Draft Framework Adjustment 47
To the Northeast Multispecies FMP

Including an

Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis

November 14, 2011

This document is still under development and will be modified prior to the November 2011 Council meeting.

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

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2.0 Introduction and Background

2.1 Background

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

> (1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States;
>
> (2) to support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species;
>
> (3) to promote domestic and recreational fishing under sound conservation and management principles;
>
> (4) to provide for the preparation and implementation, in accordance with national standards, of fishery management plans which will achieve and maintain, on a continuing basis, the optimum yield from each fishery;
>
> (5) to establish Regional Fishery Management Councils to exercise sound judgment in the stewardship of fishery resources through the preparation, monitoring, and revisions of such plans under circumstances which enable public participation and which take into account the social and economic needs of the States.

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

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

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

Three framework adjustments have updated the measures in Amendment 16. The first, published as Framework 44, became effective on May 1, 2010 concurrently with Amendment 16. It adopted the required specifications for regulated northeast multispecies stocks for fishing years 2010-2012, as well as stocks managed by the U.S./Canada Resource Sharing Agreement. It was also used to incorporate the best available information in adjusting effort control measures adopted in Amendment 16. Framework 45 became effective on May 1, 2011. It built upon revisions made to the sector program in Amendment 16 and Framework 44, set specifications required under the U.S./Canada Resource Sharing Agreement, and incorporated an updated stock assessment for pollock. Finally, Framework 46 is expected to be implemented in late 2011 and will adjust the amount of haddock that is allocated to the midwater trawl herring fishery.

This framework is primarily intended to set specifications for FY 2012-2014 as required by Amendment 16, including those developed under the U.S./Canada Resource Sharing Agreement and incorporating updated stock assessments. It will also build upon revisions made to the fishery administration program in Amendment 16 and Frameworks 44 through 46.

2.2 Purpose and Need for the Action

The Northeast Multispecies FMP requires that the NMFS Regional Administrator, after consultation with the Council, determine the specifications for the groundfish fishery. The FMP requires the Council and the Regional Administrator to review the best available information regarding the status of the resource and fishery and develop appropriate fishery specifications. Previous amendments to the FMP established processes to evaluate fishing mortality and rebuilding progress. If necessary as a result of these evaluations, periodic framework adjustments were planned to facilitate any changes to the management program that may prove necessary in order to comply with the rebuilding programs and to provide an opportunity to adjust other management measures as necessary.

In 2011, the International Fisheries Agreement Clarification Act was modified so that for stocks subject to the U.S./Canada Resource Sharing Understanding, it is possible to exceed the catch levels otherwise required under the Northeast Multispecies Fishery Management Plan if certain conditions are met (described in Section XXX). This change in the law, in addition to scientific reviews of rebuilding process, is another source of need to consider the adjustment of management measures.

Additionally, several elements of Amendment 16 have been updated in recent frameworks in order to allow the fishery to operate more effectively and to ensure that overfishing does not occur. This framework similarly proposes several modifications of that nature.

These specifications and adjustments to Amendment 16, listed in the following table, are intended to meet the goal and many of the objectives of the Northeast Multispecies FMP, as modified in Amendment 16.

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

Need for Framework 47	***Corresponding Purpose For Framework 47***
Set specifications for ACLs in Fishing Years 2012-2014 consistent with best available science, the ABC control rules adopted in Amendment 16 to the Northeast Multispecies FMP, the International Fisheries Agreement Clarification Act, and the most recent relevant law	• Revisions to status determination criteria, including updated winter flounder assessments • Revision of rebuilding strategy for GB yellowtail flounder • Measures to adopt ACLs, including relevant sub-ACLs and incidental catch TACs • Measures to adopt TACs for U.S./Canada area
Modify management measures in order to ensure that overfishing does not occur consistent with the status of stocks, the National Standard guidelines, and the requirements of the MSA of 2006	• Modification of management measures for SNE/MA winter flounder • Modification of restrictions on the catch of yellowtail flounder in Georges Bank access areas • Modification of accountability measures for certain stocks

2.3 Brief History of the Northeast Multispecies Management Plan

Groundfish stocks were managed under the M-S Act beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was rejected in 1982 with the adoption of the Interim Groundfish Plan, which relied on minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented reductions in time fished (days-at-sea, or DAS) for some fleet sectors and adopted year-round closures to control mortality. A more detailed discussion of the history of the management plan up to 1994 can be found in Amendment 5 (NEFMC 1994). Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program and accelerated the reduction in DAS first adopted in Amendment 5. After the implementation of Amendment 7, there were a series of amendments and smaller changes (framework adjustments) that are detailed in Amendment 13 (NEFMC 2003). Amendment 13 was developed over a four-year period to meet the M-S Act requirement to adopt rebuilding programs for stocks that are overfished and to end overfishing. Amendment 13 also brought the FMP into compliance with other provisions of the M-S Act. Subsequent to the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expanded the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock. FW 42 included measures to implement the biennial adjustment to the FMP as well as a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, an extension of the DAS leasing program, and introduced the differential DAS system. FW 43 adopted haddock catch caps for the herring fishery and was implemented August 15, 2006. Amendment 16 was adopted in 2009 and provided major changes in the realm of groundfish management. Notably, it greatly expanded the sector program and implemented Annual Catch Limits in compliance with 2006 revisions to the M-S Act. 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. Framework 44 was also adopted in 2009, and it set specifications for FY 2010 – 2012 and incorporated the best available information in adjusting effort control measures adopted in Amendment 16. Framework 45 was approved by the Council in 2010 and adopts further modifications to the sector program and fishery specifications; it was implemented May 1, 2011. Two more revisions to the FMP have been approved by the NEFMC and are expected to be implemented in late 2011: Framework 46, which revised the allocation of haddock to be caught by the herring fishery and Amendment 17, which authorizes the function of NOAA-sponsored state-operated permit banks. A more detailed description of the history of the FMP is included in Amendment 16, and each of these actions can be found on the internet at http://www.nefmc.org.

2.4 National Environmental Policy Act (NEPA)

NEPA provides a structure for identifying and evaluating the full spectrum of environmental issues associated with Federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is a combined framework adjustment to a fishery management plan and an environmental assessment (EA). An EA provides an analysis of a Proposed Action, the alternatives to that action that were considered, and the impacts of the action and the alternatives. An EA is prepared rather than an Environmental Impact Statement (EIS) when the environmental impacts are not expected to be significant. The required NEPA elements for an EA are discussed in Section XXX. The evaluation that this action will not have significant impacts is in Section XXX, and the required Finding of No Significant Impact (FONSI) statement is included at the end of that section.

3.0 Alternatives under Consideration

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

3.1.1 Revised Status Determination Criteria for Winter Flounders and Gulf of Maine Cod

3.1.1.1 Option 1: No Action

If no action is adopted, there will be no revisions to status determination criteria for the Georges Bank, Gulf of Maine, or Southern New England/Mid-Atlantic winter flounder stocks. The following criteria, as implemented in Amendment 16, would apply:

Table 1 – No Action status determination criteria for winter flounder stocks

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Gulf of Maine Winter Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GB Winter Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
SNE/MA Winter Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GOM cod	SSB_{MSY}: SSB/R (40%MSP)	½ Btarget	F40% MSP

Numerical estimates of SDCs are in Table 2.

Table 2 – No Action numerical estimates of SDCs for winter flounder stocks

Stock	Model	Bmsy or proxy (mt)	Fmsy or proxy	MSY (mt)
GB Winter Flounder	VPA	16,000	0.26	3,500
GOM Winter Flounder	VPA	3,792	0.28	917
SNE/MA Winter Flounder	VPA	38,761	0.25	9,742
GOM Cod	VPA	58,248	0.24	10,014

3.1.1.2 Option 2: Revised Status Determination Criteria for Georges Bank, Gulf of Maine, and Southern New England/Mid-Atlantic Winter Flounder Stocks and GOM Cod (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

The M-S Act requires that every fishery management plan specify "objective and measureable criteria for identifying when the fishery to which the plan applies is overfished." Guidance on this requirement identifies two elements that must be specified: a maximum fishing mortality threshold (or reasonable proxy) and a minimum stock size threshold. The M-S Act also requires that FMPs specify the maximum sustainable yield and optimum yield for the fishery. Amendment 16 adopted status determination criteria for regulated groundfish stocks as determined by the GARM III (NEFSC 2008) and, in the case of Atlantic wolffish, the DPWG (2009). Framework 45 updated status determination criteria for Atlantic pollock to reflect the results of an additional assessment conducted in 2010.

The NEFSC conducted new assessments for the three New England winter flounder stocks in 2011. These assessments adopted a new model and recommended revised status determination criteria for each stock (NEFSC 2011). This action adopts the revised status determination criteria for these stocks. The review panel recommended the criteria and numerical values in Table 3 and Table 4.

The NEFSC will conduct an assessment for GOM cod in December 2011. The reference points for this stock may also change but the details are not known.

Table 3 – Option 2 status determination criteria for winter flounder stocks

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Gulf of Maine Winter Flounder	Undefined	Undefined	F40%MSP
GB Winter Flounder	SSB_{MSY}	½ SSBMSY	FMSY
SNE/MA Winter Flounder	SSB_{MSY}	½ SSBMSY	F_{MSY}
GOM Cod	SSB_{MSY} or a proxy for SSB_{MSY}	½ SSB_{MSY} or the SSB_{MSY} proxy	F_{MSY} or a proxy for F_{MSY}

Numerical estimates of SDCs are in Table 4.

Table 4 – Option 2 numerical estimates of SDCs for winter flounder stocks

Stock	Model	Bmsy or proxy (mt)	Fmsy or proxy	MSY (mt)
GOM Winter Flounder	Swept Area Biomass	Undefined	0.31	Undefined
GB Winter Flounder	VPA	10,100	0.42	3,700
SNE/MA Winter Flounder	ASAP/SCAA	43,661	0.290	11,728
GOM cod	TBD	30,000 – 100,000 mt	0.1 – 0.5	5,000 – 15,000 mt

3.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

3.1.2.1 Option 1: No Action

The current rebuilding strategy for Georges Bank yellowtail flounder, adopted in FW 45, uses a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success.

3.1.2.2 Option 2: Revised Rebuilding Strategy for Georges Bank Yellowtail Flounder

Two options are being considered for a revised rebuilding strategy for GB yellowtail flounder.

<u>Sub-Option A:</u> The rebuilding strategy would be to rebuild the stock with a median probability of success by 2023. This strategy is based on fishing at a fishing mortality rate (75% of F_{MSY}) consistent with the default ABC control rule adopted by Amendment 16.

<u>Sub-Option B (*Groundfish Committee Preferred Alternative*):</u> The rebuilding strategy would be to rebuild the stock with a median probability of success by 2032. This strategy is based on fishing at a fishing mortality rate that was based on analyses that considered two different criteria. The first was a rate that would, on average, increase SSB by 10 percent per year. The second was the maximum fishing mortality calculated to achieve SSB_{MSY}. The fishing mortality rate for both, when estimated in 2011, was nearly identical.

The GAP recommends this option.

Rationale: In 2011, the International Fisheries Agreement Clarification Act (IFACA) was modified so that for stocks subject to the U.S./Canada Resource Sharing Understanding, it is possible to "exceed the catch levels otherwise required under the Northeast Multispecies Fishery Management Plan if--

(A) overfishing is ended immediately;

(B) the fishing mortality level ensures rebuilding within a time period for rebuilding specified taking into account the Understanding pursuant to paragraphs (1) and (2) of this subsection; and

(C) such catch levels are consistent with that Understanding."

In light of the changed law, the stock is exempted from the ten-year requirement for rebuilding, as long as it is rebuilt as quickly as possible and overfishing is ended immediately, taking into account communities and other factors including the purpose and intent of the Understanding itself.

There are other provisions of the M-S Act and IFACA that should be considered when selecting the rebuilding strategy. M-S Act rebuilding requirements specified in section 304(e)(4)(A)(i) include the requirements that the FMP or amendment must specify a time period for rebuilding that is as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem. IFACA, however, states that for the stocks covered by the U.S./Canada Resource

Sharing Understanding, the Understanding and decisions made under the Understanding should be taken into account in the application of this section. In other words, the Understanding and decisions made under the Understanding should be considered when determining the period that is as short as possible.

Section 304(e)4(A)(ii) of the M-S Act says that generally the rebuilding period should not exceed 10 years except in cases where the biology of the stock of fish and other environmental conditions, or management measures under an international agreement, dictate otherwise. IFACA states that decisions made under the Understanding should be considered "management measures under an international agreement" that "dictate otherwise."

The application of these provisions to the two sub-options is as follows:

Sub-Option A: The fishing mortality rate used for determining the time period is 75% of F_{MSY} , or 0.1875 (future adjustments may increase or decrease this mortality rate needed to rebuild by the end of the period). The predicted rebuilding period extends beyond ten years since the initial year was 2006 and would be 17 years if the current retrospective pattern in the assessment continues. Since the harvest strategy for the U.S./Canada Resource Sharing Understanding is to have a low risk of exceeding Fref (F_{MSY} proxy, or 0.25) when stock conditions are poor, this strategy is consistent with the Understanding. Because of differences between U.S. and Canadian legal requirements it is not likely that a lower mortality target could be negotiated as the basis for annual catches. As a result, this is the shortest time period that is possible after taking into account decisions named under the Understanding. This sub-option does reduce yields, however, when compared to sub-Option B and so does not consider the needs of fishing communities to the same extent.

Sub-Option B: The fishing mortality rate used for determining the time period is 0.21 (future adjustments may increase or decrease this mortality rate needed to rebuild by the end of the period). The predicted rebuilding period extends beyond ten years since the initial year was 2006 and would be 26 years if the current retrospective pattern continues. Since the harvest strategy for the U.S./Canada Resource Sharing Understanding is to have a low risk of exceeding Fref (F_{MSY} proxy, or 0.25) when stock conditions are poor, this strategy is consistent with the Understanding. This mortality rate is about 12 percent higher than that used in sub-option A. This results in slightly higher catches, which gives more flexibility for negotiating catches with Canada under the terms of the Understanding. As a result it also better addresses the needs of fishing communities when compared to sub-option A.

3.1.3 Identification of Additional Sub-Annual Catch Limits

The Groundfish Committee moved this entire measure to considered but rejected. The text is included here only to make it easier to refer to the Committee motions and meeting summary during Council discussions.

Amendment 16 identified how the ABC is distributed to various components of the fishery. The identified components include sub-ACLs as well as other identified sub-components. In general, sub-ACLs are specified when the catch by a component of the fishery is large enough that controls are needed to make certain that the overall ACL will not be exceeded. Accountability measures are identified for sub-ACLs, either in the Northeast Multispecies FMP or in another FMP. Other identified sub-components are used for smaller catches that are determined unlikely to need a specific control. AMs on other parts of the fishery must be sufficient to account for any overages of the other sub-components. This action considers modifying the components of the catch that were adopted by Amendment 16.

Option 1: No Action

There would not be any changes to the distribution of ABCs as adopted by Amendment 16. The components of the catch would be as shown in **Table 7**.

Option 2: SNE/MAB Windowpane Flounder Sub-ACLs

Sub-ACLs for SNE/MA windowpane flounder would be adopted as follows:

- Large mesh multispecies fishery: Amount goes here
- Scallop fishery: Amount Goes here
- {Other fishery TBD}: Amount goes here

AMs for the scallop fishery sub-ACL for this stock will be developed within the Atlantic Sea Scallop FMP and will be implemented in FY 2013. If catches of this stock by the scallop fishery in FY 2012 exceed the sub-ACL, the adopted AMs will be implemented as designed.

AMs for the {other} fishery sub-ACL for this stock will be developed within the {other} FMP and will be implemented in FY 2013. If catches of this stock by the {other} fishery in FY 2012 exceed the sub-ACL, the adopted AMs will be implemented as designed. If AMs are not adopted by FY 2013, then the AMs in section 3.2.5 will apply to the XXX fishery.

Rationale: The accounting of FY 2010 catches indicates the scallop fishery caught more than the ACL for SNE/MAB windowpane flounder, and the {other fishery} caught approximately xx percent. These amounts are large enough that management of groundfish fishery catches of this stock are insufficient to assure that overfishing does not occur.

Option 3: SNE/MA Winter Flounder Sub-ACL

A sub-ACL for SNE/MA winter flounder is implemented for the scallop fishery. AMs for this stock will be developed within the Atlantic Sea Scallop FMP and will be implemented in FY 2013. If catches of this stock by the scallop fishery in FY 2012 exceed the sub-ACL, the adopted AMs will be implemented as designed.

The sub-ACL for SNE/MA winter flounder is specified as {fill in amount here}.

3.1.4 U.S./Canada Resource Sharing Understanding TACs

3.1.4.1 Option 1: No Action

If no action is taken on specifications, the recommendations of the TMGC would also not be implemented and there would be no TAC for EGB cod, haddock, or GB yellowtail flounder in the U.S./Canada area for FY 2012. Vessels would still be constrained by the other regulations of the FMP, including days-at-sea (DAS), sector regulations, and closed areas.

3.1.4.2 Option 2: U.S./Canada TACs (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

This alternative would specify TACs for the U.S./Canada Management Area for FY 2012 as indicated in Table 5 below. These TACs would be in effect for the entire fishing year, unless NMFS determines that FY 2011 catch of GB cod, haddock, or yellowtail flounder from the U.S./Canada Management Area exceeded the pertinent 2011 TAC. If the TAC in a particular fishing year is exceeded, the Understanding and the regulations require that the TAC for the subsequent fishing year is reduced by the amount of the overage. In order to minimize any disruption to the fishing industry, NMFS would attempt to make any necessary TAC adjustment in the first quarter of the fishing year.

The percentage share for the U.S. would increase by 5 percent for cod in FY 2012 compared to FY 2011 and would decrease by 6 percent for yellowtail in FY 2012. The percentage share for the U.S. would not change for haddock. Each country's percentage share is based on a formula that accounts for historic catch and current resource distribution. For FY 2012, the weighting formula used to determine the percentage shares would be 90/10 (resource distribution/historic catch). More information on the calculation of the percentage shares is available on the TMGC website at the following address:
http://www.mar.dfo-mpo.gc.ca/science/tmgc/background/share.pdf.

Table 5 - Proposed FY 2012 U.S./Canada TACs (mt) and Percentage Shares

TAC	Eastern GB Cod	Eastern GB Haddock	GB Yellowtail Flounder
Total Shared TAC	675	16,000	1,150
U.S. TAC	162 (24%)	6,880 (43%)	564 (49%)
Canada TAC	513 (76%)	9,120 (57%)	586 (51%)

A comparison of the proposed FY 2012 U.S. TACs and the FY 2011 U.S. TACs is shown in

Table 6. Changes to the U.S. TACs reflect changes to the percentage shares, stock status, and the TMGC recommendations.

Table 6 - Comparison of the Proposed FY 2012 U.S. TACs and the FY 2011 U.S. TACs (mt)

Stock	U.S. TAC		Percent Change
	FY 2012	FY 2011	
Eastern GB cod	162	200	– 19 %
Eastern GB haddock	6,880	9,460	– 27 %
GB yellowtail	564	1,458	– 61 %

3.1.5 Mixed Stock Exception for SNE/MAB Windowpane Flounder

Option 1: No Action

ABCs and ACLs for SNE/MAB windowpane flounder would be based on the ABC control rule adopted by Amendment 16. The ABC would be set below the Overfishing Limit (OFL) and the expectation is that overfishing would not occur.

The Groundfish Committee moved this measure to considered but rejected. The text is included here only to make it easier to refer to the Committee motions and meeting summary during Council discussions.

Option 2: Application of Mixed Stock Exception to SNE/MAB Windowpane Flounder

ABCs and ACLs for SNE/MAB windowpane flounder would not be based on the ABC control rule adopted by Amendment 16. The ABC and ACL could be set at or above the OFL, but could not exceed the recommendation of the Science and Statistical Committee (SSC). Overfishing could occur.

Rationale: The M-S Act and the NSGs allow limited exceptions to the requirement to end overfishing. One of these is described in the NSGs and is referred to as the Mixed Stock Exception (MSE). As described in 50 CFR 600.310(m), harvesting one stock at its optimum level may result in overfishing of another stock. A Council may decide to allow this type of overfishing if the fishery is not overfished and analysis demonstrates that:

(1) Such action will result in long-term net benefits to the Nation;
(2) Mitigation measures have been considered and it has been demonstrated that a similar level of net-benefits cannot be achieved by modifying fleet behavior, gear selection/configuration, or other technical characteristics in a manner such that no overfishing would occur;
(3) The resulting rate of fishing mortality will not cause any stock or stock complex to fall below its MSST more than 50 percent of the time in the long term, although it may fall below B_{MSY} more than 50 percent of the time in the long term.

SNE/MAB windowpane flounder is not overfished. This stock is caught by groundfish fishing vessels, scallop fishing vessels, and other fishing vessels in the SNE/MA region. Analysis in sections XXX, XXX, XXX demonstrate that the criteria specified in the NSGs can be met and allowing the possibility of overfishing this stock is likely to result in long-term net benefits to the Nation.

3.1.6 Administration of Scallop Fishery Sub-ACLs

3.1.6.1 Option 1: No Action

There would not be any changes to the way scallop fishery sub ACLs are administered. When the sub-ACL is caught, it would result in the implementation of the applicable AMs.

Rationale: Under the multispecies AM system, the ABC is distributed into various sub-components. This approach partitions the overall fishing mortality among different components. In order to have the greatest likelihood that mortality targets will be achieved over the long term it is important that each component remain within its allocation. The AM system is designed to automatically correct if one of the components –such as the scallop fishery – catches more than it is allocated. For this reason, the catch of each component is compared to its sub-ACL to determine when AMs would be implemented.

3.1.6.2 Option 2: Changes to Scallop Fishery Sub-ACL Administration – AM Implementation *(Groundfish Committee Preferred Alternative)*

The GAP recommends this option.

Scallop fishery sub-ACLs would be administered and evaluated in the context of total catches in the fishery. The general principle is that if a scallop fishery sub-ACL (for any stock) would be exceeded, but the overall ACL was not exceeded, then the scallop fishery would not be subject to AMs unless the scallop fishery sub-ACL was exceeded by 50 or more percent. There would be two criteria that would result in implementing the AMs if either was met:

- The scallop fishery exceeds its sub-ACL for a stock and the overall ACL is also exceeded
- The scallop fishery exceeds its sub-ACL for a stock by 50 or more percent

This is modified in the case of stocks that are allocated to groundfish sectors because sectors are allowed to carry-over a portion of unused ACE into the next fishing year. When evaluating whether the total ACL has been exceeded or not, NMFS will account for the maximum amount of carry-over available to the groundfish fishery and add that to the estimate of total catch.

Rationale: The purpose of the ACL and AM system is to prevent overfishing. Overfishing is likely to occur only if the total ACL is exceeded. It makes little sense to sacrifice yield or increase fishing costs from the scallop fishery because of AMs designed to reduce the catch of groundfish stocks if the total ACL for those stocks is not exceeded. At the same time ,there is a need to hold the scallop fishery accountable for its catch so if the sub-ACL is exceeded by 50 or more percent the AM is implemented even if the overall ACL is not exceeded.

3.1.6.3 Option 3: In-Season Re-estimation of Scallop Fishery GB Yellowtail Flounder Sub-ACL (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

A portion of the GB yellowtail flounder ABC is allocated to the scallop fishery as a sub-ACL. This allocation is based on an initial estimate of the amount of GB yellowtail flounder the scallop fishery is expected to catch if it harvests all of the available scallops. The estimate of this catch is prepared and the Council then bases its allocation on a percentage of this estimate. There are no restrictions on the percentage that can be allocated; recent allocations have ranged from 90 percent to more than 100 percent.

This initial estimate is based on past fishing activity and projected changes in stock size for both yellowtail flounder and scallops. Because there is uncertainty in these estimates there is a possibility that the allocation may be either too high or too low. If the initial allocation is too low, the impacts on the scallop fishery are that AMs may triggered if the scallop fishery exceeds its sub-ACL (if the measure in section 3.1.6 Option 2 is adopted, then the AM would only be triggered if the total ACL was also exceeded).

If the estimate is too high then there is a possibility that the available catch will not be harvested, sacrificing yellowtail flounder yield. In order to prevent the loss of available yield of this stock, if this option is adopted NMFS would re-estimate the expected scallop fishery catch of GB yellowtail flounder by January 15 of the fishing year. Should the estimate indicate that the scallop fishery will catch less than 90 percent of the entire sub-ACL,NMFS will reduce the scallop fishery sub-ACL to the amount expected to be caught and increase the groundfish sub-ACL by the difference between the original estimate and the revised estimate. The increase in the groundfish sub-ACL will be distributed to sectors and the common pool. If the amount of yellowtail flounder projected to be caught by the scallop fishery exceeds the scallop fishery sub-ACL, there will not be any changes to the sub-ACL.

