fished. There are data quality issues to consider as well. VMS started to be used fishery-wide in 2007 and provides more fine-scale position information than VTRs, which assign one point to each trip. Data prior to 2007 would be based entirely on VTRs. Thus, the quality of the data would be better under sub-Option A than B. However, VMS cannot distinguish between fishing and transiting, so VMS data are less than ideal for this purpose.

Option C. The split between the inshore and offshore GOM cod sub-ACLs would be set proportional to the level of GOM cod distribution in each area. Two sub-options for the calendar years used to determine the level of fish distribution are considered.

Economic. The economic impacts of Option C are expected to be negative, and low negative relative to Option B. Relative to Option A, the economic impacts of Option C would be low positive. Under Option C, the allocation of the sub-ACL would be made in accordance with the

GOM cod distribution history between the two areas. As commercial catch is largely a function of fish population, Option C should be relatively similar to Option B but would be based off a metric that is less certain than catch. The inshore fleet would likely receive the majority of the GOM cod sub-ACL under Option C, and may receive a larger proportion of the GOM cod sub-ACL than the proportion of the ACL they have caught in recent fishing years. If this is the case, vessels fishing inshore may be positively impacted by Option C relative to Option B and vessels fishing offshore may be negatively impacted.

Social. The social impacts of Option C are expected to be low positive relative to Option A and negative relative to Option B. There may be negative impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management. GOM cod is assessed as one stock, not at a finer scale, so it would thus be difficult to determine the accurate proportion of cod distribution. There may also be a negative impact of implicitly recognizing the importance of the distribution at a finer scale than the current stock assessment, but not making any related changes to the assessment. Relative to Option A, the social impacts are expected to be low positive, in terms of the *Attitudes, Beliefs, and Values* of the industry towards management, because basis for determining the split would be known, allowing more certainty for the future and business planning. Relative to Option B, the social impacts are expected to be negative, because fishery effort has shifted inshore in recent years, more than fish distribution has, which would result in less inshore GOM cod sub-ACL available.

Sub-Option A. The last 10 calendar years prior to the year in which the specifications are developed.

Economic. The economic impacts of sub-Option A are expected to be low positive relative to sub-Option B. Under sub-Option A, the allocation of the sub-ACL would be made in accordance with the distribution history between the two areas over the last 10 calendar years. As the population of GOM cod has undergone major changes over the last 10 calendar years and would continue to do so, Sub-Option A would capture these changes, more so than sub-Option B, but would not weigh recent fishing years more heavily. The long-term economic impacts of such an approach are uncertain but likely minor. Furthermore, population history is less certain than catch history.

Social. The social impacts of sub-Option A are expected to be positive relative to sub-Option B, because it would better reflect the present day fishery and cause less fishery disruption.

Sub-Option B. The last 20 calendar years prior to the year in which the specifications are developed.

Economic. The economic impacts of sub-Option B are expected to be low negative relative to sub-Option A. Under sub-Option B, the allocation of the sub-ACL would be made in accordance with the distribution history between the two areas over the last 20 calendar years. As the population of GOM cod has undergone major changes over the last 20 calendar years and would continue to do so, sub-Option B would capture these changes, less so than sub-Option B, but would not weigh recent fishing years more heavily. The long-term economic impacts of such an approach are uncertain but likely minor. Furthermore, population history is less certain than catch history.

Social. The social impacts of sub-Option B would be negative relative to sub-Option A, because sub-Option A would better reflect the present day fishery and cause less fishery disruption.

Commercial Catch Monitoring

With an observer or monitor. If a commercial trip carries an observer or monitor, the vessel may declare into and fish in both the inshore and offshore areas.

Without an observer or monitor. Commercial vessels would be prohibited from fishing in both the inshore and offshore Gulf of Maine areas on a single trip without an observer (or electronic monitoring technology, should such be approved in the future), which can correctly attribute catch to each area. Vessels could only fish in a single area on a given trip. If the vessel wishes to fish in the inshore area, the vessel must declare and execute its intent to fish in the inshore area exclusively for the trip. Declarations would be made to the sector manager via the Trip Start Hail. Without an observer or monitor, if the vessel declares into more than one Broad Stock Area on the trip (e.g., Georges Bank and Gulf of Maine), the vessel is prohibited from fishing in the inshore GOM Area.

Economic. The economic impacts of this provision are expected to be neutral, as sectors have already agreed to these monitoring provisions in their operations plans since FY 2014. As the GOM cod sub-ACLs would be quite small initially, accurately tracking catch between the two areas would be critical. Limiting vessels to one area without an observer on board would limit the flexibility of some vessels fishing in the GOM.

Social. The social impacts of the catch monitoring provision are expected to be neutral relative to No Action, because this reflects what sectors have voluntarily agreed to through sector operations plans since FY 2014. However, this provision would remove the choice of a sector to agree to this plan. On the other hand, administrative burden of sectors would be reduced if they did not have to go through the annual process to have this approved. There may be some negative impacts on the *Attitudes, Beliefs and Values* of stakeholders towards management, because a monitoring program would be established to collect data at a finer scale than that at which GOM cod is assessed, yet the assessment is not structured to use finer-scale information. The utility of the data for the assessment would be limited.

7.6.5.3 GB/GOM Inshore Restricted Roller Gear Area

7.6.5.3.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) No Action. The current GOM/GB Restricted Roller Gear Area would not be revised. In Figure 3, the polygon in aqua is the current trawl roller area (12" max) for all trawls fishing under a groundfish DAS or sector trip (i.e., not shrimp).

Potential No Action. Pending Habitat OA2 approval and implementation, the 12" roller gear restriction would be applied to all bottom trawl gear.

Economic. The economic impacts of No Action to the groundfish fishery and other fisheries are expected to be neutral. The economic impacts of the Potential No Action are expected to be low positive to the groundfish fleet. Vessels fishing for shrimp would be negatively impacted.

Social. The social impacts of No Action are expected to be neutral, but negative relative to the Potential No Action, as the Potential No Action may improve the sense of fairness between fisheries, a positive impact on the *Non-Economic Social Aspects* of the fishery.

7.6.5.3.2 Alternative 2: Revise GOM/GB Inshore Restricted Roller Gear Area

The GOM/GB Inshore Restricted Roller Gear Area would be revised to be consistent with the boundary alternative (and option) selected in Section 4.4.1.2. With either boundary alternative, this area would be smaller than the current No Action alternative (Section 4.4.3.1).

Economic. The short-term economic impacts of Alternative 2 are expected to be neutral to low positive if boundary Option A or B is selected in Section 4.4.1.2, as the gear restricted area would be smaller than the status quo. Vessels fishing offshore with roller gear may have slightly more opportunity to fish further inshore with a smaller gear restricted area. The long-term economic impacts of Alternative 2 are expected to be uncertain, as any potential harm to inshore vessels may outweigh the additional flexibility provided to offshore vessels. If boundary Option C is selected in Section 4.4.1.2, the gear restricted area be larger and would include the entire coast of Maine, though very little groundfish fishing is currently occurring in that area. Under Option C, the short-term economic impacts of Alternative 2 are expected to be neutral to low negative and the long-term impacts are expected to be uncertain.

Social. The social impacts of Alternative 2 are expected to be neutral relative to No Action or the Potential No Action. Management would be simplified by aligning boundaries, a positive impact on the *Attitudes, Beliefs, and Values* of stakeholders towards management. If boundary Option A or B is selected in Section 4.4.1.2, the gear restricted area would decrease in size, so vessels with larger rockhoppers could fish in additional areas, a positive social impact for these vessels. There may be increased gear conflicts as a result, a negative impact on the *Non-Economic Social Aspects* of the fishery. If Option C is selected, the GOM/GB Inshore Restricted Roller Gear Area would substantially increase. This would restrict vessels fishing with larger roller gear, a negative impact for these vessels, but there may be less gear conflict if fewer vessels may fish in this area, a positive impact on the *Non-Economic Social Aspects* of the fishery.

Additional notes. NMFS does not collect data on rockhopper size, so identifying how many industry members would be impacted and where they are from is difficult. Discussions with one industry representative from Gloucester, MA indicate that most offshore trawl vessels already use 12” rockhoppers if they are fishing in the GOM, so they can make tows within the current GOM/GB Inshore Restricted Roller Gear Area at the beginning or end of a trip. It is likely that Alternative 2 would not substantially change how the fishery operates, so impacts are expected to be minor.

Note that there could be impacts to the monkfish and skate fisheries. Should the Potential No Action be implemented, the boundary would change for those fisheries as well, yet as above, the impacts could be positive or negative depending on the boundary selected.

7.6.5.4 Declaration Time Periods for the Commercial Fishery

7.6.5.4.1 Alternative 1: No Action

(PREFERRED ALTERNATIVE) Time periods would not be specified for which a commercial vessel must declare into or out of one of the Gulf of Maine management sub-areas, as defined in Section 4.4.1.2.

Economic. The economic impacts of Alternative 1 are expected to be neutral, and positive relative to Alternatives 2-4. Groundfish vessels would continue to fish inshore and offshore on the same trip with an observer onboard, but may be restricted to one area if an observer is not on board, given the observer provision in Section 4.4.2.2. Alternative 1 would be less restrictive to groundfish vessels than Alternatives 2-4.

Social. The social impacts are expected to be neutral, and positive relative to Alternatives 2-4.

7.6.5.4.2 Alternative 2: Annual Declaration

For each fishing year, commercial vessels must declare their intent to fish in either the inshore or the offshore Gulf of Maine management sub-area, as defined in Section 4.4.2.2. Vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given fishing year. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Economic. The economic impacts of Alternative 2 are expected to be negative compared to Alternatives 1, 3, and 4. Groundfish vessels which have historically fished in both inshore and offshore Gulf of Maine would be negatively impacted, as it would be no longer be possible to make groundfish trips to both areas in a given fishing year. While the percentage of GOM cod that is caught inshore had been consistently over 80% under Option A in FY 2010-2012 and >90% under Option C during the same time period (Table 93), the percentage of inshore groundfish catch that is cod has decreased dramatically from FY 2010-2013 (Table 96). The percentage of offshore catch that is cod has also decreased from FY 2010-2013, but was generally never >10% (Table 97). In terms of total groundfish catch and revenue from FY 2010-2013, the story is similar. There has been a large decrease in the proportion of groundfish catch and revenue that is generated inshore on groundfish trips (Table 98 and Table 99).

Vessels that have historically fished entirely inshore may be low positively impacted relative to No Action, as GOM cod ACE would be made available to them from vessel owners that declare into the offshore region. Because all members of the inshore fleet would be unable to pay a high price for the ACE, and all members of the offshore fleet would be actively looking to lease what they cannot use, the inshore fleet may be able to profit off the additional ACE. Vessels that have historically fished mainly offshore would likely be minimally impacted. These vessels would possess little, if any, GOM cod ACE for inshore waters, so no fishing opportunity would be lost, and they would not be forced to lease any ACE at a low price.

Among vessels that submitted VTRs that included at least one trip to inshore and offshore GOM in FY 2013, a vast majority of revenue was generated offshore under boundary line Options A and B (Table 100). Both inshore and offshore revenues are considerably higher under Option C, indicating that Alternative 2 may be particularly harmful to some groundfish vessels under the Option C boundary line. Vessels in the 30-50' range have generally fished inshore on their groundfish trips in recent years, while vessels in the >75' range have generally fished offshore (Table 101).

Social. The social impacts of Alternative 2 are expected to be negative relative to Alternatives 1, 3, and 4, as this would be the most restrictive alternative. This alternative may impact larger vessels the most, those that are capable of fishing in both the inshore and offshore areas. Larger vessels would have to face tough decisions. With either declaration, they would forgo opportunities to fish in the other area for the entire year. Due to safety concerns, they may elect to declare only into the inshore area. Vessels could still be able to lease out the GOM cod for the area that they do not declare into, so the negative impacts of Alternative 2 would be somewhat mitigated.

7.6.5.4.3 Alternative 3: Seasonal Declaration

For each trimester as defined below, commercial vessels must declare their intent to fish in either the inshore or the offshore Gulf of Maine management sub-area, as defined in Section 4.4.1.2. Vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for a given season. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Trimester 1: May 1 – August 31

Trimester 2: September 1 – December 31

Trimester 3: January 1 – April 30

Economic. The economic impacts of Alternative 3 are expected to be negative relative to No Action, but low positive relative to Alternative 2. If Alternative 3 is selected, groundfish vessels which have historically fished in both inshore and offshore Gulf of Maine would be negatively impacted, as it would no longer be possible to do so in a given trimester. If these vessels tend to fish more inshore during summer and more offshore during winter, then Alternative 3 may be less negatively impactful to them than Alternative 2. For example, some vessels may declare inshore in trimester 1, and offshore in trimesters 2 and 3. If this were to occur, the inshore vessels that may benefit from leasing in GOM cod ACE under Alternative 2 would see smaller benefits under Alternative 3. Vessels that have historically fished mainly offshore will likely be minimally impacted by Alternative 3. These vessels would possess little, if any, GOM cod ACE for inshore waters, so no fishing opportunity will be lost, and they will not be forced to lease any ACE at a low price.

Social. The social impacts of Alternative 3 are expected to be negative relative to No Action and Alternative 4, but positive relative to Alternative 2. This alternative may impact larger vessels the most, those that are capable of fishing in both the inshore and offshore areas. Larger vessels would have to face tough decisions, but not as tough as Alternative 2. With either declaration, they would forgo opportunities to fish in the other area for the trimester. Due to safety concerns, they may elect to declare only into the inshore area, particularly in winter. Vessels could lease out the GOM cod for the area that they do not declare into, so the negative impacts of Alternative 3 would be somewhat mitigated.

7.6.5.4.4 Alternative 4: Trip Declaration

For each trip, vessels would need to choose whether they would fish for GOM cod entirely within the inshore or offshore GOM area for the trip. Vessels may only fish in the non-declared area on a non-groundfish trip when declared out of the fishery. If a vessel elects to declare into the offshore GOM cod area, the inshore GOM cod ACE associated with its permits could be leased to sectors that have vessels declared into the inshore area. The converse for offshore GOM cod is also true.

Economic. The economic impacts of Alternative 4 are expected to be low negative relative to No Action, but positive relative to Alternatives 2 and 3. Groundfish vessels which have historically fished in both inshore and offshore Gulf of Maine would be negatively impacted, though not to the same extent as under Alternatives 2 or 3. Vessels that have fished entirely inshore would likely be minimally impacted, as would vessels that have historically fished mainly offshore. Under Option A and B, there were few groundfish trips that had VTRs submitted for both inshore and offshore areas in FY 2013 (Table 102). The number of trips is considerably higher under Option C, indicating that the negative impacts of Alternative 4 would increase under the Option C boundary line.

Social. The social impacts of Alternative 4 are expected to be low negative relative to No Action, but positive relative to Alternatives 2 and 3. Each trip, vessels would only be able to catch GOM cod in the area they declared into, but there would be more flexibility than Alternatives 2 and 3. Vessels could lease out the GOM cod for the area that they do not declare into, so the negative impacts of Alternative 4 are expected to be somewhat mitigated. However, with a trip declaration, this may occur less relative to Alternatives 2 and 3.

Table 98 - Inshore and offshore GOM groundfish catch (lbs.) on all trips by fishing year

Option	2010 Inshore	2010 Offshore	2010 % Inshore	2011 Inshore	2011 Offshore	2011 % Inshore	2012 Inshore	2012 Offshore	2012 % Inshore	2013 Inshore	2013 Offshore	2013 % Inshore
A	9,542,669	13,151,249	42.0%	12,622,284	16,164,782	43.8%	6,990,249	19,098,327	26.8%	2,434,635	16,776,278	12.7%
B	8,396,146	14,297,771	37.0%	11,661,666	17,125,400	40.5%	6,822,707	19,265,869	26.2%	2,334,436	16,876,477	12.2%
C	12,640,727	9,498,703	57.1%	16,240,909	11,899,769	57.7%	10,744,847	13,758,670	43.9%	5,364,794	12,905,111	29.4%

Table 99 - Inshore and offshore GOM groundfish revenue on all trips by fishing year

Option	2010 Inshore	2010 Offshore	2010 % Inshore	2011 Inshore	2011 Offshore	2011 % Inshore	2012 Inshore	2012 Offshore	2012 % Inshore	2013 Inshore	2013 Offshore	2013 % Inshore
A	$17,978,378	$15,600,447	53.5%	$21,995,633	$18,438,366	54.4%	$13,432,330	$21,851,862	38.1%	$4,551,257	$19,122,640	19.2%
B	$16,149,950	$17,428,875	48.1%	$20,498,537	$19,935,462	50.7%	$13,133,507	$22,150,684	37.2%	$4,387,477	$19,286,420	18.5%
C	$22,425,542	$10,684,772	67.7%	$26,974,316	$12,805,961	67.8%	$19,250,748	$14,774,795	56.6%	$8,785,843	$14,014,243	38.5%

Table 100 - Vessels that submitted VTRs on groundfish trips for inshore and offshore GOM in FY 2013 and associated revenue

Option	# Vessels that fished in both areas	Inshore revenue by such vessels	Offshore revenue by such vessels
A	47	$1,752,360	$8,734,941
B	57	$2,549,609	$8,122,647
C	68	$5,230,849	$12,151,777

Table 101 - Inshore and offshore GOM groundfish revenue by vessel size on groundfish trips in FY 2013

Option	<30' Inshore	<30' Offshore	<30' % Inshore	30-<50' Inshore	30-<50' Offshore	30-<50' % Inshore	50-<75' Inshore	50-<75' Offshore	50-<75' % Inshore	>75' Inshore	>75' Offshore	>75' % Inshore
A	$642	$0	100.0%	$3,056,294	$3,621,888	45.8%	$1,328,037	$7,431,968	15.2%	$166,284	$8,068,785	2.0%
B	$642	$0	100.0%	$2,927,721	$3,750,461	43.8%	$1,311,064	$7,448,941	15.0%	$148,051	$8,087,018	1.8%
C	$642	$0	100.0%	$4,316,915	$2,187,761	66.4%	$3,341,953	$5,217,201	39.0%	$1,126,333	$6,609,281	14.6%

Table 102 - Groundfish trips that had VTRs submitted for inshore and offshore GOM in FY 2013 and associated revenue

Option	# Trips to Both Areas	Inshore revenue on trips to both areas	Offshore revenue on trips to both areas
A	24	$93,617	$279,980
B	23	$90,144	$274,639
C	146	$1,145,334	$1,702,647

7.6.6 Redfish Exemption Area

7.6.6.1 Alternative 1: No Action

There would continue to be no specific redfish exemption area established in the FMP. Sectors may be given exemptions from groundfish regulations. In recent years, sectors have annually requested an exemption from the currently required 6.5” minimum groundfish mesh to target redfish. Common pool vessels are not allowed to fish with this exemption.

The sector exemption published in the FY 2015-2016 Sector Rule regarding redfish is as follows. Allow commercial vessels fishing in sectors to use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4) with the stipulations below. Vessels would be subject to the standard groundfish monitoring coverage levels. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (NMFS 2015c).

Economic. The economic impacts of Alternative 1 are expected to be neutral relative to Alternative 2. A redfish exemption area would not be established in the FMP, though sectors would still benefit from the annual sector exemption if granted. The impacts of the Status Quo sector exemption would be positive relative to not having an exemption as quota utilization may be improved.

Social. The social impacts of Alternative 1 are expected to be neutral, and neutral relative to Alternative 2. Under Alternative 1, the annual exemption process would allow for greater flexibility to revise the exemption relative to Alternative 2, a positive impact on the *Attitudes, Beliefs, and Values* of stakeholders towards management. However, relying on an annual approval may cause greater uncertainty for the fishery, hampering business investment and planning. Both the Status Quo and Alternative 2 would encourage effort offshore, which may result in decreased gear conflicts inshore, a positive impact in terms of the *Non-Economic Social Aspects* of the fishery.

7.6.6.2 Alternative 2: Establish a Redfish Exemption Area

(PREFERRED ALTERNATIVE) Establish in the fishery management plan that commercial vessels fishing in sectors may use a 5.5” (or larger) codend mesh within the Redfish Exemption Area (Table 12, Figure 4), with several stipulations as listed. Approval through the annual (or biennial) sector operations plan approval process would not be necessary. When declared into the Redfish Exemption Area, the allocated groundfish kept needs to be 50% redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Two options for fishery monitoring coverage levels are considered. Sectors may continue to request other exemptions related to redfish.

Economic. The economic impacts of Alternative 2 are expected to be positive relative to not having an exemption (a possibility under No Action) and neutral relative to the Status Quo. Under either the Status Quo or Alternative 2, vessels would have a greater opportunity to catch redfish, a stock that is currently considered underutilized. Redfish landings in the Gulf of Maine that occurred north of 42°N and east of have 70°W increased in recent years from 4,762,166 lbs. in FY 2011 to 6,994,043 in FY 2013. Revenues have increased from $3,168,116 to $3,712,965 during the same time period. Total groundfish catch in the same area has decreased from 23,073,639 in FY 2011 to 21,401,991 in FY 2013, while total groundfish revenues have decreased from $27,947,264 in FY 2011 to $25,612,807 in FY 2013. Redfish-related revenue in the exemption area has helped fill the void of lost revenue from other groundfish stocks in the same area in recent fishing years.

With the redfish stock in healthy condition, there may be opportunity to further increase redfish-related revenue. The redfish cooperative research project, or REDNET, is committed to redirecting groundfish fishing to stocks with healthy populations, such as redfish. In their baseline catch and bycatch evaluation report, REDNET found that fishing for redfish using a 4.5" double twine diamond mesh produces a very clean fishery, with redfish accounting for around 95% of total catch in trials (Kanwit et al. 2013). REDNET has yet to release their final report on codend selectivity under different mesh sizes, but given the results under a 4.5" mesh, increased discarding should not be a major concern with respect to decreasing mesh size from 6.0" to 5.5".

Social: The social impacts of Alternative 2 are expected to be positive relative to not having an exemption (a possibility under No Action) and neutral relative to the Status Quo. Alternative 2 would provide more flexibility for the fishery and allow fishermen to more fully use available redfish ACE than not having the exemption. Using a smaller mesh would increase catch per unit effort (CPUE) by retaining a greater proportion of the fish in the trawls codend. Because sector members would operate under an ACE, an increase in CPUE would result in fewer gear-days, leading to more efficient operations. Should disturbance to stock age structure occur, rebuilding efforts may be slowed, resulting in negative impacts in the long-term. Alternative 2 may have greater potential to promote fleet diversity and ACE utilization. More fishermen may be incentivized to invest capital into and participate in the redfish fishery.

There would also be reduced administrative burden on sectors, if sectors did not have to annually reapply for this exemption. This is expected to be a positive impact on the *Non-Economic Social Aspects* of the fishery (though the time savings would be a positive economic impact). Alternative 2 does not eliminate the possibility that a different redfish exemption request could be made in the future, which continues to provide flexibility for the industry. If so, similar measures would be considered simultaneously through two separate approaches, a sector exemption and a Council action. This could lead to confusion by industry members and managers, as well as additional complications, a potentially negative impact on the *Attitudes, Beliefs and Values* of stakeholders towards management.

Relative to the Status Quo (the FY 2015-2016 sector exemption), the social impacts of Alternative 2 are expected to be neutral. Under Alternative 2, establishing the exemption in the FMP would allow less flexibility to revise the exemption relative to Alternative 1, a negative impact on the *Attitudes, Beliefs, and Values* of stakeholders towards management. However, Alternative 2 may cause greater certainty for the fishery, encouraging business investment and planning. Both the Status Quo and Alternative 2 would encourage effort offshore, which may result in decreased gear conflicts inshore, a positive impact in terms of the *Non-Economic Social Aspects* of the fishery.

Commercial Catch Monitoring

> **Option A.** Fishing under this exemption would not require observers (or electronic monitoring technology, should such be approved in the future) to be on-board, beyond what is required for the commercial groundfish fishery.

Economic. The economic impacts of Option A are expected to be neutral relative to No Action, as it would maintain the status quo. The economic impacts are expected to be low positive relative to Option B. Groundfish vessels may have greater opportunity to fish under the redfish exemption, as there would be no need to secure observer coverage before leaving the dock. As vessels must declare their intention to fish under the exemption prior to leaving the dock, there would not be any increased flexibility for vessels once at sea under Option A relative to Option B.

The discards that would occur under a 5.5” mesh vs. a 6.5” mesh are an important consideration to Option A. The smaller mesh size should allow for greater retention of most redfish, but may also increase unwanted catch. On trips without an observer on board, the increased discards that occur under the smaller mesh size would not be factored into the calculated discard rates. If the increase in discards was significant enough to impact the sustainability of a particular stock and those discards were not being accounted for, then long-term negative economic impacts could occur. However, as mentioned under Alternative 2, REDNET has had success in avoiding bycatch with a 4.5” mesh size in the exemption area. It is therefore reasonable to believe that unwanted catch should not be a major sustainability concern regarding a 5.5” mesh. The long-term economic impacts of Option A are expected to also be low positive relative to Option B.