3.1.7 Annual Catch Limit Specifications

3.1.7.1 Option 1: No Action

If the No Action option is selected, the specifications for FY 2012 would remain as adopted by FW 44 and FW 45, and there would not be any ABCs defined for FY 2013 and 2014 (with the exception of pollock). There would not be additional sub-ACLs and there would be no changes to the distribution of available catch to various sub-components. The F Y 2012 ABCs would be as specified in **Table 7**.

Table 7 – No Action/Option 1 Northeast Multispecies OFLs, ABCs, ACLs, and other ACL sub-components for FY 2012 (metric tons, live weight). Values are rounded to the nearest metric ton.
(1) Grayed out values may be adjusted as a result of future recommendations of the TMGC. Values shown for GB haddock and cod are estimates..

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops Sub-ACL	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ACL	Total ACL
GB Cod(1)	2012	8,090	5,364	54	215	0	4,841		0	4,647	194	0	5,109
GOM Cod	2012	11,742	9,018	598	299	0		4,828	2,826	4,472	356	0	8,551
GB Haddock(1)	2012	51,150	29,016	290	1,161	0	26,132		0	25,609	523	54	27,637
GOM Haddock	2012	1,296	1,013	7	29	0		661	259	630	31	2	959
GB Yellowtail Flounder(1)	2012	4,335	1,222	0	51.2	307.5	686.3		0.0	665.7	20.6	0.0	1045.0
SNE/MA Yellowtail Flounder	2012	3,166	1,003	10	40	126	760		0	552	208	0	936
CC/GOM Yellowtail Flounder	2012	1,508	1,159	12	46	0	1,046			976	70	0	1,104
Plaice	2012	4,727	3,632	36	145	0	3,278			3,067	211	0	3,459

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops (1)	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Prelim-inary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
Witch Flounder	2012	2,141	1,639	16	66	0	1,479			1,406	73	0	1,561
GB Winter Flounder	2012	3,297	2,543	0	127	0	2,295			2,227	68	0	2,422
GOM Winter Flounder	2012	685	238	60	12	0	158			132	26	0	230
SNE/MA Winter Flounder	2012	2,830	1,198	96	60	0	969			0	969	0	1,125
Redfish	2012	12,036	9,224	92	369	0	8,325			8,041	284	0	8,786
White Hake	2012	5,306	3,638	36	146	0	3,283			3,128	156	0	3,465
Pollock	2014	20,554	16,000	760	1,400	0	13,148		0	12,622	526	0	15,308
N. Window-pane Flounder	2012	317	237	2	69	0	154		0	0	154	0	225

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops (1)	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Prelim-inary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
S. Window-pane Flounder	2012	317	237	2	69	0	154			0	154	0	225
Ocean Pout	2012	361	271	3	11	0	239			0	239	0	253
Atlantic Halibut	2012	143	85	43	4	0	36			0	36	0	83
Atlantic Wolffish	2012	92	83	1	3	0	73			0	73	0	77

Table 8 – Option 1preliminary incidental catch TACs for Special Management Programs (metric tons, live weight). These values may change as a result of changes in sector membership.

	Cat B (regular) DAS Program			CAI Hook Gear Haddock SAP			EUS/CA Haddock SAP		
Stock	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
GB cod	1.7	2.6	2.8	0.6	0.8	0.9	1.2	1.7	1.9
GOM cod	3.4	3.6	3.6						
GB Yellowtail	0.6	0.5	0.5				0.6	0.5	0.5
CC/GOM yellowtail	0.5	0.6	0.7						
SNE/MA Yellowtail	0.9	1.4	2.1						
Plaice	9.2	10.0	10.6						
Witch Flounder	2.1	3.1	3.7						
White Hake	5.2	7.3	9.7						
SNE/MA Winter Flounder	1.1	1.2	1.4						
GB Winter Flounder	1.2	1.4	1.6				1.2	1.4	1.6
Pollock	1.2	1.2	1.2	0.4	0.4	0.4	0.8	0.8	0.8

Table 9 – Proposed CAI Hook Gear Haddock SAP TACs, FY 2010- 2012

Year	**Exploitable Biomass (thousand mt)**	**WGB Exploitable Biomass**	**B(year)/B2004**	**TAC (mt, live weight)**
2004	78,037	27,313		
2010	291,682	102,089	3.738	4,223.7
2011	218,054	76,319	2.794	3,157.5
2012	177,978	62,292	2.281	2,577.2

3.1.7.2 Option 2: Revised Annual Catch Limit Specifications (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

If Option 2 were selected, the specifications for FY 2012 through FY 2014 would be as specified in **Table 10**. This option defines FY 2012 specifications for twelve stocks that were last assessed at GARM III as the values previously established in FW 44 and FW 45. This is because the Council's SSC recommended against using the results of five to seven year projections to define OFLs and ABCs. No specifications are made for FY 2013 and F Y 2014 for these stocks. Updated assessments will be completed in early 2012 and a future action will use those results for setting the FY 2013 – FY 2014 values. The updated assessments may also lead to changes in the FY 2012 values.

For other stocks that are assessed with an index-based assessment, or that have had an assessment recently completed, specifications are defined for the period FY 2012 – 2014.

A benchmark assessment for GOM cod is planned for December 2011. The results will not be available in time for them to be included in this framework. In order to allow the results to be adopted as quickly as possible, the framework considers and analyzes a range of values that are expected to encompass the likely assessment result. The framework also includes the FY 2012 value that was included in FW 44. After the assessment results are completed, the Council's SSC will use the new results to recommend OFLs and ABCs for FY 2012 – 2014, the Council will consider the recommendations at a Council meeting, and the revised values may be included in the proposed and final rule.

To a large extent, the values for specifications are determined by the decisions made on the options in sections 3.1.1, 3.1.2, 4.1.1, 3.1.4, and 4.1.1. and the decisions made on section 3.2.5 (AMs). If the AMs in that section are adopted, then for ocean pout, both windowpane flounder stocks, and Atlantic wolffish the groundfish fishery will not have a specific sub-ACL and **Table 10** will be revised accordingly.

Table 10 – Option 2 Northeast Multispecies OFLs, ABCs, ACLs, and other ACL sub-components for FY 2012 – FY 2014 (metric tons, live weight). Values are rounded to the nearest metric ton. ***PRELIMINARY VALUES SHOWN 011 SECTOR ROSTERS..***
(1) Grayed out values may be adjusted as a result of future recommendations of the TMGC.
(4) SNE/MAB windowpane flounder without the Mixed Stock Exception and without new sub-ACLs

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
GB Cod[1]	2012	7,311	5,103	51	204	0	4,605		0	4,506	100	0	4,861
	2013												
	2014												
GOM Cod	2012	11,742	9,018	598	299	0		4,828	2,826	4,724	104	0	8,551
	Low		500	33	17	0		268	157	262	6	0	474
	High		20,000	1,326	663	0		10,707	6,268	10,477	231	0	18,965
GB Haddock[1]	2012	54,150	30,726	307	1,229	0	27,438		0	27,270	168	286	29,260
	2013												
	2014												
GOM Haddock	2012	1,296	1,013	15	22	0		653	259	647	6	9	958
	2013												
	2014												
GB Yellowtail Flounder[1]	2012	1,691	564	0	22.6	307.5	217.7		0	214	4	0	547.8
	2013	1,691	564	0	22.6	307.5	217.7		0	214	4	0	547.8
	2014												
SNE/MA Yellowtail Flounder	2012	3,166	1,003	10	40	126	760		0	585	174	0	936
	2013												
	2014												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Prelim-inary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
CC/GOM Yellowtail Flounder	2012	1,508	1,159	35	23	0	1,046		0	1,016	30	0	1,104
	2013												
	2014												
Plaice	2012	4,727	3,632	36	145	0	3,278		0	3,204	74	0	3,459
	2013												
	2014												
Witch Flounder	2012	2,141	1,639	49	66	0	1,448		0	1,419	29	0	1,563
	2013		0	0	0	0	0		0	0	0	0	0
	2014		0	0	0	0	0		0	0	0	0	0
GB Winter Flounder	2012	4,839	3,753	0	188	0	3,387		0	3,364	23	0	3,575
	2013	4,819	3,750	0	188	0	3,384		0	3,361	23	0	3,572
	2014	4,626	3,598	0	180	0	3,247		0	3,225	22	0	3,427
GOM Winter Flounder	2012	1,458	1,078	272	54	0	715		0	679	36	0	1,040
	2013	1,458	1,078	272	54	0	715		0	679	36	0	1,040
	2014	1,458	1,078	272	54	0	715		0	679	36	0	1,040
SNE/MA Winter Flounder (2)	2012	2,336	626	175	125	0	303		0	0	303	0	603
	2013	2,637	697	195	139	0	337		0	0	337	0	672
	2014	3,471	912	255	182	0	441		0	0	441	0	879
Redfish	2012	12,036	9,224	92	369	0	8,325		0	8,285	40	0	8,786
	2013												
	2014												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Prelim-inary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
White Hake	2012	5,306	3,638	73	109	0	3,283		0	3,252	31	0	3,465
	2013												
	2014												
Pollock	2012	19,887	15,400	754	1,370	0	12,612		0	12,518	94	0	14,736
	2013	20,060	15,600	756	1,380	0	12,791		0	12,695	95	0	14,927
	2014	20,554	16,000	760	1,400	0	13,148		0	13,050	98	0	15,308
N. Window-pane Flounder	2012	230	173	2	33	0	129		0	0	129	0	163
	2013	230	173	2	33	0	129		0	0	129	0	163
	2014	230	173	2	33	0	129		0	0	129	0	163
S. Window-pane Flounder	2012	515	386	39	270	0	72		0	0	72	0	381
	2013	515	386	39	270	0	72		0	0	72	0	381
	2014	515	386	39	270	0	72		0	0	72	0	381
Ocean Pout	2012	342	256	3	23	0	214		0	0	214	0	240
	2013	342	256	3	23	0	214		0	0	214	0	240
	2014	342	256	3	23	0	214		0	0	214	0	240
Atlantic Halibut	2012	143	85	43	4	0	36		0	0	36	0	83
	2013	143	85	43	4	0	36		0	0	36	0	83
	2014	143	85	43	4	0	36		0	0	36	0	83
Atlantic Wolffish	2012	92	83	1	3	0	73		0	0	73	0	77
	2013	92	83	1	3	0	73		0	0	73	0	77
	2014	92	83	1	3	0	73		0	0	73	0	77

Table 11 – Option 2 preliminary incidental catch TACs for Special Management Programs (metric tons, live weight). These values may change as a result of changes in sector membership.

	Cat B (regular) DAS Program			CAI Hook Gear Haddock SAP			EUS/CA Haddock SAP		
Stock	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
GB cod	1.0	0.0	0.0	0.3	0.0	0.0	0.7	0.0	0.0
GOM cod	1.0	0.1	2.3						
GB Yellowtail	0.0						0.0		
CC/GOM yellowtail	0.3		0.0						
SNE/MA Yellowtail	1.7								
Plaice	3.7	0.0	0.0						
Witch Flounder	1.5	0.0	0.0						
White Hake	3.0	3.4	4.4						
SNE/MA Winter Flounder	0.5	0.5	0.4						
GB Winter Flounder	0.3	0.0	0.0				0.3	0.0	0.0
Pollock	0.2	1.0	0.9	0.1	0.3	0.3	0.1	0.7	0.6

Table 12 – Proposed CAI Hook Gear Haddock SAP TACs, FY 2010- 2012

Year	Exploitable Biomass (thousand mt)	WGB Exploitable Biomass	B(year)/B2004	TAC (mt, live weight)
2012	177,978	62,292	2.281	2,577.2

3.2 Commercial and Recreational Fishery Measures

3.2.1 Management Measures for SNE/MA Winter Flounder

3.2.1.1 Option 1: No Action (*Groundfish Committee Preferred Alternative*)

Landing SNE/MA winter flounder would continue to be prohibited for all commercial and recreational vessels. This stock would not be allocated to sectors.

3.2.1.2 Option 2: Allocate SNE/MA Winter Flounder to the Groundfish Fishery

Although Amendment 16 did not allocation the SNE/MA winter flounder stock to sectors, it stipulated that this could "…be considered and adopted in the biennial specification or framework process in the event a future allocation can be made available. If an allocation of SNE/MA winter flounder is made, it will be made in the same manner as for other multispecies stocks" (NEFMC 2010).

This measure would create the allocation of SNE/MA winter flounder to sectors in the same manner as the allocation is calculated for other multispecies stocks. This entails using permit history from FY 1996-2006 to calculate a PSC for each vessel in the fishery. All sector provisions would apply to fishing for SNE/MA winter flounder. For example, if a sector did not have ACE for SNE/MA winter flounder, it would not be allowed to fish in the SNE/MA winter flounder stock area unless its operations plan specified how such activity could occur without catching the stock.

Both sector and common pool groundfish vessels would be allowed to land SNE/MA winter flounder. This measure would also result in a specific sub-ACL for the common pool which, if necessary, may be subject to a trip limit as established by the Regional Administrator and if caught would trigger AMs for the common pool as described by Amendment 16. Beginning with FY 2012, as described in Amendment 16, the common pool ACL for this stock would be distributed over three trimesters. If a trimester ACL would be exceeded, then common pool vessels would be subject to stock-specific area closures as implemented by Amendment 16.

An allocation would not be made between the commercial and recreational fisheries, as it was determined in Amendment 16 that federal waters catch for this stock was less than five percent of removals.

Recreational vessels would not be allowed to land SNE/MA winter flounder.

Rationale: This measure would allow fishermen to modify their behavior to control catches and would provide sampling information on a stock with very poor data. It is also not considered to be likely to increase targeting of the stock since the ACL is so low.

3.2.2 Scallop Catch of Yellowtail Flounder in GB Access Areas – Modification of Restrictions

3.2.2.1 Option 1: No Action

The scallop fishery would be subject to a maximum catch of yellowtail flounder in GB access areas (Closed Area 1, Closed Area 2, and the Nantucket Lightship Area). These TACs are equivalent to 10% of the total GB yellowtail flounder TAC (CA1 and CA2) and 10% of the total SNE/MA YT ACL (NL). This TAC has been in place since the scallop fishery was granted access into GF mortality closed areas in 1999.

3.2.2.2 Option 2: Eliminate Cap on Yellowtail Flounder Caught in the GB Access Areas (*Groundfish Committee Preferred Alternative*)

This alternative would remove the 10% cap on yellowtail flounder that can be caught in the scallop fishery access areas. The scallop fishery would still be subject to its sub-ACL of yellowtail flounder as specified in section 3.1.7, but there would not be any limits on how much of the sub-ACL could be caught in a Georges Bank access area.

Rationale: The scallop fishery is now subject to ACLs since the implementation of Amendment 15 to the Scallop FMP in 2011, and a total amount of GB yellowtail flounder that can by caught by the scallop fishery was allocated in Framework 45 to the Northeast Multispecies FMP. Because the ACLs limit the overall amount of scallops and yellowtail that can be caught, restricting the amount that can be caught in the access areas is seen to be a redundant rule that is no longer necessary to meet mortality objectives.

3.2.3 Atlantic Wolffish Landing Limit

3.2.3.1 Option 1: No Action (*Groundfish Committee Preferred Alternative*)

Landing Atlantic wolffish would continue to be prohibited.

3.2.3.2 Option 2: Revised Atlantic Wolffish Possession Limit

The GAP recommends this option.

Commercial vessels would be allowed to land one Atlantic wolfish per trip. This measure would be adopted in conjunction with revised Atlantic wolffish AMs in section 3.2.5.

3.2.4 Common Pool Restricted Gear Areas

3.2.4.1 Option 1: No Action

Restricted gear areas (RGAs) adopted in Amendment 16 would remain in effect. These areas are described as follows.

Restricted Gear Areas: Two restricted gear areas would remain. Vessels fishing under a groundfish DAS are currently required to comply with the gear requirements for these areas and these provisions would remain in place if the No Action alternative is adopted.

Administration: Vessel operators must comply with the following administrative requirements to fish in these areas:

- As specified by the Regional Administrator, vessel operators must either request a Letter of Authorization (LOA) from NMFS or must make a specific VMS declaration to fish in the areas. The minimum participation period if an LOA is required is seven days.
- A vessel can fish inside and outside the area on the same trip, but is subject to the most restrictive measures (gear, trip limits, etc.) for the entire trip.
- Existing gear performance standards apply to gear used in these areas. Gillnets with large mesh that are allowed in the area are allowed to retain monkfish subject to monkfish possession limits and not the gear performance standards.
- Other gear is not allowed on board when operating in these areas.
- Additional gear (such as the five-point trawl, raised footrope trawl, or tie-down sink gillnets with mesh less than ten inches) may be considered for use in this area if approved by the Regional Administrator consistent with the regulations for approving additional gear in special management programs.

Areas: The areas are defined as:

Western GB Multispecies RGA:
42-00N 69-30W
42-00N 68-30W
41-00N 68-30W
41-00N 69-30W

Southern New England Multispecies RGA:
41-30N 70-30W
40-00N 70-30W
40-00N 71-30W
40-30N 71-30W
40-30N 72-00W
North to the Connecticut shoreline at 72-00W

East along the shoreline to 41-30N

Gear restrictions include:

<u>Trawl Gear</u>: <u>Trawl vessels</u> fishing under a groundfish DAS must use a haddock separator trawl, eliminator trawl, or the rope trawl. The haddock separator trawl and Ruhle trawl are described in existing regulations.

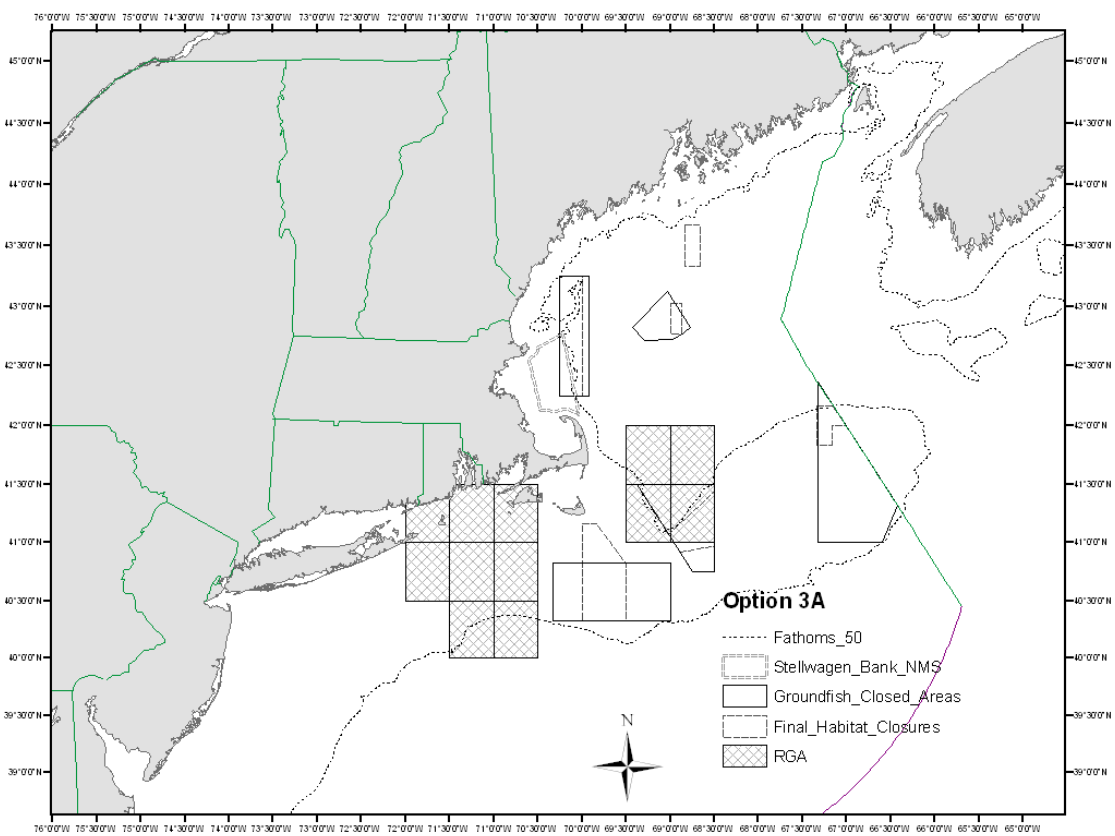
Rope trawl: The design includes a four-panel structure to increase headline height and large mesh in the front part of the trawl. The separator panel is made from a series of parallel ropes of different lengths. The panel is one-third from the fishing line in the vertical plane. There is a large escape opening in the bottom of the trawl. Additional details will be clarified by NMFS in the proposed rule and final regulations.

<u>Sink gillnets:</u> No tiedown nets allowed using mesh less than ten inches. Stand-up gillnets are allowed with legal size mesh.

<u>Longline/tub trawls</u>

<u>Handgear</u>

Figure 1 – Option 1 restricted gear areas



3.2.4.2 Option 2: Removal of Common Pool Restricted Gear Areas (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

The restricted gear areas (RGAs) for common pool vessels that were adopted in Amendment 16 would be removed. The selective gears that were authorized for these areas would remain approved for use as selective gear in other programs. These gears include the Ruhle trawl, the haddock separator trawl, the rope trawl, and other trawl gear approved for use in special management programs.

Rationale: This measure was designed to be considered as part of the AM measure changes proposed in section 3.2.5. With modifications to the AMs that may be adopted for FY 2012 the RGAs would be an unnecessary regulation. Sufficient controls exist to control fishing mortality by common pool vessels. Removing these measures will simplify the regulations, avoid possible confusion between AM areas and RGAs, and facilitate fishing by common pool vessels without risk of exceeding mortality targets.

3.2.5 Accountability Measures

3.2.5.1 Option 1: No Action

The AMs for Atlantic halibut, ocean pout, windowpane flounder, and Atlantic wolffish would remain as adopted by Amendment 16. The AMs for SNE/MA winter founder would remain the same unless the measure in section 3.2.1.2 is adopted in which chase sector vessels would have controls on their catches of this stock. These No Action AMs measures provide that SNE/MA winter flounder and Atlantic wolffish ACLs are divided into three trimester TACs and the AM is evaluated on the basis of the catch in a trimester. If catches exceed the ACL in a trimester, fishing activity by common pool vessels would be constrained.

For Atlantic wolffish and SNE/MA winter flounder, if the catch exceeds 90 percent of the trimester TAC, the area that accounts for 90 percent of the catch would be closed to common pool fishing by certain gears. The areas and gears are shown in Table 13.

Table 13 – Gears prohibited in specific areas when a TAC/ACL is caught.

SPECIES	STOCK	Area/Gear Prohibited When TAC/ACL is Caught	
		Statistical Areas	Gear
Winter Flounder	SNE/MA	521,526,537,539,612,613	Trawl
Atlantic Wolffish		513,514,521,522	Gillnet, trawl, longline

For ocean pout, windowpane flounders, and Atlantic halibut, at the point that 60 percent of the ACL is harvested possession limits are adjusted to prevent the ACL from being exceeded.

3.2.5.2 Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish (*Groundfish Committee Preferred Alternative for Ocean Pout and Windowpane Flounder Only*)

These AMs are designed to apply to groundfish fishing activity, by both common pool and sector vessels. Since the design of these AMs is based on constraining all fishing activity, sectors will not be able to request an exemption from the AM provisions.

Timing: There are two options on the timing of this AM.

Sub-Option A: An overage in year 1 would lead to implementation of the AM in year 2. In order to implement this AM by the start of the fishing year, NMFS may have to make assumptions on the catch of ACL sub-components because of a lack of data. When final results are available, changes to the AM may be announced if the final estimates differ from the original estimate.

Sub-Option B (*Groundfish Committee Preferred Alternative*) : Catches in year 1 would be evaluated in year 2. If there is an overage in year 1, the AM would be implemented in year 3.

Windowpane Flounder and Ocean Pout

The groundfish fishery AM for ocean pout would be implemented if the total ACL (as opposed to the groundfish sub-ACL) is projected to be exceeded. Should a sub-ACL be allocated to other fisheries and AMs developed for those fisheries, the AMs for either (or both) fisheries will be implemented only if the total ACL for the stock is exceeded. If only one fishery exceeds its sub-ACL the AM will be implemented only for that fishery.

The groundfish fishery AM for windowpane flounder will be implemented if the total ACL (as opposed to the groundfish sub-ACL) is exceeded. Should a sub-ACL be allocated to another fishery and AMs developed for that fishery, the AMs for both fisheries will be implemented only if the total ACL for the stock is exceeded.

If the AM is implemented trawl vessels would be required to use approved selective trawl gear that reduces the catch of demersal species. Approved gears include the separator trawl, Ruhle trawl, mini-Ruhle trawl, rope trawl, and other gear authorized by the Council in a management action or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6). There would be no restrictions on longline or gillnet gear.

Areas: The applicable areas where gear restrictions would apply are shown in Figure 2. The areas are designed to be stock specific – the areas on GB are implemented only if the ACL for northern windowpane flounder is exceeded; the areas in SNE are implemented only if the southern windowpane flounder ACL is exceeded. Both areas would be implemented if the ACL for ocean pout is exceeded. The size of the areas for the restrictions is based on the amount of the overage. In each case the smaller area is implemented for ACL overages that are between the management uncertainty buffer and to 20 percent; both the smaller and larger areas area implemented for overages of more than 20 percent.

Northern Windowpane Flounder AM area – Small

41-10N 67-40W
41-10N 67-20W
41-00N 67-20W
41-00N 67-00W
40-50N 67-00W
40-50N 67-40W

Northern Windowpane Flounder AM area – Large

42-10N 67-40W
42-10N 67-20W
41-00N 67-20W
41-00N 67-00W
40-50N 67-00W
40-50N 67-40W

Southern Windowpane Flounder Area – Small

41-10N 71-30W
41-10N 71-20W
40-50N 71-20W
50-50N 71-30W

Southern Windowpane Flounder Area - Large

41-10N 71-50W
41-10N 71-10W
41-00N 71-10W
41-00N 71-20W
40-50N 71-20W
40-50N 71-50W

And

NY coast at 73-30W
40-30N 73-30W
40-30N 73-50W
40-20N 73-50W
NJ coast at 73-50W
North along 73-50W to NY coast

Figure 2 - AM areas (small) for Northern and Southern Windowpane and Ocean Pout

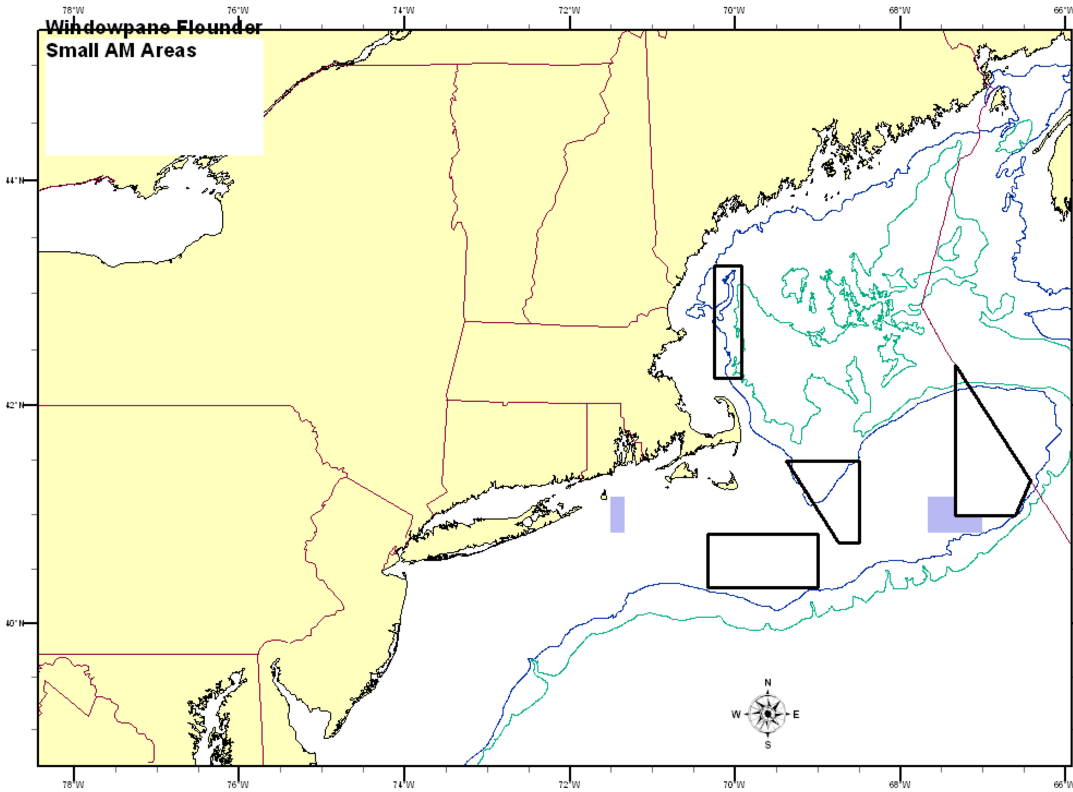
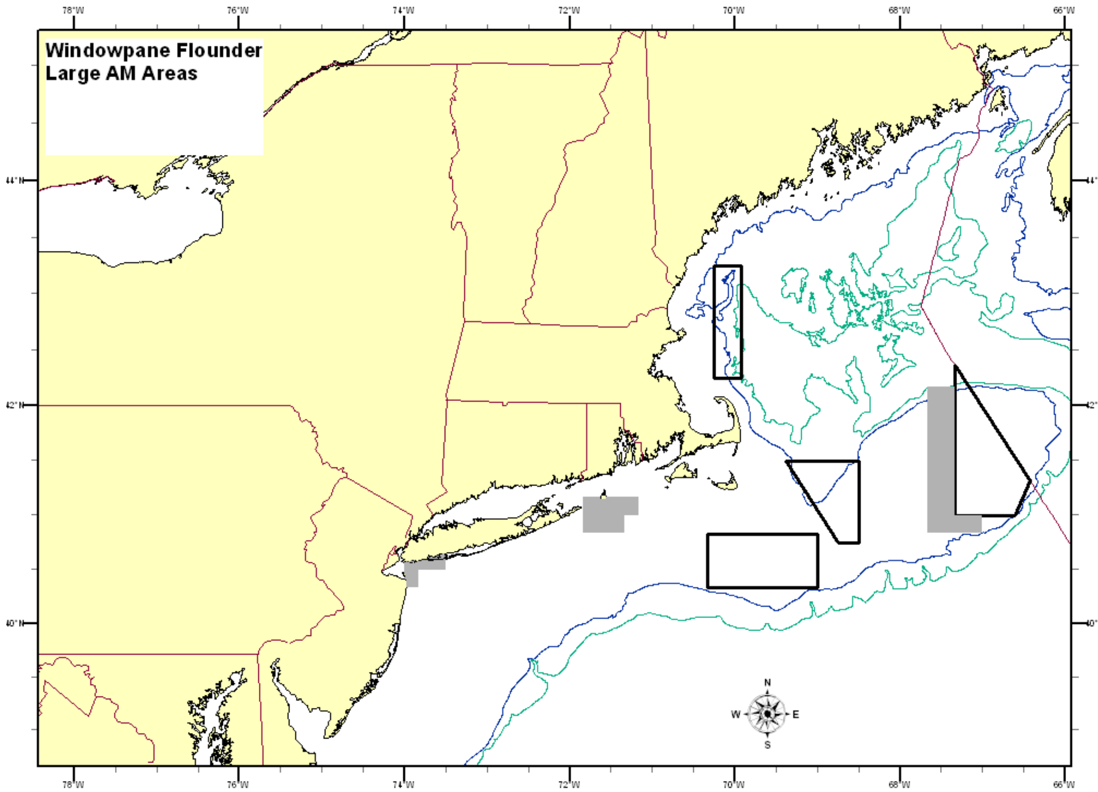


Figure 3 – AM area (large) for windowpane flounder and ocean pout



Atlantic halibut

The groundfish fishery AM for Atlantic halibut would be implemented if the total ACL (as opposed to the groundfish sub-ACL) is projected to be exceeded. Should a sub-ACL be allocated to other fisheries and AMs developed for those fisheries, the AMs for either (or both) fisheries will be implemented only if the total ACL for the stock is exceeded. If only one fishery exceeds its sub-ACL the AM will be implemented only for that fishery.

If the AM is implemented trawl vessels would be required to use approved selective trawl gear that reduces the catch of flounders and retention of Atlantic halibut would be prohibited. Approved gears include the separator trawl, Ruhle trawl, mini-Ruhle trawl, rope trawl, and other gear authorized by the Council in a management action or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6).

If the AM is implemented, sink gillnet and longline vessels would not be allowed to fish in the AM areas described below. Should selective gear be developed that reduces catches of these species then fishing would be allowed in these areas as long as the gear is used. Such gear must be approved through the process used to authorize selective trawl gear before it is authorized for use.

Areas: The areas are designed to account for an ACL overage of up to 20 percent. The areas would be implemented for ACL overages that are between the management uncertainty buffer and 20 percent.

The applicable areas where trawl gear restrictions would apply are shown in Figure 4.

The areas where sink gillnet and longline fishing would be prohibited (or if selective gear is developed, where use of the gear would be required) are also shown in Figure 4.

Trawl Gear Halibut AM Area

42-00N 69-20W
42-00N 68-20W
41-30N 68-20W
41-30N 69-20W

Fixed Gear Halibut AM areas

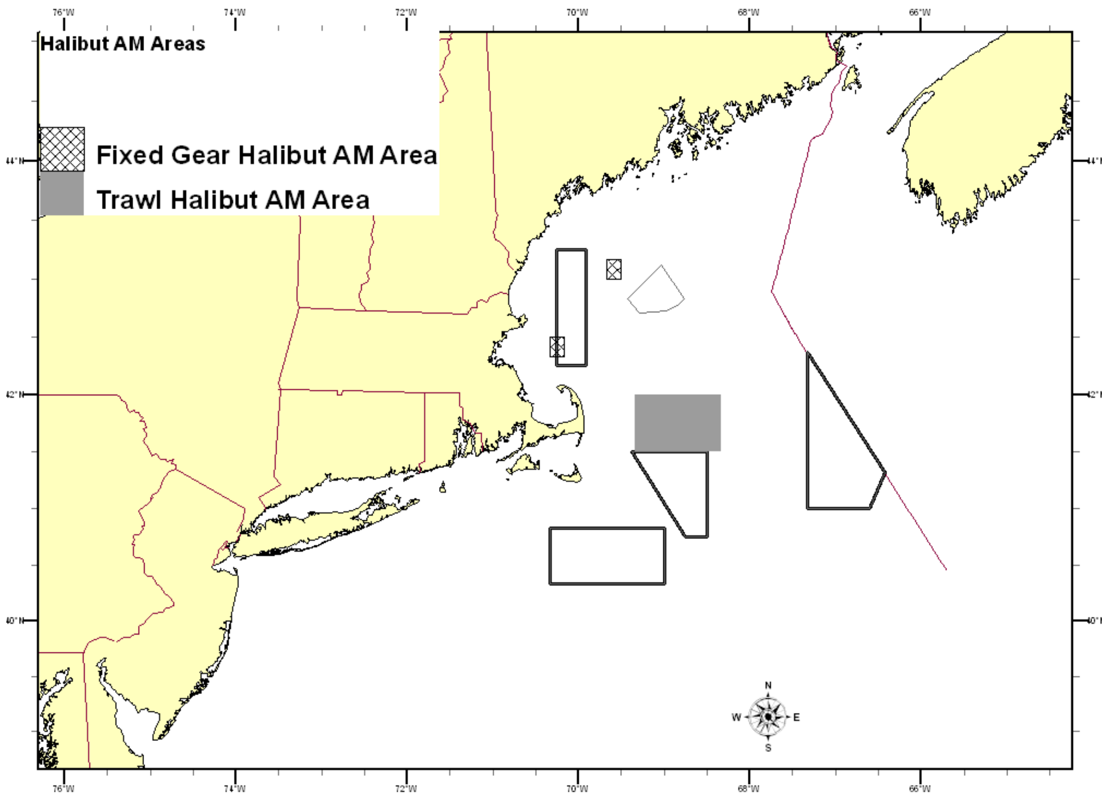
41-40N 69-40W
41-40N 69-30W
41-30N 69-30W
41-30N 69-40W

And

43-10N 69-40W
43-10N 69-30W
43-00N 69-30W

43-00N 69-40W

Figure 4 – Proposed AM areas for fixed gear and trawl vessels for halibut.



Atlantic Wolffish

The groundfish fishery AM for Atlantic wolffish would be implemented if the total ACL (as opposed to the groundfish sub-ACL) is projected to be exceeded. Should a sub-ACL be allocated to other fisheries and AMs developed for those fisheries, the AMs for either (or both) fisheries will be implemented only if the total ACL for the stock is exceeded. If only one fishery exceeds its sub-ACL the AM will be implemented only for that fishery.

If the AM is implemented trawl vessels would be required to use approved selective trawl gear that reduces the catch of demersal species. Approved gears include the separator trawl, Ruhle trawl, mini-Ruhle trawl, rope trawl, and other gear authorized by the Council in a management action or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6).

If the AM is implemented, sink gillnet and longline vessels would not be allowed to fish in the AM areas described below. Should selective gear be developed that reduces catches of these species then fishing would be allowed in these areas as long as the gear is used. Such gear must be approved through the process used to authorize selective trawl gear before it is authorized for use.

The AM measures would be in effect from May through December, and in April. The measures would not be in effect from January through March because the habits of wolffish make it less susceptible to fishing at that time.

Areas: The areas are designed to account for an AM overage of up to 20 percent. The areas would be implemented for ACL overages that are between the management uncertainty buffer and 20 percent.

The applicable areas where trawl gear restrictions would apply are shown in Figure 5.

The areas where sink gillnet and longline fishing would be prohibited (or if selective gear is developed, where use of the gear would be required) are shown in Figure 5.

Trawl Wolffish AM Area

42-30N 70-30W
42-30N 70-15W
42-15N 70-15W
42-15N 70-10W
42-10N 70-10W
42-10N 70-20W
42-20N 70-20W
42-20N 70-30W

Fixed Gear Wolffish AM Area

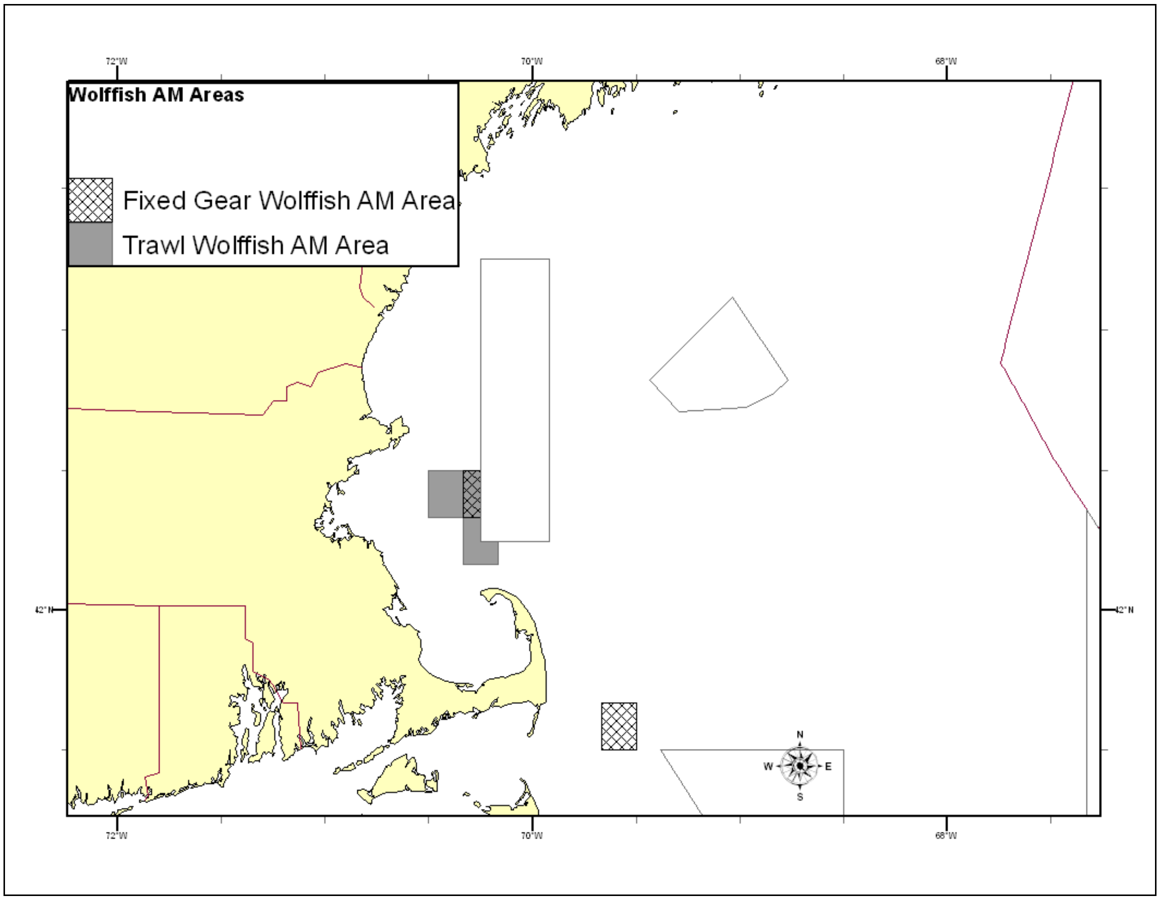
41-40N 69-40W
41-40N 69-30W

41-30N 69-30W
41-30N 69-40W

And

42-30N 70-20W
42-30N 70-15W
42-20N 70-15W
42-20N 70-20W

Figure 5 – Proposed AM areas for fixed gear and trawl gear for wolffish. Note the AM areas overlap on the western side of the WWGOM closed area.



3.2.5.3 Option 3: Atlantic Halibut No Possession AM (*Groundfish Committee Preferred Alternative*)

The GAP recommends this option.

If the Atlantic halibut AM is exceeded, the landing of Atlantic halibut both commercial fishing vessels would be prohibited. All halibut that are caught must be returned alive to the sea.

Timing: There are two options on the timing of this AM.

Sub-Option A: An overage in year 1 would lead to implementation of the AM in year 2. In order to implement this AM by the start of the fishing year, NMFS may have to make assumptions on the catch of ACL sub-components because of a lack of data. When final results are available, changes to the AM may be announced if the final estimates differ from the original estimate.

Sub-Option B (*Groundfish Committee Preferred Alternative*) : Catches in year 1 would be evaluated in year 2. If there is an overage in year 1, the AM would be implemented in year 3.

3.2.5.4 Option 4: Atlantic Wolffish – No Possession AM (*Groundfish Committee Preferred Alternative*)

Possession of Atlantic wolffish would be prohibited. This proactive AM would apply for both commercial and recreational vessels.

The GAP recommends this option.

4.0 Alternatives Considered and Rejected

4.1.1 Identification of Additional Sub-Annual Catch Limits

Amendment 16 identified how the ABC is distributed to various components of the fishery. The identified components include sub-ACLs as well as other identified sub-components. In general, sub-ACLs are specified when the catch by a component of the fishery is large enough that controls are needed to make certain that the overall ACL will not be exceeded. Accountability measures are identified for sub-ACLs, either in the Northeast Multispecies FMP or in another FMP. Other identified sub-components are used for smaller catches that are determined unlikely to need a specific control. AMs on other parts of the fishery must be sufficient to account for any overages of the other sub-components.

The Council considered several additional sub-ACLs:

- A sub-ACL of SNE/MAB windowpane flounder for the scallop fishery
- A sub-ACL of SNE/MAB windowpane flounder for other fishery components that catch the stock
- A sub-ACL of SNE/MA winter flounder for the scallop fishery

These sub-ACLs were not pursued because of difficulties encountered in estimating recent catches for these stocks. The Council may consider these sub-ACLs in a future action.

4.1.2 Mixed Stock Exception for SNE/MAB Windowpane Flounder

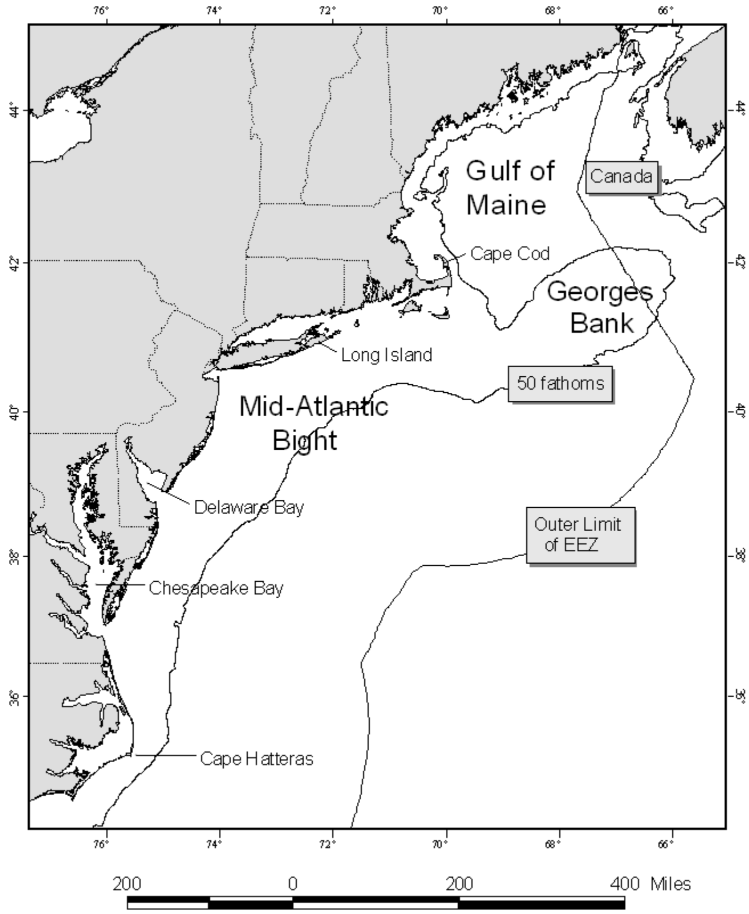
The Groundfish Committee discussed applying the Mixed Stock Exception for SNE/MAB windowpane flounder. This measure was not pursued because analyzing the options may have prevented timely completion of the framework.

5.0 Affected Human Environment

5.1 Physical Environment/Habitat/EFH

The Northeast U.S. Shelf Ecosystem (Figure 6) has been described as including the area from the Gulf of Maine south to Cape Hatteras, North Carolina, extending from the coast seaward to the edge of the continental shelf, including offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 meters (m). Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic region, and the continental slope. Since the groundfish fleet will primarily be fishing in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic areas, the description of the physical and biological environment is focused on these sub-regions. Information on the affected environment was extracted from Stevenson et al. (2004).

Figure 6 – Northeast U.S. shelf ecosystem

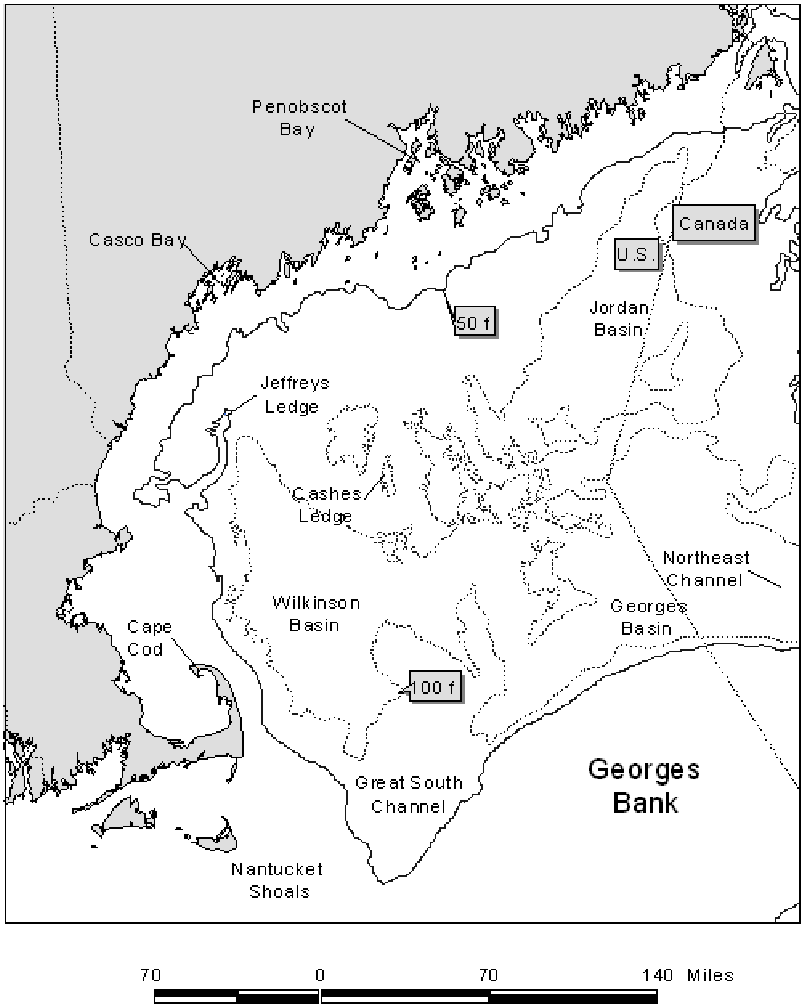


5.1.1 Affected Physical Environment

5.1.1.1 Gulf of Maine

The Gulf of Maine is an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 6). The Gulf of Maine is a boreal environment and is 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 250 m, with a maximum depth of 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 9 m below the surface.