Social. The social impacts of Option A are expected to be neutral relative to No Action, as it would maintain the status quo. Relative to Option B, the impacts are expected to be low positive, because vessels would be able to declare the exemption on any trip, not just when an observer is onboard. The flexibility afforded by Option A is expected to positively impact the *Attitudes, Beliefs, and Values* of fishermen towards management. Option A provides greater potential for the redfish ACE to be harvested relative to Option B, leading to positive impacts in the *Size and Demographic Characteristics* of the fishery. However, some stakeholders may feel that it is important to account for bycatch and discards accurately for trips that are using smaller mesh than the standard. Thus, Option A is expected to have a negative impact for those stakeholders on their *Attitudes, Beliefs, and Values* towards management.

> **Option B.** Fishing under this exemption would require observers to be on-board (or electronic monitoring technology, should such be approved in the future) for 100% of the trips.

Economic. The economic impacts of Option B are expected to be low negative relative to No Action and Option A. Groundfish vessels may have less opportunity to fish under the redfish exemption. If an observer is not present at the dock when a vessel is ready to depart for a trip that was intended to declare the redfish exemption, then the vessel would have to expend time waiting at the dock for an observer, or could lose the opportunity to fish under the exemption.

Social. The social impacts of Option B are expected to be low negative relative to No Action and Option A, particularly if industry has to bear the cost of additional monitoring to use the redfish exemption on trips that would normally be unobserved. Option B would be less flexible than Option A, a negative impact the *Attitudes, Beliefs, and Values* of fishermen towards management. Relative to Option A, there is less potential that the redfish ACE would be harvested, leading to negative impacts for the fishery in terms of the *Size and Demographic Characteristics* of the fishery. However, some stakeholders may feel that it is important to account for bycatch and discards accurately for trips that are using smaller mesh than the standard. Thus, Option B is expected to have a positive impact for those stakeholders on their *Attitudes, Beliefs, and Values* towards management.

Option B has the potential to create new strata for observer coverage during a time when there are less available funds for observers. If fishing under the redfish exemption becomes desirable, many observed trips could be diverted from regular groundfish trips. This could reduce observer coverage below necessary levels to achieve required CVs, making the sea sampling of the fleet less random. This could lead to reduced data quality for the fishery overall, a negative impact on the *Attitudes, Beliefs, and Values* of stakeholders towards management.

7.7 CUMULATIVE EFFECTS

7.7.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Amendment 18 together with past, present, and reasonably foreseeable future actions that affect the human environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

7.7.1.1 Valued Ecosystem Components (VEC)

As noted in Section 6.0, the VECs that exist within the groundfish fishery are identified and the basis for their selection is established. Those VECs were identified as follows:

1. Target Species;
2. Nontarget Species;
3. Physical Environment and Essential Fish Habitat;
4. Protected Resources; and
5. Human Communities.

Impacts to the VECs are as defined in Table 87.

7.7.1.2 Temporal Scope of the VECs

While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery, rather than foreign fleets. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, this analysis examines the period between the expected implementation of this amendment (May, 2016) and 2020.

7.7.1.3 Geographic Scope of the VECs

The geographic scope of the analysis of impacts to regulated groundfish stocks, non-groundfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment (Section 6.0). However, the analyses of impacts presented in this amendment focuses primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species (Section 6.4).

Because the potential exists for far-reaching social and economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure social and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (Section 6.5.2) from the U.S.-Canada border to, and including North Carolina.

7.7.1.4 Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the culmination of the following:

1. Impacts from past, present and reasonably foreseeable future actions;
2. The baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); and
3. Impacts from the Proposed Action and other alternatives.

A description of past, present and reasonably foreseeable future actions is in Table 103. The baseline conditions of the resources and human community are subsequently summarized, although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this amendment is included. The culmination of all these factors is considered when making the cumulative effects assessment.

7.7.2 Past, Present and Reasonably Foreseeable Future Actions

The following is a synopsis of the most applicable past, present, and reasonably foreseeable future actions (PPRFFA) that have the potential to interact with the current action. For a complete historical list of PPRFFAs, see Amendment 16 – the last EIS developed for the Northeast Multispecies FMP. Table 103 summarizes the effects of other past, present and reasonably foreseeable future actions that affect the VECs, i.e., actions other than those alternatives under development in this document. Table 104summarizes the combined effects of these actions on the VECs.

Note that most of the actions effecting this amendment and considered in Table 103 and Table 104 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straight-forward effects on environmental conditions, and were, are, or would be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management - the MSFCMA. That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the Act stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socioeconomic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long-term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, nontarget species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

Table 103 - Effects on VECs from past, present and reasonably foreseeable future actions

Action	Target Species	Nontarget Species	EFH	Protected Resources	Human Communities
Past and Present Fishing Actions					
Groundfish A13 (2004) – Implemented requirements for stock rebuilding plans and the process for creating sectors, dramatically cut fishing effort on groundfish stocks, and established the GB Cod Hook Gear Sector.	**H+**	**+**	**L+**	**L+**	**Mixed**
Groundfish FW40A (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.	**L-**	**L-**	**Negl**	**Negl**	+
Groundfish 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 DAS credit for vessels standing by an entangled whale, new notification requirements for Category I herring vessels, and removed the net limit for trip gillnet vessels.	**L-**	**L-**	**Negl to L+**	**Negl**	**L+**

Action	Target Species	Nontarget Species	EFH	Protected Resources	Human Communities
Groundfish FW41 (2005) – Allowed for participation in the Hook Gear Haddock SAP by non-sector vessels.	**Negl**	**Negl to L-**	**Negl**	**Negl**	+
Groundfish FW42 (2006) – Implemented further reductions in fishing effort based upon stock assessment data and stock rebuilding needs, implemented GB Cod Fixed Gear Sector.	+	+	**L+**	**L+**	**Mixed**
Atlantic Large Whale Take Reduction Plan	**Negl**	**Negl**	**Negl to L-**	+	**L-**
Monkfish FMP and A5 (2011) - Implemented ACLs and AMs; set the specifications of DAS and trip limits; and make other adjustments to measures in the Monkfish FMP.	+	+	**L+**	+	**Mixed**
Spiny Dogfish FMP	**Negl**	+	**Negl**	**Negl**	**L+**
Groundfish A16 (2009) - Implemented DAS reductions and gear restrictions for the common pool, approved formation of additional 17 sectors.	+	+	+	+	**Mixed**
Skate FMP and A3 (2010) - A3 implemented final specifications for FY 2010 and 2011, ACLs and AMs, a rebuilding plan for smooth skate, and established an ACL and annual catch target for the skate complex, total allowable landings for the skate wing and bait fisheries, seasonal quotas for the bait fishery, new possession limits, in season possession limit triggers.	+	+	+	+	**-**
Groundfish FW44 (2010) - Set ACLs, established TACs for transboundary U.S./CA stocks, and made adjustments to trip limits/DAS measures	+	+	+	+	**Mixed**
Groundfish FW45 (2011) - Revised the biological reference points and stock status for pollock, updated ACLs for several stocks for FYs 2011–2012, adjusted the rebuilding program for GB yellowtail flounder, increased scallop vessel access to the Great South Channel Exemption Area, modified the existing dockside and at-sea monitoring requirements, established a GOM Cod Spawning Protection Area, authorized new sectors and adjusted TACs for stocks harvested in the U.S./CA area for FY 2011.	**L+**	**L+**	**L+**	**L+**	**Mixed**
Groundfish FW46 (2011) - Increased the haddock catch cap for the herring fishery to 1% of the haddock ABC for each stock of haddock.	**Negl**	**Negl**	**Negl**	**Negl**	**L-**

Action	Target Species	Nontarget Species	EFH	Protected Resources	Human Communities
Harbor Porpoise Take Reduction Plan (2010) - 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 occur.	+	+	+	+	**-**
Scallop A15 (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.	**L+**	**Negl**	**Negl**	**Negl**	**L+**
Groundfish A17 (2011) - Streamlined the administration process so NOAA-sponsored, state-operated permit banks may operate in the sector allocation management program.	**Negl**	**Negl**	**Negl**	**Negl**	**Negl**
Groundfish FW47 (2012) - Revised the status determination for winter flounder, revising the rebuilding strategy for GB yellowtail flounder, Measures to adopt ACLs, including relevant sub-ACLs and incidental catch TACs; adopting TACs for U.S/Canada area, as well as modifying management measures for SNE/MA winter flounder, restrictions on catch of yellowtail flounder in GB access areas and accountability measures for certain stocks.	+	+	**Negl**	**Negl**	**-**
Secretarial Amendment to Establish Annual Catch Limits and Accountability Measures for the Small-Mesh Multispecies Fishery - Established the mechanism for implementing ACLs and AMs.	**Negl**	**Negl**	**Negl to L+**	**Negl**	**Negl to +**
Spiny Dogfish A3 (2013) - Established a research set aside program, updated EFH definitions, year-end rollover of management measures, revised quota allocation scheme.	**Negl**	**L+**	**Negl**	**Negl**	**L+**
Scallop FW24/Groundfish FW49 (2013) - Set specifications for scallop FY 2013 and 2014, considered measures to refine the management of yellowtail flounder bycatch in the scallop fishery.	**Negl to L+**	**Negl to L+**	**Negl**	**Negl**	**- to +**
Groundfish FW48 (2013) - Modified the ACL components for several stocks, adjust AMs for commercial and recreational vessels, modify catch monitoring provisions, and allow sectors to request access to parts of groundfish closed areas.	+	+	**Mixed**	+	**Mixed**

Action	Target Species	Nontarget Species	EFH	Protected Resources	Human Communities
Groundfish FW50 (2013) - Adopted FY 2013-2015 ACLs and specifications for the U.S./Canada TACs	+	+	+	**Negl**	-
Groundfish FW51 (2014) - Adopted FY 2014-2014 ACLs and specifications for the U.S./Canada TACs and included changes to management measures	+	+	**Mixed**	**Negl**	**Mixed**
Scallop FW 25 (2014) - Sets specifications for scallop FY 2014 and 2015 and considered AMs for windowpane flounder stocks.	**Negl to L+**	**Negl to L+**	**Negl**	**Negl**	**- to +**
Groundfish FW52 (2014) - Modify existing AMs for northern and southern windowpane flounder.	+	**L+**	+	**Negl**	+
Groundfish FW53 (2015) - Set specifications for FY 2015, revised cod spawning and mortality closures, allowed rollover of groundfish specifications and modified sector ACE carryover provisions.	**Mixed**	**Mixed**	**Negl**	**Negl**	**Mixed**
Scallop FW 26 (2015) - Set specifications for scallop FY 2016 and 2017. It is also considering proactive accountability measures for windowpane flounder.	**Negl to L+**	**Negl to L+**	**Negl**	**Negl**	**- to +**
Reasonably Foreseeable Future Fishing Actions					
Phase 2 of the Omnibus EFH Amendment (2015) - Considers 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. Reconsider closures put in place to protect EFH and groundfish mortality in the Northeast Region.	+	+	+	**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.	+	+	**L+**	+	-
Groundfish FW 54/Monkfish FW 9 - Modify regulations for vessels in the DAS program.	**Negl**	**Negl to L-**	**Negl**	**Negl**	+

Table 104- Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Amendment 18

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Target Species	**Mixed -** Combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary. However, some stocks remain overfished.	**Positive -** Current regulations continue to manage for sustainable stocks.	**Positive -** Would continue rebuilding and strive to maintain sustainable stocks.	**Short-term Negative -** Several stocks are currently overfished, have overfishing occurring, or both. **Long-term Positive -** Stocks are being managed to attain rebuilt status.
Nontarget Species	**Positive -** Combined effects of past actions have decreased effort and improved habitat protection.	**Positive -** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species.	**Positive -** Would continue rebuilding and target healthy stocks, thus limiting the take of discards/bycatch.	**Positive -** Continued management of directed stocks will also control incidental catch/bycatch.
Physical Environment and EFH	**Mixed -** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality.	**Mixed -** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed -** Would likely control effort and thus habitat impacts, but as stocks improve, effort will likely increase along with additional non-fishing activities.	**Mixed -** Continued fisheries management will likely control effort and thus fishery-related habitat impacts, but fishery and non-fishery related activities will continue to reduce habitat quality.
Protected Resources	**Positive -** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources.	**Positive -** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed -** Would likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions.	**Positive -** Continued effort controls along with past regulations will likely help stabilize protected species interactions.
Human Communities	**Mixed -** Fishery resources have supported profitable industries and communities but increasing effort and catch limit controls have curtailed fishing opportunities.	**Mixed -** Fishery resources continue to support communities but increasing effort and catch limit controls combined with non-fishing impacts such as high fuel costs have had a negative economic impact.	**Short-term Negative -** As effort controls are maintained or strengthened, economic impacts will be negative. **Long-term Positive -** As stocks improve, effort will likely increase which would have a positive impact.	**Short-term Negative -** Revenues would likely decline dramatically in the short-term and may remain low until stocks are fully rebuilt. **Long-term Positive -** Sustainable resources should support viable communities and economies.

Note: Table 87 contains impact definitions.

7.7.3 Baseline Conditions for VECs

For the cumulative effects assessment, the baseline conditions for resources and human communities are considered: the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. Table 105 summarizes the added effects of the condition of the VECs (i.e., status/trends from Section 5.0) and the sum effect of the past, present and reasonably foreseeable future actions (Table 103, Table 104). The CEA baseline for each VEC is in the shaded column. In general, straight-forward quantitative metrics of the baseline conditions are only available for the target species, nontarget species, and protected resources. The conditions of the EFH and human communities VECs are complex and varied. As such, the reader should refer to the characterizations given in Sections 6.3 and 6.5, respectively. This cumulative effects baseline is used to assess cumulative effects of the proposed management actions (Table 106).

Table 105 - Cumulative effects assessment baseline conditions of the VECs

VEC		Status/Trends	Combined Effects of PPRFFA	Combined CEA Baseline Conditions
Target species	**GB Cod**	Overfished, overfishing occurring.	**Negative** – short-term Several stocks are currently overfished, have overfishing occurring, or both. **Positive** – long-term Stocks are being managed to attain rebuilt status.	**Negative** – short-term Overharvesting in the past contributed to several stocks being overfished or where overfishing is occurring; **Positive –** long-term Regulatory actions taken over time have reduced fishing effort and with the addition of A16, stocks are expected to rebuild in the future.
	GOM Cod	Overfished, overfishing occurring		
	GB Haddock	Not overfished, overfishing not occurring.		
	GOM Haddock	Not overfished, overfishing not occurring.		
	GB Yellowtail Flounder	Overfished and overfishing status is unknown.		
	SNE/MA Yellowtail Flounder	Not overfished, overfishing not occurring.		
	CC/GOM Yellowtail Flounder	Overfished, overfishing occurring		
	American Plaice	Not overfished, overfishing not occurring.		
	Witch Flounder	Overfished, overfishing occurring		
	GB Winter Flounder	Not overfished, overfishing not occurring.		
	GOM Winter Flounder	Overfishing not occurring, overfished status unknown.		
	SNE/MA Winter Flounder	Overfished, overfishing not occurring.		
	Acadian Redfish	Not overfished, overfishing not occurring.		
	White Hake	Not overfished, overfishing not occurring.		
	Pollock	Not overfished, overfishing not occurring.		
Nontarget	**N. Windowpane Flounder**	Overfished, overfishing occurring	**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.	**Positive** – Although prior groundfish management measures likely contributed to redirecting effort onto nontarget species, as groundfish rebuild this pressure should lessen and all of these species are also managed through their own FMP.
	S. Windowpane Flounder	Not overfished, overfishing not occurring.		
	Ocean Pout	Overfished, overfishing not occurring.		
	Atlantic Halibut	Overfished, overfishing not occurring.		
	Monkfish	Not overfished, overfishing not occurring.		
	Dogfish	Not overfished, overfishing not occurring.		
	Skates	One skate species is overfished (thorny) and overfishing is not occurring in any of the seven skate species.		
Physical Environment and Essential Fish Habitat		Fishing impacts are complex and variable and typically adverse; nonfishing activities had historically been negative with site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities.	**Mixed** - reduced habitat disturbance by fishing gear but impacts from nonfishing actions, such as global warming, could increase and have a negative impact.

Protected Resources	**Sea Turtles**	Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened.	**Positive** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact.	**Positive** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.
	Large Cetaceans	Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MSA and with the exception of minke whales, all are listed as endangered under the ESA. The population trend for North Atlantic Right Whales are positive and slowly accelerating.		
	Small Cetaceans	Pilot whales, dolphins and harbor porpoise are all protected under the MSA.		
	Pinnipeds	Population trends for gray seals and harp seals are positive, and unknown for harbor and hooded seals.		
Human Communities		Complex and variable. Although there are exceptions, generally groundfish landings and revenues have decreased for most New England states since 2001.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities.	**Negative –** short-term; lower revenues would continue until stocks are sustainable. **Positive** – long-term; sustainable resources should support viable communities and economies

7.7.4 Cumulative Effects of Amendment 18 Actions

The alternatives contained in Amendment 18 are focused on promoting fleet diversity, enhancing sector management, enabling quota utilization, and establishing accumulation limits. The Proposed Action would establish an accumulation limit for the holdings of PSC as well as permits, establish a HA permit sub-ACL, remove the March 1-20 closure for common pool HA vessels; remove the standard fish tote requirement for HA vessels; allow sectors to annually request that HA vessels fishing in the sector be exempt from use of VMS; and establish an area in which vessels could fish with a smaller mesh net than the standard mesh size, targeting redfish. These measures affect the prosecution of the commercial fishery.

Table 106 summarizes the likely cumulative effects found in the different sections of management alternatives contained in Amendment 18. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effects on the VEC are expected to be negative and tend to reduce the positive effects of the "other" actions.

Table 106 - Cumulative effects expected on the VECs of Amendment 18 alternatives

Measure	VECs				
	Target Species	Nontarget Species	Physical/EFH	Protected Resources	Human Communities
ACCUMULATION LIMITS	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Uncertain** but minor to **Neutral.** Some measures may change within-fishery fishing effort or behavior.	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Mixed.** Some measures may prevent market power and/or reduce scale efficiency. Varying short-and long-term impacts.
HANDGEAR A PERMIT	**Neutral** to **low negative.** Size of HA permit effort is very small. Modest fishing on spawning stocks may occur. May reduce data quality.	**Neutral** to **low negative.** Size of HA permit effort is very small. Modest fishing on spawning stocks may occur. May reduce data quality.	**Neutral.** Hook gear does not generate adverse impacts on EFH.	**Neutral.** Hook gear does not generate adverse impacts on protected resources.	**Neutral** to **low positive.** Some measures improve flexibility for HA permit fishermen.
DATA CONFIDENTIALITY	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Neutral.** Measures are administrative, with no change to total fishing effort.	**Uncertain** but minor to **low positive.** Some measures may improve ACE use, but may be seen as an overreach of management.
INSHORE/ OFFSHORE GOM	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Uncertain** but minor. Could be positive or negative.	**Neutral.** Measures would not change total fishing effort.	**Neutral** to **negative.** Some measures would decrease fleet flexibility, particularly for inshore fishermen.
REDFISH EXEMPTION AREA	**Uncertain** but minor. An option may produce data biases.	**Uncertain** but minor. An option may produce data biases.	**Positive.** Some measures encourage effort offshore.	**Neutral.** Trawl gear interaction in Area low.	**Positive** to **neutral.** Encourages quota use. An option may discourage use of exemption.

7.7.4.1 Target Species Cumulative Impacts

The combined impacts of past federal fishery management actions have led to decreased fishing effort, positively impacting regulated groundfish (target) species in the short-term (Table 103 and Table 104). However, management measures, in particular modifications implemented through Amendment 16, are expected to yield rebuilt and sustainable groundfish stocks in the future.

The action proposed by Amendment 18 is expected to continue this trend, as no significant adverse impacts on target species are anticipated. The modifications in management measures may affect target species, but changes in total fishing effort are not expected. The accumulation limit measures are administrative in nature, and are not expected to have any impacts on regulated groundfish species, because they would not change total fishing effort or fishing behavior. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels would have minimal impact on target species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing a Redfish Exemption Area within the FMP is expected to have uncertain but minor impacts on target species, and the option to require 100% monitoring on trips using the exemption may produce biases in the catch data.

Overall, the combination of past and present impacts, combined with the Preferred Alternatives and future actions would continue rebuilding and strive to maintain sustainable stocks, yielding positive non-significant impacts to managed resources in the long-term.

7.7.4.2 Nontarget Species Cumulative Impacts

The combined impacts of past federal fishery management actions have led to decreased fishing effort, positively impacting nontarget species in the short-term (Table 103 and Table 104). Current management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort, and decrease bycatch and discards.

The action proposed by Amendment 18 is expected to continue this trend, as no significant adverse impacts on target species are anticipated. The modifications in management measures may affect nontarget species, but changes in total fishing effort are not expected. The accumulation limit measures are administrative in nature, and are not expected to have any impacts on nontarget species, because they would not change total fishing effort or fishing behavior. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels would have minimal impact on nontarget species, because HA permit PSC is minimal, <0.8% of the total PSC of the commercial groundfish fishery. Establishing a Redfish Exemption Area within the FMP is expected to have uncertain but minor impacts on nontarget species, and the option to require 100% monitoring on trips using the exemption may produce biases in the catch data.

Overall, the combination of past and present impacts, combined with the Preferred Alternative and future actions would continue rebuilding and strive to maintain sustainable stocks, yielding positive non-significant impacts to nontarget species.

7.7.4.3 Physical Environment and Essential Fish Habitat Cumulative Impacts

The combined impacts of past federal fishery management actions have led to decreased fishing effort, positively impacting habitat protection in the short-term (Table 103 and Table 104). In addition, better control of non-fishing activities has also been positive for habitat protection. However, both fishing and non-fishing activities continue to decrease habitat quality.

The action proposed by Amendment 18 is expected to have substantial impacts on EFH. The modifications in management measures may affect habitat, but changes in total fishing effort are not expected. The accumulation limit measures are expected to have neutral impacts on EFH, as geographic effort shifts are not expected. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to have neutral impact on EFH, because hook gear has no impact on EFH. Establishing a Redfish Exemption Area is expected to have positive impacts on habitat, as offshore effort would be encouraged, away from sensitive juvenile habitat.

Overall, the combination of past, present, and future actions is expected to reduce fishing effort, and hence, reduce damage to habitat, resulting in slightly positive, non-significant cumulative impacts. However, it is likely that fishing and non-fishing activities will continue to degrade habitat quality.

7.7.4.4 Protected Resources Cumulative Impacts

The combined impacts of past federal fishery management actions have led to decreased fishing effort, positively impacting protected resources in the short-term (Table 103 and Table 104). In addition, better control of non-fishing activities has also been positive for protected resources. However, both fishing and non-fishing activities continue to cause interactions with protected resources.

The action proposed by Amendment 18 is not expected to have substantial impacts on protected resources. The modifications in management measures may affect protected resources, but changes in total fishing effort are not expected. The accumulation limit measures are administrative in nature, and are not expected to have any impacts on protected resources, because they are expected to not change total fishing effort or fishing behavior. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels would be expected to have no impact on EFH, because hook gear has minimal interaction with protected resources. Establishing a Redfish Exemption Area is expected to have neutral impacts on protected resources, because trawl gear has minimal interaction with protected resources in the proposed exemption area.

Overall, the combination of past, present, and future actions is expected to reduce fishing effort, and hence, reduce interactions with protected resources, resulting in slightly positive, non-significant cumulative impacts.

7.7.4.5 Human Communities Cumulative Impacts

The combined impacts of past federal fishery management actions have led to decreased fishing effort, negatively impacting human communities in the as fishing opportunities have been curtailed (Table 103 and Table 104). Past and current management measures, including those implemented through Amendment 16 to the FMP and subsequent framework actions, will maintain effort and catch limit controls, which together with non-fishing factors, such as rising fuel costs, have had significant negative short-term economic impacts on human communities.

The action proposed by Amendment 18 is expected to impact human communities. Two accumulation limit measures would be implemented: a PSC cap for individuals and entities of 15.5 for all allocated stocks combined, as well as a 5% permit cap. Neither cap would constrain the current holdings of any individual or entity, thus resulting in no short-term negative economic impact. As no individual is currently approaching either constraint, it is unlikely that the scale efficiency of the groundfish fleet will be compromised. However, there is currently no accurate measure of the point in which economies of scale is no longer realized in the groundfish fishery, so no definitive statement can be made at this time.

Under the Proposed Action, if an individual was able to acquire all of the permits with highest PSC amounts for a given stock, PSC greater than 40 could be accumulated for that stock. The maximum value for any stock would be GB winter flounder at 74 PSC. These PSC values may be high enough to result in market power being exerted; however, it is extremely unlikely an individual would be able to undertake such activity. Probabilistic analysis resulted in maximum consolidation for most stocks around 20 PSC given an MRI cap of 70. The maximum value for any stock was GB winter flounder at 29 PSC. The probabilistic analysis provides a far more realistic simulation of accumulation in the groundfish fishery than the deterministic analysis, hence, the proposed combination of an aggregate PSC cap of 15.5 and a 5% permit cap should be sufficient to prevent market power from being exerted. Details of the deterministic and probabilistic analyses will be in the forthcoming Regulatory Impacts Review, Section 9.11.