Figure 7 – Gulf of Maine



The Gulf of Maine is an enclosed coastal sea that was glacially derived and is characterized by a system of deep basins, moraines, and rocky protrusions (Stevenson et al. 2004). The Gulf of Maine is topographically diverse from the rest of the continental border of the U.S. Atlantic coast (Stevenson et al. 2004). Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[1] sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a depth of about 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 20 to 40 m,

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

except off eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

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

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

Sandy offshore banks: fauna are characteristically sand dwellers with an abundant interstitial component;

Rocky offshore ledges: fauna are predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers;

Shallow (< 60 m) temperate bottoms with mixed substrate: fauna population is rich and diverse, primarily comprised of polychaetes and crustaceans;

Primarily fine muds at depths of 60 to 140 m within cold Gulf of Maine Intermediate Water[2]: fauna are dominated by polychaetes, shrimp, and cerianthid anemones;

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;

Deep basin, muddy bottom, overlaying water usually 7 to 8°C: fauna densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipods; and

Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always greater than 8°C: upper slope fauna extending into the Northeast Channel.

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

Deepwater/Slope and Canyon: offshore hake, blackbelly rosefish, Gulf stream flounder;

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

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

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.

5.1.1.2 Georges Bank

Georges Bank is a shallow (3 to 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Figure 6). It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank and has steep submarine canyons on its eastern and southeastern edges. It is characterized by 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. It is anticipated that erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents reduces the amount of sand and cause an overall coarsening of the bottom sediments (Valentine and Lough 1991).

Bottom topography on eastern Georges Bank is characterized by 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 is characterized by 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 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 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, which influence productivity and may influence fish abundance and distribution.

Georges Bank has been historically characterized by 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, and overall biomass was dominated by sand dollars and bivalves (Theroux and Wigley 1998). Using the same database, four macrobenthic invertebrate assemblages that occur on similar habitat type were identified (Theroux and Grosslein 1987):

The Western Basin assemblage is found in comparatively deepwater (150 to 200 m) with relatively slow currents and fine bottom sediments of silt, clay, and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers.

The Northeast Peak assemblage is found in variable depth 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.

The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths less than 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.

The Southern Georges Bank assemblage is found on the southern and southwestern flanks at depths from 80 to 200 m, where fine-grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids, and starfish.

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

5.1.1.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 6). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England and generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 to 200 m water depth) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson et al. 2004). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations during past ice ages. 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. On the slope, silty sand, silt, and clay predominate. Permanent sand ridges occur in groups with heights of about 10 m, lengths of 10 to 50 km and spacing of 2 km. The sand ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Sand waves are usually found in patches of 5 to 10 with heights of about 2 m, lengths of 50 to 100 m, and 1 to 2 km between patches. The sand waves are usually found on the inner shelf and are temporary features that form and re-form in different locations, 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 significant Mid-Atlantic Bight habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). In general, reefs are important for attachment sites, shelter, and food for many species. In addition, fish predators, such as tunas, may be attracted 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 are comprised of either exposed rock, wrecks, kelp, or other hard material, and these are generally dominated by boring mollusks, algae, sponges, anemones, hydroids, and coral. 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 are generally comprised 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.

The benthic inhabitants of this primarily sandy environment are dominated in terms of numbers by amphipod crustaceans and bivalve mollusks. Biomass is dominated by mollusks (70 percent) (Theroux and Wigley 1998). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

The “sand fauna” zone is dominated by polycheates and was defined for sandy sediments (1 percent or less silt) that are at least occasionally disturbed by waves, from shore out to a depth of about 50 m.

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.

Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley supporting the “silt-clay fauna.”

Rather than substrate as in the Gulf of Maine and Georges Bank, latitude and water depth are considered to be the primary factors influencing demersal fish species distribution in the Mid-Atlantic Bight area. The following assemblages were identified by Colvocoresses and Musick (1984) in the Mid-Atlantic subregion during spring and fall.[4]

Northern (boreal) portions: hake (white, silver, red), goosefish (monkfish), longhorn sculpin, winter flounder, little skate, and spiny dogfish;

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

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.

5.1.2 Habitat

Habitats provide living things with the basic life requirements of nourishment and shelter, ultimately providing for both individual and population growth. The fishery resources of a region are influenced by the quantity and quality of available habitat. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat which, in turn, determine the type and level of resource population that the habitat supports. Table 14 briefly summarizes the habitat requirements for each of the 12 groundfish species managed by the Northeast Multispecies (large-mesh) FMP, some of which consist of multiple stocks within the Northeast Multispecies FMP. Information for this table was extracted from the original FMP and profiles available from NMFS (Clark 1998). Essential fish habitat information for egg, juvenile and adult life stages for these species was compiled from Stevenson et al. 2004 (Table 14). Note that EFH for the egg stage was included for species that have a demersal egg stage (winter flounder and ocean pout); all other species' eggs are found either in the surface waters, throughout the water column, or are retained inside the parent until larvae hatch. The egg habitats of these species are therefore not generally subject to interaction with gear and are not listed in Table 14.

Table 14 - Summary of geographic distribution, food sources, essential fish habitat features, and commercial gear used to catch each species in the Northeast Multispecies Fishery Management Unit

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat		Commercial Fishing Gear Used
			Water Depth	Substrate	
Atlantic cod	Gulf of Maine, Georges Bank and southward	Omnivorous (invertebrates and fish)	(J): 25-75 m (82-245 ft) (A): 10-150 m (33-492 ft)	(J): Cobble or gravel bottom substrates (A): Rocks, pebbles, or gravel bottom substrate	Otter trawl, longlines, gillnets
Haddock	southwestern Gulf of Maine and shallow waters of Georges Bank	Benthic feeders (amphipods, polychaetes, echinoderms), bivalves, and some fish	(J): 35-100 m (115– 28 ft) (A): 40-150 m (131-492 ft)	(J): Pebble and gravel bottom substrates (A): Broken ground, pebbles, smooth hard sand, smooth areas between rocky patches	Otter trawl, longlines, gillnets
Acadian redfish	Gulf of Maine, deep portions of Georges Bank and Great South Channel	Crustaceans	(J): 25-400 m (82-1,312 ft) (A): 50-350 m (164–1,148 ft)	(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): 0-250 m (0-820 ft) (A): 15-365 m (49-1,198 ft)	(J): Bottom habitats with aquatic vegetation or substrate of sand, mud, or rocks (A): Hard bottom habitats including artificial reefs	Otter trawl, gillnets

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat		Commercial Fishing Gear Used
			Water Depth	Substrate	
Ocean Pout	Gulf of Maine, Cape Cod Bay, Georges Bank, southern New England, middle Atlantic south to Delaware Bay	Juveniles feed on amphipods and polychaetes. Adults feed mostly on echinoderms as well as on mollusks and crustaceans	(E): <50 m (<164 ft)	(E): Bottom habitats, generally hard bottom sheltered nests, holes, or crevices where juveniles are guarded.	Otter trawl
			(L): <50 m (<164 ft)	(L): Hard bottom nesting areas	
			(J): <80 m (262 ft)	(J): Bottom habitat, often smooth areas near rocks or algae	
			(A): <110 m (361 ft)	(A): Bottom habitats; dig depressions in soft sediments	
Atlantic Halibut	Gulf of Maine, Georges Bank	Juveniles feed on annelid worms and crustaceans, adults mostly feed on fish	(J): 20-60 m (66-197 ft)	(J): Bottom habitat with a substrate of sand, gravel, or clay	Otter trawl, longlines
			(A):100-700 m (328-2,297 ft)	(A): Same as for (J)	
White hake	Gulf of Maine, Georges Bank, southern New England	Juveniles feed mostly on polychaetes and crustaceans; adults feed mostly on crustaceans, squids, and fish	(J): 5-225 m (16-738 ft)	(J): Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	Otter trawl, gillnets
			(A): 5-325 m (16-1,066 ft)	(A): Bottom habitats with substrate of mud or fine grained sand	
Yellowtail flounder	Gulf of Maine, southern New England, Georges Bank	Amphipods and polychaetes	(J): 20-50 m (66-164 ft)	(J): Bottom habitats with substrate of sand or sand and mud	Otter trawl
			(A): 20-50 m (66-164 ft)	(A): Same as for (J)	

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
American plaice	Gulf of Maine, Georges Bank	Polychaetes, crustaceans, mollusks, echinoderms	(J): 45-150 m (148-492 ft)	(J): Bottom habitats with fine grained sediments or a substrate of sand or gravel	Otter trawl
			(A): 45–175 m (148-574 ft)	(A): Same as for (J)	
Witch flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Mostly polychaetes (worms), echinoderms	(J): 50-450 m (164-1,476 ft)	(J): Bottom habitats with fine grained substrate	Otter trawl
			(A): 25-300 m (82-984 ft)	(A): Same as for (J)	
Winter flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Polychaetes, crustaceans	(E): <5 m (16 ft)	(E): Bottom habitats with a substrate of sand, muddy sand, mud, and gravel	Otter trawl, gillnets
			(J): 0.1-10 m (0.3-32 ft) (1-50 m age 1+) (3.2-164 ft)	(J): Bottom habitats with a substrate of mud or fine grained sand	
			(A): 1-100 m (3.2-328 ft)	(A): Bottom habitats including estuaries with substrates of mud, sand, gravel	
Atlantic wolffish Proposed in Amendment 16	Gulf of Maine & Georges Bank	Mollusks, brittle stars, crabs, and sea urchins	(J): 40-240 m (131.2-787.4 ft)	J): Rocky bottom and coarse sediments	Otter trawl, longlines, and gillnets
			(A): 40-240 m (131.2-787.4 ft)	(A): Same as for (J)	
Windowpane flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Juveniles mostly crustaceans; adults feed on crustaceans and fish	(J): 1-100 m (3.2-328 ft)	(J): Bottom habitats with substrate of mud or fine grained sand	Otter trawl
			(A): 1-75 m (3.2-574 ft)	(A): Same as for (J)	

Note: Species life stages are summarized by letter in parentheses following species name. A = adult; E = egg; J = juvenile; m = meter.

5.1.3 Essential Fish Habitat (EFH)

EFH is defined by the Sustainable Fisheries Act of 1996 as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The environment that could potentially be affected by the Proposed Action has been identified as EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; Atlantic sea scallop; monkfish; deep-sea red crab; northeast skate complex; Atlantic herring; summer flounder, scup, and black sea bass; tilefish; squid, Atlantic mackerel, and butterfish; Atlantic surfclam and ocean quahog FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs are summarized in Table 14. Full descriptions and maps of EFH for each species and life stage (except Atlantic wolffish) are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.htm. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna.

5.1.4 Gear Types and Interaction with Habitat

The groundfish fleet fishes 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.

5.1.4.1 Gear Types

The characteristics of typical gear types used by the multispecies fishery are summarized in Table 15.

Table 15 - Descriptions of the fixed gear types used by the multispecies fishery

Gear Type	Trawl	Sink/ Anchor Gillnets	Bottom Longlines	Hook and Line
Total Length	Varies	90 m long per net.	~450 m.	Varies
Lines	N/A	Leadline and floatline with webbing (mesh) connecting	Mainline is parachute cord. Gangions (lines from mainline to hooks) are 15 inches long, 3 to 6 inches apart, and made of shrimp twine	One to several with mechanical line fishing
Nets	Rope or large-mesh size, depends upon target Species	Monofilament, mesh size depends on the target species (groundfish nets minimum mesh size of 6.5 inches	No nets, but 12/0 circle hooks are required.	No nets, but single to multiple hooks, “umbrella rigs”
Anchoring	N/A	22 lb (9–11 kg) Danforth-style anchors are required at each end of the net string	20-24lb (9-11kg) anchors, anchored at each end, using pieces of railroad track, sash weights, or Danforth anchors, depending on currents	No anchoring, but sinkers used (stones, lead)
Frequency/ Duration of Use	Tows last for several hours	Frequency of trending changes from daily (when targeting groundfish) to semi-weekly (when targeting monkfish and skate)	Usually set for a few hours at a time	Depends upon cast/target species

5.1.4.2 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. Bottom trawls are designed to be towed along the seafloor and to catch a variety of demersal fish and invertebrate species.

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

Three general types of bottom trawl are used in the Northeast Region, but bottom otter trawls account for nearly all commercial bottom trawling activity. There is a wide range of otter trawl types used in the Northeast as a result of the diversity of fisheries and bottom types encountered in the region (NREFHSC 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. Bottom trawls are towed at a variety of speeds, but average about 5.6 km/hour (3 knots). Use of this gear in the Northeast is managed under several federal FMPs. Bottom trawling is also subject to a variety of state regulations throughout the region.

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

Bottom otter trawls that are used on "hard" bottom (i.e., gravel or rocky bottom), or mud or sand bottom with occasional boulders, are rigged with rockhopper gear. The purpose of the "ground gear" in this case is to get the sweep over irregularities in the bottom without damaging the net. The purpose of the sweep in trawls rigged for fishing on smooth bottoms is 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 0.5 to 0.6 m above the bottom (Carr and Milliken 1998). Although the doors of the trawl still ride on the bottom, underwater video and observations in flume tanks have confirmed that the sweep in the raised-footrope trawl has much less contact with the seafloor than the traditional cookie sweep that it replaces (Carr and Milliken 1998).

5.1.4.3 Gillnet Gear

The fishery also uses individual sink/anchor gillnets which are about 90 m long and are usually fished as a series of 5 to 15 nets attached end-to-end. A vast majority of “strings” consist of 10 gillnets. Gillnets typically have three components: the leadline, webbing and floatline. In New England, leadlines are approximately 30 kilogram (kg)/net. Webs are monofilament, with the mesh size depending on the species of interest. Nets are anchored at each end using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. For New England groundfish, frequency of tending ranges from daily to semiweekly [Northeast Region Essential Fish Habitat Steering Committee (NREFHSC 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. Bottom gillnets are used to catch a wide range of species. Bottom gillnets are fished in two different ways, as "standup" and "tiedown" nets (Williamson 1998). Standup nets are typically used to catch Atlantic cod, haddock, pollock, and hake and are soaked (duration of time the gear is set) for 12 to 24-hours. Tiedown nets are used to catch flounders and monkfish and are left in the water for 3 to 4 days. Other species caught in bottom gillnets in are dogfish and skates.

5.1.4.4 Hook and Line Gear

5.1.4.4.1 Hand Lines/Rod and Reel

The simplest form of hook-and-line fishing is the hand line, which 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 and the sinkers vary from stones to cast lead. The hooks can vary from single to multiple arrangements in “umbrella” rigs. An attraction device must be used with the hook, usually consisting of a natural bait or an artificial lure. Hand lines can be carried by currents until retrieved or fished in such as manner as to hit bottom and bounce (Stevenson et al. 2004). Hand lines and rods and reels are used in the Northeast Region to catch a variety of demersal species.

5.1.4.4.2 Mechanized Line Fishing

Mechanized line-hauling systems have been developed to allow smaller fishing crews to work more lines, and to use electrical or hydraulic power to work the lines on the spools. The reels, also called “bandits”, are mounted on the vessel bulwarks with the mainline wound around a spool. The line is taken from the spool over a block at the end of a flexible arm and each line may have a number of branches and baited hooks.

Jigging machines are used to jerk a line with several unbaited hooks up in the water to snag a fish in its body and is commonly used to catch squid. Jigging machine lines are generally fished in waters up to 600 m (1970 ft) deep. Hooks and sinkers can contact the bottom, depending upon the way the gear is used and may catch a variety of demersal species.

5.1.4.5 Longlines

The remaining gear type that is used by the fishery are bottom longlines which are a long length of line, often several miles long, 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 450 m and are deployed with 9 to 11 kg anchors. The mainline is a parachute cord. Gangions are typically 40 centimeters (cm) long and 1 to 1.8 m apart and are made of shrimp twine. These longlines are usually set for a few hours at a time (NREFHSC 2002).

When fishing with hooks, all hooks must be 12/0 circle hooks. A “circle hook” is, defined as a hook with the point turned back towards the shank and 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. The design of circle hooks enables them to be employed to reduce the damage to habitat features that would occur with use of other hook shapes (NREFHSC 2002).

5.1.4.6 Gear Interaction with Habitat

Historically, commercial fishing in the region has been conducted using hook and line, longline, gillnets and trawls. For decades, trawls have been intensively used throughout the region and have accounted for the majority of commercial fishing activity in the multispecies fishery off New England.

Amendment 13 (NEFMC 2003) describes the general effects of bottom trawls on benthic marine habitats. The primary source document used for this analysis was an advisory report prepared for the International Council for the Exploration of the Seas (ICES) that identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats (ICES 2000). This report is based on scientific findings summarized in Lindeboom and de Groot (1998), which were peer-reviewed by an ICES working group. The focus of the report is the Irish Sea and North Sea, but it also includes assessments of effects in other areas. Two general conclusions were: 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). Regarding direct habitat effects, the report also concluded that:

Loss or dispersal of physical features such as peat banks or boulder reefs (changes are always permanent and lead to an overall change in habitat diversity, which 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 (changes may be permanent leading to an overall change in habitat diversity, which could in turn lead to the local loss of species and species assemblages dependent on such biogenic features);

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 (changes are not likely to be permanent); and

Alteration of the detailed physical features of the seafloor by reshaping seabed features such as sand ripples and damaging burrows and associated structures that provide important habitats for smaller animals and can be used by fish to reduce their energy requirements (changes are not likely to be permanent).

A more recent evaluation of the habitat effects of trawling and dredging was prepared by the Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002). Trawl gear evaluated included bottom otter trawls and beam 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.

An additional source of information for various gear types that relates specifically to the Northeast region is the report of a "Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern U.S." sponsored by the NEFMC and Mid-Atlantic Fishery Management Council (MAFMC) in October 2001 (NEFSC 2002). A panel of invited 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: 1) evaluating the existing scientific research on the effects of fishing gear on benthic habitats; 2) determining the degree of impact from various gear types on benthic habitats in the Northeast; 3) specifying the type of evidence that is available to support the conclusions made about the degree of impact; 4) ranking the relative importance of gear impacts on various habitat types; and 5) 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 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.

Additional information is provided in this report 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 to rank these three substrates in terms of their vulnerability to the effects of bottom trawling, although other factors such as frequency of disturbance from fishing and from natural events are also important. In general, impacts from trawling were determined to be greater in gravel/rock habitats with attached epifauna. Impacts on biological structure were ranked higher than impacts on physical structure. Effects of trawls on major physical features in mud (deep water clay-bottom habitats) and gravel bottom were described as permanent, and 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 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 longlines on sand would not be expected.

The contents of a second expert panel report, produced by the Pew Charitable Trusts and entitled "Shifting Gears: Addressing the Collateral Impacts of Fishing Methods in U.S. Waters" (Morgan and Chuenpagdee 2003), was also summarized in Amendment 13. This group evaluated the habitat effects of 10 different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls have relatively high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. As in the

International Council for Exploration of the Sea (ICES) and National Research Council (NRC) reports, individual types of trawls and dredges were not evaluated. The impacts of bottom gillnets, traps, and longlines were limited to warm or shallow water environments with rooted aquatic vegetation or “live bottom” environments (e.g., coral reefs).

5.1.5 Assemblages of Fish Species

Georges Bank and the Gulf of Maine have been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel (1992) identified six assemblages, which are compared with the results of Overholtz and Tyler (1985) in Table 16 (adapted from Amendment 16). For the Affected Area, including southern New England, these assemblages and relationships are considered to be relatively consistent for purposes of general description. The assemblages include allocated target, non-allocated target, and bycatch species. As presented in Table 16, the terminology and definitions of habitat types varies slightly between the two studies. For further information on fish habitat relationships, see Table 14.

Table 16 – Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine

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

5.2 Target Species

This section describes the species life history and stock population status for each of the 20 fish stocks that are managed under the Northeast Multispecies FMP that would be harvested by the groundfish fishery under provisions of the FMP. The description of species habitat associations described in Section 5.1.2 provides context for considering the interactions between gear and species. A comparison of depth-related demersal fish assemblages of Georges Bank and the Gulf of Maine is also provided for additional context. The discussion of allocated target species is concluded with an analysis of the interaction between the gear types the fishery will use (as described in Section 5.1.4) and allocated species. Most of the following discussions have been adapted largely from the GARM III report (NEFSC 2008) and can be accessed via the NEFMC website at http://www.nefmc.org.

5.2.1 Description of the Managed Species

The management unit is described in Amendment 16 to the FMP. Life history and habitat characteristics of the stocks managed in this FMP can be found in the Essential Fish Habitat Source documents (series) published as NOAA Technical Memorandums and available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Recent revisions to the National Standard guidelines (50 CFR 600.310, published in 74 *FR* 3178) expanded on the classification of stocks in an FMP. For the Northeast Multispecies FMP, the stocks identified as the management unit are considered "stocks in the fishery" as defined by the NSGs. There are no stocks currently identified as "ecosystem component species," though this classification may be used in the future.

The managed stocks/stocks in the fishery are:

- GOM cod
- GB cod
- GOM haddock
- GB haddock
- CC/GOM yellowtail flounder
- GB yellowtail flounder
- SNE/MA yellowtail flounder
- GOM winter flounder
- GB winter flounder
- SNE/MA winter flounder
- GOM/GB (Northern) windowpane flounder
- SNE/MA (Southern) windowpane flounder
- Atlantic halibut
- Atlantic wolffish
- Plaice
- Ocean pout
- Pollock
- Redfish
- White hake
- Witch flounder

A full description of the life history of these stocks can be found in Framework 44 (NEFMC 2010); no information in that section has been updated.

5.2.1.1 Atlantic Sea Scallops

The Atlantic sea scallop (*Placopecten magellanicus*) is a bivalve mollusk that is distributed along the continental shelf, typically on sand and gravel bottoms from the Gulf of St. Lawrence to North Carolina (Hart and Chute, 2004). The species generally inhabit waters less than 20$_o$ C and depths that range from 30-110 m on Georges Bank, 20-

80 m in the Mid-Atlantic, and less than 40 m in the near-shore waters of the Gulf of Maine. Although all sea scallops in the US EEZ are managed as a single stock per Amendment 10, four regional components and six resource areas are recognized. Major aggregations occur in the Mid-Atlantic from Virginia to Long Island (Mid-Atlantic component), Georges Bank, the Great South Channel (South Channel component), and the Gulf of Maine (Hart and Rago, 2006; NEFSC, 2007). These four regional components are further divided into six resource areas: Delmarva (Mid-Atlantic), New York Bight (Mid-Atlantic), South Channel, southeast part of Georges Bank, northeast peak and northern part of Georges Bank, and the Gulf of Maine (NEFMC, 2007). Assessments focus on two main parts of the stock and fishery that contain the largest concentrations of sea scallops: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock (NEFMC, 2007). In 2009, sea scallops were not overfished and overfishing was not occurring.

Biomass

The scallop abundance and biomass on Georges Bank increased from 1995-2000 after implementing closures and effort reduction measures. Biomass and abundance then declined from 2006-2008 because of poor recruitment and the reopening of portions of groundfish closed areas. Biomass has increased on Georges Bank in both 2009 and 2010, mainly due to increased growth rates and strong recruitment in the Great South Channel, along with continuing concentrations on the Northern Edge and in the central portion of Closed Area I, especially just south of the “sliver” access area. The highest concentrations of biomass on Georges Bank are currently on the Northern Edge, within Closed Area I, and within the Nantucket Lightship closed area . In general, the 2010 Mid-Atlantic biomass is down from 2009, mainly from the depletion of Elephant Trunk. Figure 2 shows the biomass in the Mid-Atlantic based on the 2010 NMFS scallop survey, with largest densities in the Hudson Canyon and Delmarva closed areas, and notably high biomass in a few areas south of Long Island.

5.3 Protected Resources

There are numerous species that inhabit the environment within the Northeast Multispecies FMP management unit, and that therefore potentially occur in the operations area of the groundfish fishery, that are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. Fifteen species are classified as endangered or threatened under the ESA, while the remainder are protected by the provisions of the MMPA.

5.3.1 Species Present in the Area

Table 17 lists the species, protected either by the ESA, the MMPA, or both, may be found in the environment that would be utilized by the groundfish fishery.

Table 17 – Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery

Species	Status
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Northern bottlenose whale (*Hyperoodon ampullatus*)	Protected
Beaked whale (*Ziphius and Mesoplodon spp*.)	Protected
Pygmy or dwarf sperm whale (*Kogia spp.)*	Protected
Pilot whale (*Globicephala spp*.)	Protected
False killer whale (*Pseudorca crassidens*)	Protected
Melonheaded whale (*Peponocephala electra*)	Protected
Rough-toothed dolphin (*Steno bredanensis*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella spp*.)	Protected
Bottlenose dolphin – Offshore stock (*Tursiops truncatus*)[a]	Protected
White-beaked dolphin (*Lagenorhynchus albirostris*)	Protected
Harbor Porpoise (*Phocoena phocoena*)	Protected

Table 17 **(continued)**
Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery.

Species	Status
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered[b]
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Pagophilus groenlandicus*)	Protected
Hooded seal (*Cystophora cristata*)	Protected

Note:

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

[b] 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 occurring in U.S. waters.

Two additional species of pinnipeds: Ringed seal (*Phoca hispida*) and the Bearded seal (*Erignathus barbatus*) are listed as candidate species under the ESA. The Northeastern U.S. is at the southern tip of the habitat range for both of these species. These species are rarely sighted off the northeastern U.S., although a few stranding records have been recorded in the Northeast Region, but sightings are rare in the Northeast Atlantic.

5.3.2 Species Potentially Affected

It is expected that the sea turtle, cetacean, and pinniped species discussed below have the potential to be affected by the operation of the multispecies fishery. Background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and longline types) can be found in a number of published documents. These include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998, 2000; NMFS and USFWS 2007a, 2007b; Leatherback TEWG 2007), recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 2006; 2007; 2009), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

Additional ESA background information on the range-wide status of these species and a description of critical habitat can be found in a number of published documents including recent sea turtle (NMFS and USFWS 1995, TEWG 2000, NMFS SEFSC 2001, NMFS and USFWS 2007a), loggerhead recovery team report (NMFS and USFWS 2008), status reviews and stock assessments, Recovery Plans for the humpback whale (NMFS 1991), right whale (NMFS 1991a, NMFS 2005), right whale EIS (August 2007), fin and sei whale (NMFS 1998b), and the marine mammal stock assessment report (Waring et al. 2008) and other publications (*e.g.*, Perry *et al.* 1999; Clapham *et al.* 1999; IWC 2001 *a*). A recovery plan for fin and sei whales is also available and may be found at the following web site http://www.NOAAFisheries.noaa.gov/prot_res/PR3/recovery.html (NOAA Fisheries unpublished).

5.3.2.1 Sea Turtles

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

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

5.3.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2009) reviewed the current population trend for each of these cetacean species within U.S. EEZ waters, as well as providing information on the estimated annual human-caused mortality and serious injury, and a description of the commercial fisheries that interact with each stock in the U.S. Atlantic. Information from the SAR is summarized below.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf and Maine and Georges Bank, to low latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2009). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002, Patrician et al. 2009). Blue whales are most often sighted on the east coast of Canada, particularly in the Gulf of St. Lawrence, and occurs only infrequently within the U.S. EEZ (Waring et al. 2002).

In comparison to the baleen whales, sperm whale distribution occurs more on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2006). However, sperm whales distribution in U.S. EEZ waters also occurs in a distinct seasonal cycle (Waring et al. 2006). Typically, sperm whale distribution is concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the Mid-Atlantic Bight (Waring et al. 2006). Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 1999).

For North Atlantic right whales, the available information suggests that the population is increasing at a rate of 1.8 percent per year during 1990-2003, and the total number of North Atlantic right whales is estimated to be at least 323 animals in 2003 (Waring et al. 2009). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 3.8 per year during 2002 to 2006 (Waring et al. 2009). Of these, 1.4 per year resulted from fishery interactions. Recent mortalities included six female right whales, including three that were pregnant at the time of death (Waring et al. 2009).

The North Atlantic population of humpback whales is estimated to be 11,570, although the estimate is considered to be negatively biased (Waring et al. 2009). The best estimate for the Gulf of Maine stock of humpback whales is 847 whales (Waring et al. 2009). The population trend was considered positive for the Gulf of Maine population, but there are insufficient data to estimate the trend for the larger North Atlantic population. Based on data available for selected areas and time periods, the minimum population estimates for other western north Atlantic whale stocks are 2,269 fin whales, 207 sei whales, 4,804 sperm whales, and 3,312 minke whales (Waring et al. 2009). No recent estimates are available for blue whale abundance. Insufficient data exist to determine trends for any other large whale species.

The ALWTRP was recently revised with publication of a new final rule (72 FR 57104, October 5, 2007) that is intended to continue to address entanglement of large whales (right, humpback, fin, and minke) in commercial fishing gear and to reduce the risk of death and serious injury from entanglements that do occur.

It should also be noted that NMFS expects to propose changes to critical habitat designations of the North Atlantic right whale in 2011. At the time of writing, an announcement by the agency acknowledged that it is proceeding with the petition by working on a rule to propose revisions to the critical habitat designation for this species. "Critical habitat" is an area that contains physical or biological features that may require special management and that are essential to the conservation of the species. Three critical habitat areas currently exist, established in 1994, two of which are within the jurisdiction of the NEFMC; the feeding grounds in Cape Cod Bay and the Great South Channel.

5.3.2.3 Small Cetaceans

Numerous small cetacean species (dolphins; pygmy and dwarf sperm whales; pilot and beaked, whales; and the harbor porpoise) occur within [the area from Cape Hatteras through the Gulf of Maine]. Seasonal abundance and distribution of each species in [Mid-Atlantic, Georges Bank, and/or Gulf of Maine] waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso's dolphin), and still others occupy all three habitats (e.g., common dolphin, spotted dolphins, striped dolphins). Information on the western North Atlantic stocks of each species is summarized in Waring et al. (2009).

5.3.2.4 Pinnipeds

Of the four species of seals expected to occur in the area, harbor seals have the most extensive distribution with sightings occurring as far south as 30° N (Katona et al. 1993, Waring et al. 2009). Gray seals are the second most common seal species in U.S. EEZ waters, occurring primarily in New England (Katona et al. 1993; Waring et al. 2009). Pupping for both species occurs in both U.S. and Canadian waters of the western north Atlantic with the majority of harbor seal pupping likely occurring in U.S. waters and the majority of gray seal pupping in Canadian waters, although there are at least three gray seal pupping colonies in U.S. waters as well. Harp and hooded seals are less commonly observed in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late winter/early spring, and then travel to more northern latitudes for molting and summer feeding (Waring et al. 2006). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch (Waring et al. 2009).

5.3.2.1 Atlantic Sturgeon DPSs

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). As noted in section **Error! Reference source not found.**, information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT, 2007). Based on data through 1998, an estimate of 870 spawning adults per year was developed for the Hudson River (Kahnle et al., 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson, 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT, 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include subadults and early life stages)

5.3.3 Species Not Likely to be Affected

The Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services on June 19, 2009 (74 FR 29344) included an expanded range for the GOM DPS of Atlantic salmon.

Presently, the GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery (GLNFH) and Craig Brook National Fish Hatchery (CBNFH). Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the GOM DPS of Atlantic salmon (74 FR 29300; June 19, 2009). The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine.

At the time of this writing, a set of four public hearings on the proposed listing of Atlantic sturgeon under the endangered species act have been scheduled along the eastern seaboard. NMFS has proposed that five populations along the east coast receive protection, after the 2007 formal status review. Two of the proposed five populations (Gulf of Maine and New York Bight) are in the areas managed by the NEFMC in which the groundfish fishery operates.

The action being considered in the EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Shortnose sturgeon and salmon belonging to the Gulf of Maine DPS of Atlantic salmon occur within the general geographical areas fished by the multispecies fishery, but they are unlikely to occur in the area where the fishery operates given their numbers and distribution. Therefore, none of these species are likely to be affected by the groundfish fishery. The following discussion provides the rationale for these determinations. Although there are additional species that may occur in the operations area that are not known to interact with the specific gear types that would be used by the groundfish fleet, impacts to these species are still considered due to their range and similarity of behaviors to species that have been adversely affected.

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

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S. - Canada border are listed as endangered under the ESA. These populations include those in the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove Brook. Juvenile salmon in New England rivers typically migrate to sea in May after a 2- to 3-year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn. Results from a 2001 post-smolt trawl survey in Penobscot Bay and the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid- to late May. Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the approval of this EA would affect the Gulf of Maine DPS of Atlantic salmon given that operation of the groundfish fishery would not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found and groundfishing gear used by the fleet operates in the ocean at or near the bottom rather than near the water surface. Thus, this species is not considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare. Since operation of the multispecies fishery would not occur in waters that are typically used by hawksbill sea turtles, it is highly unlikely that its operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2009). In the North Atlantic, blue whales are most frequently sighted in the St. Lawrence from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the mid- and north Atlantic areas of the outer continental shelf (CeTAP 1982). Calving for the species occurs in low latitude waters outside of the area where the groundfish fishery operates. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. Given that the species is unlikely to occur in areas where the groundfish fishery operates, and given that the operation of the fishery would not affect the availability of blue whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the EEZ. However, the distribution of the sperm whales in the EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2006). In contrast, the multispecies fishery would operate in continental shelf waters. The average depth of sperm whale sightings observed during the CeTAP surveys was 1792 m (CeTAP 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 1000 m and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). Given that sperm whales are unlikely to occur in areas (based on water depth) where the groundfish fishery would operate, and given that the operation of the fishery would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect sperm whales.

Although large whales and marine turtles may be potentially affected through interactions with fishing gear, it is likely that the continued authorization of the multispecies fishery should not have any adverse effects on the availability of prey for these species. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The multispecies fishery would not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that would pass through multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish (e.g., sand lance, herring, mackerel) (Aguilar 2002, Clapham 2002). Multispecies fishing gear operates on or very near the bottom. Fish species caught in multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders versus schooling fish such as herring and mackerel that occur within the water column. Therefore, the continued authorization of the multispecies fishery should likely not affect the availability of prey for foraging humpback or fin whales. Moreover, none of the turtle species are known to feed upon groundfish.

5.3.4 Interactions between Gear and Protected Resources

Commercial fisheries are categorized by NMFS based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each stock. The system is based on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level (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). Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries while Tier 2 considers marine mammal mortality caused by the individual fisheries; Tier 2 classifications are used in this EA to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals. Table 18 identifies the classifications used in the List of Fisheries (LOF) for FY 2011 (50 CFR 229), which are broken down into Tier 2 Categories I, II, and III).

Table 18 – Descriptions of the Tier 2 Fishery Classification Categories

Category	Category Description
Tier 2, Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's potential biological removal (PBR) level.
Tier 2, Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Tier 2, Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serous injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

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

Although interactions between deployed gear and protected species would vary, interactions generally include becoming caught on hooks (longlines), entanglement in mesh (gillnets and trawls), entanglement in the float line (gillnets and trawls), entanglement in the groundline (gillnets, trawls, and longlines), entanglement in anchor lines (gillnets and longlines), or entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, trawls, and longlines). Entanglements are assumed to occur with increased frequency in areas where more gear is set and in areas with higher concentrations of protected species.

Table 19 lists the marine mammals known to have had interactions with sink gillnets, bottom trawls, and bottom longlines within the Gulf of Maine and Georges Bank, as excerpted from the proposed LOF for FY 2011 (also see Waring et al. 2009). Northeast sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. Impacts to protected resources through interaction with bottom longline gear are not known within the operations area; however, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

Table 19 – Marine mammals impacts based on groundfishing gear and Northeast Multispecies fishing areas (based on 2011 List of Fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	Type		
Tier 2, Category I	Mid-Atlantic gillnet	5,495	Bottlenose dolphin, Northern Migratory costal Bottlenose dolphin, Southern Migratory costal Bottlenose dolphin, Northern NC estuarine system Bottlenose dolphin, Southern NC estuarine system Bottlenose dolphin, WNA, offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Short-finned pilot whale, WNA White-sided dolphin, WNA
Tier 2, Category I	Northeast sink gillnet	7,712	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, Gulf of Maine Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	**Type**		
Tier 2, Category II	Mid-Atlantic bottom trawl	1,182	Bottlenose dolphin, WNA offshore Common dolphin, WNA Long-finned pilot whale, WNA Risso's dolphin, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast bottom trawl	1,635	Common dolphin, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Atlantic mixed species trap/pot	1,912	Fin whale, WNA Humpback whale, Gulf of Maine
Tier 2, Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	1,183	None documented in the most recent 5 years of data

To minimize potential impacts to certain cetaceans, multispecies fishing vessels would be required to adhere to measures in the ALWTRP, which was developed to reduce the incidental take of large whales, specifically the right, humpback, fin, and minke whales in specific Category I or II commercial fishing efforts that utilize traps/pots and gillnets. The ALWTRP calls for the use of gear markings, area restrictions, and use of weak links, and neutrally buoyant groundline. Fishing vessels would be required to implement the ALWTRP in all areas where gillnets were used. In addition, the HPTRP would be implemented in the Gulf of Maine to reduce interactions between the harbor porpoise and gillnets; the HPTRP implements gear specifications, seasonal area closures, and in some cases, the use of pingers (acoustic devices that emit a loud sound) to deter harbor porpoises, and other marine mammals, from approaching the nets.

Although sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets and hook and line fishing, mortalities from these gear types account for only about 50 percent of the mortalities associated with trawling gear (NMFS 2009c). A study conducted in the mid-Atlantic region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). Sea turtles generally occur in more temperate waters than those in the Northeast multispecies area. Gillnets are considered more detrimental to marine mammals such as pilot whales, dolphins, porpoises, and seals, as well as large marine whales; however, protection for marine mammals would be provided through various Take Reduction Plans outlined above.

5.4 Human Communities and the Fishery

5.4.1.1 FY 2010 Groundfish Catch Accounting

Amendment 16 adopted ACLs for the multispecies fishery. FY 2010 was the first year using this system. Table 20 through Table 22 summarize the catches by the various components of the ACLs. This tables are based on landings and discard information available to NMFS in September, 2011 and may be updated as more data become available. This information was used to inform decisions on the composition of the ACLs in section 3.1.7.2.

ACLs were exceeded for GOM/GB (Northern) and SNE/MAB (Southern) windowpane flounder. While the overage for northern windowpane flounder was small, the catches for southern windowpane flounder was more than twice the ACL and exceeded the ABC for that stock and exceeded the OFL. The overage was primarily due to catches of this stock by the scallop fishery and other subcomponents.

Table 20 - FY 2010 End of Year Accounting of NE Multispecies Catch (mt) (see notes on following page)

Stock	Total Groundfish Catch	NE Multispecies Catch by Fishery Component							
		Groundfish Fishery	Sector	Common Pool	Recreational[1]	Herring Fishery	Scallop Fishery	State Water[2,3]	Other[3]
	A to G	A+B+C	A	B	C	D	E	F	G
GB cod	3,023.2	2,829.7	2,745.8	84.0				27.7	165.7
GOM cod	5,738.7	5,497.1	3,617.1	226.0	1,654.0			190.3	51.3
GB Haddock	8,531.2	8,340.2	8,248.0	92.2		69.2		1.6	120.3
GOM Haddock	784.3	774.0	370.5	7.1	396.3	0.5		8.5	1.3
GB Yellowtail Flounder	781.6	757.6	739.0	18.6			17.6	0.0	6.4
SNE Yellowtail Flounder	318.8	171.9	152.5	19.4			113.0	6.7	27.2
CC/GOM Yellowtail Flounder	643.6	596.7	559.8	36.9				33.2	13.8
Plaice	1,583.8	1,536.4	1,503.7	32.8				25.1	22.3
Witch Flounder	827.6	725.3	695.4	30.0				23.5	78.8
GB Winter Flounder	1,438.3	1,391.2	1,382.4	8.8				0.0	47.1
GOM Winter Flounder	176.1	106.1	80.7	25.4				64.2	5.8
SNE Winter Flounder	363.2	47.4	42.3	5.1				181.0	134.8
Redfish	2,167.0	2,151.2	2,143.3	7.9				10.5	5.3
White Hake	2,344.3	2,259.8	2,215.6	44.2				25.3	59.2
Pollock	7,537.8	5,601.1	5,449.8	151.2				1,059.8	877.0
Northern Windowpane	162.1	153.5	151.7	1.8				0.0	8.5
Southern Windowpane	534.0	73.6	52.7	20.9				31.0	429.3
Ocean Pout	90.3	65.2	56.5	8.7				0.0	25.0
Halibut	36.0	27.8	25.6	2.2				6.6	1.6
Wolffish	22.5	22.4	18.9	3.5				0.0	0.1

[1]Discard estimate not available

[2]Recreational discard estimate only; commercial discard estimate not available

[3]See Table 1A for additional detail

Values in live weight
Includes estimate of missing dealer reports
Source: NMFS Northeast Regional Office
Run Date: September 15, 2011

Any value for a non-allocated species may be due to landings of that stock; misreporting of species and/or stock area; and/or estimated landings (in lieu of missing reports) based on vessel histories. These include SNE winter flounder, northern windowpane, southern windowpane, ocean pout, halibut, and wolffish.

These data are the best available to NOAA's National Marine Fisheries Service (NMFS). Data sources for this report include: (1) Vessels via VMS; (2) Vessels via vessel logbook reports; (3) Dealers via Dealer Electronic reporting. Differences with previous reports are due to corrections made to the database.

Table 21 - FY 2010 End of Year Accounting Detail of NE Multispecies Catch (mt)

Stock	Total Groundfish Catch	NE Multispecies Catch by Fishery Component								
		Groundfish Fishery	Sector	Common Pool	Recreational[1]	Herring Fishery	Scallop Fishery	State Water Commercial[1]	State Water Recreational	Other
	A to G	A+B+C	A	B	C	D	E	F		G
GB cod	3,023.2	2,980.7	2,745.8	84.0	151.0		8.1	27.7		6.7
GOM cod	5,738.7	5,497.1	3,617.1	226.0	1,654.0		0.0	190.3		51.3
GB Haddock	8,531.2	8,340.2	8,248.0	92.2		69.2	2.6	1.6		117.7
GOM Haddock	784.3	774.0	370.5	7.1	396.3	0.5	0.0	8.5		1.3
GB Yellowtail Flounder	781.6	757.6	739.0	18.6			17.6	0.0		6.4
SNE Yellowtail Flounder	318.8	171.9	152.5	19.4			113.0	6.7		27.2
CC/GOM Yellowtail Flounder	643.6	596.7	559.8	36.9			7.4	33.2		6.4
Plaice	1,583.8	1,536.4	1,503.7	32.8			1.1	25.1		21.2
Witch Flounder	827.6	725.3	695.4	30.0			15.7	23.5		63.1
GB Winter Flounder	1,438.3	1,391.2	1,382.4	8.8			29.2	0.0		17.9
GOM Winter Flounder	176.1	106.1	80.7	25.4			1.7	20.1	44.1	4.0
SNE Winter Flounder	363.2	47.4	42.3	5.1			72.6	48.4	132.6	62.2
Redfish	2,167.0	2,151.2	2,143.3	7.9			0.0	10.5		5.3
White Hake	2,344.3	2,259.8	2,215.6	44.2			7.7	25.3		51.5
Pollock	7,537.8	6,463.4	5,449.8	151.2	862.3		0.0	455.5	604.3	14.6
Northern Windowpane	162.1	153.5	151.7	1.8			8.2	0.0		0.4
Southern Windowpane	534.0	73.6	52.7	20.9			258.5[5]	31.0		170.8
Ocean Pout	90.3	65.2	56.5	8.7			10.0	0.0		15.0
Halibut	36.0	27.8	25.6	2.2			0.1	6.6		1.5
Wolffish	22.5	22.4	18.9	3.5			0.0	0.0		0.1

[5] This number needs updating; based on information received from NMFS November 2, 2011 the correct value is ~180 mt.

Table 22 - FY 2010 End of Year Accounting of NE Multispecies Catch - Percent of Annual Catch Limit (ACL) Caught (%)

Stock	ACLs and sub-ACLs: With accountability measures (AMs)							sub-components: No AMs	
	% of Total ACL	% of Groundfish sub-ACL	% of Sector sub-ACL	% of Common Pool sub-ACL	% of Recreational sub-ACL	% of Herring Fishery sub-ACL	% of Scallop Fishery sub-ACL	% of State Water	% of Other
	A to G	A+B+C	A	B	C	D	E	F	G
GB cod	83.5	82.5	83.2	65.6				73.0	109.0
GOM cod	71.0	75.9	83.6	94.2	61.9			33.6	18.1
GB Haddock	19.9	20.6	20.5	36.3		82.3		0.3	6.7
GOM Haddock	65.5	67.4	46.4	27.4	122.3	25.5		94.6	3.6
GB Yellowtail Flounder	76.6	92.1	92.0	93.1			12.1	NA	12.3
SNE Yellowtail Flounder	67.8	55.4	64.9	25.9			83.7	134.4	135.9
CC/GOM Yellowtail Flounder	78.3	76.6	76.8	73.8				368.6	39.4
Plaice	52.7	53.9	54.7	32.8				78.3	17.7
Witch Flounder	92.1	85.1	84.1	119.9				261.2	207.3
GB Winter Flounder	73.6	75.1	75.8	30.3				NA	45.7
GOM Winter Flounder	76.2	67.2	60.7	101.6				107.1	48.0
SNE Winter Flounder	60.0	9.1	NA	NA				341.4	421.3
Redfish	30.0	31.4	31.7	8.8				13.9	1.7
White Hake	86.9	88.4	88.4	86.6				90.2	52.4
Pollock	39.8	33.8	33.7	40.3				89.2	73.8
Northern Windowpane	100.7	139.5	NA	NA				0.4	17.4
Southern Windowpane	237.3	47.8	NA	NA				1,550.1	622.2
Ocean Pout	35.7	27.3	NA	NA				1.1	227.7
Halibut	52.2	92.8	NA	NA				18.2	40.8
Wolffish	29.2	30.7	NA	NA				2.7	1.7

5.4.1.2 U.S./Canada Fishery Information

U.S./Canada TACs

The U.S. TACs have varied over time as a result of changes to the percentage shares allocated to the U.S. under the Understanding, as well as the stock conditions (fishing mortality and stock size) (Table 23). Stock conditions exert the dominant influence on the size of the TACs, and it should be noted that in some years, there is relatively high scientific uncertainty regarding stock size (see Transboundary Resource Assessment Committee documents). The weighting formula that accounts for current resource distribution and historic catch has changed from 60/40 in 2004 to 90/10 beginning in 2010. Despite this change, the percentage shares for the U.S. have not changed substantially from 2004. The U.S. percentage share of cod increased between 2005 and 2009, decreased in 2010 and 2011, and will increase again in 2012. The U.S. share of haddock had increased since 2008, though the percentage share will not change in 2012 when compared to 2011. The yellowtail flounder share for the U.S. has typically decreased each year since 2004. In FY 2010, discards as a percent of the total catch decreased by 29 percent for cod and by 18 percent for yellowtail.

Table 23 - U.S./Canada TACs (mt) and Percentage Shares by Year

Year	Weighting Formula	TAC	Cod	Haddock	Yellowtail Flounder
2012	90/10	**Total Shared TAC**	**675**	**16,000**	**1,150**
		U.S. TAC	162 (24%)	6,880 (43%)	564 (49%)
		Canada TAC	513 (76%)	9,120 (57%)	586 (51%)
2011	90/10	**Total Shared TAC**	**1,050**	**22,000**	**2,650**
		U.S. TAC	200 (19%)	9,460 (43%)	1,458 (55%)
		Canada TAC	850 (81%)	12,540 (57%)	1,192 (45%)
2010	90/10	**Total Shared TAC**	**1,350**	**29,600**	**1,500**[6]
		U.S. TAC	338 (25%)	11,988 (40.5%)	1,200[7] (64%)
		Canada TAC	1,012 (75%)	17,612 (59.5%)	756 (36%)[8]
2009	85/15	**Total Shared TAC**	**1,700**	**30,000**	**2,100**
		U.S. TAC	527 (31 %)	11,100 (37 %)	1,617 (77 %)
		Canada TAC	1,173 (69 %)	18,900 (63 %)	483 (23 %)
2008	80/20	**Total Shared TAC**	**2,300**	**23,000**	**2,500**

[6] The total shared TAC was developed unilaterally by the Council.
[7] The U.S. TAC was adjusted downwards to 1,047 mt due to an overage of the FY 2009 U.S. TAC.
[8] The Canada TAC was 36 percent of Canada's desired shared TAC of 2,100 mt.