However, the measures are expected to allow a substantial amount of consolidation of holdings to occur from present level. Thus, negative impacts to the size or continuing existence of fishing communities and participation in the fishery may not be prevented. The Council is also proposing an allowance for any current (not applicable given the preferred alternative) or future holdings that exceed the limit, that individuals and entities may hold permits that would result in excess PSC. However, the PSC must be annually redistributed to the remainder of the fleet. This measure is expected to help mitigate any negative impact of the PSC cap on individuals.

Cumulative impacts of other proposed measures are as follows. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to be positive for HA permit holders, as it would allow more flexibility, though other stakeholders may consider these measures to be unfair. Establishing a Redfish Exemption Area is expected to have be positive for human communities, as it would encourage use of an under-harvested resource, resulting fishery investment benefits.

Overall, the combination of past, present, and future actions is expected to enable a long-term sustainable harvest of groundfish stocks, which should lead to a long-term positive impact on fishing communities and economies. However, the overall combination of impacts thus far has been pretty consistently negative for human communities.

7.7.1 Cumulative Effects Summary

The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the MSFCMA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.

8.0 DATA AND RESEARCH NEEDS

The MSA (Section 303(a)) requires that FMPs identify data and research needs. The five-year (2011-2015) research priorities listed here were derived from research recommendations provided by the SSC in 2009, and from the research needs identified by NEFMC Committees and PDTs and from SSC discussions in June 2010. The list was consolidated and prioritized at the November 2010 meeting of the SSC. The list is not prioritized except where noted. This list may be revised or updated by the Council at any time.

1. Incorporate risk assessment in quantifying uncertainty in the ACL/AM setting process. Risk assessment would help the Council agree on the risk it is willing to tolerate in making tradeoffs between the potential harm due to overfishing and the expected cost of lost yield. Risk assessments needs to be incorporated for target fish populations and for specific compartment of the fishing industry, but also for other fisheries, other types of fishery (e.g., recreational vs. commercial), and other priority concerns, such as threatened and endangered species. Setting ABC to incorporate the risk of damage to fish stocks (e.g., overfishing) and to the ecological environment and the risk of damage to the fishery (loss in yield) involves making trade-offs. Use social science research to estimate supply and demand factors to improve on using catch data to set ABC in data poor fisheries where catches are suspected of being underestimated because the catch history was constrained by factors other stock than biomass. Use this approach to quantify past catches where these are considered poorly estimated (e.g., monkfish).

   Action Plan: a workshop for the SSC and the NEFMC to incorporate social science of risk assessment in setting the precautionary buffers between OFL and ABC and between Annual Catch Limit and Annual Catch Target.
2. Design Ecosystem Based Fishery Management plans (EBFM) for implementation by the Council in the context of Ecosystem Based Management (EBM) and the National Ocean Policy framework, incorporating biological, social, economic and institutional factors. EBFM implies trade-offs between damage (costs) and benefits between various fisheries and between fisheries and other users of ecosystem-based services to achieve agreed upon objectives. Agreeing on trade-offs requires decision making processes among stakeholders and with other segment of society that use metrics other than dollar value. Use social science research to estimate impacts on fishing communities and the Integrated Ecosystem Assessments, required in designing and implementing EBFM. Use social science research to allow more direct input from stake holders in the decision making process and make it possible to agree on trade-offs. Investigate processes and trade-offs in the choice of harvesting / rebuilding strategies of various species of predators, preys and competing species.
3. Management measures in the Northeast Multispecies (Large Mesh/Groundfish) Fishery Management Plan Species have become increasingly restrictive starting with Amendment 5 in 1994 with large areas being closed to fishing, substantial reduction in the days-at-sea and significant increases in mesh sizes. The perception is that benefits expected from these measures have not been fully met since further restrictions have subsequently been necessary. Evaluate the extent to which the benefits have been met and formulate and

evaluate hypotheses to explain the differences between the expectation and the results of management actions.

4. Retrospective patterns have been major impediments to the formulation of advice (e.g., Atlantic herring). The issue has been thoroughly investigated by the NEFSC (Legault 2009). Retrospective patterns are an indication that something is inconsistent in the data or model assumptions and simulation analyses have demonstrated a number of sources for retrospective patterns, including missing catch, changes in natural mortality rate, and changes in survey catchability. Use management strategy evaluation to provide guidelines on how to use assessments that suffer from retrospective patterns or where the assessment has been "corrected" for the retrospective pattern in the formulation of management advice, taking into account the possible consequences of being wrong.
5. Develop reliable indices of abundance for red crab, pollock, herring, mackerel, wolfish and cusk. Investigate the existence of pollock cryptic biomass, including age/size based estimates of catchability. For red crab, gather or recover data from the fishery to improve the stock assessment.
6. Quantify discards, discard mortality and incidental mortality from interaction with the fishing gear. Identify and evaluate methods to reduce by-catch of all species (with particular emphasis on endangered, threatened and protected species) through gear research and other technical measures and time and area based measures.
7. Advance research on basic biology of fishery resource populations:
    a. Improve knowledge on stock definition, stock movements, mixing, and migration through tagging studies, DNA markers, morphological characteristics and other means, focusing on: (a) short- and long-term movements, and (b) habitat use in relation to broad scale movements, with priority for monkfish, cod, pollock, silver hake and herring. Investigate localized depletion for species in FMPs, particularly for Atlantic herring.
    b. Improve the knowledge on (a) age and growth, (b) longevity, (c) reproduction, and (d) natural mortality with priority for monkfish, skates, wolfish, red hake and red crab.
8. Identify and evaluate methods to reduce habitat impacts, including, but not limited to, broader investigation of variability in gear efficiency across habitats, time, area, and gear design.
9. Evaluate the cost and benefits of generating social and economic data streams parallel to that of fish to understand how the industry works, identify the economic drivers that affect fleet behavior, and make recommendations on the implications for individual sector of various management options.

In addition to these nine research priorities, the SSC also recommends research on the following topics, which are not prioritized.

- Investigate size dependent demand curves on revenue per recruit.
- Review experiences/processes used regionally, nationally and internationally in identifying goals and objectives (social, economic and otherwise) in support of ecosystem based management/EBFM. Summarize findings from NE regional initiatives (e.g., EBM workshops 2005; fleet visioning 2005; SSB M & E performance measures).

- Investigate the feasibility and utility of voluntary mechanisms to temporarily or permanently reduce fishing pressure.
- Identify and evaluate the major sources of management uncertainties in setting ACL.
- Review, evaluate, and recommend practical means to improve compliance with regulations.
- Evaluate mechanisms, including taxes, to provide incentives for fishermen to keep by-catch that would otherwise be discarded while not providing incentives to target these species, i.e., evaluate the opportunity costs of keeping the by-catch rather than discard it.
- Review, evaluate and recommend practical means of increasing the economic benefits from the fishery from a given amount of fish to be caught.
- Develop a cost and revenue curve for the multispecies groundfish fishery to identify optimum yield for the aggregate fishery.
- Conduct research on the habitat effects from fishing and develop practicable methods to minimize or mitigate those impacts.

In 2014, the Council identified research priorities for a NEFMC Groundfish Research Program Request for Proposals, which was administered through a contract with the Northeast Consortium.

- Demonstrate how to access closed areas and increase catch of haddock without impacting cod, yellowtail flounder, and windowpane flounder through the application of developed gear technologies, mesh selectivity studies, and temporal harvest strategies, while minimizing habitat impacts;
- Develop gear-engineering solutions to minimize bycatch for flatfish, prioritizing stocks and fisheries according to current stock status and potential imposition of AMs (for example, windowpane flounder caught in small mesh fisheries or yellowtail or windowpane flounder caught on Georges Bank);
- Determine the recreational haddock discard mortality rate;
- Develop solutions for bycatch avoidance for flatfish, prioritizing stocks and fisheries according to current stock status and potential imposition of AMs (for example, windowpane flounder caught in small mesh fisheries or yellowtail or windowpane flounder caught on Georges Bank).
- Improve understanding of groundfish spawning, which may include research that enables the Council to improve groundfish spawning protection by increasing the understanding of spawning activity or aggregations of spawning groundfish.

9.0 APPLICABLE LAWS/EXECUTIVE ORDERS

9.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

9.1.1 Consistency with National Standards

Section 301 of the MSFCMA requires that regulations implementing any fishery management plan or amendment be consistent with the ten National Standards.

1. *Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*

Amendment 16 to the Northeast Multispecies FMP adopted measures designed to end overfishing on the groundfish stocks that were subject to excessive fishing pressure during its development. For overfished fisheries, the MAFCMA defines optimum yield as the amount of fish which provides for rebuilding to a level consistent with producing the maximum sustainable yield from the fishery. The Proposed Action in Amendment 18 would not adjust catch limits or rebuilding targets, but would promote maximizing optimum yield while preventing overfishing and continuing rebuilding plans. For example, establishing a Redfish Exemption Area would promote the utilization of the ACL for Acadian Redfish.

2. *Conservation and management measures shall be based on the best scientific information available.*

The Proposed Action in Amendment 18 would not adjust catch limits or rebuilding targets, but is based on the most recent estimates of stock status and bycatch for target and nontarget species. These estimates are mostly in the form of information provided by the NEFSC and assessment peer reviews, and the scientific advice of the SSC. Bycatch data from observer reports, vessel logbooks, or other sources must be rigorously reviewed before conclusions can be drawn on the extent and amount of bycatch. While additional observer data has been collected since the most recent assessments were completed, it has not been analyzed or reviewed through the stock assessment process and thus cannot be used.

The economic analyses are based primarily on permit holdings, landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery. The analysis of excessive shares was conducted by two economists from Compass Lexecon and peer-reviewed by a panel of four economists, all external to NOAA and the NEFMC. The Proposed Action is consistent with the findings of this work, in that an accumulation limit is proposed. However, the Proposed Action would not implement the tool recommended by Compass Lexecon, a stock-specific PSC cap, or other approaches suggested by the peer review, because the Council believes a modified approach would be more practical.

3. *To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.*

The Proposed Action in Amendment 18 manages each individual groundfish stock as a unit throughout its range. In addition, the groundfish complex as a whole is managed in close coordination. Management measures are designed and evaluated for their impact on the fishery as a whole.

4. *Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.*

The Proposed Action in Amendment 18 is not intended to discriminate between residents of different states. The Action is applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. For example, establishing a Redfish Exemption Area would primarily benefit those fishery participants who can logistically transit to and fish in that particular area. Thus, some impacts may be localized, as often communities near a stock may have developed fisheries that target it. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.

Regarding the requirement that fishing privileges be fair and equitable, promote conservation, and prevent excessive shares, the Council has considered the historic, current, and future participation in the fishery. The Proposed Action on accumulation limits represents a balance between considering the levels of current holdings in the fishery and preventing consolidation that would result in market power.

5. *Conservation and management measures shall, where practicable consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.*

The Proposed Action in Amendment 18 is not expected to significantly reduce the efficiency of fishing vessels. None of the measures in this action have economic allocation as their sole purpose; all are designed to contribute to the control of fishing mortality. The accumulation limit measures would not constrain scale efficiency, at least in the short-term, and have important social considerations as well as economic.

6. *Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.*

The Proposed Action in Amendment 18 does not reduce the flexibility of the fishery. The primary effort controls used in this FMP - catch limits and sectors - allow each vessel operator to fish when and how it best suits his or her business. Vessels can make short or long trips, and may fish in any open area at any time of the year. The measures allow for the use of different gear, vessel size, and fishing practices. The measures related to HA permits and the Redfish Exemption Area would increase flexibility.

7. *Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.*

The Proposed Action in Amendment 18 would neither increase costs nor duplicate other regulatory efforts. Management of multispecies stocks in federal waters is not subject to coordinated regulation by any other management body. The Council considered the costs and benefits of a range of alternatives to achieve the goals and objectives of this FMP. It considered the costs to the industry of taking no action relative to adopting the measures herein.

8. *Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse impacts on such communities.*

The Proposed Action in Amendment 18 takes into account the importance of fishery resources to fishing communities. The HA permit measures would promote the continued participation of vessels using handgear in communities. The Redfish Exemption Area would promote quota utilization, which would benefit communities. The accumulation limit measures would limit consolidation of permit holdings are likely to prevent market power. However, the measures would allow a substantial amount of consolidation of holdings to occur from present level. Thus, negative impacts to the size or continuing existence of fishing communities and participation in the fishery would not be prevented, though quantification of this impact is difficult.

9. *Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.*

The Proposed Action in Amendment 18 would continue the benefits of measures adopted in Amendment 16 to limit the discards of groundfish and nontarget species, including the sector management program. The Proposed Action would result in no substantial changes to bycatch.

10. *Conservation and management measures shall, to the extent practicable, promote safety of human life at sea.*

The Proposed Action in Amendment 18 would promote safety. Measures adopted in Amendment 16 were designed to improve safety in spite of low ACLs (e.g., the flexibility inherent in sector management, the option to use common pool DAS), and Amendment 18 would build off of these measures, improving flexibility for the industry (e.g., Handgear A measures).

9.1.2 Other MSFCMA Requirements

Section 303 (a) of MSFCMA contains required provisions for FMPs.

1. *Contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;*

Foreign fishing is not allowed under this management plan or this action, and so specific measures are not included to specify and control allowable foreign catch. On December 20, 2010, the International Fisheries Clarification Act stipulated that the U.S./Canada Resource Sharing Understanding, implemented through Amendment 13, can be considered an international agreement for the purposes of setting ACLs. This is the one international agreement that is germane to multispecies management. The Proposed Action in Amendment 18 is consistent with that Understanding.

2. *Contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;*

Amendment 16 included a thorough description of the multispecies fishery from 2001 through 2008, including the gears used, number of vessels, landings and revenues, and effort used in the fishery. This action updates that information and includes additional relevant information about the fishery in Section 6.5.

3. *Assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;*

The present biological status of the fishery is described in Section 6.1. Likely future conditions of the resource are described in Section 7.2. Impacts resulting from measures in the management plan other than the measures included here can be found in Framework 53 (NEFMC 2015)and earlier action documents. The maximum sustainable yield for each stock in the fishery is defined in Amendment 16 and optimum yield for the fishery is defined in Amendment 9.

4. *Assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;*

U.S. fishing vessels are capable of, and expected to, harvest the optimum yield from this fishery as specified in Amendment 16 and Frameworks 44, 45, 47, 49, 50, 51, and 53. U.S. processors are also expected to process the harvest of U.S. fishing vessels. None of the optimum yield from this fishery can be made available to foreign fishing.

5. *Specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;*

Current reporting requirements for this fishery have been in effect since 1994 and were originally specified in Amendment 5. They were slightly modified in Amendments 13 and 16, and VMS requirements were adopted in FW 42. The requirements include Vessel Trip Reports (VTRs) that are submitted by each fishing vessel. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7.

6. *Consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;*

Provisions in accordance with this requirement were implemented in earlier actions, and continue with this action. For common pool vessels, the carry-over of a small number of DAS is allowed from one fishing year to the next. If a fisherman is unable to use all of his DAS because of weather or other conditions, this measure allows his available fishing time to be used in the subsequent fishing year. Sectors may also carry forward a small amount of ACE into the next fishing year. This will help sectors react should adverse weather interfere with harvesting the entire ACE before the end of the year. Neither of these practices requires consultation with the Coast Guard.

7. *Describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;*

Essential fish habitat was defined for Atlantic wolffish in Amendment 16, and for all other stocks in Amendment 11. A summary of the EFH can be found in Section 6.3. The adverse EFH impacts of the multispecies trawl fishery, as it existed in 2003, were evaluated in Amendment 13 and minimized by the implementation of seven habitat closed areas on Georges Bank and in the Gulf of Maine. As a result of this action, the adverse habitat impacts of this fishery will continue to be minimized to the extent practicable, as required by the MSA and the EFH regulations.

8. *In the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

Current research needs are described in Section 8.0.

9. *Include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;*

The impacts on fishery participants and fishing communities are described in Section 7.6.

10. *Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;*

Objective and measurable Status Determination Criteria for all species in the management plan are presented in Amendment 16, and have been updated in subsequent frameworks, most recently FW 48 and FW 53.

11. *Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;*

The Standardized Bycatch Reporting Methodology (SBRM) omnibus amendment was dismissed by the U.S. Court of Appeals for the District of Columbia Circuit in 2011 (No. 10-5299 Oceana, Inc. v. Gary F. Locke). That method no longer applies to this amendment. None of the measures in this amendment are expected to increase bycatch beyond what was considered in Amendment 16. In 2014, the Councils approved and submitted a new SBRM amendment and it is under review by NMFS.

12. *Assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;*

This management plan does not include a catch and release recreational fishery management program, and thus does not address this requirement.

13. *Include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;*

As noted above, the description of the commercial, recreational, and charter fishing sectors was fully developed in Amendment 16, and has been updated here in Section 6.5.

14. *To the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

The Proposed Action in Amendment 18 does not allocate harvest restrictions or stock benefits to the current fishery. While accumulation limits are proposed, the limits recommended would not constrain current holdings. Allocations were adopted in Amendment 16, and this action adjusts management measures for some stocks within the existing allocation structure.

15. *Establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.*

The mechanism for establishing ACLs was adopted in Amendment 16. This action continues to use that mechanism.

9.1.3 Essential Fish Habitat Assessment

This Essential Fish Habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

9.1.3.1 Description of Action

The purpose of Amendment 18 (Northeast Multispecies FMP) Proposed Action is to address the stated purpose and need for the amendment, to address concerns regarding fleet diversity and fishery consolidation within the Northeast Multispecies FMP.

Fishing for groundfish species occurs off the New England and Mid-Atlantic coasts in federal waters. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, EFH distribution maps, and the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the SAFMC as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

The Proposed Action is described in Section 4.0. For a summary of the impacts of the Proposed Action on EFH, refer to Section 7.7.4.3. The Proposed Action includes the following general measures, implementation of accumulation limits, creation of a HA permit sub-ACL and other measures related to HA permits, and establishment of a Redfish Exemption Area.

9.1.3.2 Potential Adverse Impacts of the Action on EFH

A list of specific measures and a summary of the habitat impacts of the proposed measures is in Section 7.4. The action proposed by Amendment 18 would not have substantial impacts on EFH. The modifications in management measures may affect habitat, but changes in total fishing effort are not expected. The accumulation limit measures are expected to have neutral impacts on EFH, as geographic effort shifts are not expected. Creating a HA permit sub-ACL, removing the March 1-20 closure for fishing with a HA permit in the common pool, removing the standard tote requirement, and allowing sectors to request an exemption from VMS for HA vessels are expected to have no impact on EFH, because hook gear has no impact on EFH. Establishing a Redfish Exemption Area is expected to have positive impacts on habitat, as it would encourage effort to move offshore, away from sensitive juvenile habitat inshore.

9.1.3.3 Proposed Measures to Avoid, Minimize, or Mitigate Adverse Impacts of This Action

The Proposed Action would not have any habitat impacts that are more than minimal and, overall, the net effect of this action would be positive. Therefore, no mitigation measures are required. The adverse EFH impacts of the multispecies trawl fishery, as it existed in 2003, were evaluated in Amendment 13 to the FMP (NEFMC 2003a) and minimized by the implementation of seven habitat closed areas on Georges Bank and in the Gulf of Maine. As a result of this action, the adverse habitat impacts of this fishery will continue to be minimized to the extent practicable, as required by the MSA and the EFH regulations [50 CFR Part 600.815(a)(2)(ii)].

9.1.3.4 Conclusions

Because there are no adverse impacts associated with this action, no EFH consultation is required.

9.2 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the MSA and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508) and NOAA's agency policy and procedures for NEPA are found in NOAA Administrative Order 216-6. All of those requirements are addressed in this document, as referenced below.

9.2.1 Public Scoping

The Council announced its intent to prepare Amendment 18 and an Environmental Impact Statement (EIS) on December 21, 2011. The scoping period extended from that date until March 1, 2012 (NOAA 2011). A summary of the scoping process, comments, and responses to those comments is provided in Section 3.4.

9.2.2 Areas of Controversy

[This section will be completed after the public comment period (summer 2015).]

Amendment 18 was developed under close scrutiny, and there was mixed public reaction to the measures herein, especially on the topics of accumulation limits and inshore/offshore GOM cod. Approximately XXX written comments were received during the comment period that offered various concerns with the amendment measures.

The major areas of controversy are related to ……

9.2.3 Document Distribution

The draft document is available on the NEFMC web page, www.nefmc.org. Copies were provided to all Council members. Announcements of the documents availability will be made in the *Federal Register* and to the interested parties' mailing list. In addition, copies were distributed to the following:

US Environmental Protection Agency
EIS Filing Section
Office of Federal Activities
Ariel Rios Building (South Oval Lobby)
Mail Code 2252-A
1200 Pennsylvania Avenue NW
Washington, DC 20460

Judith A. Enck
Regional Administrator
USEPA, Region 2
290 Broadway, 25th Floor
New York, NY 10007
212.637.5000
enck.judith@epa.gov

H. Curtis Spalding
Regional Administrator
USEPA, Region 1
5 Post Office Square, Suite 100
Boston, MA 02109
617.918.1010
spalding.curt@epa.gov

Shawn M. Garvin
Regional Administrator
USEPA, Region 3
1650 Arch Street
Philadelphia, PA 19103
215.814.5155
garvin.shawn@epa.gov

Heather McTeer Toney
Regional Administrator
USEPA, Region 4
61 Forsyth Street
Atlanta, GA 30303
404.562.9900

RDML Linda Fagan
District Commander
First Coast Guard District
408 Atlantic Avenue
Boston, MA 02210
617.223.8515

William Gibbons-Fly
Director
Office of Marine Conservation
Department of State
2201 "C" Street, NW
Washington, DC 20520
202.647.2335

Rebecca Lent, Ph.D.
Executive Director
Marine Mammal Commission
4340 East-West Highway, Suite 700
Bethesda, MD 20814
301-504-0087
rlent@mmc.gov

Willie R. Taylor
Office of Environmental Policy and Compliance
Department of Interior
1849 "C" Street, NW MS 2462
Washington, DC 20240
202.208.3891
willie_taylor@ios.doi.gov

9.2.4 Point of Contact

Questions concerning this document may be addressed to:

Mr. Thomas A. Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950 (978) 465-0492

9.2.5 List of Preparers

The following personnel participated in the preparation of this DEIS.

- New England Fishery Management Council
  - Dr. Jamie Cournane, Groundfish Plan Coordinator
  - Rachel Feeney, ABD, Amendment 18 Coordinator
  - Sherie Goutier
  - Dr. Fiona Hogan
  - Chris Kellogg
  - Thomas Nies
  - Joan O'Leary
  - Jonathon Peros
- National Marine Fisheries Service
  - Greg Ardini, NEFSC (contractor, Integrated Statistics)
  - Dan Caless, GARFO
  - Timothy Cardiasmenos, GARFO

- Chad Demarest, NEFSC
- Mark Grant, GARFO
- Sarah Heil, GARFO
- Anna Henry, NEFSC (contractor, Integrated Statistics)
- Sue Murphy, GARFO
- Paul Nitschke, NEFSC
- Danielle Palmer, GARFO
- Mike Ruccio, GARFO
- Dr. William Whitmore, GARFO

- State agencies
  - Steven Correia, Massachusetts Division of Marine Fisheries
  - Sally Sherman, Maine Department of Marine Resources

9.2.6 Agencies Consulted

The following agencies were consulted in the preparation of this document:

- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council, which includes representatives from the following additional organizations:
  - Connecticut Department of Environmental Protection
  - Rhode Island Department of Environmental Management
  - Massachusetts Division of Marine Fisheries
  - New Hampshire Fish and Game
  - Maine Department of Marine Resources
- National Marine Fisheries Service, NOAA, Department of Commerce
- United States Coast Guard, Department of Homeland Security

9.2.7 Opportunity for Public Comment

Opportunities for public comment have been provided at Advisory Panel, Committee, and Council meetings. In addition, a public comment period was held from December 21, 2011 through May 1, 2012. Comments were accepted via letter, facsimile, and email during that period. Table 107 lists the public meetings related to this action. Meeting discussion documents and summaries are available at www.nefmc.org.