Year	Weighting Formula	TAC	Cod	Haddock	Yellowtail Flounder
		U.S. TAC	667 (29 %)	8,050 (35 %)	1,950[9] (78 %)
		Canada TAC	1,633 (71 %)	14,950 (65 %)	550 (22 %)
		Total Shared TAC	**1,900**	**19,000**	**1,250**
2007	75/25	U.S. TAC	494 (26 %)	6,270 (33 %)	900 (72 %)
		Canada TAC	1,406 (74 %)	12,730 (67 %)	350 (28 %)
		Total Shared TAC	**1,700**	**22,000**	**3,000**
2006	70/30	U.S. TAC	374 (22 %)	7,480 (34 %)	2,070 (69 %)
		Canada TAC	1,326 (78 %)	14,520 (66 %)	930 (31 %)
		Total Shared TAC	**1,000**	**23,000**	**6,000**
2005	65/35	U.S. TAC	260 (26 %)	7,590 (33 %)	4,260 (71 %)
		Canada TAC	740 (74 %)	15,410 (67 %)	1,740 (29 %)
		Total Shared TAC	**1,300**	**15,000**	**7,900**
2004	60/40	U.S. TAC	300 (23 %)	5,100 (34 %)	6,000 (76 %)
		Canada TAC	1,000 (77 %)	9,900 (66 %)	1,900 (24 %)

The percent changes of the U.S. percentage share of each stock compared to the previous year's percentage share are presented in Table 24

Table 24 - Percent Change of the U.S. Percentage Share by Year

Year	Cod	Haddock	Yellowtail Flounder
2012	26.3	0.0	-10.9
2011	-24.0	6.2	-14.1
2010	-19.4	9.5	-16.9
2009	6.9	5.7	-1.3
2008	11.5	6.1	8.3
2007	18.2	-2.9	4.3
2006	-15.4	3.0	-2.8
2005	13.0	-2.9	-6.6

U.S. Catch of Shared Stocks

U.S. catch of eastern GB cod and haddock and GB yellowtail flounder have varied due to the availability of TAC, pertinent regulations, fish availability, market conditions, and other factors

[9] The U.S. TAC was adjusted downwards to 1,868.7 mt due to an overage of the FY 2007 U.S. TAC.

(Table 25). Since 2004, the U.S. haddock TAC has not been a limiting factor; however, access to the eastern U.S./Canada Area was limited due to closures multiple times when the cod and yellowtail flounder TACs were projected to have been caught. The U.S. TAC for GB yellowtail flounder was exceeded twice, by 9 percent, in both FY 2007 and FY 2009.

Table 25 - U.S. Catch of Shared Stocks by Year

Stock	Fishing Year	TAC mt	Catch % of TAC	Catch mt	Discards (% of Catch)
Cod	2004	300	59%	177	23%
	2005	260	94%	244	64%
	2006	374	90%	335	50%
	2007	494	64%	315	67%
	2008	667	75%	501	15%
	2009	527	89%	467	35%
	2010	338	75%	254	6%
Haddock	2004	5,100	21%	1,060	18%
	2005	7,590	8%	589	12%
	2006	7,480	9%	671	37%
	2007	6,270	5%	307	46%
	2008	8,050	20%	1,649	4%
	2009	11,100	14%	1,563	1%
	2010	11,988	15%	1,905	1%
Yellowtail Flounder	2004	6,000	98%	5,852	8%
	2005	4,260	88%	3,760	9%
	2006	2,070	89%	1,851	29%
	2007	900	109%	981	39%
	2008	1,869	82%	1,531	28%
	2009	1,617	109%	1,770	31%
	2010	1,021	77%	782	13%

Prior to FY 2010, in-season monitoring attributed all cod and haddock catch from trips that fished both inside and outside of the Eastern U.S./Canada Area against the pertinent TAC. Final catch numbers were then adjusted to reflect only the catch that occurred inside the Eastern U.S./Canada Area. This methodology was used for in-season monitoring due to the difficulty of monitoring these trips in real time. Beginning in FY 2010 with the improvement of in-season monitoring methods, cod and haddock catches on trips that fished both inside and outside of the Eastern U.S./Canada Area were only attributed to the U.S. TAC if the catch occurred inside the

Eastern U.S./Canada Area. All final catch numbers include adjustments made to reflect live weight, as well as adjustments made to account for the discrepancy between vessel monitoring system data and dealer data.

Pursuant to Regional Administrator authority to modify certain measures to optimize catch (neither under-harvest, nor over-harvest the TACs), NMFS has relied on three management tools: modifications to the cod and yellowtail trip limits, closures to the eastern U.S./Canada Area, and prohibition on the use of flatfish nets. For FY 2008 through FY 2011, NMFS implemented a delay in the opening of the Eastern U.S./Canada Area for vessels fishing with trawl gear in order to avoid trawl fishing during the season when the cod catch rate is usually high. In FYs 2010 and 2011, this measure only applied to common pool vessels. In addition, beginning in FY 2010, modifications to the cod and yellowtail trip limits and prohibition on the use of flatfish nets were only used to optimize catch by common pool vessels. Sector vessels were allocated a portion of the U.S. TAC for each of the shared stocks, and if a sector caught its entire ACE for any stock, it was required to stop fishing in the pertinent stock area.

During FYs 2004-2010 there were several Special Access Programs (SAPs), which provided vessels opportunities to fish in the U.S. Canada Management Area under rules which differed from the generic regulations that apply to the U.S. Canada Management Area. The catch under each of the SAPs (kept and discarded) counted toward the pertinent U.S. TAC specified for each FY (cod, haddock, and yellowtail flounder), and were consistent with the Understanding.

A summary of the number of trips and days-at-sea (DAS) used in the U.S./Canada Management Area since 2004 is presented in Table 26. The total number of trips in the U.S./Canada Management Area in FY 2010 was slightly less than FY 2009. Of the 1,517 trips in the U.S./Canada Management Area in FY 2010, 1,507 of these trips were taken by sector vessels. Sector vessels accounted for all 393 trips in the Eastern U.S./Canada Area in FY 2010. The total number of DAS used in the U.S./Canada Area decreased in FY 2010 by 71 percent when compared to FY 2009 DAS usage.

Table 26 - Summary of Number of Trips and DAS in U.S./Canada Management Area

Fishing Year	Trips			DAS		
	Eastern U.S./Canada Area	Western U.S./Canada Area	Total	Eastern U.S./Canada Area	Western U.S./Canada Area	Total
2004	468	1,424	1,910	1,997	7,808	9,805
2005	213	1,963	2,176	1,081	13,287	14,368
2006	284	1,295	1,579	1,375	7,907	9,282
2007	138	1,134	1,272	686	10,264	10,950
2008	714	559	1,273	4,186	4,804	8,990
2009	446	1,175	1,621	2,515	6,911	9,426

Fishing Year	Trips			DAS		
	Eastern U.S./Canada Area	Western U.S./Canada Area	Total	Eastern U.S./Canada Area	Western U.S./Canada Area	Total
2010	393	1,380	1,517	850	2,542	2,734

Table 27 – Percent of Total Trips Observed in U.S./Canada Management Area

Fishing Year	Percentage of Trips Observed
2006	19%
2007	26%
2008	29%
2009	23%
2010	21%

The number of distinct vessels that fished in the U.S./Canada Management Area each year since 2004 is presented in Table 28. The total number of vessels fishing in the U.S./Canada Management Area in FY 2010 increased compared to FY 2009, and was greater than any other fishing year since 2004. All of the 65 vessels that fished in the Eastern U.S./Canada Management Area in FY 2010 were sector vessels. Only four distinct common pool vessels fished in the Western U.S./Canada Management Area in FY 2010.

Table 28 – Number of Distinct Vessels Fishing in the U.S./Canada Management Area

Fishing Year	Western U.S./Canada Area	Eastern U.S./Canada Area	Total
2004	159	110	162
2005	184	78	184
2006	155	92	161
2007	148	59	151
2008	126	92	147
2009	127	81	136
2010	203	65	203

Table 29 – Canadian Catch of Shared Stocks by Year

Stock	**Fishing Year**	**TAC** (mt)	**Total Catch** (mt)	**Total Catch** (% of TAC)	**Discards** (% of Total Catch)
Cod	2004	1,000	1,112	111%	unknown
	2005	640	627	98%	unknown
	2006	1,326	1,448	109%	25%
	2007	1,275	1,195	94%	10%
	2008	1,633	1,529	94%	9%
	2009	1,173	1,209	103%	17%
	2010	976	840	86%	11%
Haddock	2004	9,900	9,745	98%	unknown
	2005	15,410	14,483	94%	unknown
	2006	14,520	12,054	83%	unknown
	2007	12,728	11,951	94%	<1%
	2008	14,950	14,815	99%	<1%
	2009	18,900	17,649	93%	<1%
	2010	17,612	16,623	94%	<1%
Yellowtail Flounder	2004	1,900	95	<1%	unknown
	2005	1,740	29	<1%	unknown
	2006	930	580	62%	unknown
	2007	350	132	38%	80%
	2008	550	158	29%	74%
	2009	483	87	18%	97%
	2010	756	217	29%	92%

A summary of GB yellowtail flounder catch in the scallop fishery is presented in Table 30, and GB yellowtail flounder catch from scallop access areas is presented in Table 31. Both the CA I and CA II Scallop Access Area were closed in FY 2010. The total catch by the scallop fishery in FY 2010 was approximately 85 percent lower compared to total catch in FY 2009, and is also the lowest catch since FY 2005.

Table 30 – Summary of GB Yellowtail Flounder Catch (mt) by the Scallop Fishery[10]

Fishing Year	U.S. TAC	Scallop Fishery sub-ACL	Landings	Discards	Total Catch	Percent of U.S. TAC Caught	Percent of sub-ACL Caught
2005	4,260	na	0.9	213	214	5%	na
2006	2,070	na	7.3	430	437	21%	na
2007	900	na	0.5	189	189	21%	na
2008	1,869	na	4.5	215	220	12%	na
2009	1,617	na	2.3	231	233	14%	na
2010	1,047	146	0.3	34	34	3%	23%

Table 31 – GB Yellowtail Flounder Catch (mt) from Scallop Access Areas

Fishing Year	Access Area	Landings	Discards	Total Catch
2006	CA II Scallop Access Area	3.4	206	210
2007	CA I Scallop Access Area	0.2	24	24
2009	CA II Scallop Access Area	3.3	139	142

5.4.1.1 Restricted Gear Area Activity in FY 2010

Amendment 16 adopted requirements for common pool vessels to use specific gears in two large areas in SNE and on western GB. The measures for these restricted gear areas (RGAs) are described in section 3.2.4. Fishing activity by common pool vessels in FY 2010 was examined to determine the rate of compliance with these requirements and to determine how the measures may have affected catches.

Fishing activity in the two RGAs was determined from VTRs and compared to the number of trips declared into the areas based on VMS declarations. As shown in Table 32 there were more trips in the areas based on VTRs than were declared as such by VMS. This suggests compliance with the requirement was not widespread. Some of the trips into the SNE/MA RGA were observed which provides an opportunity to compare catches with and without selective gear. There were 12 observed trips where vessels deployed either haddock separator or otter trawls in the RGAs in FY2010 (Table 33). There were quite a few more observed trips where other gear, particularly sink gillnets, were deployed in the RGAs.

[10] Scallop fishery catch summary includes catch in both GB scallop access areas and GB open areas.

Also, there were quite a few more observed trips that deployed otter trawl gear outside of the RGAs and four more trips outside of the RGAs that used haddock separator gear.

On the twelve observed trips the catch rates for several species were not what would be expected. For example, the average catch per day of cod was higher for the haddock separator trawl tows than for the otter trawl trips, the opposite of what would be expected (Table 34). Standard deviations are large and for most species the differences are not statistically significant at the 0.05 level. Part of the reason for the lack of statistical significance is the low sample size for some species that were only caught on a few trips.

Table 32 - Restricted Gear Area (RGA) Activity based on Vessel Trip Report (VTR) Latitude / Longitude Info, and Vessel Monitoring System (VMS) Declarations.

Area	# Trips (VTR data)	# Trips (VMS)	# Vessels (VMS)
Western Georges Bank RGA	14	3	2
Southern New England RGA	688	138	16

Table 33 - Observed Trips in RGAs by vessels using haddock separator or regular otter trawls

Area	Number of Observed Trips
Western Georges Bank RGA	0
Southern New England RGA	12

Table 34 – Catches on twelve observed trips in the SNE/MA RGA in FY 2010

Row Labels	OHS Average of CPUE	StdDev of CPUE	OTF Average of CPUE	StdDev of CPUE
COD, ATLANTIC	501	887	130	269
FLOUNDER, FOURSPOT	50	116	117	209
FLOUNDER, SAND DAB (WINDOWPANE)	345	318	787	1,214
FLOUNDER, SUMMER (FLUKE)	343	417	2,783	4,184
FLOUNDER, WINTER (BLACKBACK)	72	79	598	635
FLOUNDER, YELLOWTAIL	282	374	25	61
HAKE, RED (LING)	3	6	3	7
HAKE, SILVER (WHITING)	25	56	57	114
HAKE, SPOTTED				

	7	16	31	49
HAKE, WHITE	-	-	6	14
MONKFISH (GOOSEFISH)	5	8	58	75
OCEAN POUT	7	10	1	1
POLLOCK	-	-	-	-
SKATE, BARNDOOR	3	8	24	53
SKATE, CLEARNOSE	-	-	1	2
SKATE, LITTLE	6,928	13,549	51,386	70,548
SKATE, NK	9,176	17,208	13,899	20,308
SKATE, SMOOTH	-	-	-	-
SKATE, WINTER (BIG)	2,034	1,989	12,649	21,479
Grand Total	**1,041**	**5,256**	**4,345**	**20,003**

5.4.2 Sea Scallop Fishery

The Scallop FMP was implemented in 1982 and limited entry followed in 1994 (Amendment 4). In the fishing years 2002-2010, the landings from the northeast sea scallop fishery stayed above 50 million pounds, surpassing the levels observed historically (Figure 8). The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16 million pounds during the 1994-1998 fishing years, less than one-third of the present level of landings.

The limited access scallop fishery consists of 347 vessels. It is primarily full-time, with 250 full-time (FT) dredge, 52 FT small dredge vessels and 11 FT net boats (Table 7 and Table 8, Appendix I of Scallop Framework 23). Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices (Table 9 to Table 11, Appendix I). Amendment 11 implemented a limited entry program for the general category fishery reducing the number of general category permits after 2007. In 2010, there were 333 LAGC IFQ permits, 122 NGOM and 285 incidental catch permits in the fishery totaling 740 permits. Although not all vessels with general category permits were active in the years preceding 2008, there is no question that the number of vessels (and owners) that hold a limited access general category permit under the Amendment 11 regulations are less than the number of general category vessels that were active prior to 2008 (Table 11 and Table 12 in Appendix I of Framework 23).

Error! Reference source not found. shows that total fleet revenues tripled from about $120 million in 1994 to over $450 million in 2010 (in inflation-adjusted 2010 dollars). Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the main factor that led to the increase in revenue in the recent years compared to 1994-1998. The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active limited access vessels during the same period.

There has been a steady decline in the total DAS used by the limited access scallop vessels from 1994 to 2010 fishing years as a result of the effort-reduction measures since Amendment 4 (1994) (Table 3, Appendix I of Framework 23). The impact of the decline in effort below 30,000 days-at-sea since 2005 (with the exception of 2007) on scallop revenue per vessel was small, however, due to the increase in LPUE from about 1,600 pounds per day-at-sea in 2007 to over 2,000 pounds per day-at-sea in 2010 (Figure 8, Appendix I of Framework 23).

Figure 8. Scallop landings by permit category and fishing year (dealer data)

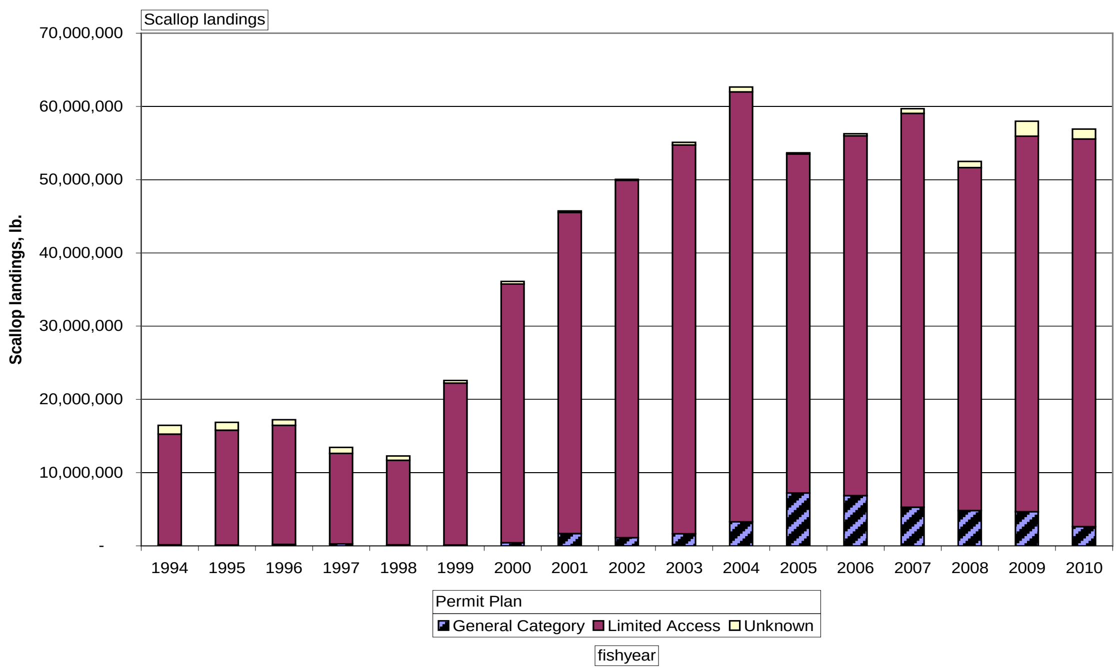
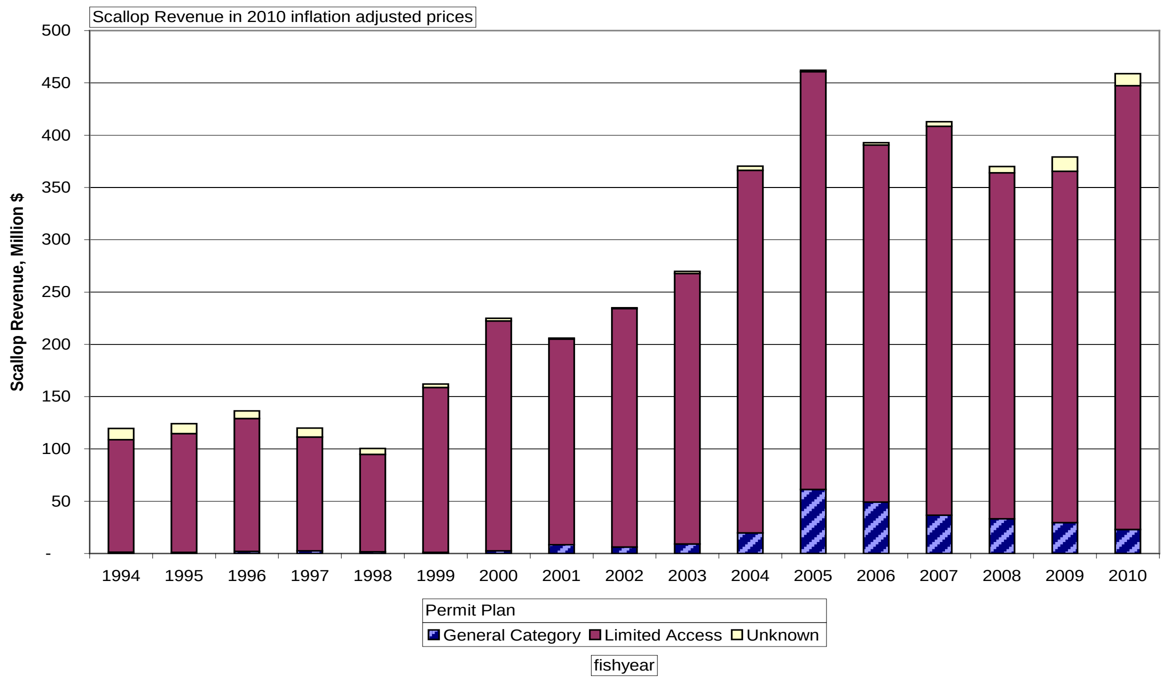


Figure 9. Scallop revenue by permit category and fishing year in 2010 inflation adjusted prices (dealer data)



Most limited access category effort is from vessels using scallop dredges, including small dredges. The number of vessels using scallop trawl gear has decreased continuously and has been at 11 full-time trawl vessels since 2006 (Section 1.1.6 of Appendix I of Framework 23). Furthermore, according to the 2009-2010 VTR data, the majority of these vessels (10 out of 11 in 2010) landed scallops using dredge gear even though they had a trawl permit. Most general category effort is, and has been, from vessels using scallop dredge and other trawl gear. The percentages of scallop landings show that landings made with a scallop dredge in 2010 continue to be the highest compared to other general category gear types (Table 16 through Table 18, Appendix I of Framework 23).

Sea Scallop limited access fishery has a highly concentrated ownership structure (Table 19 to Table 26, Appendix I of Framework 23). According to the ownership data for 2011, only 71 out of 343 vessels belonged to single boat owners (Table 21, Appendix I of Framework 23). The rest were owned by several individuals and/or different corporations with ownership interest in more than one vessel. This in contrast to the LAGC IFQ fishery which is dominated mostly with single boat owners (155 out of 259 vessels belonged to the single boat owners, Table 27 to Table 30, Appendix I of Framework 23).

Both full-time and part-time limited access vessels had a high dependence on scallops as a source of their income. Full-time limited access vessels had a high dependence on scallops as a source of their income and the majority of the full-time vessels (94%) derived more than 90% of their revenue from the scallop fishery in 2010. Comparatively, part-time limited access vessels were less dependent on the scallop fishery in 2010, with only 46% of part-time vessels earning more than 90% of their revenue from scallops (Table 31, Appendix I of Framework 23).

Table 32 of Appendix I of Framework 23, shows that general category permit holders (IFQ and NGOM) are less dependent on scallops compared to vessels with limited access permits. In 2010, only about half (49%) of IFQ permitted vessels earned greater than 50% of their revenue from scallops. Among NGOM permitted vessels, only 31% earned more than 50% of their revenue from scallops in 2010. Scallops still comprise the largest proportion of the revenue for these general category vessels, accounting for 59% - 66% of the revenue for IFQ and NGOM vessels respectively.

The landed value of scallops by port landing fluctuated from 1994 through 2010 for many ports. During the past five years, five ports have consistently brought in the most landed value: New Bedford, MA; Cape May, NJ; Newport News, VA; Barnegat Light/Long Beach, NJ, and Seaford, VA (Table 40, Appendix I of Framework 23). In addition to bringing in the most landed value, in 1994 scallop landings represented more than 37% of the total landed value for New Bedford, MA and Cape May, NJ, and more than 65% of the total landed value for Newport News and Barnegat Light/Long Beach, NJ. This increased in 2010 to 84% and 87% for New Bedford, MA and Cape May, NJ, respectively, and 97% and 90% for Newport News and Barnegat Light/Long Beach, NJ, respectively.

The largest numbers of permitted limited access scallop vessels are currently in the ports of New Bedford, MA and Cape May, NJ, which represent 38% and 19% of the total, respectively (Table 42, Appendix I of Framework 23). In addition to having the greatest number of permitted limited access scallop vessels, New Bedford, MA also has the greatest number of general category scallop vessels. Gloucester, MA, Boston, MA, and Point Judith, RI, also have high numbers of general category scallop vessels (Table 44, Appendix I of Framework 23).

6.0 Environmental Consequences – Analysis of Impacts

6.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies stocks. Changes in fishing mortality may result in changes in stock size. Impacts on essential fish habitat and endangered or threatened species are discussed in separate sections. Impacts are discussed in relation to impacts on regulated multispecies and other species.

6.1.1 Updates to Status Determination Criteria, Formal rebuilding Programs, and Annual Catch Limits

6.1.1.1 Revised Status Determination Criteria for Winter Flounders and Gulf of Maine Cod

Option 1: No Action

Impacts on regulated groundfish

Adoption of the No Action alternative would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be the criteria adopted in Amendment 16. These values were based on the GARM III assessments completed in 2008. Since new benchmarks assessments have been completed for these stocks, and as part of those assessments new SDCs were determined, the use of GARM III values would conflict with M-S Act requirements to use the best available science.

It is difficult to directly compare the Amendment 16 SDCs with updated biomass target values to determine the impacts if the older values are retained because of differences between the two assessments. For GB winter flounder, the No Action biomass target of SSB_{MSY} is larger than the Option 2 biomass target of B_{MSY}. Using this value as the rebuilding target would lead to larger stock sizes. This is not the case for SNE/MA winter flounder, where the No Action SSB_{MSY} is lower than the Option 2 B_{MSY} target. While difficult to make a direct comparison there may be little difference between these two values. The biomass target for GOM winter flounder would not be defined by defined by either Option 1 or Option 2. The changes in the GOM cod biomass target will not be known until the assessment is completed in December 2011.