Table 107 - Public meetings related to Amendment 18

Date	Meeting Type	Location
2010		
4/6/10	Interspecies Committee	
4/28/10	Council	Mystic Hilton, Mystic, CT
6/16/10	Groundfish Committee	Mansfield, MA
6/23/10	Council	Holiday Inn by the Bay, Portland, ME
9/9/10	Groundfish Committee	Holiday Inn, Mansfield, MA
2011		
1/10/11	GF PDT Meeting	MA Audubon, Newburyport, MA
1/19/11	Groundfish Committee	Clarion Hotel, Portland, ME
1/25-27/11	Council	Sheraton Harborside, Portsmouth, NH

Date	Meeting Type	Location
3/17/11	Groundfish Committee	Crowne Plaza, Danvers, MA
4/18/11	Groundfish Committee	Holiday Inn, Mansfield, MA
4/26-28/11	Council	Mystic Hilton, Mystic, CT
6/9/11	Accumulation Limits Workshop	Crowne Plaza, Danvers, MA
6/21-23	Council	Holiday Inn by the Bay, Portland, ME
8/11/11	Groundfish Committee	Crowne Plaza, Danvers, MA
9/26-29/11	Council	Crowne Plaza, Danvers, MA
11/2/11	Groundfish Committee	Plymouth, MA
11/16/11	Council	Newport Marriott, Newport, RI
2012		
1/17/12	Amendment 18 Scoping Hearing	Ellsworth Town Hall, Ellsworth, ME
1/18/12	Amendment 18 Scoping Hearing	Holiday Inn by the Bay, Portland, ME
1/20/12	Amendment 18 Scoping Hearing	Seaport Inn, Fairhaven, MA
1/20/12	Amendment 18 Scoping Hearing	Holiday Inn, So. Kingstown, RI
1/23/12	Amendment 18 Scoping Hearing	Hotel Indigo, Riverhead, NY
1/24/12	Amendment 18 Scoping Hearing	Holiday Inn, Manahawkin, NJ
1/26/12	Amendment 18 Scoping Hearing	Holiday Inn, Hyannis, MA
1/26/12	Amendment 18 Scoping Hearing	Radisson Hotel, Plymouth, MA
1/30/12	Amendment 18 Scoping Hearing	MA DMF, Annisquam, MA
1/31/12	Amendment 18 Scoping Hearing	Sheraton Harborside, Portsmouth, NH
1/31/12-2/2/12	Council	Sheraton Harborside, Portsmouth, NH
6/19-6/21/12	Council	Holiday Inn by the Bay, Portland, ME
10/4/12	Groundfish Advisory Panel	Peabody, MA
11/5/12	Groundfish Committee	Portland, ME
11/13-15/12	Council	Newport Marriott, Newport, RI
2013		
3/6/13	Joint Committee and Advisory Panel	Sheraton Colonial, Wakefield, MA
4/16-17/13	Groundfish Committee	Holiday Inn, Mansfield, MA
4/23-25/13	Council	Hilton Hotel, Mystic, CT
6/10/13	Groundfish Advisory Panel	Providence Biltmore, Providence, RI
6/12/13	Groundfish Committee	Providence Biltmore, Providence, RI
6/19/13	Council	Holiday Inn by the Bay, Portland, ME
8/14/13	Groundfish Committee	Holiday Inn, Peabody, MA
9/16/13	Groundfish Advisory Panel	Holiday Inn, Portsmouth, NH
9/17/13	Groundfish Committee	Holiday Inn, Portsmouth, NH
9/24-9/26/13	Council	Cape Codder Hotel, Hyannis, MA
10/30/13	Compass Lexecon Webinar	conference call
11/18-19/13	Groundfish Committee	Newport Marriott, Newport, RI
11/20/13	Council	Newport Marriott, Newport, RI
12/9/13	Groundfish Committee	Omni Hotel, Providence, RI
12/16-18/13	Council	DoubleTree Hilton, Danvers, MA
2014		
1/23/14	Groundfish Committee	DoubleTree Hilton, Danvers, MA

Date	Meeting Type	Location
1/28-30/14	Council	Sheraton Harborside, Portsmouth, NH
3/28/14	Groundfish Committee	Omni Providence, Providence, RI
4/1/14	Groundfish Advisory Panel	Sheraton Colonial, Wakefield, MA
4/5/14	Groundfish Committee	Sheraton Colonial, Wakefield, MA
4/24/14	Council	Hilton Hotel, Mystic, CT
6/9/14	Groundfish Committee	Hampton Inn and Suites, Warwick, RI
6/18/14	Council	Holiday Inn by the Bay, Portland, ME
8/4/14	Groundfish Committee	Crowne Plaza, Danvers, MA
9/16/14	Recreational Advisory Panel	DoubleTree, Portland, ME
9/16/14	Groundfish Advisory Panel	DoubleTree, Portland, ME
9/17-18/14	Groundfish Committee	DoubleTree, Portland, ME
9/30-10/2/14	Council	Cape Codder, Hyannis, MA
11/17-20/14	Council	Newport Marriott, Newport, RI
2015		
3/25/15	Groundfish Advisory Panel	DoubleTree, Portland, ME
3/26/15	Groundfish Committee	DoubleTree, Portland, ME
4/23/15	Council	Hilton Hotel, Mystic, CT

9.3 ENDANGERED SPECIES ACT

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed action and the prosecution of the multispecies fishery are not likely to jeopardize any ESA-listed species or alter or modify any critical habitat. NMFS has already concurred with that conclusion. The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when seen in light of the large reductions in fishing effort being implemented. Section 7.5 contains the potential impacts on listed species of the proposed actions.

9.4 MARINE MAMMAL PROTECTION ACT

Section 7.5 contains the potential impacts on marine mammals of the proposed actions. The NEFMC has reviewed the impacts of Amendment 18 on marine mammal species and has concluded that the management actions contained in this action are consistent with the provisions of the MMPA. The take of harbor porpoise under the existing FMP have been reduced to the point that would allow the stocks to achieve optimum levels. The level of take for the remaining odontocetes and seals that are affected by this fishery are low enough, in relation to the size of their populations, that it has been determined that the stocks would be allowed to achieve optimum levels. Therefore, since the mortality and serious injury that is likely to occur under the existing FMP has been assessed relative to the PBR allowed for each species under the MMPA and found to be below those levels, the NEFMC concludes that Amendment 18 will provide ongoing protection to these species.

9.5 COASTAL ZONE MANAGEMENT ACT

[This section will be completed by GARFO after the FIES is submitted.]

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to the CZMA regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in § 930.34(b), or through case-by-case monitoring of unlisted activities; (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity.

9.6 ADMINISTRATIVE PROCEDURES ACT

This action was developed in compliance with the requirements of the Administrative Procedures Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the NEFMC is not requesting any abridgement of the rulemaking process for this action.

9.7 DATA QUALITY ACT

Pursuant to NOAA guidelines implementing Section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. This section addresses these requirements.

9.7.1 Utility of Information Product

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the Proposed Action, 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.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process, and the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the NEFMC, and NOAA NMFS.

This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page in PDF format. The *Federal Register* notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the GARFO website, and through the Regulations.gov website. The *Federal Register* documents will provide metric conversions for all measurements.

9.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA NMFS adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

9.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the MSFCMA; the Operational Guidelines, Fishery Management Plan Process; the EFH Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the NEPA.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. These update assessments were reviewed for TRAC by the Integrated Peer Review, SAW/SARC 59, and 2014 Groundfish Updates and Peer Review, which all included participation by independent stock assessment scientists. Landing and revenue information is based on information collected through the VTR and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA NMFS observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish PDT.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Preferred Alternative were conducted using information from the most recent complete calendar years, through 2013, and in some cases includes information that was collected during the first eight months of calendar year 2014. Complete data were not available for calendar year 2014. The data used in the analyses provide the best available information on the number of harvesters in the fishery, the catch (including landings and discards) by those harvesters, the sales and revenue of those landings to dealers, the type of permits held by vessels, the number of DAS used by those vessels, the catch of recreational fishermen and the location of those catches, and the catches and revenues from various special management programs. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the groundfish fishery.

The policy choices are clearly articulated in this EIS (Section 4.0), as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section 7.0. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the NEFSC, GARFO, and NOAA NMFS Headquarters. The NEFSC's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The NEFMC review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by GARFO staff is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA FMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

9.8 E.O. 13132 (FEDERALISM)

Executive Order 13132 established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in Amendment 18. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

9.9 E.O. 13158 (MARINE PROTECTED AREAS)

Executive Order 13158 on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by a MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this document, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

9.10 PAPERWORK REDUCTION ACT

[This section will be completed by GARFO after the FIES is submitted.]

The purpose of the Paperwork Reduction Act (PRA) is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

The Proposed Action in Amendment 18 would modify existing collection of information requirements implemented by previous amendments to the FMP that are subject to the PRA. Specifically, Handgear A (HA) vessels enrolled in groundfish sectors would no longer be required to use the Vessel Monitoring System (VMS). Instead, vessels fishing with handgear in a sector must declare trips through the Interactive Voice Response (IVR) system.

The PRA package prepared in support of this action and the information collection identified above, including the required forms and supporting statements, will be submitted when the Proposed Action is determined and the final amendment is submitted. [to be completed]

9.11 REGULATORY IMPACT REVIEW

[This section will be completed before the FEIS is submitted.]

9.11.1 Executive Order 12866

The purpose of E.O. 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be “significant.” Section 9.11 of this document represents the Regulatory Impact Review (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 RIR analysis shows that this action is not a “significant regulatory action,” because it will not affect in a material way the economy or a sector of the economy.

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

1. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the Executive Order.

9.11.2 Initial Regulatory Flexibility Act

[This section will be completed before the FEIS is submitted.]

9.11.2.1 Introduction

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

With certain exceptions, the RFA requires agencies to conduct an Initial Regulatory Flexibility Analysis (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.

[Remainder to be completed.]

10.0 REFERENCES

Abernathy A ed. 1989. Description of the Mid-Atlantic Environment. Herndon (VA): U.S. Department of the Interior, Minerals Management Service. 167 p.

Almeida F. 1987. Stock definition of silver hake in the New England-Middle Atlantic area. North American Journal of Fisheries Management. 7: 169-186.

Angliss RP, DeMaster DP. Differentiating Serious and Non-Serious Injury of Marine Mammals Taken Incidental to Commercial Fishing Operations. Proceedings of the Serious Injury Workshop 2 April 1997; 1998; Silver Spring (MD): U.S. Department of Commerce.

ASMFC. 2007. Special Report to the Atlantic Sturgeon Management Board: Estimation of Atlantic Sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic. Alexandria (VA): Atlantic States Marine Fisheries Commission. 95 p.

ASMFC. 2009. American Lobster Stock Assessment Report for Peer Review. Alexandria (VA): Atlantic States Marine Fisheries Commission. Stock Assessment Report No. 09-01 (Supplement).

ASSRT. 2007. Status Review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) - Report of the Atlantic Sturgeon Status Review Team to NMFS. Gloucester (MA): U.S. Department of Commerce. 174 p.

Attard J, Hudon C. 1987. Embryonic development and energetic investment in egg production in relation to size of female lobster (*Homarus americanus*). Canadian Journal of Fisheries and Aquatic Sciences. 44: 1157-1164.

Backus RH. 1987. Georges Bank. Cambridge (MA): Massachusetts Institute of Technology Press. 593 p.

Bain MB, Haley N, Peterson D, Waldman JR, Arend K. 2000. Harvest and habitats of Atlantic sturgeon *Acipenser oxyrinchus* Mitchill, 1815, in the Hudson River Estuary: Lessons for sturgeon conservation. Instituto Espanol de Oceanografia Boletin. 16: 43-53.

Barnhardt WA, Kelley JT. 1998. Mapping the Gulf of Maine with side-scan sonar: A new bottom-type classification for complex seafloors. Journal of Coastal Research. 14(2): 646-659.

Baum ET. 1997. Maine Atlantic Salmon - A National Treasure. Hermon (ME): Atlantic Salmon Unlimited.

Baumgartner MF, Cole TVN, Campbell GJ, Teegarden GJ, Durbin EG. 2003. Associations between North Atlantic right whales and their prey, *Calanus finmarchicus*, over diel and tidal time series. Marine Ecology Progress Series. 264: 155-166.

Baumgartner MF, Lysiak NSJ, Schuman C, Urban-Rich J, Wenzel FW. 2001. Diel vertical migration behavior of *Calanus finmarchicus* and its influence on right and sei whale occurrence. Marine Ecology Progress Series. 423: 167-184.

Baumgartner MF, Mate BR. 2003. Summertime foraging ecology of North Atlantic right whales. Marine Ecological Progress Series. 264: 123-135.

Beardsall JM, Solomon JL, Bell CD, Austin TJ, Ebanks-Petrie G, Coyne MS, Broderick AC, Godley BJ. 2013. Consequences of incidental otter trawl capture on survival and physiological condition of threatened Atlantic sturgeon. Transactions of the American Fisheries Society. 142: 1202-1214.

Beardsley RC, Butman B, Geyer WR, Smith P. 1996. Physical oceanography of the Gulf of Maine: An update. In: Proceedings of the Gulf of Maine Ecosystem Dynamics Scientific

Symposium and Workshop. 97-1 ed.: Regional Association for Research in the Gulf of Maine. p. 39-52.
Blaxter JHS, Danielssen D, Moksness E, Oiestad V. 1983. Description of the early development of the halibut, *Hippoglossus hippoglossus,* and attempts to rear the larvae past first feeding. Marine Biology. 73: 99-107.
Blumenthal JM, Solomon JL, Bell CD, Austin TJ, Ebanks-Petrie G, Coyne MS, Broderick AC, Godley BJ. 2006. Satellite tracking highlights the need for international cooperation in marine turtle management. Endangered Species Research. 2: 51-61.
Bolles K, Begg G. 2000. Distinction between silver hake (*Merluccius bilinearis*) stocks in U.S. waters of the Northwest Atlantic based on whole otolith morphometrics. Fisheries Bulletin. 98: 451-462.
Bolster WJ. 2008. Putting the ocean in Atlantic history: Maritime communities and marine ecology in the Northwest Atlantic, 1500-1800. American Historical Review. 19-47.
Brandt S, Ding N. 2008. Impact of property rights on labor contracts in commercial fisheries. Ocean and Coastal Management. 51(11): 740-748.
Braun-McNeill J, Epperly S. 2004. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). Marine Fisheries Review. 64(4): 50-56.
Braun-McNeill J, Epperly SP, Avens L, Snover ML, Taylor JC. 2008. Life stage duration and variation in growth rates of loggerhead *(Caretta caretta)* sea turtles from the western North Atlantic. Herpetological Conservation and Biology. 3(2): 273-281.
Braun J, Epperly SP. 1996. Aerial surveys for sea turtles in southern Georgia waters, June 1991. Gulf of Mexico Science. 1996(1): 39-44.
Brodziak J, Holmes E, Sosebee K, Mayo R. 2001. Assessment of the Silver Hake Resource in the Northwest Atlantic in 2000. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 01-03.
Brodziak J, Macy III W. 1996. Growth of long-finned squid, *Loligo pealeii*, in the Northwest Atlantic. Fisheries Bulletin. 94: 212-236.
Brooks DA. 1996. Physical oceanography of the shelf and slope seas from Cape Hatteras to Georges Bank: A brief overview. In: The Northeast Shelf Ecosystem - Assessment, Sustainability, and Management. Cambridge (MA): Blackwell Science. p. 564.
Brown MW, Nichols OC, Marx MK, Ciano JN. 2002. Surveillance of North Atlantic Right Whales in Cape Cod Bay and Adjacent Waters - Final Report to the Division of Marine Fisheries, Commonwealth of Massachusetts. Provincetown (MA): Provincetown Center for Coastal Studies. 29 p.
Burdge RJ. 1998. A Conceptual Approach to Social Impact Assessment. Revised ed. Madison (WI): Social Ecology Press. 284 p.
Carothers C, Lew DK, Sepez J. 2010. Fishing rights and small communities: Alaska halibut IFQ transfer patterns. Ocean & Coastal Management. 53(9): 518-523.
Carr HA, Milliken HO. 1998. Conservation engineering: options to minimize fishing's impacts to the sea floor. In: Effects of Fishing Gear on the Sea Floor of New England. Boston (MA): MIT Sea Grant. p. 160.
Census. State and County QuickFacts. US Census Bureau,; Available from: http://quickfacts.census.gov/qfd/index.html.
CeTAP. 1982. Final Report of the Cetacean and Turtle Assesment Program: A Characterization of Marine Mammals and Turtles in the Mid- and North Atlantic Areas of the U.S. Outer

Continental Shelf. Washington (DC): University of Rhode Island. AA511-CT8-48. 568 p.
Chang S, Berrien PL, Johnson DL, Morse WW. 1999. Essential Fish Habitat Source Document: Windowpane, *Scophthalmus aquosus*, Life History and Habitat Characteristics. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-137. 40 p.
Clapham PJ, Baraff LS, Carlson MA, Christian DK, Mattila CA, Mayo CA, Murphy MA, Pittman S. 1993. Seasonal occurrence and annual return of humpback whales, *Megaptera novaeangliae*, in the southern Gulf of Maine. Canadial Journal of Zoology. 71: 440-443.
Clark SH, Linvingstone R. 1982. Ocean pout, *Macrozoarces americanus*, fish distribution, Marine Ecosystem Analysis (MESA). New York Bight Atlas Monograph. 15: 76-79.
Clay PM, Colburn LL, Olson J, Pinto da Silva P, Smith SL, Westwood A, Ekstrom J. Community Profiles for the Northeast U.S. Fisheries. August 22, 2012. Woods Hole (MA): Northeast Fisheries Science Center; Available from: http://www.nefsc.noaa.gov/read/socialsci/communityProfiles.html.
Cohen A. 1976. The systematics and distribution of Loligo (*Cephalopoda Myopsida*) in the western North Atlantic, with descriptions of two new species. Malacol. 15(2): 299-367.
Cole TVN, Hamilton P, Henry AG, Duley P, Pace III RM, White BN, Frasier T. 2013. Evidence of a North Atlantic right whale *Eubalaena glacialis* mating ground. Endangered Species Research. 21(55-64).
Collette BB, Klein-MacPhee G eds. 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. Washington (DC): Smithsonian Institution Press. 882 p.
Collins MR, Smith TIJ. 1997. Distribution of shortnose and Atlantic sturgeons in South Carolina. North American Journal of Fisheries Management. 17: 995-1000.
Colvocoresses JA, Musick JA. 1984. Species associations and community composition of Middle Atlantic Bight continental shelf demersal fishes. Fisheries Bulletin. 82: 295-313.
Conant TA, Dutton PH, Eguchi T, Epperly SP, Fahy CC, Godfrey MH, MacPherson SL, Possardt EE, Schroeder BA, Seminoff JA, et al. 2009. Loggerhead Sea Turtle (*Caretta caretta*) 2009 Status Review under the U.S. Endangered Species Act. Silver Spring (MD): U.S. Department of Commerce. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service. 222 p.
Cook SK. 1988. Physical oceanography of the Middle Atlantic Bight. In: Characterization of the Middle Atlantic Water Management Unit of the Northeast Regional Action Plan. AL Pacheco ed. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-F/NEC-56. 322 p.
Copes P, Charles A. 2004. Socioeconomics of Individual Transferable Quotas and community-based fishery management. Agricultural and Resource Economics Review. 33(2): 171-181.
Dadswell MJ. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. Fisheries. 31: 218-229.
Dadswell MJ, Taubert BD, Squires TS, Marchette D, Buckley J. 1984. Synopsis of biological data on shortnose sturgeon, *Acipenser brevirostrum*. LeSuer. 1818.
Damon-Randall K, Colligan M, Crocker J. 2013. Composition of Atlantic Sturgeon in Rivers, Estuaries, and Marine Waters. Gloucester (MA). National Marine Fisheries Service/GARFO.

Dirlam J, Georgianna D. 1994. Recent adjustment in New England fresh fish processing. Marine Resource Economics. 9: 375-384.

Dodge KL, Galuardi B, Miller TJ, Lutcavage ME. 2014. Leatherback turtle movements, dive behavior, and habitat characteristics in ecoregions of the northwest Atlantic Ocean. PLoS ONE. 9(3 e91726): 1-17.

Dorsey EM. 1998. Geological overview of the sea floor of New England. In: Effects of Fishing Gear on the Sea Floor of New England. EM Dorsey, Pederson J eds. Cambridge (MA): MIT Sea Grant Publication. 98-4. 8-14 p.

Dovel WL, Berggren TJ. 1983. Atlantic sturgeon of the Hudson River Estuary, New York. New York Fish and Game Journal. 30: 140-172.

Dunton KJ, Jordaan A, McKown KA, Conover DO, Frisk MG. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. Fishery Bulletin. 108: 450-465.

Eckert SA, Bagley D, Kubis S, Ehrhart L, Johnson C, Stewart K, DeFreese D. 2006. Internesting and postnesting movements of foraging habitats of leatherback sea turtles (*Dermochelys coriacea*) nesting in Florida. Chelonian Conservation Biology. 5(2): 239-248.

Epperly SP, Braun J, Chester AJ. 1995. Areal surveys for sea turtles in North Carolina inshore waters. Fishery Bulletin. 93(254-261).

Epperly SP, Braun J, Chester AJ, Cross FA, Merriner JV, Tester PA. 1995. Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. Bulletin of Marine Science. 56(2): 547-568.

Epperly SP, Braun J, Veishlow. 1995. Sea turtles in North Carolina waters. Conservation Biology. 9(2): 384-394.

Erickson DL, Kahnle A, Millard MJ, Mora EA, Bryja M, Higgs A, Mohler J, DuFour M, Kenney G, Sweka J, et al. 2011. Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*. Jounal of Applied Ichthyology. 27: 356-365.

Falk-Petersen IR, Hansen TK. 1991. Reproductive biology of wolffish *Anarhincas lupus* from north-Norwegian waters. ICES CM. G(14): 17.

Fay C, Barton M, Craig S, Hecht A, Pruden J, Saunders R, Sheehan T, Trial J. 2006. Status Review for Anadromous Atlantic Salmon (*Salmo salar*) in the United States - Report to the National Marine Fisheries Service and U.S. Fish and Wildlife Service. 294 p.

Furevik D, Humborstad O-B, Jorgensen T, Lokkeborg S. 2008. Floated fish pot eliminates bycatch of red king crab and maintains target catch of cod. Fisheries Research. 92: 23-27.

Gabriel W. 1992. Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, northwest Atlantic. Journal of Northwest Atlantic Fisheries. 14: 29-46.

GFWA. The Gloucester Fishermen's Wives Association. Gloucester (MA); Available from: www.gfwa.org.

GMRI. Workshop on Proactive Conservation Planning for Northwest Atlantic Cusk. 2012 December 7-8, 2011: Gulf of Maine Research Institute in coordination with National Marine Fisheries Service.

Griffin DB, Murphy SR, Frick MG, Broderick AC, Coker JW, Coyne MS, Dodd MG, Godfrey MH, Godley BJ, Mawkes LA, et al. 2013. Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: Implications for conservation. Marine Biology. 160: 3071-3086.

Grosslein MD, Azarovitz TR. 1982. Fish distribution, Marine Ecosystem Analysis (MESA). In: New York Bight Atlas Monograph.Vol. 15. Albany (NY): NYSG Institute.
Haas HL. 2010. Using observed interactions between sea turtles and commercial bottom-trawling vessels to evaluate the conservation value of trawl gear modifications. Marine and Coastal Fisheries. 2: 263-276.
Hain JHW, Ratnaswamy MJ, Kenney RD, Winn HE. 1992. The fin whale, *Balaenoptera physalus,* in waters of the northeastern United States continental shelf. Reports of the International Whaling Commission. 42: 653-669.
Hamilton PK, Mayo CA. 1990. Population characteristics of right whales (*Eubalaena glacialis*) observed in Cape Cod and Massachusetts Bays, 1978-1986. Reports of the International Whaling Commission. 12: 203-208.
Hart DR, Chute AS. 2004. Essential Fish Habitat Source Document: Sea Scallop, *Placopecten magellanicus*, Life History and Habitat Characteristics 2nd ed. Woods Hole (MA): U.S. Department of Commerce. Northeast Fisheries Science Center Technical Memorandum NE-198.
Hartley D, Whittingham A, Kenney JF, Cole TVN, Pomfret E. 2003. Large Whale Entanglement Report. Gloucester (MA): U.S. Department of Commerce. National Marine Fisheries Service Northeast Regional Office.
Haug T, Gulliksen B. 1988. Fecundity and oocyte sizes in ovaries of female Atlantic halibut, *Hippoglossus hippoglossus* (L.). Sarsia. 73: 259-261.
Hawkes LA, Broderick AC, Coyne MS, Godfrey MH, Lopez-Jurado L-F, Lopez-Suarez P, Merino SE, Varo-Cruz N, Godley BJ. 2006. Phenotypically linked dichotomy in sea turtle foraging requires multiple conservation approaches. Current Biology. 16: 990-995.
Hawkes LA, Witt MJ, Broderick AC, Coker JW, Coyne MS, Dodd MG, Frick MG, Godfrey MH, Griffin DB, Murphy SR, et al. 2011. Home on the range: spatial ecology of loggerhead turtles in Atlantic waters of the USA. Diversity and Distributions. 17: 624-640.
Hayes ML. 1983. Active fish capture methods. In: Fisheries Techniques. Bethesda (MD): American Fisheries Society. p. 123-145.
Hirth HF. 1997. Synopsis of the Biological Data of the Green Turtle, *Chelonia mydas* (Linnaeus 1758). In: US Fish and Wildlife Service Biological Report 97.Vol. 1. 120 p.
Holland DS. 2013. Making cents out of barter data from the British Columbia groundfish ITQ market. Marine Resource Economics. 28(4): 311-330.
Hyvarinen P, Suuronen P, Laaksonen T. 2006. Short-term movement of wild and reared Atlantic salmon smolts in brackish water estuary - preliminary study. Fisheries Management and Ecology. 13(6): 399-401.
ICES. 2000. Report of the ICES Advisory Committee on the Marine Environment. International Council for the Exploration of the Sea. Cooperative Research Report No. 241. 27 p.
Jacobson L. 2005. Essential fish habitat source document: longfin inshore squid, *Loligo pealeii,* life history and habitat characteristics. 2nd ed. Woods Hole (MA): U.S. Department of Commerce. NOAA Tech. Memo. NMFS-NE-193. 42 p.
James M, Myers R, Ottenmeyer C. 2005. Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. Proceedings of the Royal Society of Biological Sciences. 272(1572): 1547-1555.
James MC, Sherrill-Mix SA, Martin K, Myers RA. 2006. Canadian waters provide critical foraging habitat for leatherback sea turtles. Biological Conservation. 133: 347-357.