The maximum fishing mortality thresholds are also difficult to compare because a single value actually represents a vector of a number of factors such as selectivity. The Option 1/No Action fishing mortality thresholds for the three winter flounder stocks are all numerically lower than the Option 2 values. In general, lower fishing morality thresholds should lead to higher stock sizes. In all cases, the fishing mortality thresholds are based on a proxy for F_{MSY}. This proxy is based on spawning potential. In general this is often considered a robust estimator for F_{MSY}, suggesting that it is unlikely that the proxy exceeds the actual estimate of F_{MSY}. This is not always the case, however, and it is possible that the proxy may exceed the F_{MSY} value and result in an increased risk of overfishing.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. It does, however, also determine the maximum fishing mortality rates that are permissible and as a result puts a cap on catches of these species. Since the allowed catches could influence the level of fishing effort it may indirectly affect catches of monkfish, skates, and dogfish that are made while targeting these stocks. When compared to Option 2, the SDCs are generally more restrictive and would lead to lower catches and reduced interactions with these other species. All of these catches are considered when setting catch levels for the other species so it is not likely this would increase the risk of exceeding mortality targets.

Option 2: Revised Status Determination Criteria

Impacts on regulated groundfish

Adoption of Option 2 would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be based on the most recent benchmark assessments and would be based on the best available science, consistent with M-S Act requirements.

It is difficult to directly compare the Amendment 16 SDCs with updated biomass target values to determine the impacts if the older values are retained because of differences between the two assessments. For GB winter flounder, the Option 2 B_{MSY} target is lower than the Option 1/No Action SSB_{MSY} alternative. Using this as a biomass target would, over the long-term, lead to lower stock sizes and reduced SSB. For SNE/MA winter flounder the Option 2 B_{MSY} value is larger than the Option 1/No Action SSB_{MSY} value, but it is difficult to compare these two numbers as they measure different quantities. This option does not define a biomass target for GOM winter flounder and in that respect does not differ from Option 1.

The fishing mortality targets for GB winter flounder and SNE/MA winter flounder that would be adopted by this option are based on a direct estimate of F_{MSY}. In the case of GB winter flounder, this estimate is higher than an updated estimate of F40%, the F_{MSY} proxy used in Option 1/No Action. By adopting this mortality threshold, higher fishing mortality rates would be possible and stock sizes may be reduced when compared to Option 1/No Action.

For SNE/MA winter flounder, the Option 2 F_{MSY} value is lower than F40% for this stock. Adopting this target would lead to lower fishing mortality rate than under Option 1/No Action and as a result stock sizes would be expected to be larger over the long term.

For GOM winter flounder, Option 2 would adopt an F_{MSY} proxy that is slightly higher than that in Option 1/No Action. Over time this would allow slightly higher fishing mortalities and a slight decline in stock size.

For GOM cod, this adoption would adopt a fishing mortality and biomass targets based on results of the December 2011 assessment of this stock. These could be higher or lower than the Option 1/No Action values.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. It does, however, also determine the maximum fishing mortality rates that are permissible and as a result puts a cap on catches of these species. Since the allowed catches could influence the level of fishing effort it may indirectly affect catches of monkfish, skates, and dogfish that are made while targeting these stocks. When compared to Option 1/No Action, the SDCs are generally less restrictive and would lead to increased catches and more interactions with these other species. All of these catches are considered when setting catch levels for the other species so it is not likely this would increase the risk of exceeding mortality targets.

6.1.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

Option 1: No Action

Impacts on regulated groundfish

This option would maintain the rebuilding strategy adopted for this stock in FW 45. The strategy calls for rebuilding by 2016 with a median probability of success. Assessment results from TRAC 2011 indicate that the stock cannot rebuild by 2016 even in the absence of all fishing mortality. As a result, if this strategy would be continued then fishing mortality would have to be kept as close to 0 as possible.

If fishing mortality could be successfully reduced to 0 – an unlikely event that is possible only if all U.S. and Canadian fishing activity would be prohibited – then the length of time expected to rebuild the stock can be calculated. When estimating rebuilding time, a projection is made from the most recent estimate of stock size. Because the assessment has a retrospective pattern that tends to over-estimate stock size, the projection can be run both with and without an adjustment that attempts to address these biases. Without an adjustment for the retrospective pattern, the stock would be expected to rebuild by 2017. With an adjustment for the retrospective pattern, the projection indicates the stock would be expected to rebuild by 2018. Either date is faster than would be expected if either of the sub-options in Option 2 were to be adopted.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure does, however, determine the amount of GB yellowtail flounder that can be harvested and thus has an indirect impact the amount of fishing activity on GB. It also influences the size of the sub-ACL of GB yellowtail flounder allocated to the scallop fishery and thus could indirectly affect scallop fishing effort on GB.

Since the most recent assessment indicates that the stock cannot rebuild by 2016 as would be called for by this option, if this option would be adopted the expectation is that GB yellowtail flounder specifications would be set at very low levels. This could reduce the amount of fishing activity on GB (or lead to the use of selective gear that does not typically catch skates, dogfish, and monkfish). Catches of those species on GB might decline as a result. Fishing effort might redirect into other areas, however, and this could lead to increased targeting of these species to make up for loss GB yellowtail flounder revenues. When compared to Option 2 (either sub-option) such re-direction of effort is more likely to occur. With respect to scallop fishing, a drastically reduced ACL would reduce the scallop fishery sub-ACL for GB yellowtail flounder. This would make it more likely that scallop fishery AMs might be triggered, reducing fishing effort on GB. While this might result in reduced fishing activity in GB by the scallop fishery, it may result in effort shifts into other areas. In addition to an increased chance that AMs are triggered under this option, if the sub-ACL is low enough, scallop allocations into GB access areas, namely Closed Area II, may need to be adjusted, allocating less effort in Closed Area II if there is not sufficient YT catch available for access area trips. When compared to Option 2, this option would introduce additional uncertainty into the prosecution of the scallop fishery and could lead to unexpected changes in scallop fishing mortality.

Option 2: Revised Rebuilding Strategy for GB Yellowtail Flounder

Impacts on regulated groundfish

There are two sub-options in this option, either of which would modify the rebuilding strategy for GB yellowtail flounder. The sub-options are designed to target a fishing mortality rate that will rebuild with a median probability of success by a specific data. In each case, the end date was selected to take into account the possibility that the retrospective pattern observed in the assessment in TRAC 2011 will continue and taking this into account would be expected to give a more accurate representation of future stock conditions. Either sub-option would rebuild more slowly than Option 1/No Action.

Sub-option A would be expected to rebuild the stock by 2023 with a median probability of success. This estimate is based on fishing at 75 percent of F_{MSY} (the default ABC control rule). If the retrospective pattern does not represent actual stock conditions, the stock might rebuild earlier – the projection indicates it could rebuild by 2021.

Sub-option B would be expected to rebuild the stock by 2032 with a median probability of success. This estimate is based on fishing at an F=0.21, which is the maximum mortality expected to rebuild to SSB_{MSY} and also is expected to result in an average annual increase in SSB of about 10 percent. If the retrospective pattern does not represent actual stock conditions, the stock might not rebuild earlier – the projection indicates it would still rebuild by 2032. The rebuilding trajectory is very flat at the end of the period and there are only small changes in the probability of success after 2028.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure does, however, determine the amount of GB yellowtail flounder that can be harvested and thus has an indirect impact the amount of fishing activity on GB. It also influences the size of the sub-ACL of GB yellowtail flounder allocated to the scallop fishery and thus could indirectly affect scallop fishing effort on GB.

If this option would be adopted the expectation is that GB yellowtail flounder specifications would be set at higher levels than Option 1/No Action. This could increase the amount of fishing activity on GB when compared to Option 1/No Action. Catches of those species that are caught when fishing for yellowtail flounder might increase as a result. Fishing effort would be less likely to redirect into other areas, however, and this could lead to reduced targeting of these species to make up for loss GB yellowtail flounder revenues. With respect to the scallop fishery, an extended rebuilding period would lead to higher GB yellowtail flounder sub-ACLs for this stock than those under Option 1/No Action. This would make it less likely that the sub-ACLs would be exceeded and AMs triggered than would be the case if Option 1 is adopted. Furthermore, the potential that YT bycatch limits reduce scallop fishery allocations on GB would be less likely. Therefore, scallop fishery allocations would be set based on available scallop resource and would be less likely to be constrained by potentially low YT bycatch levels under this option, compared to No Action. As a result, scallop fishing effort would occur in areas with highest scallop abundance having beneficial impacts on the scallop resource and would be more predictable having a greater chance of attaining mortality targets.

6.1.1.3 Identification of Additional Sub-Annual Catch Limits

This measure has been considered and rejected. This section will be removed from the final document.

Option 1: No Action

Impacts on regulated groundfish

If this option would be adopted, there would be no additional fishery components that would be restricted to a specific groundfish sub-ACL, with AMs that would be implemented of the sub-ACL were to be exceeded. This measure would primarily be expected to have biological impacts on the two stocks for which a sub-ACL is being considered: SNE/MA windowpane flounder (Option 2) and SNE/MA winter flounder (Option 3).

In the case of SNE/MA windowpane flounder, total catches of SNE/MA windowpane flounder in FY 2010 exceeded the OFL (Table 35). This was due in part to catches by the scallop fishery; these catches alone exceeded the ACL for this stock. If a sub-ACL for the scallop fishery was not adopted, then it is likely that catches would continue to exceed the ABC, and possible the OFL, for this stock. This would cause overfishing which, over the long term, would be expected to result in a decline in stock size and result in the stock being overfished. The other subcomponents portion of the catch was also large, and not adopting controls on this part of the catch may also lead to overfishing.

Table 35 – SNE/MA windowpane flounder FY 2010 catches

OFL	ABC	ACL	Total Catch	Commercial Groundfish	Scallop Fishery	State Waters Commercial	Other Sub-components
317	271	225	534	73.6	258.5	31	170.8

In the case of SNE/MA winter flounder, the impacts of adopting this option are not as clear. Only 60 percent of the total ACL was caught in FY 2010, but the allowance for state waters and the allocation to other subcomponents were both exceeded. The other subcomponents catch was exceeded in part because of scallop fishery catches and also because of catches by other fisheries. Only 9 percent of the amount allocated to the groundfish fishery was caught, but in FY 2010 landing SNE/MA winter flounder was prohibited. This may change in FY 2012 (see section 3.2.1), and if it does it is likely that a larger percentage of the groundfish sub-ACL will be caught.

Scallop dredge fishery discards of SNE/MA winter flounder have been a relatively constant amount over the last ten years (the assessment does not estimate trawl discards by gear or fishery, so it is not possible to create a time series that includes scallop trawl discards of SNE/MA winter flounder). Since about 1998, scallop dredge discards of this stock have generally been less than 100 mt; until the reduction in total catches in 2010, this was usually less than five percent of the total catches of this stock (Figure 10).

Adopting SNE/MA winter flounder sub-ACLs for the scallop fishery would be expected to reduce the likelihood of overfishing because there would be direct controls on a larger portion of the catch. Given the relative stability in the scallop fishery catches, however, it is not clear that a sub-ACL is required to prevent overfishing.

Figure 10 – Scallop dredge discards of SNE/MA winter flounder

<u>Option 2: SNE/MAB Windowpane Flounder Sub-ACLs</u>

Impacts on regulated groundfish

If Option 2 is adopted, sub-ACLs would be defined for the groundfish, scallop, and other fisheries. This option would be expected to reduce the risk of overfishing of this stock. If sub-ACLs would be adopted, then AMs for each fishery would also be defined. At present, only the groundfish component is subject to AMs and has effective controls on its catch. As shown in Table 35, the scallop fishery catches exceeded the ACL and the catches by the other sub-components were over 75 percent of the ACL. By adopting sub-ACLs for these two components, the catches will be held below the ACL and will reduce the risk of overfishing. When compare to Option 1/No Action, the risk of overfishing of SNE/MA windowpane flounder would be reduced.

<u>Option 3: SNE/MA Winter Flounder Sub-ACL for the Scallop Fishery</u>

Impacts on regulated groundfish

If Option 3 is adopted a SNE/MA winter flounder sub-ACL would be defined for the scallop fishery. As a result, catches of this stock by both the groundfish and scallop fisheries would be better controlled. In FY 2010 these two components accounted for 33 percent of the catch, while catches in state waters (both commercial and recreational) accounted for about half the catch. Commercial catches in federal waters, however, were restricted by a prohibition on possession and this may change in FY 2012. Adopting a sub-ACL for the scallop fishery would increase the proportion of the catch that is subject to AMs and when compared to Option 1/No Action, would be expected to reduce the risk of overfishing.

6.1.1.4 U.S./Canada Resource Sharing Understanding TACs

<u>Option 1: No Action</u>

The biological impacts of the No Action Alternative would be primarily negative. The No Action Alternative does not represent the appropriate level of TACs from a biological perspective, and would allow fishing mortality to be too high. Allowing an excessive amount of fish to be caught would represent a level of fishing mortality that exceeded the desired level of fishing mortality. If the appropriate levels of fishing mortality were exceeded, it is likely that stock rebuilding would be compromised. Under the No Action Alternative (with no TACs specified), it is possible that excessive harvest could occur for all three shared stocks. Since 2004, the U.S./Canada TACs have proved effective at controlling fishing effort on the shared stocks, in a precise manner.

Option 2: U.S./Canada TACs

The proposed TACs are at levels that correspond to the fishing mortality rates consistent with the management strategy agreed to under the Understanding as well as the recommendations of the SSC for GB yellowtail flounder. Under the Understanding, the strategy is to maintain a low to neutral risk of exceeding the fishing mortality limit reference (F_{ref} = 0.18, 0.26, 0.25, for cod, haddock, and yellowtail flounder, respectively), and when stock conditions are poor, fishing mortality rates should be further reduced to promote rebuilding. The recommended 2012 TACs for cod, haddock, and yellowtail flounder were based upon the most recent stock assessments (TRAC 2011). The 2012 TACs for Eastern GB cod and haddock, and GB yellowtail flounder, were recommended by the TMGC, based upon the fishing mortality strategy shared by both the United States and Canada. The full justification for the proposed TACs is described in Section 3.1.4.2 of this EA.

Based on catch information for the U.S./Canada Management Area from FY 2004 through FY 2010, management measures have generally restrained catches of Eastern GB cod and haddock and GB yellowtail flounder below their respective TACs. However, in FY 2007, catch of GB yellowtail flounder exceeded the TAC by nine percent due to late reporting and because yellowtail catch by the scallop fishery was not accounted for until after the end of the fishing year. The GB yellowtail TAC was exceeded by nine percent again in FY 2009 as a result of increases to the catch rate late in the fishing year. The TAC in the subsequent fishing year was reduced following both the overage in FY 2007 and FY 2009. In addition, the monitoring methodology has been modified to provide for more accurate inseason monitoring of the U.S./Canada TACs. Based upon preliminary information, NMFS does not anticipate that the TACs for Eastern GB cod, Eastern GB haddock, or GB yellowtail flounder will be exceeded in FY 2011.

Although it is not possible to separate out the precise impact of the hard TACs on the overall pattern of fishing behavior and landings, the TACs and associated regulations have played an important role in determining fishing patterns on GB, as further explained in the Economic Impacts of the proposed action for U.S./Canada TACs. Because the proposed TACs are based upon fishing mortality rates that are in accordance with the Understanding and the FMP, and the management measures that are associated with the U.S. Canada Management Area have effectively controlled fishing effort, the proposed TACs are appropriate and will contribute toward the growth of the GB cod and yellowtail flounder stocks, and the maintenance of the GB haddock stock. Therefore, the biological impacts of this alternative would likely be positive. In addition, substantive changes in fishing behavior as a result of sector management, increased observer coverage in the fishery, and improved monitoring methods also likely contribute to a reduced risk of exceeding the U.S./Canada TACs when compared to fishing years prior to FY 2010. The ACLs specified in this action also account for management uncertainty.

A delay in the opening of the Eastern U.S./Canada Area for common pool vessels fishing with trawl gear in FY 2012 until August 1, 2012, would likely reduce the chance that the Eastern GB cod TAC for common pool vessels would be exceeded. This measure delays access to the area to prevent trawl fishing during the time when cod catch is relatively high.

FY 2012 will be the third year the FMP has operated under the revised sector regulations, and a high percentage of active vessels are expected to participate in sectors. Since trip limits only apply to common pool vessels now, this management measure would play a reduced role in the inseason management of catch. Sectors would continue to have more choices regarding fishing strategy in the U.S./Canada Management Area.

6.1.1.5 Mixed Stock Exception for SNE/MAB Windowpane Flounder

This measure has been considered and rejected. This section will be removed from the final document.

Option 1: No Action

Impacts on regulated groundfish

If this option is adopted, the Mixed Stock Exception (MSE) would not be invoked for establishing the catch levels for SNE/MAB windowpane flounder. Catches for this stock would be based on the default ABC control rule for groundfish stocks. Generally, ABCs would be determined by calculating the catch at 75 percent of the F_{MSY} proxy applied to the most recent estimate of stock size. Because ACLs would be set at or below the ABC, the risk of overfishing is expected to be slight. The exact risk cannot be calculated because this stock is assessed with an index-based assessment, but would be a function of the uncertainty over the F_{MSY} estimate and the estimate of current stock size. According to GARM III, the 90 percent confidence interval for the F_{MSY} proxy was imprecise; the point estimate was 1.47 and the interval ranged from 0.77 to 2.11.

Given that Option 2 explicitly considers invoking the MSE to allow overfishing, this option, if adopted, would be expected to have a lower risk of overfishing. Stock size under this option would be expected to be larger than under Option 2 over the long-term, and there would be less risk that the stock will be overfished in the future.

Option 2: Application of Mixed Stock Exception to SNE/MAB Windowpane Flounder

Impacts on regulated groundfish

Option 2 would invoke the MSE when determining catches for SNE/MAB windowpane flounder. Since the point of using the MSE is to allow overfishing to occur, clearly when compared to Option 1/No Action would have a greater risk that overfishing will occur. Indeed, it is almost certain that catch levels would be set at a level that, if the ACL were to be caught, would lead to overfishing. An extended period of overfishing would likely lead to declines in stock size and could lead to the stock being overfished. If the stock is overfished, the MSE could no longer be applied for setting catches and a rebuilding program would have to be developed.

The NSGs establish requirements for the application of the MSE. From a biological perspective, the SME can only be invoked if the fishery is not overfished (see 50 CFR 600.310(m)). As described in section XXX, based on the most recent trawl survey indices, this stock is rebuilt so the first criterion is met for using the MSE.

The more stringent criterion is that if the MSE is invoked, the resulting rate of fishing mortality will not cause the stock or stock complex to fall below its MSST more than 50 percent of the time. Because this stock is assessed using the index-based AIM model, this is difficult to evaluate. The AIM projection model is essentially a linear projection. When the exploitation index exceeds the F_{MSY} proxy, the slope of the projection is negative and the stock is projected to decline. Unlike age-based analytic projections, there are not stock dynamics included in the projection and the projection will show the stock never stops declining.

TBC

6.1.1.6 Administration of Scallop Fishery Sub-ACLs

Option 1: No Action

Impacts on regulated groundfish

If Option 1/No Action is implemented there would not be any changes to the way scallop fishery sub-ACLs are administered. Under this option, when a sub-ACL is caught the AMs that apply to the scallop fishery are implemented. The particular AMs are specified by the Atlantic Sea Scallop FMP. The AMs are implemented without regard to whether other components have caught their allocation and without regard to whether the overall ACL is exceeded.

Under this option, the concept is that fishing mortality is partitioned to each subcomponent by allocating a portion of the ACL. Each subcomponent is then held to its allocation through the implementation of measures, including AMs. As a result, this option would have less risk of overfishing than Option 2 because AMs would be triggered on the scallop fishery if that sub-ACL were exceeded, regardless of whether or not the total ACL was exceeded.

Impacts on other species

If Option 1/No Action is adopted there would not be expected to be any direct impacts on other species. This measure is primarily administrative in nature. It is possible that with this option there is more of a chance the scallop fishery AMs will be triggered to account for catches of yellowtail flounder. This could redirect scallop fishing effort out of the AM areas which may in turn result in changes to their catches of monkfish, skates, and scallops.

The primary impact would likely be on scallop catches if this were to occur. The increased likelihood that an AM might be triggered creates additional uncertainty on the location of scallop fishing activity. In terms of scallop management, this makes it more difficult to determine the appropriate effort levels necessary to achieve mortality targets if effort is shifted to an area with lower scallop catch rates. This complicates scallop management and could result in exceeding scallop mortality targets. This is more likely to occur under this option than if Option 2 is adopted.

Option 2: Changes to Scallop Fishery Sub-ACL Administration

Impacts on regulated groundfish

If Option 2 is adopted, then scallop fishery catches of groundfish stocks would continue to be compared to the sub-ACLs, but the AM would only be triggered if the overall ACL was exceeded or the scallop fishery sub-ACL was exceeded by 50 percent or more. As a result, in any given year it is possible that the scallop fishery might exceed its sub-ACL, but AMs would not be triggered if total catches did not exceed the overall ACL or the overage was less than 50 percent of the sub-ACL. Since the purpose of AMs is to prevent overfishing, this option only implements the scallop fishery AMs when – based on catches exceeding the ACL – overfishing is more likely to have occurred.

In any single year there is little difference in the biological impacts of this approach to administering the sub-ACL and Option 1/No Action. Fishing mortality on stocks with a scallop fishery sub-ACL might be marginally higher than under Option 1. This is because the limits on the scallop fishery catches are not as restrictive as would be the case under Option 1 where the only criterion for implementing AMs is whether the scallop fishery sub-ACL is exceeded. Since the AMs on the scallop fishery are only triggered if the overall ACL is exceeded or the overage is 50 percent or more the scallop fishery could exceed its sub-ACL and exceed its portion of the fishing mortality. Catches would thus be higher than if the scallop fishery catch was kept to its sub-ACL, and fishing mortality would be higher. But this would not likely lead to overfishing as AMs would be triggered if the overall ACL was exceeded and generally the ACLs are set well below the OFL (this may change for SNE/MA windowpane flounder if the MSE is adopted for this stock).

Over the longer term, this option may have a greater risk overfishing. If scallop fishery catches exceed the sub-ACL, then the only way the AMs are not triggered would be if other fishery components do not catch their allocations. If this happens AMs would not be automatically implemented to limit scallop catches to the sub-ACL. As a result scallop fishery catches would be expected to exceed the sub-ACL in the following year as well. If other components increase their catches to their allocations in the following year overfishing will occur. The only exception would be if the scallop fishery overage was 50 percent or more, in which case AMs would be implemented. As a result there may be less stringent controls on the scallop fishery catches of groundfish stocks with a sub-ACL than is the case if Option 1 is adopted.

Impacts on other species

If Option 2 is adopted there would not be expected to be any direct impacts on other species. This measure is primarily administrative in nature. With this option there is less of a chance the scallop fishery AMs will be triggered to account for catches of yellowtail flounder. This makes the location of scallop fishing activity more predictable and reduces potentially negative impacts on the scallop resource from effort shifts caused by YT flounder AMs being triggered. . In terms of scallop management, this option reduces the ability to shift effort making it easier to determine the appropriate effort levels necessary to achieve mortality targets compared to Option 1.

Option 3: In-Season Re-Estimation of Scallop Fishery GB Yellowtail flounder Sub-ACL

Impacts on regulated groundfish

This option would re-estimate the GB yellowtail flounder sub-ACL for the scallop fishery based on data from the current fishing year. If the data show that less than 90 percent of the sub-ACL will be caught the sub-ACL would be re-specified and the underage made available to the groundfish fishery. This measure might result in increased catches of GB yellowtail flounder than would be the case under Option 1/No Action. This is because any underage shifted to the groundfish fishery would be likely to be caught, unlike Option 1 where it would not be caught. Fishing mortality rates for GB yellowtail flounder would likely to be closer to the target rates, but would not be expected to exceed the overfishing level.

Impacts on other species

When compared to Option 1/No Action this measure might lead to increased catches of skates, dogfish, and other species that are caught while fishing for yellowtail flounder on GB. It would not be expected to threaten mortality targets for those stocks since they are also subject to ACLs and AMs designed to prevent overfishing.

6.1.1.7 Annual Catch Limit Specifications

Option 1: No Action

Impacts on regulated groundfish

This option would maintain the specifications (OFLs/ABC/ACLs) for FY 2012 at the same levels as adopted by FW 44 and FW 45. It would also maintain the distribution of the catches to various fisheries sub-components. If this option would be adopted, the specifications would only be identified for FY 2012 for all stocks except pollock. The specifications would not reflect the recent assessments of the three winter flounder stocks, GB yellowtail flounder, and GOM cod.