Jefferson TA, D. F, Bolanos-Jimenez J, Zerbini AN. 2009. Distribution of common dolphins (*Delphinus sp.*) in the western North Atlantic: A critical re-examination. Marine Biology. 156: 1109-1124.

Jennings S, Kaiser MJ, Reynolds JD. 2001. Marine Fisheries Ecology. Oxford: Blackwell Science p.

Jin D, Hoagland P, Thunberg E. 2005. An analysis of the relationship between fish harvesting and processing sectors in New England. Marine Resource Economics. 21: 47-62.

Johnson AJ, Salvador GS, Kenney JF, Robbins J, Krauss SD, Landry SC, Clapham PJ. 2005. Fishing gear involved in entanglements of right and humpback whales. Marine Mammal Science. 21(4): 635-645.

Kanwit K, Pol M, He P. 2013. REDNET - A Network to Redevelop a Sustainable Redfish *(Sebastes fasciatus)* Trawl fishery in the Gulf of Maine: Final Report, Component 2 - Baseline Criteria and Bycatch Evaluation. Maine Department of Marine Resources. 35 p.

Keats DW, South GR, Steele DH. 1985. Reproduction and egg guarding of Atlantic wolffish (*Anarhichas lupus*: Anarhichidae) and ocean pout (*Macrozoarces americanus*: Zoarcidae) in Newfoundland waters. Canadian Journal of Zoology. 63: 2565-2568.

Kelley JT. 1998. Mapping the surficial geology of the western Gulf of Maine. In: Effects of Fishing Gear on the Sea Floor of New England. EM Dorsey, Pederson J eds. Cambridge (MA): MIT Sea Grant Publication. 98-4. 15-19 p.

Kenney RD. 2001. Anomalous 1992 spring and summer right whale (*Eubalaena glacialis*) distribution in the Gulf of Maine. Journal of Cetacean Research and Management. 2: 209-223.

Kenney RD, Hyman MAM, Owen RE, Scott GP, Winn HE. 1986. Estimation of prey densities required by western North Atlantic right whales. Marine Mammal Science. 2: 1-13.

Kenney RD, Winn HE, Macaulay MC. 1995. Cetaceans in the Great South Channel, 1979-1989: right whale (*Eubalaena glacialis*). Continental Shelf Research. 15: 385-414.

Khan C, Cole TVN, Duley P, Glass A, Gatzke. 2010. North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2009 Results Summary. Woods Hole (MA): U.S. Department of Commerce. 10-07. 7 p.

Khan C, Cole TVN, Duley P, Glass A, Gatzke. 2011. North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2010 Results Summary. Woods Hole (MA): U.S. Department of Commerce. 11-05. 6 p.

Khan C, Cole TVN, Duley P, Glass A, Gatzke. 2012. North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2011 Results Summary. Woods Hole (MA): U.S. Department of Commerce. 12-09. 6 p.

Khan C, Cole TVN, Duley P, Glass A, Niemeyer M, Christman C. 2009. North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2008 Results Summary. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 09-05. 7 p.

King TL, Jubinski BA, Spidle AP. 2001. Microsatellite DNA variation in Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and cross-species amplification in the Acipenseridae. Conservation Genetics. 2: 103-119.

Kitts A, Bing-Sawyer E, McPherson M, Olson J, Walden J. 2011. Report for Fishing Year 2010 on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2010 - April 2011). December 2011. Woods Hole (MA): NOAA Fisheries Northeast Fisheries Science Center. 11-12. 44 p.

Knowlton AR, Hamilton PK, Marx MK, Pettis HM, Kraus SD. 2012. Monitoring North Atlantic right whale (*Eubalaena glacialis*) entanglement rates: a 30 yr retrospective. Marine Ecology Progress Series. 466: 293-302.

Kocik JF, Wigley SE, Kircheis D. 2014. Annual Bycatch Update Atlantic Salmon 2013 U.S. Atlantic Salmon Assessment Committee Working Paper.Vol. 2014. Old Lyme (CT): (cited with permission of authors). 05. 6 p.

Kynard B, Horgan M, Kieffer M, Seibel D. 2000. Habitat use by shortnose sturgeon in two Massachusetts rivers, with notes on estuarine Atlantic sturgeon: A hierarchical approach. Transactions of the American Fisheries Society. 129: 487-503.

Lacroix GL, Knox D. 2005. Distribution of Atlantic salmon *(Salmo salar)* postsmolts of different origins in the Bay of Fundy and Gulf of Maine and evaluation of factors affecting migration, growth, and survival. Canadian Journal of Fisheries and Aquatic Sciences. 62: 1363-1376.

Lacroix GL, McCurdy P. 1996. Migratory behavoir of post-smolt Atlantic salmon during initial stages of seaward migration. Journal of Fish Biology. 49: 1086-1101.

Lacroix GL, McCurdy P, Knox D. 2004. Migration of Atlantic salmon post smolts in relation to habitat use in a coastal system. Transactions of the American Fisheries Society. 133(6): 1455-1471.

Laney RW, J.E. H, Versak BR, Mangold MF, Cole Jr. WW, Winslow SE. 2007. Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988–2006. In: Anadromous Sturgeons: Habitats, Threats, and Management. Bethesda (MD): American Fisheries Society Symposium,.

Lee M, Thunberg E. 2012. An Inverse Demand System for New England Groundfish: Welfare Analysis of the Transition to Catch Share Management. Paper presented at: 2012 Agricultural & Applied Economics Association's Annual Meeting, Seattle (WA).

Legault C. 2009. Report of the Retrospective Working Group. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 09-01. 38 p.

Lindeboom HJ, de Groot SJ. 1998. Impact II - The Effects of Different Types of Fisheries on the North Sea and Irish Sea Benthic Ecosystems. NIOZ Report. 1998-1. 404 p.

Local Catch. Local Catch.org A Network of Community Supported Fisheries. Available from: http://www.localcatch.org/index.html.

Lock M, Packer D. 2004. Essential Fish Habitat Source Document: Silver Hake, *Merluccius bilinearis*, Life History and Habitat Characteristics. 2nd ed. Woods Hole (MA): National Marine Fisheries Service. NOAA Technical Memorandum NMFS-NE-186.

MAFMC. 1998. Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. Dover (DE): Mid-Atlantic Fishery Management Council and the ASMFC in cooperation with the NMFS the NEFMC and the SAFMC. 496 p.

MSFCMA. 2007. Magnuson-Stevens Fishery Conservation and Management Reauthorization Act. Public Law 109-479, 16 USC 1801-1884.

Mansfield KL, Saba VS, Keinath J, Mauick JA. 2009. Satellite telemetry reveals a dichotomy in migration strategies among juvenile loggerhead sea turtles in the northwest Atlantic. Marine Biology. 156: 2555-2570.

Mayo CA, Marx MK. 1990. Surface foraging behaviour of the North Atlantic right whale, *Eubalaena glacialis*, and associated zooplankton characteristics. Canadian Journal of Zoology. 68: 2214-2220.

McClellan CM, Read AJ. 2007. Complexity and variation in loggerhead sea turtle life history. Biology Letters. 3: 592-594.

Mercer S, Brown GE, Clearwater S, Yao Z. 1993. Observations of the copulatory bahavior of the ocean pout, *Macrozoarces americanus*. Canadian Field-Naturalist. 107: 243-244.

Methven DA, Brown JA. 1991. Time of hatching affects development, size, yolk volume and mortality of newly hatched *Macrozoarces americanus* (Pisces: *Zoarcidae*). Canadian Journal of Zoology. 69(8): 2161-2167.

Miller JM, Burke JS, Fitzhugh GR. 1991. Early life history patterns of Atlantic North American flatfish: Likely (and unlikely) factors controlling recruitment. Netherland Journal of Sea Research. 27: 261-275.

Miller TJ, Shepard G. 2011. Summary of Discard Estimates for Atlantic Sturgeon. Woods Hole (MA): Northeast Fisheries Science Center Population Dynamics Branch.

Mirarchi F. 1998. Bottom trawling on soft substrates. In: Effects of Fishing Gear on the Sea Floor of New England. Boston (MA): MIT Sea Grant.

Mitchell G, Peterson S. 2013. Recommendations for Excessive-Share Limits in the Northeast Multispecies Fishery. December 31, 2013. Pasadena (CA): Compass Lexecon. 60 p.

Mitchell GH, Kenney RD, Farak AM, Campbell RJ. 2003. Evaluation of Ocurrence of Endangered and Threatened Marine Species in Naval Ship Trial Areas and Transit Lanes in the Gulf of Maine and Offshore of Georges Bank. NUWC-NPT Technical Memo 02-121A. 113 p.

Moore E. 1947. Studies on the marine resources of southern New England. VI. The sand flounder, *Lophopsetta aquosa* (Mitchill): a general study of the species with special emphasis on age determination by means of scales and otoliths. Bulletin of the Bingham Oceanographic Collection. 11(3): 1-79.

Moore MJ, van der Hoop JM. 2012. The painful side of trap and fixed net fisheries: Chronic entanglement of large whales. Journal of Marine Biology. 2012(Article ID 230653): 4.

Morgan LE, Chuenpagdee R. 2003. Shifting Gears: Assessing the Collateral Impacts of Fishing Methods in U.S. Waters. Pew Charitable Trusts. Pew Science Series on Conservation and the Environment. 42 p.

Morreale S, Standora E. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. Chelonean Conservation and Biology. 4(4): 872-882.

Morse WW, Able KW. 1995. Distribution and life history of windowpane, Scophthalmus aquosos, off the Northeastern United States. Fishery Bulletin. 93: 674-693.

Mountain DG, Langton RW, Watling L. 1994. Oceanic processes and benthic substrates: Influences on demersal fish habitats and benthic communities. In: Selected Living Resources, Habitat Conditions, and Human Perterbations of the Gulf of Maine: Environmental and Ecological Considerations for Fishery Management. RW Langton, Pearce JB, Gibson JA eds. Woods Hole (MA): Department of Commerce. NOAA Technical Memorandum NMFS-NE-106. 20-25 p.

Murphy T, Kitts A, Demarest C, Walden J. 2015. 2013 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2013 - April 2014). Woods Hole (MA): NOAA Fisheries Northeast Fisheries Science Center. 106 p.

Murphy T, Kitts A, Records D, Demarest C, Caless D, Walden J, Benjamin S. 2014. 2012 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery (May

2012-April 2013). January 2014. Woods Hole (MA): NOAA Fisheries Northeast Fisheries Science Center. 14-01. 121 p.

Murphy T, Kitts A, Records D, Demarest C, McPherson M, Walden J, Caless D, Bing-Sawyer E, Steinback S, Olson J. 2012. 2011 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2011-April 2012). December 2012. Woods Hole (MA): NOAA Fisheries Northeast Fisheries Science Center. 12-30. 111 p.

Murphy TM, Murphy SR, Griffin DB, Hope CP. 2006. Recent occurrence, spatial distribution and temporal variability of leatherback turtles (*Dermochelys coriacea*) in nearshore waters of South Carolina, USA. Chelonian Conservation Biology. 5(2): 216-224.

Murray KT. 2008. Estimated Average Annual Bycatch of Loggerhead Sea Turtles (*Caretta caretta*) in U.S. Mid-Atlantic Bottom Otter Trawl Gear, 1996–2004. Woods Hole (MA): US Department of Commerce. NEFSC Reference Document 08-20. 32 p.

Murray KT. 2009. Characteristics and magnitude of sea turtle bycatch in U.S. Mid-Atlantic gillnet gear. Endangered Species Research. 8: 211-224.

Murray KT. 2013. Estimated Loggerhead and Unidentified Hard-shelled Turtle Interactions in Mid-Atlantic Gillnet Gear, 2007-2011. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NM-225. 20 p.

Murray KT, Orphanides CD. 2013. Estimating the risk of loggerhead turtle *Caretta caretta* bycatch in the U.S. Mid-Atlantic using fishery-independent and -dependent data. Marine Ecological Progress Series. 477: 259-270.

NEPA. 1970. National Environmental Policy Act. Public Law 91-190: 852-859 and as amended Public Law 94-52 and 94-83, 42 USC 4321- 4347.

NDPSWG. 2009. The Northeast Data Poor Stocks Working Group Report, December 8-12, 2008 Meeting. Part A. Skate Species Complex, Deep Sea Red Crab, Atlantic Wolffish, Scup, and Black Sea Bass. Woods Hole (MA): U.S. Department of Commerce. Northeast Fisheries Science Center Reference Document 09-02. 496 p.

NEFMC. 1993. Amendment 5 to the Multispecies Fishery Management Plan. Newburyport (MA): New England Fishery Managment Council. 366 p.

NEFMC. 1997. Amendment 7 to the Northeast Multispecies Fishery Management Plan. Newburyport, MA: New England Fishery Management Council. 1-239 p.

NEFMC. 1998a. Final Amendment #11 to the Northeast Multispecies Fishery Management Plan, #9 to the Atlantic Sea Scallop Fishery Management Plan, Amendment #1 to the Monkfish Fishery Management Plan, Amendment #1 to the Atlantic Salmon Fishery Management Plan, and components of the proposed Atlantic Herring Fishery Management Plan for Essential Fish Habitat, incorporating the Environmental Assessment. Newburyport (MA): New England Fishery Management Council. 388 p.

NEFMC. 1998b. Monkfish Fishery Management Plan. Saugus (MA): New England and Mid-Atlantic Fishery Management Councils. 480 p.

NEFMC. 1999. Framework Adjustment 27 to the Northeast Multispecies Fishery Management Plan. New England Fishery Management Council in consultation with the National Marine Fisheries Service. 112 p.

NEFMC. 2003a. Amendment 13 to the Northeast Multispecies Fishery Management Plan including a Final Supplemanetal Environmental Impact Statement and an Initial Regulatory Flexibility Analysis. Newburyport (MA): National Marine Fisheries Service in collaboration with the New England Fishery Management Council. 1660 p.

NEFMC. 2003b. Fishery Management Plan for the Northeast Skate Complex including Final Environmental Impact Assessment and an Initial Regulatory Flexibility Analysis. Newburyport (MA): New England Fishery Management Council and National Marine Fisheries Service. 443 p.
NEFMC. 2006. Framework 42 to the Northeast Multispecies Fishery Management Plan. Newburyport, MA
NEFMC. 2007. Amendment 11 to the Atlantic Sea Scallop Fishery Management Plan: Including a Final Supplemental Environmental Impact Statement and Initial Regulatory Flexibility Analysis. Newboryport (MA): New England Fishery Management Council in consultation with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council. 1076 p.
NEFMC. 2009a. Amendment 16 to the Northeast Multispecies Fishery Management Plan Including an Environmental Impact Statement and Initial Regulatory Flexibility Analysis. Newburyport (MA) 1-905 p.
NEFMC. 2009b. Draft Final Amendment 3 to the Fishery Management Plan for the Northeast Skate Complex and Final Environmental Impact Statement. Newburyport (MA): New England Fishery Management Council and National Marine Fisheries Service. 459 p.
NEFMC. 2010. Framework Adjustment 44 to the Northeast Multispecies Fishery Management Plan. Newburyport (MA): New England Fishery Management Council. 306 p.
NEFMC. 2011. Framework 45 to the Northeast Multispecies Fishery Management Plan. Newburyport (MA) 408 p.
NEFMC. New England Fishery Management Council [Internet]. Newburyport (MA); Available from: www.nefmc.org.
NEFMC. 2013. Groundfish Plan Development Team memo to the Groundfish Oversight Committee re Groundfish Permit Banks. June 3, 2013. Newburyport (MA): New England Fishery Management Council. 36 p.
NEFMC. 2014a. Framework Adjustment 3 to the Atlantic Herring Fishery Managment Plan. Newburyport (MA): New England Fishery Management Council. 241 p.
NEFMC. 2014b. Groundfish Plan Development Team Memo to the Groundfish Oversight Committee re. Gulf of Maine Cod in Statistical Reporting Area 514. April 16, 2014. Newburyport (MA): New England Fishery Management Council. 17 p.
NEFMC. 2014c. Groundfish Plan Development Team Memo to the Groundfish Oversight Committee re. Progress on Amendment 18. September 5, 2014. Newburyport (MA): New England Fishery Management Council. 10 p.
NEFMC. 2014d. Omnibus Essential Fish Habitat Amendment 2 Draft Environmental Impact Statement, Appendix D: The Swept Area Seabed Impact (SASI) Approach: A Tool for Analyzing the Effects of Fishing on Essential Fish Habitat. January 2011. Newburyport (MA): NEFMC Habitat Plan Development Team. 257 p.
NEFMC. 2015. Framework Adjustment 53 to the Northeast Multispecies Fishery Management Plan. Newburyport (MA): New England Fishery Management Council. 388 p.
NEFSC. 2002. Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern United States, October 23-25, 2001, Boston, Massachusetts. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 02-01. 86 p.
NEFSC. 2008. Assessment of 19 Northeast Groundfish Stocks Through 2007: Report of the 3rd Groundfish Assessment Review Meeting (GARM III), August 4-8, 2008. Woods Hole (MA): U.S. Department of Commerce. 884 p.

NEFSC. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW) Assessment Summary Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 10-09. 57 p.

NEFSC. 2011a. 51st Northeast Regional Stock Assessment Workshop (51st SAW) Assessment Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 11-02. 856 p.

NEFSC. 2011b. 52nd Northeast Regional Stock Assessment Workshop (52nd SAW) Assessment Summary Report.: U.S. Department of Commerce. NEFSC Reference Document 11-11. 51 p.

NEFSC. EFH Source Documents: Life History and Habitat Characteristics. 2011. Woods Hole (MA): U.S. Department of Commerce; Available from: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

NEFSC. 2012a. 54th Northeast Regional Stock Assessment Workshop (54th SAW) Assessment Summary Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 12-14. 45 p.

NEFSC. 2012b. Assessment or Data Updates of 13 Northeast Groundfish Stocks through 2010. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 12-06. 789 p.

NEFSC. Social Sciences Branch [Internet]. 2012. Woods Hole (MA): NMFS Northeast Fisheries Science Center; Available from: http://www.nefsc.noaa.gov/read/socialsci/index.html.

NEFSC. 2013a. 55th Northeast Regional Stock Assessment Workshop (55th SAW) Assessment Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 13-11. 845 p.

NEFSC. 2013b. 55th Northeast Regional Stock Assessment Workshop (55th SAW) Assessment Summary Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 13-01. 47 p.

NEFSC. 2013c. 56th Northeast Regional Stock Assessment Workshop (56th SAW) Assessment Summary Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 13-04. 42 p.

NEFSC. 2013d. 57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Summary Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 13-16. 967 p.

NEFSC. 2013e. 2013 Monkfish Operational Assessment. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 13-23. 116 p.

NEFSC. SAW and SARC Reports: 2004-present. Woods Hole (MA): U.S. Department of Commerce; Available from: http://www.nefsc.noaa.gov/saw/reports.html.

NEFSC. Social Sciences Branch [Internet]. 2012. Woods Hole (MA): NMFS Northeast Fisheries Science Center; Available from: http://www.nefsc.noaa.gov/read/socialsci/index.html.

NEFSC. Status of Fishery Resources off the Northeast U.S. Woods Hole (MA): U.S. Department of Commerce; Available from: http://www.nefsc.noaa.gov/sos/.

NEFSC. 2014. 59th Northeast Regional Stock Assessment Workshop (59th SAW) Assessment Report. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 14-09. 782 p.

NEFSC. 2015. 2014 Operational Stock Assessments for Georges Bank winter flounder, Gulf of Maine winter flounder, and pollock. . Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 15-01. 228 p.

Neilson JD, Kearney JF, Perley P, Sampson H. 1993. Reproductive biology of Atlantic halibut (*Hippoglossus hippoglossus*) in Canadian waters. Canadian Journal of Fisheries and Aquatic Sciences. 50: 551-563.

Nelson GA, Ross MR. 1992. Distribution, growth and food habits of the Atlantic wolffish (*Anarhichas lupus*) from the Gulf of Maine-Georges Bank region. Journal of Northwest Atlantic Fisheries Science. 13: 53-61.

Neuman MJ, Witting DA, Able KW. 2001. Relationships between otolith microstructure, otolith growth, somatic growth and ontogenetic transitions in two cohorts of windowpane. Journal of Fish Biology. 58: 967-984.

NMFS. 1991. Final Recovery Plan for the Humpback Whale (*Megaptera novaeangliae*). Silver Spring (MD): U.S. Department of Commerce. 105 p.

NMFS. 1999. Amendment 11 to the Summer Flounder, Scup & Black Sea Bass Fishery Management Plan; Amendment 7 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan; Amendment 11 to the Atlantic Surf Clam and Ocean Quahog Fishery Management Plan; Amendment 8 to the Atlantic Sea Scallop Fishery Management Plan; Amendment 10 to the Northeast Multispecies Fishery Management Plan; Amendment 7 to the American Lobster Fishery Management Plan. Gloucester (MA): National Marine Fisheries Service in consultation with the MAFMC and NEFMC. 64 p.

NMFS. 2002. Marine Mammal Protection Act Annual Report to Congress. Washington (DC): National Marine Fisheries Service Office of Protected Resources.

NMFS. 2005. Recovery Plan for the North Atlantic Right Whale (*Eubalaena glacialis*). Silver Spring (MD): U.S. Department of Commerce. 137 p.

NMFS. 2007a. Guidelines for Assessment of the Social Impact of Fishery Management Actions. In: NMFS Council Operational Guidelines - Fishery Management Process. Silver Spring (MD): National Oceanic and Atmospheric Administration. 39 p.

NMFS. 2007b. Guidelines for the Economic Review of National Marine Fisheries Service Regulatory Actions. Washington (DC): National Marine Fisheries Service. 49 p.

NMFS. 2010a. Final recovery plan for the fin whale *(Balaenoptera physalus)*. Silver Spring (MD): U.S. Department of Commerce. 121 p.

NMFS. 2010b. How is the Potential Sector Contribution Calculated? Gloucester (MA): National Marine Fisheries Service Fisheries Statistics Office. 11 p.

NMFS. Interactive Fisheries Economic Impacts Tool. Woods Hole (MA): National Marine Fisheries Service; Available from: https://www.st.nmfs.noaa.gov/pls/apex32/f?p=160:7:3415449084930703.

NMFS. 2011. Final recovery plan for the sei whale *(Balaenoptera borealis)*. Silver Spring (MD): U.S. Department of Commerce. 108 p.

NMFS. 2012. North Atlantic Right Whale *(Eubalaena glacialis)* five year review: Summary and evaluation. Gloucester (MA): U.S. Department of Commerce. 36 p.

NMFS. 2013a. Endangered Species Act Section 7 Consultation on the Continued Implementation of Management Measures for the Northeast Multispecies, Monkfish, Spiny Dogfish, Atlantic Bluefish, Northeast Skate Complex, Mackerel/Squid/Butterfish, and Summer Flounder/Scup/Black Sea Bass Fisheries.

NMFS. 2013b. Endangered Species Act Section 7 Consultation on the Continued Implementation of Management Measures for the Northeast Multispecies, Monkfish, Spiny Dogfish, Atlantic Bluefish, Northeast Skate Complex, Mackerel/Squid/Butterfish, and Summer Flounder/Scup/Black Sea Bass Fisheries. Gloucester (MA): U.S. Department of Commerce. Consultation No. F/NER/2012/01956.

NMFS. 2014a. Final Environmental Impact Statement for Amending the Atlantic Large Whale Take Reduction Plan: Vertical Line Rule. Gloucester (MA): U.S. Department of Commerce.

NMFS. 2014b. Fishing Year 2014 Northeast Multispecies Sector Operations Plans and Contracts - An Environmental Assessment. Gloucester (MA): U.S. Department of Commerce. 357 p.

NMFS. Catch Shares. National Marine Fisheries Service; Available from: http://www.nmfs.noaa.gov/sfa/management/catch_shares/index.html.

NMFS. 2015b. Fishing Years 2015-2020 Northeast Multispecies Sector Operations Plans and Contracts - A Draft Environmental Assessment. Gloucester (MA): U.S. Department of Commerce. 354 p.

NMFS. 2015c. Magnuson-Stevens Act Provisions; Fisheries of the Northeastern United States; Northeast Multispecies Fishery; 2015 and 2016 Sector Operations Plans and 2015 Contracts and Allocation of Northeast Multispecies Annual Catch Entitlements. Silver Spring (MD): U.S. Department of Commerce. 50 CFR Part 648 [Docket No. 140821699-5361-02] RIN 0648-XD461. 54 p.

NMFS, USFWS. 1991. Recovery Plan for U.S. Population of Atlantic Green Turtle *(Chelonia mydas)*. Washington (DC): U.S. Department of Commerce and U.S. Department of the Interior. 58 p.

NMFS, USFWS. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. Silver Spring (MD): U.S. Department of Commerce and U.S. Department of the Interior. 65 p.

NMFS, USFWS. 1995. Status Reviews for Sea Turtles Listed under the Endangered Species Act of 1973. Washington (DC): U.S. Department of Commerce and U.S. Department of the Interior. 139 p.

NMFS, USFWS. 2005. Recovery Plan for the Gulf of Maine Distinct Population Segment of the Atlantic Salmon (*Salmo salar*). Silver Spring (MD): National Marine Fisheries Service.

NMFS, USFWS. 2007a. Green Sea Turtle (*Chelonia mydas*) 5 Year Review: Summary and Evaluation. Silver Spring (MD): US Department of Commerce and US Department of the Interior. 102 p.

NMFS, USFWS. 2007b. Leatherback Sea Turtle (*Dermochelys coriacea*) 5 Year Review: Summary and Evaluation. Silver Spring (MD): US Department of Commerce and US Department of the Interior. 79 p.

NMFS, USFWS. 2007c. Loggerhead Sea Turtle (*Caretta caretta*) 5 Year Review: Summary and Evaluation. Silver Spring (MD): U.S. Department of Commerce and U.S. Department of the Interior. 65 p.

NMFS, USFWS. 2008. National Recovery Plan for the Loggerhead Sea Turtle *(Caretta caretta)*. 2nd ed. Siver Spring (MD): National Marine Fisheries Service. 325 p.

NMFS, USFWS. 2011. Bi-national Recovery Plan for the Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*. 2nd ed. Siver Spring (MD): National Marine Fisheries Service. 156 & appendices p.

NMFS, USFWS. 2013. Leatherback Sea Turtle (*Dermochelys coriacea*) 5 Year Review: Summary and Evaluation. Silver Spring (MD): U.S. Department of Commerce and U.S. Department of the Interior. 91 p.

NOAA. 2007. An Assessment of the Leatherback Turtle Population in the Atlantic Ocean - A Report of the Turtle Expert Working Group. Miami (FL): US Department of Commerce. NOAA Tech Memo NMFS-SEFSC-555. 116 p.

NOAA. 2008. High numbers of right whales seen in Gulf of Maine: NOAA researchers identify wintering ground and potential breeding ground. US Department of Commerce. NOAA press release. December 31, 2008.

NOAA. 2010. NOAA Catch Share Policy. National Oceanic and Atmospheric Administration ed. 25 p.

NOAA. 2011. New England Fishery Management Council; Notice of Intent To Prepare an Environmental Impact Statement (EIS); Northeast Multispecies Fishery; Notice of Public Scoping Meetings. Federal Register. 76(245): 79153-79155.

NOAA. 2012. New England Fishery Management Council; Notice of Intent To Prepare an Environmental Impact Statement (EIS); Northeast Multispecies Fishery; Notice of Public Scoping Meetings; Correction. Federal Register. 77(34): 9899.

NOAA. 2013a. Fisheries of the Northeastern United States; Northeast Multispecies Fishery, Trip Limit Adjustments for the Common Pool Fishery. Federal Register. 78(170): 54194-54195.

NOAA. 2013b. Fisheries of the Northeastern United States; Northeast Multispecies Fishery, Trip Limit Adjustments for the Common Pool Fishery. Federal Register. 78(136): 42478-42479.

NOAA. 2015. Magnuson-Stevens Fishery Conservation and Management Act Provisions; Fisheries of the Northeastern United States; Omnibus Amendment To Simplify Vessel Baselines. Federal Register. 80(95): 28217-28218.

NPFMC, NMFS. 2004. Regulatory Impact Review-Initial Regulatory Flexibility Analysis, Voluntary Three-pie Cooperative Program for the Bering Sea and Aleutian Islands Crab Fisheries. Anchorage (AK): North Pacific Fishery Management Council and National Marine Fisheries Service. 656 p.

NRC. 1999. Sharing the Fish: Towards a National Policy on Individual Fishing Quotas. Washington (DC): NA Press. 422 p.

NRC. 2002. Effects of Trawling and Dredging on Seafloor Habitat. Washington (DC): National Research Council Division on Earth and Life Studies Ocean Studies Board. 126 p.

O'Brien L, Burnett J, Mayo RK. 1993. Maturation of 19 species of finfish off the northeast coast of the United States, 1985-1990. U.S. Department of Commerce. NOAA Technical Report NMFS 113. 72 p.

O'Leary SJ, Dunton KJ, King L, Frisk MG, Chapman DD. 2014. Genetic diversity and effective size of Atlantic sturgeon, *Acipenser oxyrhinchus oxyrhinchus* river spawning populations estimated from the microsatellite genotypes of marine-captured juveniles. Conservation Genetics. 1-9.

Oliver MJ, Breece MW, Fox DA, Haulsee DE, Kohut JT, Manderson J, Savoy T. 2013. Shrinking the haystack: Using an AUV in an integrated ocean observatory to map Atlantic sturgeon in the coastal ocean. Fisheries. 38(5): 210-216.

Olsen YH, Merriman D. 1946. Studies on the marine resource of Southern New England. IV. The biology and economic importance of the ocean pout, *Macrozoarces americanus* (Bloch and Schneider). Bulletin of the Bingham Oceanographic Collection. 9(4): 1-184.
Olson J. 2011. Understanding and contextualizing social impacts from the privitization of fisheries: An overview. Ocean and Coastal Management. 54: 353-363.
Olson J, Clay PM. 2001. An Overview of the Social and Economic Survey Administered during Round II of the Northeast Multispecies Fishery Disaster Assistance Program. Woods Hole (MA): U.S. Department of Commerce. NEFSC Technical Memorandum NMFS-NE-164. 62 p.
Orach-Meza FL. 1975. Distribution and abundance of Ocean pout, *Macrozoarces americanus* (Bloch and Schneider) in the western North Atlantic Ocean [Master's thesis]. Kingston (RI): University of Rhode Island.
Overholtz WJ, Tyler AV. 1985. Long-term responses of the demersal fish assemblages of Georges Bank. Fisheries Bulletin. 83: 507-520.
Palmer MC. 2014. Assessment Update report of the Gulf of Maine Atlantic Cod Stock. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 14-14. 119 p.
Pavlov DA, Novikov GG. 1993. Life history peculiarities of common wolffish (*Anarhincas lupus*) in the White Sea. ICES Journal of Marine Science. 50: 271-277.
Pavlov SL, Moksness E. 1994. Production and quality of eggs obtained from wolffish (*Anarhincas lupus* L.) reared in captivity. Aquaculture. 122: 295-312.
Payne PM, Heinemann DW. 1993. The distribution of pilot whales (*Globicephala sp.*) in shelf/shelf edge and slope waters of the northeastern United States, 1978-1988. Reports of the International Whaling Commission. 14: 51-68.
Payne PM, Nicholas JR, O'Brien L, Powers KD. 1986. The distribution of the humpback whale, *Megaptera novaeangliae*, on Georges Bank and in the Gulf of Maine in relation to densities of the sand eel, *Ammodytes americanus*. Fishery Bulletin. 84: 271-277.
Payne PM, Selzer LA, Knowlton AR. 1984. Distribution and density of cetaceans, marine turtles, and seabirds in the shelf waters of the northeastern United States, June 1980 - December 1983, based on shipboard observations. Woods Hole (MA): U.S. Department of Commerce. NMFS NEFSC. 294 p.
Payne PM, Wiley DN, Young SB, Pittman S, Clapham PJ, Jossi JW. 1990. Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine in relation to changes in selected prey. Fishery Bulletin. 88: 687-696.
Pena LJ, Wibbels T, Bevan E, Bonka A, Martinez FI, Lara RN, Hernandez M, Montano J, Chenge H. 2012. Report on the Mexico/United States of America Population Restoration Project for the Kemp's ridley Sea Turtle, *Lepidochelys kempii*, on the Coasts of Tamaulipas, Mexico. Kemp’s Ridley Sea Turtle Binational Program. 39 p.
Pol M, He P. 2014. REDNET - A Network to Redevelop a Sustainable Refdish (*Sebastes fasciatus*) Trawl Fishery in the Gulf of Maine. Massachusetts Division of Marine Fisheries and UMass Dartmouth School for Marine Science and Technology. Final report - Component 3 - Codend Selectivity. Submitted to the Northeast Cooperative Research Partners Program. 38 p.
Pratt S. 1973. Benthic fauna. In: Coastal and Offshore Environmnetal Inventory, Cape Hatteras to Nantucket Shoals. Kingston (RI): University of Rhode Island. Marine Publications Series No. 2. 5-1 to 5-70 p.

Reddin DG. 1985. Atlantic salmon (*Salmo salar*) on and east of the Grand Bank. Journal of the Northwest Atlantic Fisheries Society. 6(2): 157-164.

Reddin DG, Friedland KD. 1993. Marine environmental factors influencing the movement and survival of Atlantic salmon. Paper presented at: 4th International Atlantic Salmon Symposium, St. Andrews (NB) Canada.

Reddin DG, Short PB. 1991. Postmolt Atlantic salmon (*Salmo salar*) in the Labrador Sea. Canadian Journal of Fisheries and Aquatic Sciences. 48(2-6).

Reid RN, Steimle J, F.W. 1988. Benthic macrofauna of the Middle Atlantic Continental Shelf. In: Characterization of the Middle Atlantic Water Management Unit of the Northeast Regional Action Plan. AL Pacheco ed. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-F/NEC-56. 125-160 p.

Richards RA, Nitschke PC, Sosebee Ka. 2008. Population biology of Monkfish *Lophius americanus*. ICES Journal of Marine Science. 65: 1291-1305.

Risch D, Clark CW, Dugan PJ, Popescu M, Siebert U, Van Parijs SM. 2013. Minke whale acoustic behavior and multi-year seasonal and diel vocalization patterns in Massachusetts Bay, USA. Marine Ecological Progress Series. 489: 279-295.

Robbins J, Landry SC, Mattilla DK. Estimating Entanglement Related Mortality from Scar-based Studies. Proceedings of the Scientific Committee Meeting of the International Whaling Commission; 2009.

Roper C, Sweeney M, Nauen C. 1984. FAO Species Catalogue - Cephalopods of the World: an annotated and illustrated catalogue of species of interest to fisheries. FAO Fisheries Synopsis. 3(125): 277.

RSRMW. 2014. Regional Sediment Resource Management Workgroup - Workgroup Report: 2014 Massachusetts Ocean Management Plan Update. 57 p.

Sainsbury JC. 1996. Commercial Fishing Methods: An Introduction to Vessels and Gears. 3rd ed. England: Fishing New Books Ltd. 119 p.

Savoy T, Pacileo D. 2003. Movements and important habitats of subadult Atlantic sturgeon in Connecticut waters. Transactions of the American Fisheries Society. 132: 1-8.

Schevill WE, Watkins WA, Moore KE. 1986. Status of *Eubalaena glacialis* off Cape Cod. Reports of the International Whaling Commission. 10: 79-82.

Schilling MR, Seipt I, Weinrich MT, Frohock SE, Kuhlberg AE, Clapham PJ. 1992. Behavior of individually-identified sei whales *Balaenoptera borealis* during an episodic influx into the southern Gulf of Maine in 1986. Fishery Bulletin. 90(749-755).

Schmitz WJ, Wright WR, Hogg NG. 1987. Physical oceanography. In: The Marine Environment of the US Atlantic Continental Slope and Rise. Boston (MA): Jones and Bartlett Publishers, Inc. p. 27-56.

Scott JS. 1982. Depth, temperature and salinity preferences of common fishes of the Scotian Shelf. Journal of Northwest Atlantic Fisheries Science. 3: 29-39.

Scott WB, Scott MG. 1988. Atlantic Fishes of Canada. Toronto (CA): University of Toronto Press. 730 p.

Seminoff JA. Chelonia mydas - the IUCN Red List of Threatened Species. Available from: http://www.iucnredlist.org/search/details.php/4615/summ.

Sherman K, Jaworski NA, Smayda TJ eds. 1996. The Northeastern Shelf Ecosystem - Assessment, Sustainability, and Management. Cambridge (MA): Blackwell Science. 564 p.

Sherman S, Stepanek K, King C, Eckert R, Tetrault R. 2012. Annual Report on the Maine-New Hampshire Inshore Trawl Survey January 1, 2012-December 31, 2012 - Submitted to the NOAA Northeast Regional Cooperative Research Partners Program. 119 p.

Shoop C, Kenney R. 1992. Seasonal distributions and abundances of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetological Monographs. 6: 43-67.

Sigourney DB, Ross MR, Brodziak J, Burnett J. 2006. Length at age, sexual maturity and distribution of Atlantic halibut, *Hippoglossus hippoglossus* L., off the Northeast USA. Journal of Northwest Atlantic Fisheries Science. 36: 81-90.

Steimle FW, Zetlin C. 2000. Reef habitats in the Middle Atlantic Bight: Abundance, distribution, associated biological communities, and fishery resource use. Marine Fisheries Review. 62: 24-42.

Steimle FW, Zetlin CA, Berrien DL, Johnson DL, Chang S. 1999. Essential Fish Habitat Source Document: Tilefish, *Lopholatilus chamaeleonticeps*, Life History and Habitat Characteristics. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-152. 30 p.

Stein A, Friedland KD, Sutherland M. 2004a. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. North American Journal of Fisheries Management. 24: 171-183.

Stein A, Friedland KD, Sutherland M. 2004b. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. Transactions of the American Fisheries Society. 133: 527-537.

Stevenson D, Chiarella L, Stephan D, Reid R, Wilhelm K, McCarthy J, Pentony M. 2004. Characterization of the Fishing Practices and Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat. Woods Hole (MA): U.S. Dept. of Commerce. NEFSC Technical Memo NMFS-NE-181. 179 p.

Stumpf RP, Biggs RB. 1988. Surficial morphology and sediments of the continental shelf of the Middle Atlantic Bight. In: Characterization of the Middle Atlantic Water Management Unit of the Northeast Regional Action Plan. AL Pacheco ed. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-F/NEC-56. 51-72 p.

Sun JC. Analysis of Landings/Discards-Proportional Allocation Scheme for the At-Sea Monitoring Program of the Groundfish Fishery in New England. Proceedings of the MFI Monitoring Workshop; 2014; New Bedford (MA): Gulf of Maine Research Institute.

SFA. 1996. Sustainable Fisheries Act. Public Law 104-297, 16 USC 1801.

Swingle W, Barco S, Pitchford T, McLellan W, Pabst D. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Marine Mammal Science. 9: 309-315.

Taning AV. 1936. On the eggs and young stages of the halibut. Medd Fra Kom For Havundersokelser Seri Fiskeri. IO(4): 1-23.

Templeman W. 1986. Some biological aspects of Atlantic wolffish (*Anarhincas lupus*) in the Northwest Atlantic. Journal of Northwest Atlantic Fisheries Science. 7: 57-65.

Terceiro M. 2012. Stock Assessment of Scup (*Stenotomus chrysops*) for 2012. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 12-25. 104 p.

TEWG. 1998. An Assessment of the Kemp's Ridley (*Lepidochelys kempii*) and Loggerhead (*Caretta caretta*) Sea Turtle Populations in the Western North Atlantic. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-409. 96 p.

TEWG. 2000. Assessment of the Kemp's Ridley and Loggerhead Sea Turtle Populations in the Western North Atlantic. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-444. 115 p.

TEWG. 2009. An Assessment of the Loggerhead Turtle Population in the Western North Atlantic. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-575. 131 p.

Theroux RB, Grosslein MD. 1987. Benthic fauna. In: Georges Bank. Cambridge (MA): MIT Press. p. 283-295.

Theroux RB, Wigley RL. 1998. Quantitative Composition and Distribution of the Macrobenthic Invertebrate Fauna of the Continental Shelf Ecosystems of the Northeastern United States. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Report NMFS 140. 240 p.

Thunberg E. 2007. Demographic and Economic Trends in the Northeastern United States Lobster (*Homarus americanus*) Fishery, 1970-2005. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 07-17. 64 p.

Thunberg E, Bjorndal T, Kruse J, Schmitz A, Weninger Q. 2014. External Peer Review of the Final Report by Compass Lexecon: "Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery". Salem (MA): Center for Independent Experts and NEFMC. 135 p.

Thunberg E, Correia S. From Fishing Capacity to Diversity: Changing Fishery Management Priorities in the New England Groundfish Fishery. Proceedings of the 17th Biennial Conference of the International Institute of Fisheries Economics and Trade; 2014; Brisbane, Australia.

Timoshkin VP. 1968. Atlantic sturgeon (*Acipenser sturio* L.) caught at sea. Journal of Ichthyology. 8(4): 598.

Townsend DW. 1992. An overview of the oceanography and biological productivity of the Gulf of Maine. In: The Gulf of Maine. DW Townsend, Larsen PF eds. Silver Spring (MD): U.S. Department of Commerce. NOAA Coastal Ocean Prog. Regional Syntheses Series No. 1. 5-26 p.

TRAC. 2014. Georges Bank Yellowtail Flounder TRAC Status Report 2014/03. Transboundary Resources Assessment Committee. 8 p.

Tucholke BE. 1987. Submarine geology. In: The Marine Environment of the US Atlantic Continental Slope and Rise. Boston (MA): Jones and Bartlett Publishers, Inc. p. 56-113.

USDOJ and FTC. 2010. Horizontal Merger Guidelines. Washington (DC): U.S. Dept. of Justice and the Federal Trade Commission. 37 p.

Valentine PC, Baker JL. 2005. Sea floor image maps showing topography, sun-illuminated topography, backscatter intensity, ruggedness, slope, and the distribution of boulder ridges and bedrock outcrops in the Stellwagen Bank National Marine Sanctuary region off Boston, Massachusetts. United States Geological Survey. Map 2840.

Valentine PC, Lough RG. 1991. The Sea Floor Environment and the Fishery of Eastern Georges Bank. Woods Hole (MA): U.S. Department of the Interior and U.S. Geological Survey. Open File Report 91-439. 25 p.

Vu E, Risch D, Clark CW, Gaylord S, Hatch L, Thompson M, Wiley DN, Van Parijs SM. 2012. Humpback whale song occurs extensively on feeding grounds in the western North Atlantic Ocean. Aquatic Biology. 14(2): 175-183.

Waldman JR, King T, Savoy T, Maceda L, Grunwald C, Wirgin I. 2013. Stock origins of subadult and adult Atlantic sturgeon, *Acipenser oxyrinchus*, in a non-natal estuary, Long Island Sound. Estuaries and Coasts. 36: 257-267.

Wallace BP, Heppell SS, Lewison RL, Kelez S, Crowder LB. 2008. Impacts of fisheries bycatch on loggerhead turtles worldwide inferred from reproductive value analyses. Journal of Applied Ecology. 45: 1076-1085.

Warden ML. 2011a. Modeling loggerhead sea turtle (Caretta caretta) interactions with U.S. Mid-Atlantic bottom trawl gear for fish and scallops, 2005-2008. Biological Conservation. 144(2202-2212).

Warden ML. 2011b. Proration of Loggerhead Sea Turtle (*Caretta caretta*) Interactions in US Mid-Atlantic bottom otter trawls for fish and scallops, 2005-2008, by managed species landed. Woods Hole (MA): U.S. Department of Commerce. NEFSC Reference Document 11-04. 8 p.

Waring G, Josephson E, Fairfield-Walsh C, Maze-Foley K. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2007. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS NE 205. 415 p.

Waring G, Josephson E, Maze-Foley K, Rosel P. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2013. Woods Hole (MA): U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-228. 475 p.

Waring GT, Fairfiled CP, Ruhsam CM, Sano M. 1992. Cetaceans associated with Gulf Stream features off the northeastern USA shelf. ICES Journal of Marine Science. 1992/N:12: 29.

Watkins WA, Schevill WE. 1982. Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. Fishery Bulletin. 80(4): 875-880.

Watling L. 1998. Benthic fauna of soft substrates in the Gulf of Maine. In: Effects of Fishing Gear on the Sea Floor of New England. EM Dorsey, Pederson J eds. Cambridge (MA): MIT Sea Grant Publication. 98-4. 20-29 p.

Whittingham A, Garron M, Kenney JF, Hartley D. 2005. Large Whale Entanglement Report 2003 updated June 2005. Gloucester (MA): U.S. Department of Commerce. National Marine Fisheries Service Northeast Regional Office. 137 p.

Whittingham A, Hartley D, Kenney JF, Cole TVN, Pomfret E. 2005. Large Whale Entanglement Report 2002 updated March 2005. Gloucester (MA): U.S. Department of Commerce. National Marine Fisheries Service Northeast Regional Office. 93 p.

Wiebe PH, Backus EH, Backus RH, Caron DA, Gilbert PM, Grassle JF, Powers K, Waterbury JB. 1987. Biological oceanography. In: The Marine Environment of the US Atlantic Continental Slope and Rise. Boston (MA): Jones and Bartlett Publishers, Inc. p. 140-201.

Williamson J. 1998. Gillnet fishing. In: Effects of Fishing Gear on the Sea Floor of New England. Boston (MA): MIT Sea Grant.

Winn HE, Price CA, Sorensen PW. 1986. The distributional biology of the right whale (*Eubalaena glacialis*) in the western North Atlantic. Reports of the International Whaling Commission. 10: 129-138.

Wirgin I, Maceda L, Waldman JR, Wehrell S, Dadswell M, King T. 2012a. Stock origin of migratory Atlantic sturgeon in the Minas Basin, Inner Bay of Fundy, Canada, determined by microsatellite and mitochondrial DNA analyses.

Wirgin II, Maceda L, Waldman JR, Wehrell S, Dadswell MJ, King T. 2012b. Stock origin of migratory Atlantic sturgeon in Minas Basin, Inner Bay of Fundy, Canada determined by microsatellite and mitochondrial DNA analyses. Transactions of the American Fisheries Society. 141(5): 1389-1398.

Witherington BE, Kubilis P, Brost B, Meylan A. 2009. Decreasing annual nest counts in a globally important loggerhead sea turtle population. Ecological Applications. 19: 30-54.

Wolff T. 1978. Maximum size of lobsters *(Homarus) (Decapoda, Nephropidae)*. Crustaceana. 34(1): 1-14.

Yao Z, Crim LW. 1995. Copulation, spawning and parental care in captive ocean pout. Journal of Fish Biology. 47(171-173).

11.0 GLOSSARY

Annual Catch Limit (ACL): The limit of each groundfish stock that can be harvested by all vessels during each fishing year.

Annual Catch Entitlement (ACE): The sum of the PSC for each MRI participating in a sector, multiplied by the commercial groundfish fishery ACL each stock for that year. The product of that multiplication is the ACE for that sector for each stock — the amount of stock in pounds that the sector is allowed to catch for that fishing year. The ACE of each stock equals the sum of PSC times the ACL.

Buyout: A federal permit buyout is a capacity reduction program wherein all the funds used to buy permits are the result of appropriation or other federal allocation (i.e., fully funded by the federal government). The permits are then retired from the fishery.

Buyback: A federal permit buyback is a specific capacity reduction program outlined in Sections 312(b) and (c) of the MSFCMA wherein industry agrees to a fee system to repay a federally subsidized loan that is used to purchase permits. The permits are then retired from the fishery.

Bycatch: (v.) The capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species. (n.) Fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: The level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Competitive fringe: A group of numerous small firms, each with 1 – 2% market shares, which cannot profitably influence market prices and will behave competitively. A competitive fringe limits the potential for firms with larger shares to successfully exercise market power.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 m in many regions.

Days absent: An estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): The total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

Discards: Animals returned to sea after being caught; see *bycatch (n.).*

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (NEFMC 1998a).

Exclusive Economic Zone (EEZ): A zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exempt fisheries: Any fishery determined by the Regional Director to have <5% regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Fishing effort: The amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: Adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the NEFMC, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Individual: For purposes of the accumulation limit alternatives and reporting of permit holdings, the term "individual" means individual human persons, not the MSFCMA definition of a person at § 3(33), which includes any corporation, partnership, association or other entity.

Individual Fishing Quota (IFQ): Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Landings: The portion of the catch that is harvested for personal use or sold.

Limited-access permits: Permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Market power: The ability to manipulate prices to one's advantage based on one's share of participation in a market (e.g., by withholding supply from the market).

Meter (m): A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the North Pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Moratorium Right Identifier (MRI): A unique identifying number that is attached to a Northeast multispecies permit. Each permit has its own MRI, and a given MRI is attached to only one permit. When NMFS calculates Potential Sector Contribution, it uses the MRI history, because this is the best way to determine how much multispecies groundfish has been associated with that permit over time.

Multispecies: The group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Observer: Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Open access: Describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Potential Sector Contribution (PSC): The proportion of the total landings of a particular groundfish stock (in live pounds) associated with an individual MRI over a particular period. For most stocks managed by the Northeast Multispecies FMP the PSC is based on a MRI's landings history during fishing years (FYs) 1996-2006, divided by the landings history of the entire fleet for each stock.

Regulated groundfish species: Cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance.

Species richness: See *species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Statistical area: A delineated area of ocean used to track where fish were caught. NMFS overlays a grid of statistical areas onto nautical charts to accurately identify specific areas of the ocean. Statistical areas are approximately one degree square although in many cases they do not correspond exactly to specific latitudes and longitudes.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock area: A group of connected statistical areas that defines the geographic distribution of a particular population of an individual species. For example, the Gulf of Maine (GOM) cod stock area comprises statistical areas 464, 465, 467, 510, 511, 512, 513, 514, and 515. All catch of cod in any of these stock areas is attributed to the GOM cod stock.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. This value is calculated by applying a target fishing mortality rate to exploitable biomass. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a “target” (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Valued Ecosystem Component (VEC): A resource or environmental feature that is important (not only economically) to a local human population, or has a national or international profile, or if altered from its existing status, will be important for the evaluation of environmental impacts of industrial developments, and the focusing of administrative efforts.

12.0 INDEX

Draft Amendment 18

To the

Northeast Multispecies FMP

Appendix I

Example methods for determining inshore and offshore Gulf of Maine cod sub-Annual Catch Limits

Example methods for determining inshore and offshore Gulf of Maine cod Sub-ACLs

The Alternatives in Section 4.4.1 and 4.4.2 of Amendment 18 to the Northeast multispecies fishery management plan contemplate creating inshore and offshore sub-Annual Catch Limits (ACLs) for the Gulf of Maine (GOM) cod stock, using one of three possible boundary lines (Options A-C, Section 4.4.1.2). The inshore/offshore proportion could be set based on average fishing effort or GOM cod distribution over the past 10 or 20 year time periods prior to a specifications process. This appendix describes potential methods for calculating this proportion using data from commercial vessel trip reports (VTRs) and Northeast Fisheries Science Center (NEFSC) bottom trawl surveys.

1. Estimated proportions using cod landing from VTR point estimates

Proportions of GOM cod landings were determined from VTR point estimates for each boundary option in the GOM cod stock area (Figure 1) on a fishing year basis, for each of the last 20 years (Figure 2). Average proportions for the past 10 and 20 year time periods were also calculated (). This analysis incorporates a large amount of data for commercial trips data that caught GOM cod over a twenty year period. However, the assumption that all cod reported on a VTR is caught at a single point location may not be necessary accurate. VTRs are not designed to collect data on a tow-by-tow basis. The estimated proportion from this analysis also does not incorporate total effort or groundfish targeting behavior. Therefore, landing distributions may not necessarily reflect actual cod stock distributions. For example, increases in total effort may shift east or west (inshore or offshore) depending on the stocks being targeted and/or avoided, and the amount of cod caught with shifting effort will influence the estimated proportions.

Figure 1 - Gulf of Maine cod broad stock area

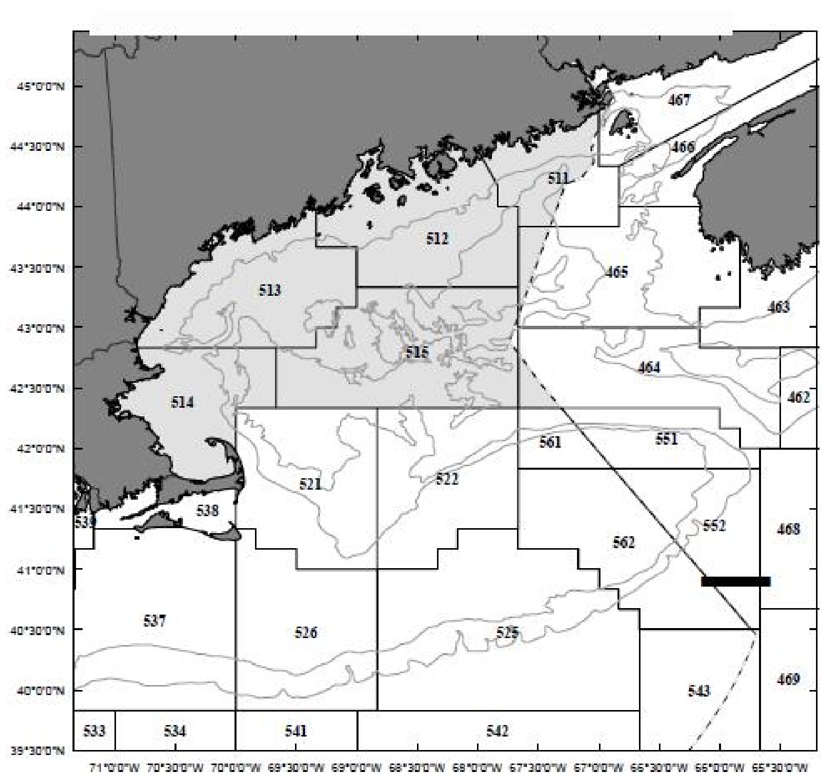


Figure 2 - Proportions of GOM cod landings from VTR point estimates for Options A (top), B (middle) and C (bottom) in the GOM cod stock area on a fishing year basis

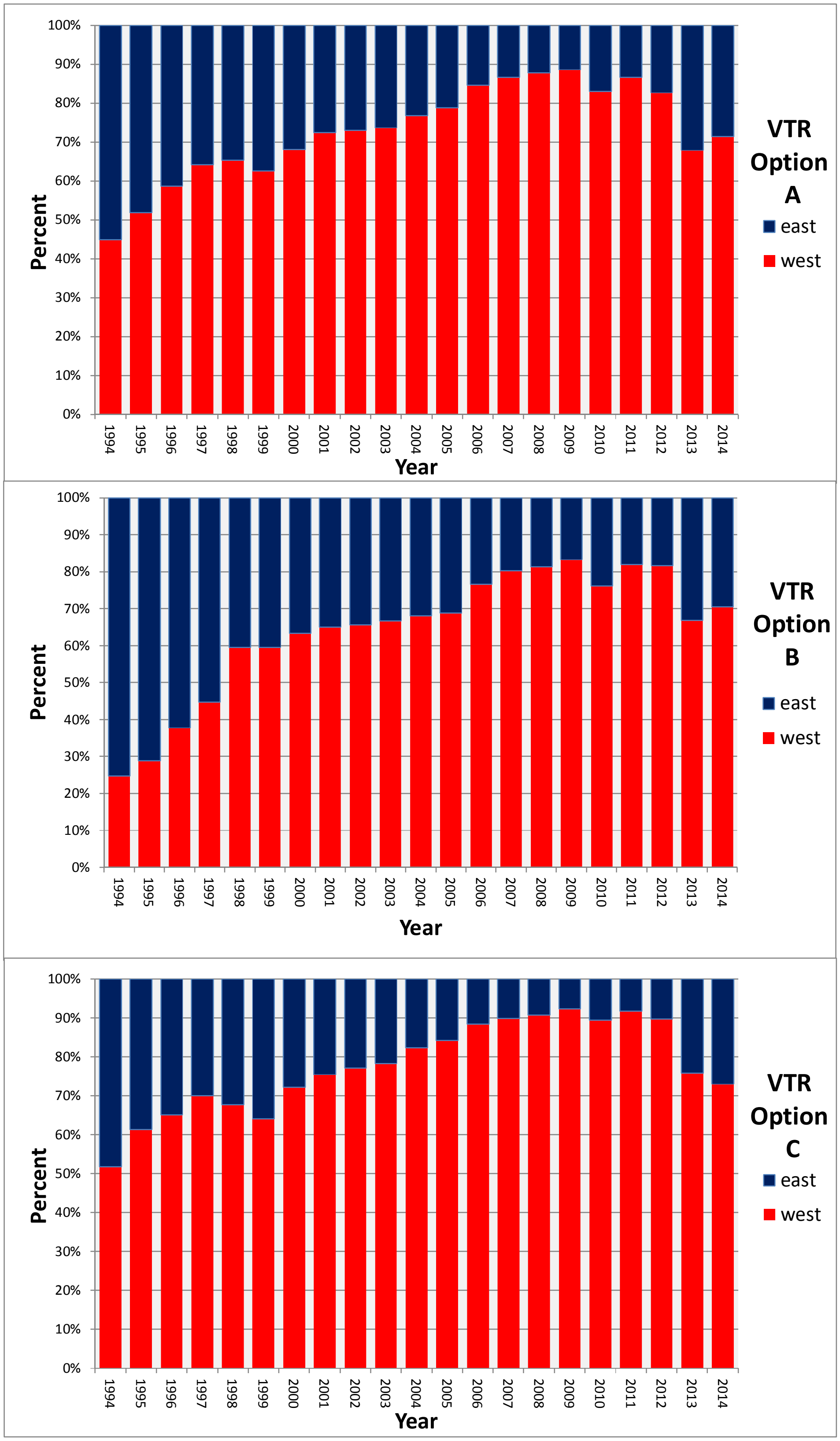


Table 1 - Proportions of GOM cod landings from VTR point estimates for Options A, B and C in the GOM cod stock area on a fishing year basis for the most recent 10 and 20 year average

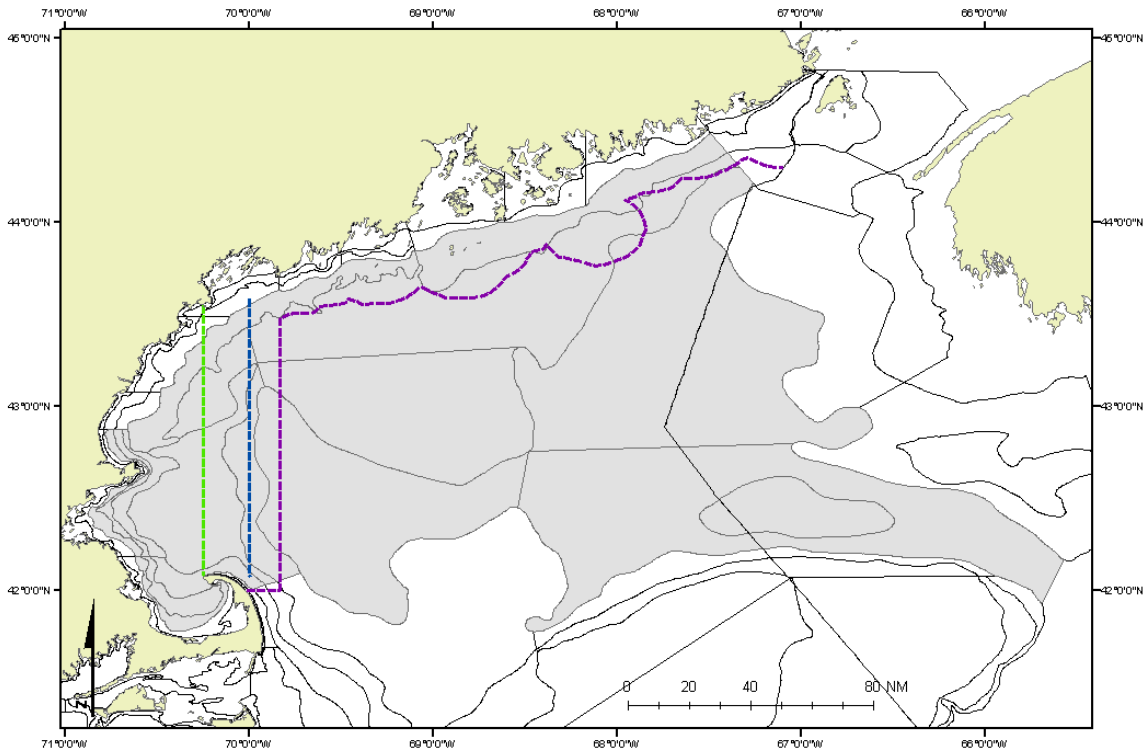
	Option A		Option B		Option C	
	Inshore (east)	Offshore (west)	Inshore (east)	Offshore (west)	Inshore (east)	Offshore (west)
10-year average	0.82	0.18	0.76	0.24	0.87	0.13
20-year average	0.73	0.27	0.64	0.36	0.78	0.22

2. Estimated proportions using cod weight per tow from NEFSC spring and fall surveys

The estimation of proportions of GOM cod biomass relative to a potential boundary (i.e., Option A, B, or C) was calculated using two different methods, since the bottom trawl survey was not specifically designed to estimate biomass distribution relative to these boundaries.

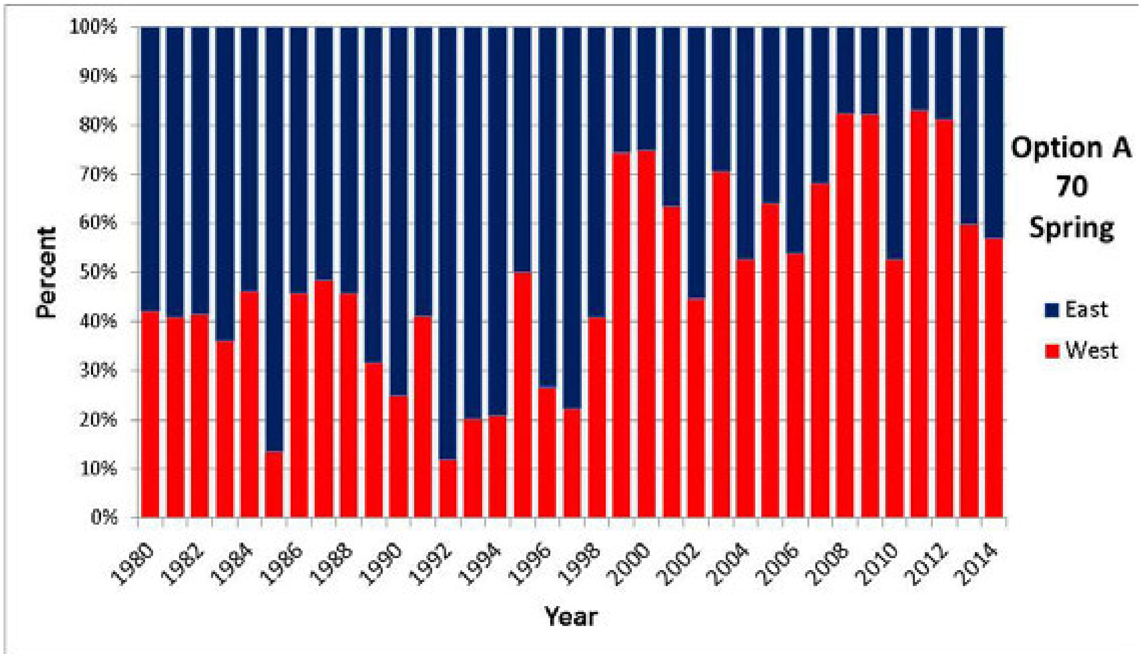
Method A: The first method preserves the survey stratified sampling design. Survey tows are randomly assigned based on the stratum area, ranging from about 1 or 2 tows for the smallest stratum to about 8 to 9 tows for the largest stratum. However, the inshore/offshore boundary options do not follow survey stratification boundaries (Figure 3). Survey strata boundaries in the Gulf of Maine also do not necessary follow the country territory boarders or the statistical area stock boundary lines. Note that some strata have a large amount of area east of the Hague line. In addition, inshore strata north of Massachusetts are not covered by the NEFSC survey and are not included in these calculations. Post stratification of the strata was not possible with the boundary options, due to the breakup of strata into relatively small areas which would not contain tow information. Therefore, the inshore/offshore boundary option's bisected stratum mean weight per tow was proportionally assigned west or east (i.e., inshore and offshore) according to the area of the stratum west or east. The proportion of area west and east for each option and each stratum was determined using ArcGIS. The total proportion west or east was estimated by summing the mean cod kg per tow for each stratum multiplied by the stratum area west and east (Figure 4 to Figure 6, Table 2).

Figure 3 - GOM survey strata boundary (shaded grey) relative to the boundary Options A (blue line), B (green line) and C (purple line)



Note: This configuration includes inshore strata in MA.

Figure 4 - Boundary Option A (70 degree longitude) spring (top) and fall (bottom) survey proportions incorporating the survey stratification in the calculation



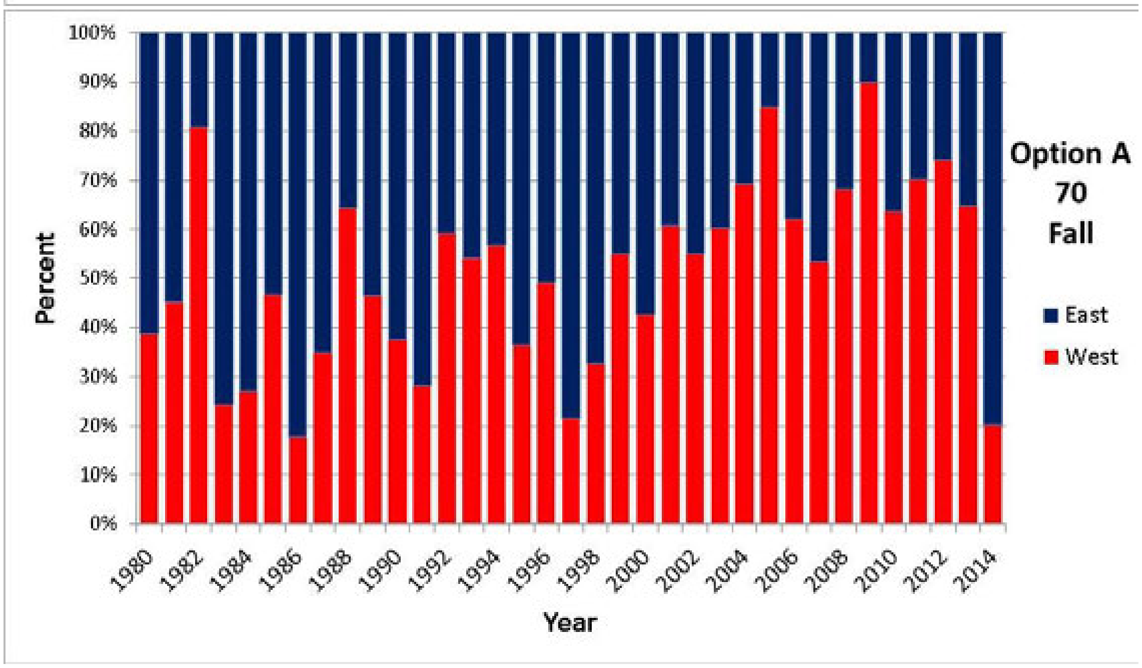


Figure 5 - Boundary Option B (70 degree longitude 15 minutes) spring (top) and fall (bottom) survey proportions incorporating the survey stratification in the calculation

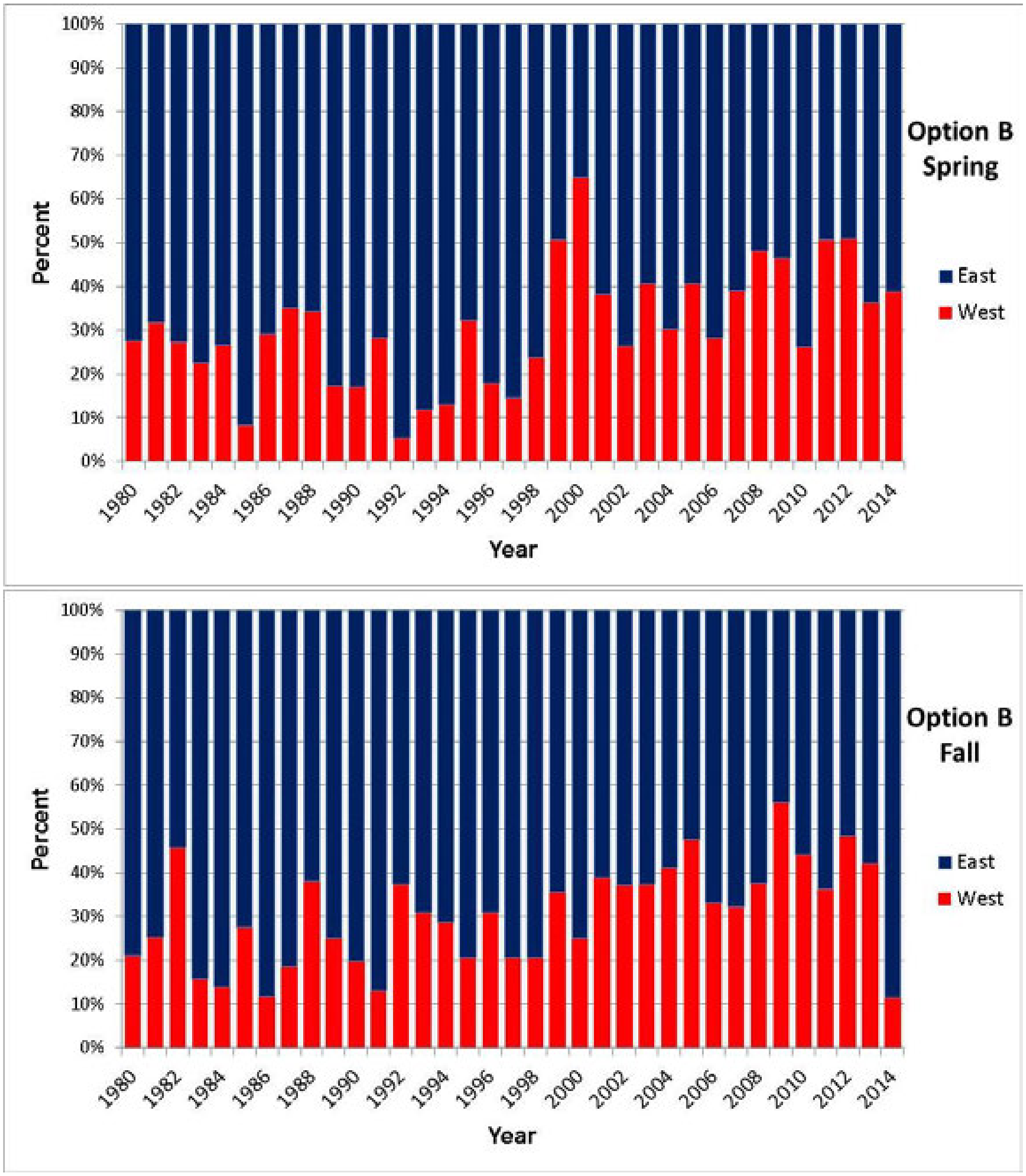
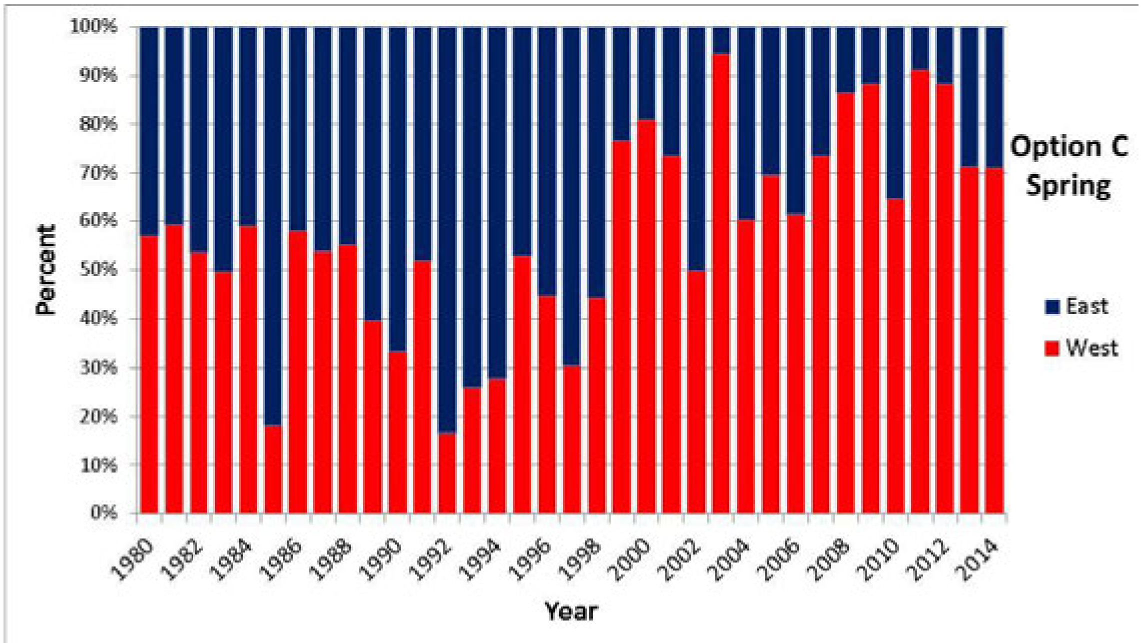


Figure 6 - Boundary Option C (includes ME coast) spring (top) and fall (bottom) survey proportions incorporating the survey stratification in the calculation



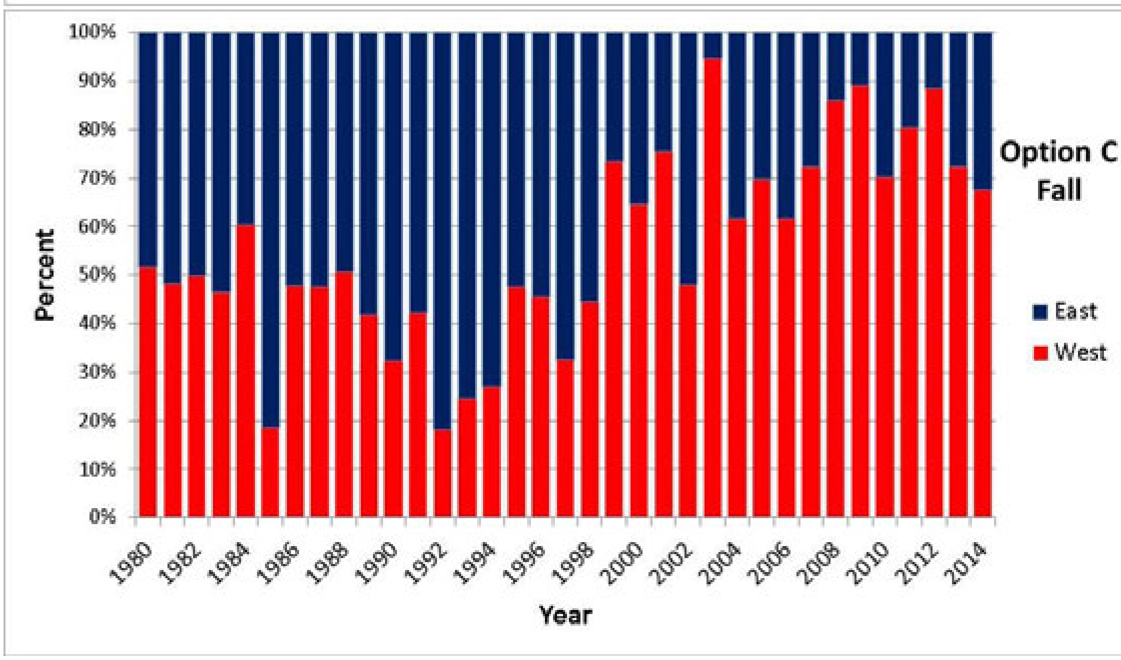


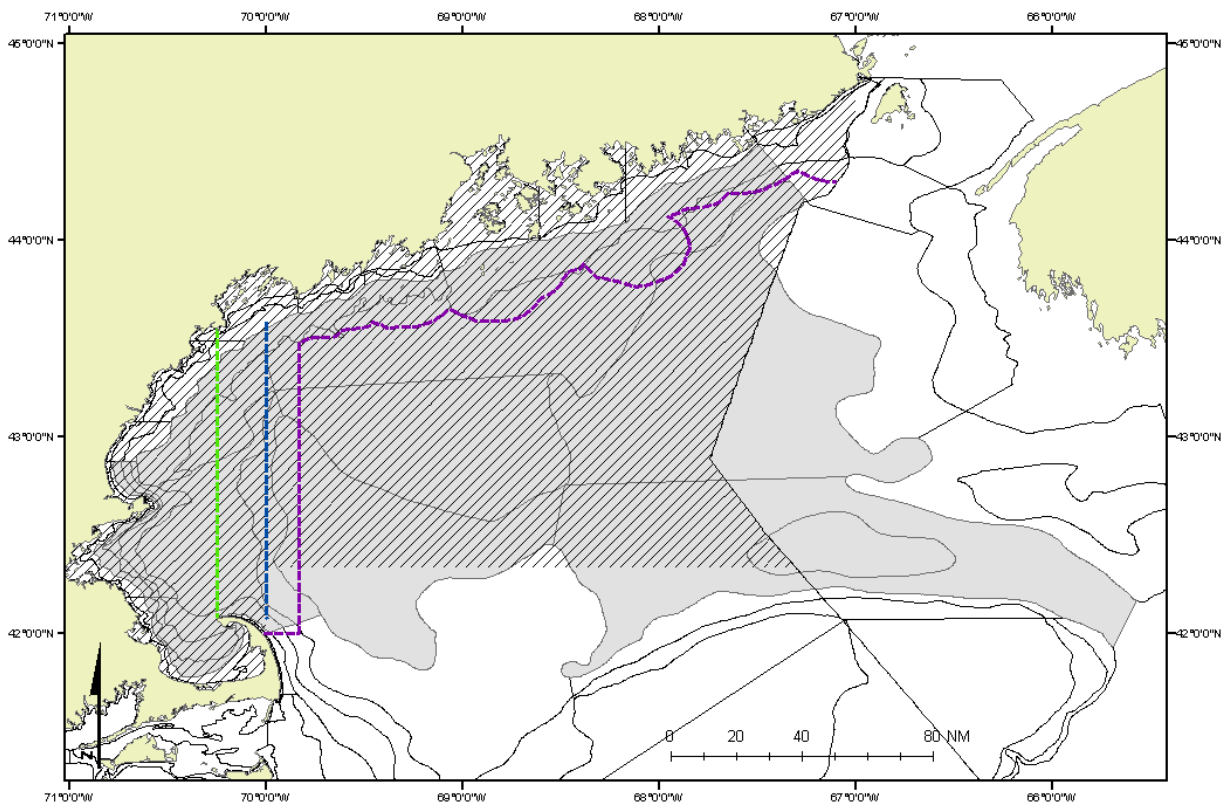
Table 2 - Boundary Options A, B and C for spring, fall, and combined seasons survey proportions for the most recent 10 and 20 year averages incorporating the survey stratification in the calculation

		Option A		Option B		Option C	
		Inshore (east)	**Offshore (west)**	**Inshore (east)**	**Offshore (west)**	**Inshore (east)**	**Offshore (west)**
Spring	**10-year average**	0.68	0.32	0.41	0.59	0.76	0.24
	20-year average	0.60	0.40	0.37	0.63	0.69	0.31
Fall	**10-year average**	0.65	0.35	0.39	0.61	0.76	0.24
	20-year average	0.57	0.43	0.35	0.65	0.67	0.33
Combined	**10-year average**	0.67	0.33	0.40	0.60	0.76	0.24
	20-year average	0.58	0.42	0.36	0.64	0.68	0.32

Note: The combined averages use annual estimates from both surveys (i.e., 10 year average is an average of 20 data points and 20 year average is an average of 40 data points).

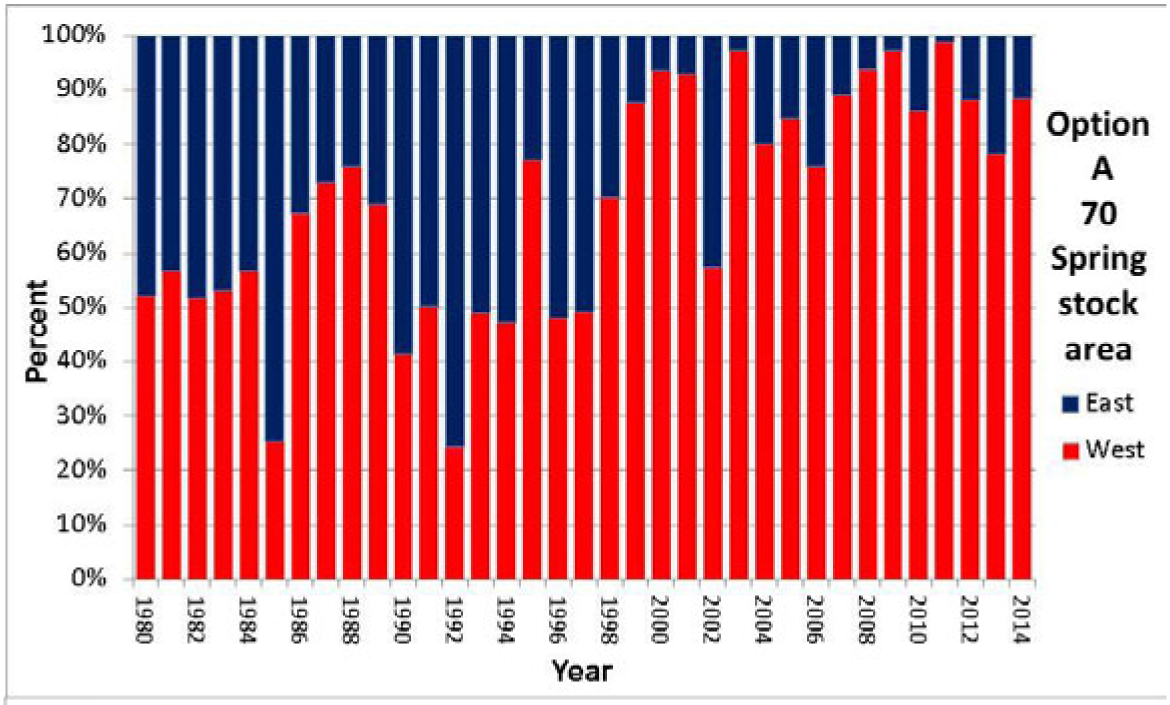
Method B: The second method ignored the survey stratified sampling design and simply assigned each tow west or east relative to each option's boundary line (Figure 7), similar to how the above fishery catch-based approach was calculated. The proportion west or east of each boundary option was then calculated by multiplying the mean weight per tow west or east by the total area within the GOM cod broad stock area west or east (Figure 8 to Figure 10, TABLE 3). This method does not include areas outside of the broad stock area in the calculation. It also assumes that the tows reflect cod abundance for the entire area west or east. For example, cod density in areas not covered by the NEFSC survey (i.e., inshore north of Massachusetts) is assumed to be the same as the other western tows conducted in the survey.

Figure 7 - GOM survey stock area (hashed area) east and west relative to the boundary Options A (blue line), B (green line) and C (purple line)



Note: Survey strata (gray area) provided as reference.

Figure 8 - Boundary Option A (70 degree longitude) spring (top) and fall (bottom) survey proportions ignoring the survey stratification in the calculation



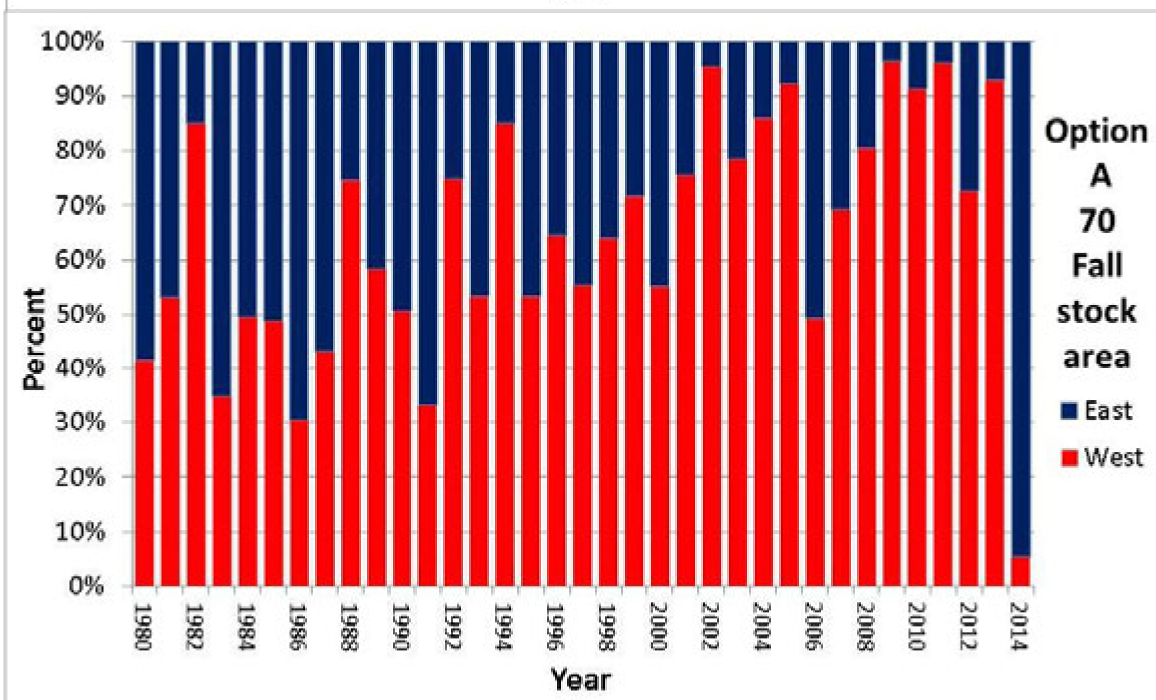
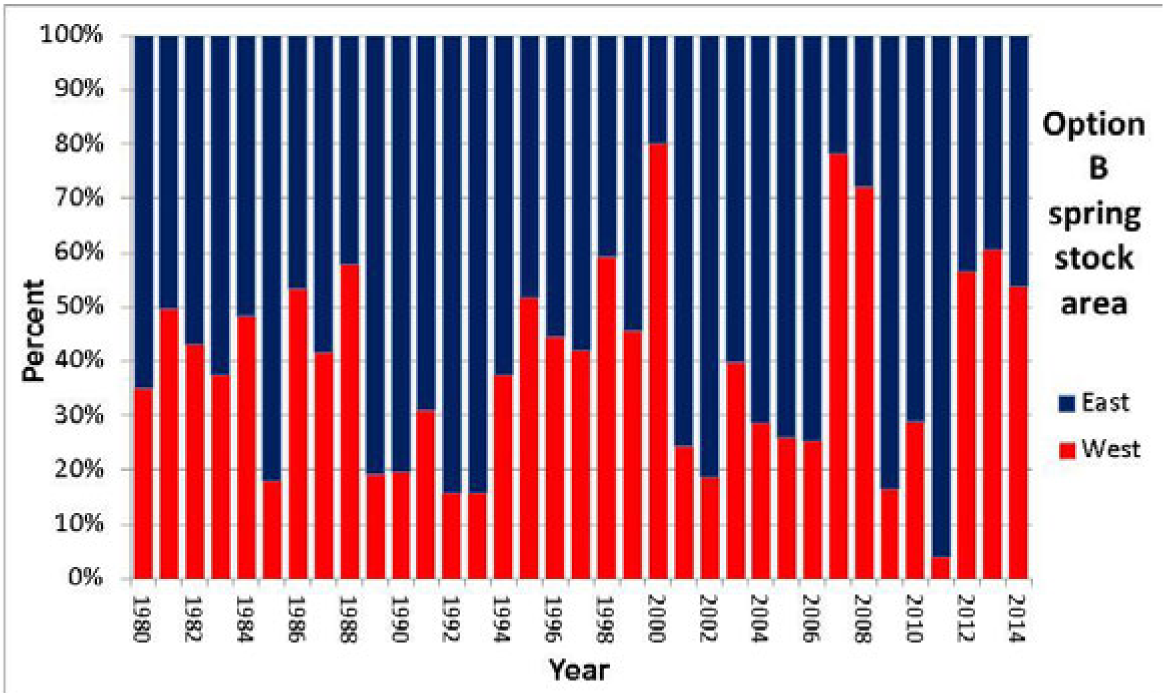


Figure 9 - Boundary Option B (70 degree longitude 15 minutes) spring (top) and fall (bottom) survey proportions ignoring the survey stratification in the calculation



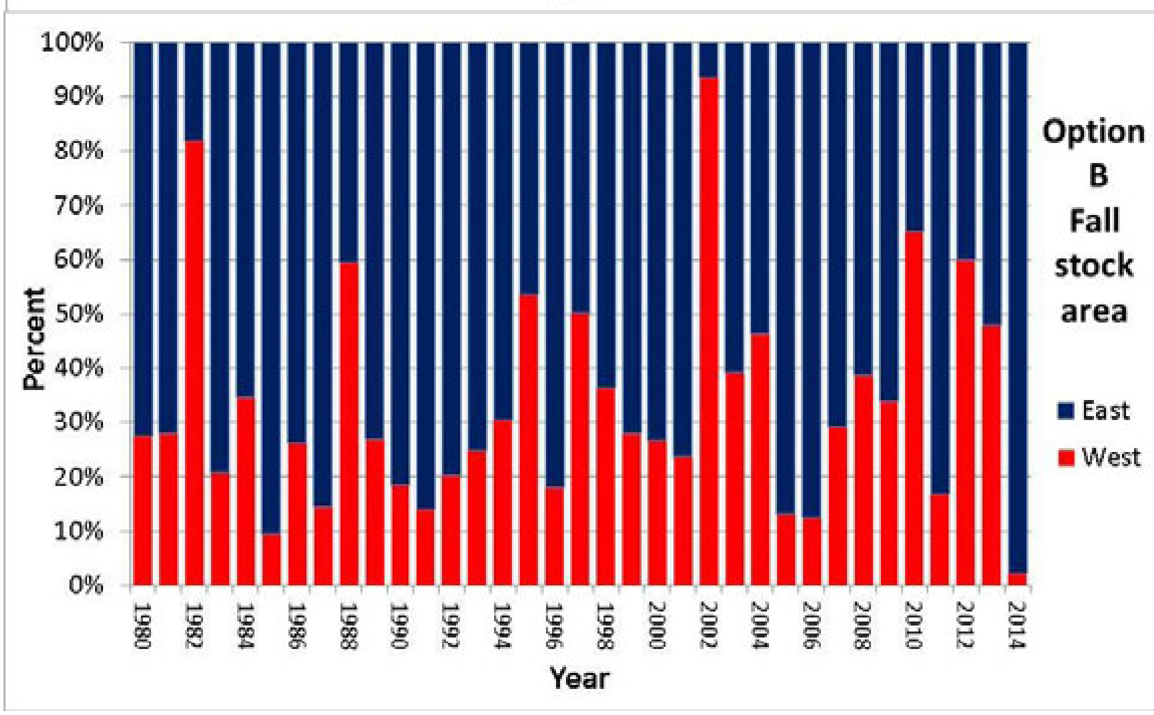


Figure 10 - Boundary Option C (includes ME coast) spring (top) and fall (bottom) survey proportions ignoring the survey stratification in the calculation

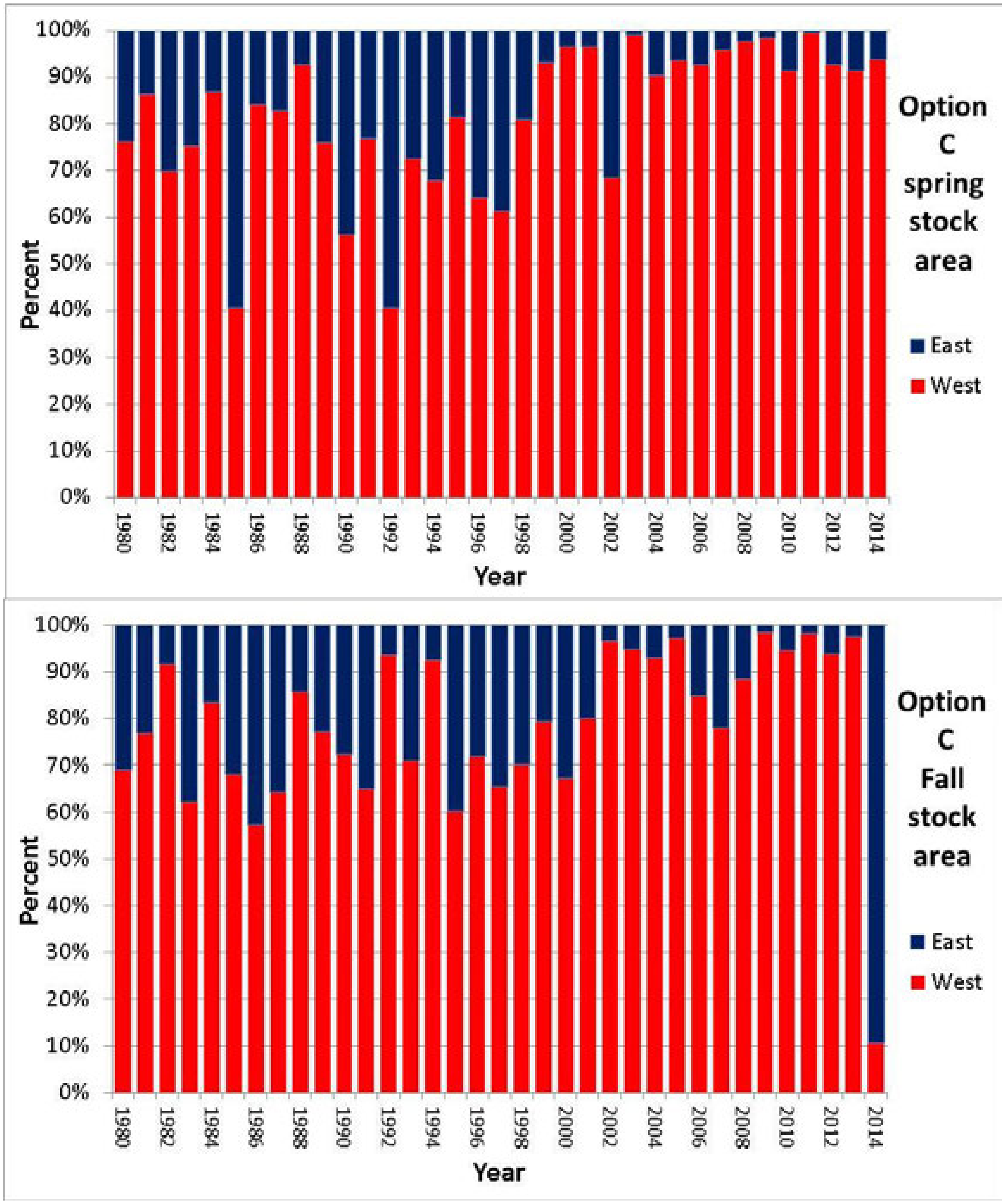


Table 3- Boundary Options A, B and C for spring, fall, and combined seasons survey proportions for a 10 and 20 year average ignoring the survey stratification in the calculation

		Option A		Option B		Option C	
		Inshore (east)	Offshore (west)	Inshore (east)	Offshore (west)	Inshore (east)	Offshore (west)
Spring	10-year average	0.88	0.12	0.42	0.58	0.95	0.05
	20-year average	0.82	0.18	0.43	0.57	0.89	0.11
Fall	10-year average	0.75	0.25	0.32	0.68	0.84	0.16
	20-year average	0.72	0.28	0.37	0.63	0.81	0.19
Combined	10-year average	0.81	0.19	0.37	0.63	0.89	0.11
	20-year average	0.77	0.23	0.40	0.60	0.85	0.15

Note: The combined averages use annual estimates from both surveys (i.e., 10 year average is an average of 20 data points and 20 year average is an average of 40 data points).

3. Conclusions

Depending on which approach and line option is selected to calculate sub-ACLs for GOM cod, the proportion of the GOM cod ACL that would be assigned west (inshore) of the line ranges from 35-95% (Table 1 to Table 3). Examples of possible inshore and offshore sub-ACLs along that range using the proposed FY 2015 commercial sub-ACL (207 mt) for GOM cod in Framework Adjustment 53 are given in Table 4.

Table 4 - Possible inshore and offshore sub-ACLs using the Proposed ACL for Gulf of Maine cod in Framework Adjustment 53 for FY 2015

Inshore		Offshore	
% inshore	sub-ACL (mt)	% offshore	sub-ACL (mt)
95%	196.65	5%	10.35
90%	186.30	10%	20.70
85%	175.95	15%	31.05
80%	165.60	20%	41.40
75%	155.25	25%	51.75
70%	144.90	30%	62.10
65%	134.55	35%	72.45
60%	124.20	40%	82.80
55%	113.85	45%	93.15
50%	103.50	50%	103.50
45%	93.15	55%	113.85
40%	82.80	60%	124.20
35%	72.45	65%	134.55

Notes:
FY 2015 GOM cod ABC = 386 mt
FY 2015 commercial groundfish ACL = 202 mt (sectors) + 5 mt (common pool) = 207 mt

Both the VTR and survey data show an increasing proportion of the stock inshore more recently (10 year versus 20 year average). Similar trends were also seen in the stock assessment. It is important to note the VTR stock proportions are a function of the cod population distribution, fishery effort and groundfish stock targeting behavior. If sub-ACLs can be accurately assigned inshore and offshore consistent with the true cod biomass distributions, then these measures would potentially have low to negligible biological effect on the GOM cod stock, since mortality would not be expected to change much between the components. However, if the GOM cod stock rebounds and/or the distribution changes (i.e., shifting to the east or populating the east and west in different proportions), the impacts on the GOM cod stock could potentially change. It is difficult to determine if those scenarios would result in a positive or negative biological impact on the stock.