This option would define the Overfishing Level (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limits (ACLs) for the multispecies fishery. The OFLs are based on an estimate of stock size and $F_{MSY.}$ The ABCs are reduced below the OFL and are based on a control rule for each stock. These control rules were identified in Amendment 16. In most cases, the ABC is based on a fishing mortality of either 75 percent of F_{MSY} or an Frebuild, whichever is lower. The ABC is thus below the OFL and if catches are kept at or below the ABC, overfishing is unlikely to occur. The ACL is set lower than the ABC to account for management uncertainty. The ABCs – and thus the ACLs - that are specified for FY 2010 through FY 2012 are based on the fishing mortality targets adopted by Amendment 16. These targets were designed to end overfishing and to rebuild groundfish stocks consistent with the requirements of the M-S Act and the Council’s rebuilding goals. The ABCs were set by the Science and Statistical Committee (SSC). In all cases the ACL is lower than the ABC. The calculation of these values was described in detail in appendices to FW 44 and 45.

If the ACL is approached or exceeded, accountability measures (AMs) are triggered that are designed to either prevent or end overfishing. The exact AM that is used depends on the component of the fishery and the fishing year, as Amendment 16 adopted different AMs for different components and fishing years.

In previous action, for stocks that have an age-based assessment and an age-based projection model the impacts on stock size of setting the ABCs were estimated using short-term projections. These project the estimated median stock size expected to result by limiting catches to the ABC. While these projections are based on the scientific advice of the GARM III and TRAC panels, the SSC, and the Groundfish Plan Development Team, projections are subject to uncertainty and future stock size may differ from the trajectories that were calculated. Recent work by NEFSC scientists and the Council’s SSC raised concerns that medium-term projections (defined as 4- 6 years forward from the terminal year of the assessment) are typically biased high – that is, stock size increases are over-estimated and as a result future fishing mortality rates are under –estimated. Because of these concerns short-term projection results are not shown for the twelve stocks that have not been re-assessed since 2008 (GARM III, terminal year of 2007). These stocks are:

- GB cod
- GOM cod (assessment scheduled for December 2011)
- GB haddock
- GOM haddock
- CC/GOM yellowtail flounder
- SNE/MA yellowtail flounder
- Witch flounder
- Plaice
- Redfish
- White hake
- Atlantic halibut
- Atlantic wolffish

The ABCs and ACLs for these stocks are believed to be set at levels that have less than a median risk of overfishing. When first adopted the probability of overfishing these stocks in FY 2012 if catch was equal to the ABC was estimated to be no more than 20 percent (Table 36). There is considerable uncertainty in these estimates given the age of the assessments. For GB, GOM, and SNE/MA winter flounder and GB yellowtail flounder, recently completed assessments allow for using short-term projections to estimate the probability of overfishing for the Option 1/No Action ABCs in FY 2012. These values are included in Table 36. The value shown for GB yellowtail flounder does not take into account that the most recent assessment exhibits a retrospective pattern. If this patter were to persist then overfishing would be almost certain to occur in FY 2012 at the Option 1/No Action catch level.

With respect to pollock, one source of uncertainty in the assessment highlighted by assessment reviewers was the selectivity in the survey and the fishery: "The ASAP model with dome-shaped survey and fishery selectivity implies the existence of a large biomass (35 – 70% of total) (i.e. cryptic biomass) that neither current surveys nor the fishery can confirm" (NEFSC 2010). Further the review panel advised "The projections of stock biomass are appropriate if the survey and fishery selectivity assumptions are true. However, density dependent influences on recruitment could become an issue if flat-topped survey selectivity is true but a domed selectivity was used to undertake the projections…The Panel recommends that it would be useful when making stock projections to more explicitly formulate the consequences to the pollock stock of different model assumptions in a decision table similar to that employed in risk assessment." (O'Boyle, pers. comm.)

FW 45 included a lengthy discussion of the differences between the approved pollock assessment model and a sensitivity run that assumed flat-topped selectivity in the survey, but continues to use dome-shaped selectivity in the fishery. This reduces stock size estimates by about 30 percent. This model formulation can be used to explore the impact of the selectivity assumption on the probability of overfishing and the probability of being overfished. *It is important to note this is not the model formulation accepted by the review panel.* Nor does this model account for all elements of model uncertainty; for example, it does not incorporate flat-topped selectivity in the fishery. But it does provide some indication of the effects of the dome-shaped selectivity pattern on catches and future stock size. It should be noted that the choice of the selectivity pattern affects the estimate of SSB_{MSY}. The approved model results in an SSB_{MSY} of 91,000 mt, so the stock is overfished if biomass is less than 45,500 mt. The alternative sensitivity run results in an SSB_{MSY} estimate of 58,000 mt, in which case the stock would be considered overfished if less than 28,000 mt.

If the dome shaped selectivity is true, there is little risk of overfishing or being overfished through 2015 under the proposed ABCs. If the dome is false, the Option 1 ABCs are likely to result in overfishing. If the dome is false the proposed ABC has a medium risk of reducing stock size to less than 45K mt by 2015, but a low risk reducing stock size to less than 29K mt by 2015. There is no difference for this stock between Option 1/No Action and Option 2 – that ABCs are the same.

With respect to GOM cod, this option would not consider the results of an assessment scheduled for December 2011. As a result there is doubt whether the specifications that would be adopted by this option would achieve the mortality targets for this stock. Only if the assessment results exactly match the projections from GARM III would the probability of overfishing match that shown in Table 36

For the three index-assessed stocks an estimate of the probability of overfishing cannot be determined but the proposed ABC can be compared to the most recent estimates of stock size to determine of the exploitation index will exceed the overfishing level if stock size does not change. This is an unrealistic assumption but past efforts to use the index projection model with these stocks have proven unreliable. There are also uncertainties in these analyses caused by the recent change in the research vessel used for the trawl survey and the strata that are covered by the survey. The new research vessel does not survey the same strata as the old vessel; this may affect both stock size estimates and reference point calculations for stocks assessed with an index. Table 37 summarizes these results. For all three stocks, overfishing would not be expected to occur at the Option 1/No Action ABCs for FY 2012. The exploitation index for ocean pout would be expected to exceed the default ABC control rule of 75% of F_{MSY}. Because ocean pout stock size has been declining it is possible that this ABC would lead to overfishing if stock size continues to decline.

To summarize, the Option 1/No Action ABCs, if caught, would be almost certain to result in overfishing of GB yellowtail flounder. Ocean pout fishing mortality might also exceed the F_{MSY} proxy if the stock continues to decline. The ABCs would not be likely to result in overfishing of any of the three winter flounder stocks or pollock. For GOM cod the proposed ABC might not be consistent with the results of an assessment scheduled for December 2011. For the remainder of the stocks there is uncertainty over the accuracy of medium term projections but overfishing would not be expected to occur based on those results. The main differences between this option and Option 2 are the expected impacts on GB yellowtail flounder, ocean pout, and GOM cod.

Table 36 - Probability that overfishing occurs ($F>F_{MSY}$) if catch is equal to ABC
(1) Assessment/projection model does not allow calculation of probability of overfishing

Species	Stock	2010	2011	2012
Cod	GB	0.118	0.153	0.170
Cod	GOM	0.133	0.148	0.159
Haddock	GB	0.027	0.020	0.018
Haddock	GOM	0.003	0.013	0.014
Yellowtail Flounder	GB			0.929
Yellowtail Flounder	SNE/MA	0.000	0.001	0.046
Yellowtail Flounder	CC/GOM	0.035	0.040	0.051
American Plaice	GB/GOM	0.003	0.019	0.057
Winter Flounder	GB			0.004
Winter Flounder	SNE/MA			0.000
Winter Flounder	GOM			0.000
Pollock				0.00
Witch Flounder		0.078	0.123	0.150

Redfish		0.000	0.000	0.000
White Hake (1)	GB/GOM			
Windowpane (1)	GOM/GB			
Windowpane(1)	SNE/MA			
Ocean Pout(1)				
Atlantic Halibut(1)				

Table 37 – Exploitation index if FY 2012 ABC is applied to most recent stock size estimate

Stock	Stock Size (3-year survey avg)	ABC/Stock Size	Percent of F_{MSY}
GOM/GB windowpane	0.4608	0.367	73.4%
SNE/MAB windowpane	0.3512	0.675	46%
Ocean pout	0.4153	0.76	86%

Impacts on other species

Adopting the Option 1/No Action specifications is not expected to have direct impacts on non-groundfish species. Indirect effects are generally likely to be beneficial. The specifications, when combined with the AMs adopted by Amendment 16, could reduce groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects the biological impacts should not be negative. There are some differences in the groundfish catch levels under this option than in Option 2: GB winter flounder, GOM winter flounder are lower, SNE/MA winter flounder is higher, and GOM cod may be higher. These differences are not likely to result in a large difference in fishing effort, so it is not likely that this option will have biological effects on other species that are noticeably different from Option 2.

Option 2: Revised Annual Catch Limit Specifications

Option 2 would adopt new ABCs for the three winter flounder stocks, GB yellowtail flounder, GOM cod, and the three stocks assessed with a survey index. The ABCs for other stocks are the same as in Option 1/No Action and so these impacts are not summarized again.

Because this option would adopt FY 2012 -2014 ABCs for GB winter flounder, SNE/MA winter flounder, and GB yellowtail flounder, and all three stocks have recent assessment updates, short-term projections can be used to estimate the probability of overfishing and short-term changes in stock size. These projections use catches equal to the ABCs that would be adopted f this option is selected. Since the management goal is to keep catches at or below ACLs, and ACLs are always less than the ABC, the projection results would be expected to slightly over-estimate the risk of overfishing and under-estimate future stock size. Projected stock sizes are shown in Figure 11 through Figure 13 for these three stocks and the risk of overfishing is listed in Table 38. There is less probability of overfishing SNE/MA winter flounder with this option than with Option 1, but a greater probability of overfishing GB winter flounder and GOM winter flounder. For both of these stocks the probability is less than 25 percent and the risk of overfishing would be considered low.

With respect to GB yellowtail flounder there is additional uncertainty in the short-term projection because the most recent assessment shows a retrospective pattern that over-estimates stock size and under-estimates fishing mortality in the terminal year of the assessment. The approved assessment model does not explicitly account for this uncertainty. Short term projections can be calculated that do account for the retrospective pattern. This sensitivity analysis can be compared to the results without accounting for the retrospective pattern. As plotted in Figure 13, projected stock size if the retrospective pattern continues indicates that the stock will be about half the size expected if the retrospective pattern does not continue. Similarly, if the retrospective pattern is considered then the risk of overfishing in FY 2012 and 2103 is much higher than if it is not.

This option would adopt an ABC for GOM cod that is within the range of 500 – 20,000 mt and that is consistent with the results of an assessment that scheduled for completion in December 2011. The ABC would be selected to be consistent with current stock status and rebuilding requirements. Unlike Option 1/No Action, because the ABC will be based on new information there is more certainty that the ABC and other specifications will achieve the desired mortality targets.

The ABCs for the index-based stocks are all based on the default ABC control and apply the control rule to current stock size. When compared to Option 1, allowed catches would be lower for ocean pout, higher for SNE/MA windowpane flounder, and about the same for GOM/GB windowpane flounder. None of the allowed catches would be expected to exceed the F_{MSY} proxies for these stocks.

To summarize the differences between Option2 and Option 1/No Action, unlike Option 1 none of the ABCs that would be adopted under this action would have a high probability of resulting in overfishing, if caught. For some stocks (GB winter flounder, GOM winter flounder, SNE/MA windowpane flounder) the ABCs under this option are higher than in Option 1 and would be expected to result in higher fishing mortality but would not be expected to exceed mortality targets. Option 2 would also be expected to adopt specifications for GOM cod that are more likely to be consistent with current stock status than would be the case under Option 1/No Action.

Table 38 – Estimated probability of overfishing if catch is equal to ABC

Species	Stock	2012	2013	2014
Yellowtail Flounder	GB	0.042	0.008	
Yellowtail Flounder	GB Retro. Adj.	0.969	0.783	
Winter Flounder	GB	0.159	0.193	0.214
Winter Flounder	SNE/MA	0.000	0.000	0.000
Winter Flounder	GOM	~0.100	~0.100	~0.100

Figure 11 – Projected SNE/MA winter flounder stock size

Figure 12 – Projected GB winter flounder stock size

Figure 13 – Projected GB yellowtail flounder stock size

Impacts on other species

Adopting the Option 2 specifications is not expected to have direct impacts on non-groundfish species. Indirect effects are generally likely to be beneficial. The specifications, when combined with the AMs adopted by Amendment 16, could reduce groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects the biological impacts should not be negative. There are some differences in the groundfish catch levels under this option than in Option 2: GB winter flounder, GOM winter flounder are higher, SNE/MA winter flounder is lower, and GOM cod may be lower. These differences are not likely to result in a large difference in fishing effort, so it is not likely that this option will have biological effects on other species that are noticeably different from Option 1/No Action.

6.1.2 Commercial and Recreational Fishery Measures

6.1.2.1 Management Measures for SNE/MA Winter Flounder

Option 1: No Action

Impacts on regulated groundfish

Landings of SNE/MA winter flounder would continue to be prohibited under this option. Because landing is prohibited there would likely be little groundfish fishing for this stock or other stocks that are caught with SNE/MA winter flounder. There is some evidence from SARC 52 what the biological impacts would likely be. The prohibition on landing this stock has been in effect for all of 2010 and eight months of 2009. Catches were well below the groundfish sub-ACL in FY 2010, with only 9 percent of the sub-ACL caught. According to SARC 52 the fully-recruited fishing mortality for those two years was 0.09 in 2009 and 0.05 in 2010, well below the overfishing level of 0.29. The expectation is that fishing mortality would continue to be low if this measure is adopted, contributing to rebuilding of this stock.

This measure would indirectly affect the ability to assess this stock by reducing the number of fish that can be obtained for biological sampling by port agents. Over time this would result in a decreased understanding of changes in the stock and would increase assessment uncertainty.

Impacts on other species

With respect to the commercial fishery this option (when compared to Option 2) would be expected to influence fishing effort for both sector and common pool vessels. The effects are likely to differ by area depending on what other groundfish fishing opportunities are available. For example, in coastal areas south of New England, the major groundfish species are yellowtail flounder and winter flounder, with cod sometimes available in the late winter/early spring. Because this measure prohibits landing winter flounder it would likely lead to reduced groundfish fishing effort in those areas. As a result catches of other species that are made on groundfish trips would likely also decrease. Counteracting these reductions might be shifts in effort to other species to make up for the lost groundfish revenue.

In the Great South Cannel and east of Cape Cod there are other species available and thus this measurer might influence the type of gear used but would not be likely to affect overall effort.

With respect to the recreational fishery this option might result into a redirection of effort onto other target species.

Option 2: Allocate SNE/MA winter flounder to the fishery

Impacts on regulated groundfish

If adopted, this option would allow the landing of SNE/MA winter flounder by both common pool and sector vessels. Catches would still be limited to the ACL that was established and in particular the groundfish fishery would be limited to its sub-ACL. Because landing would be allowed, however, it would be expected that catches would increase when compared to Option 1/No Action and would probably exceed the 9 percent of the sub-ACL caught in FY 2010. Fishing mortality would likely increase when compared to Option 1/No Action but would not be expected to exceed the target fishing mortality used to establish the ABC. This is well below the OFL and it is unlikely that this option would result in overfishing.

An indirect biological impact of this option is that allowing landing of this stock will provide increased opportunities for biological sampling of the catch. Information that is collected will be used as inputs to future assessments. When compared to Option 1/No Action more information will be available for the assessments and there may be an improvement in the quality of future assessments as a result.

Impacts on other species

With respect to the commercial fishery this option (when compared to Option 1) would be expected to influence fishing effort for both sector and common pool vessels. Groundfish effort would be expected to target winter flounder if this measure was adopted. This could lead to increased catches of some species that are caught with winter flounder but might also move effort away from dogfish, skates and monkfish. Recreational fishermen might also reduce catches of other species as they target winter flounder, but the federal recreational fishery is a small component of catches and any impacts are not likely to be noticeably different than those under Option 1.

6.1.2.2 Scallop Catch of Yellowtail Flounder in GB Access Areas – Modification of Restrictions

Option 1: No Action

Impacts on regulated groundfish

If adopted, scallop fishery catches of GB and SNE/MA yellowtail flounder in the CAI, CAII, and NLCA access areas would continue to be limited to 10 percent of the ACL of the relevant stock. This would not limit the potential total catches of yellowtail flounder by the scallop fishery but it would limit the amount of the sub-ACL that is taken within closed areas.

The stocks most affected by this measure are GB yellowtail flounder and SNE/MA yellowtail flounder. If adopted, this option would make sure that no more than 10 percent of the ACL is harvested by scallop vessels within the access areas. This would help spread the scallop fishery catches over the entire stock area. Because this measure could constrain scallop fishing effort within the access areas, it may also reduce catches of other groundfish stocks within these areas. Generally scallop vessels only harvest flatfish in appreciable quantities, so for groundfish species the measure would help limit mortality on winter flounder, plaice, and witch flounder. There would be little impact on cod or haddock.

The measure would not, however, limit the overall catch of these two stocks because it does not change the overall sub-ACL allocated to the scallop fishery. So while there may be benefits in spreading the harvest of yellowtail flounder by this fishery over a broader area, unless fish in the area are significantly larger than those outside the area there would not likely be any difference in fishing mortality between this option and Option 2. If the fish are larger in the access area, the larger the weight of fish harvested outside the area the greater the impact on fishing mortality since mortality is based on the numbers of fish caught, not the total weight. As a result, this option would lead to a higher fishing mortality for a given sub-ACL than Option 2. Whether this would lead to exceeding mortality targets depends on how accurately selectivity is incorporated into the ACLs and how large the difference is between open and access areas.

Impacts on other species

This option could have direct impacts on the catches of scallops on GB and the SNE area. Under the Option 1/No Action measure there is a cap in the amount of GB yellowtail flounder that can be caught by the scallop fishery when fishing in the CAI and CAII access areas. There is also a cap on the amount of SNE/MA yellowtail flounder that can be caught in the NLCA access area. On several occasions the cap has been exceeded and as a result the access areas have been closed before the available scallop yield was harvested. This shifts the remaining scallop fishing effort into open areas. If the scallops are smaller in the open areas than in the access areas- as is typically the case – more scallops are caught for a given weight of harvest, leading to higher scallop fishing mortality than was expected. This result is more of a possibility under this option than would be the case if Option 2 is adopted. In addition, if scallop catch rates are lower in open areas compared to access areas it will take vessels longer to catch the same amount of scallops, so the time gear is fishing could be longer. Increased bottom time can have negative impacts on bycatch if bycatch species are distributed similarly in open areas.

<u>Option 2: Eliminate cap on yellowtail flounder caught in the GB access areas</u>

Impacts on regulated groundfish

This option would potentially allow the entire scallop fishery sub-ACL for either SNE/MA or GB yellowtail flounder to be caught in the CAI, CAII, or NLCA access areas. These sub-ACLs generally are in the range of 5 to 30 percent of the overall ACL. This measure could result in more of the catch of these two stocks being caught in a relatively small part of the stock area, and possibly during a narrowly defined part of the year since the access areas are not open year-round at present. The biological impacts of these localized catches are uncertain. If fish in the closed areas are larger than fish outside the closed areas, than for a given weight of a sub-ACL fewer fish may be caught under this option than under Option 1/No Action, resulting in a lower fishing mortality. But whether this will be noticeable depends on just how large the differences are between fish inside and outside the access areas. Fishing in the access areas is generally prohibited during times when yellowtail flounder are expected to spawn, whereas activity outside the areas is not restricted. So if more of the sub-ACL is taken inside the access areas than would occur under Option 1/No Action there may be less fishing on spawning fish. In the end, since there is still an overall limit, or sub-ACL, on the amount of YTF the scallop fishery can catch the ultimate impact of this option is minimal since the fishery would still have an overall limit.

Impacts on other species

This option could have direct impacts on the catches of scallops on GB and the SNE area. Under the measure there would not be a cap (other than the overall sub-ACL) on the amount of GB yellowtail flounder that can be caught by the scallop fishery when fishing in the CAI and CAII access areas or SNE/MA yellowtail flounder in the NLCA access area. As a result it is more likely that the entire available scallop yield that was planned for will be harvested in the access area, where scallops are usually larger and more concentrated. This makes it more likely that fishing activity will reflect the planned distribution of effort and will increase the probability that scallop mortality targets will be achieved.

6.1.2.3 Atlantic Wolffish Landing Limit

Option 1: No Action

Impacts on regulated groundfish

If this option is adopted possession of Atlantic wolffish would continue to be prohibited. Both recreational and commercial fishermen would be required to return fish to the sea with a minimum of harm. This measure reduces the incentive to target Atlantic wolffish, reducing fishing mortality, but this species is not typically caught in large enough quantities that active targeting is common. Those fish that are incidentally caught would also not be retained and some would be expected to survive. Grant et al. (2005) conducted experiments to determine the survivability of wolffish caught in the yellowtail flounder trawl fishery on the Grand Banks. These experiments demonstrated that wolffish returned to the sea within 1-2 hours had survival rates exceeding ninety percent; if returned to the sea after two hours, survival rates rapidly declined. This measure would thus be expected to reduce fishing mortality of Atlantic wolffish when compared to Option 2. One indirect impact of this measure is that it compared to Option 2 it reduces the number of wolffish that are landed. This means little fishery dependent data is available to monitor the condition of this stock, making future assessments more uncertain.

Impacts on other species

Since wolffish is a minor component of the catch for groundfish fishing vessels this measure is not likely to result in any changes in groundfish fishing effort and is unlikely to have noticeable impacts on other species caught while targeting groundfish. There is no difference between this option and Option 2.

Option 2: Revised Atlantic Wolffish Possession Limit

Impacts on regulated groundfish

If this option is adopted, commercial fishing vessels would be allowed to retain one Atlantic wolffish. Recreational fishing vessels would not be allowed to retain any Atlantic wolffish. The impacts of this measure, when compared to Option 1/No Action, would be expected to be a slight increase in Atlantic wolffish fishing mortality. This is because a small number of Atlantic wolffish that would be discarded –

some of which would be expected to survive - if Option 1 was adopted might be retained and none of these fish would survive. Any impacts on fishing mortality are likely to be slight and probably undetectable. In contrast to Option 1/No Action, more fish would be available for biological sampling and the ability to monitor the stock would be improved.

Impacts on other species

Since wolffish is a minor component of the catch for groundfish fishing vessels this measure is not likely to result in any changes in groundfish fishing effort and is unlikely to have noticeable impacts on other species caught while targeting groundfish. There is no difference between this option and Option 1.

6.1.2.4 Common Pool Restricted Gear Areas

Option 1: No Action

Impacts on regulated groundfish

If this option is adopted the common pool restricted gear areas (RGAs) adopted in Amendment 16 would remain in effect. These areas and the applicable regulations are described in section 3.2.4. The RGAs were implemented primarily to reduce catches of several flatfish species by requiring the use of gear that typically is not effective at catching them. The areas were positioned to reduce catches of SNE/MA winter flounder, SNE/MA yellowtail flounder, SNE/MAB windowpane flounder, witch flounder, and plaice. Based on NMFS estimates of common pool catches in FY 2010, the areas may have helped reduce fishing mortality for SNE/MA winter flounder and SNE/MA yellowtail flounder. Common pool catches were only 25.9 percent of its allocation of SNE/MA yellowtail flounder, and total groundfish fishery catches of SNE/MA winter flounder were only 9.1 percent. There is some indication, however, that this measure is not as effective as might be expected based on the requirements adopted in Amendment 16. Section 5.4.1.1 describes fishing activity in the areas and it is apparent that compliance with this measure is poor. When compared to Option 2, this measure would be expected to reduce fishing mortality for several groundfish stocks even if compliance is weak.

Impacts on other species

The Option 1/No Action RGAs affect groundfish fishing activity by common pool vessels in certain defined areas. The gears that are required typically have reduced catches of bottom-dwelling species and would be expected to reduce catches of monkfish, skates, and dogfish while fishing on groundfish trips. Conceptually the expected result would be reduced fishing mortality for these species that would result from groundfish fishing activity. Common pool vessels represent only a small part of the fishery, however, so it is not likely these impacts would be noticeably different from the impacts of Option 2. This is particularly true given the information in section 5.4.1.1 that suggests that compliance is poor.

Option 2: Removal of Common Pool Restricted Gear Areas

Impacts on regulated groundfish

This Option would remove the restricted gear area provisions adopted by Amendment 16 and described in section 3.2.4. When compared to Option 1/No Action this measure would be expected to lead to increased fishing activity by common pool vessels that might target SNE/MA winter flounder, SNE/MA yellowtail flounder, and several other stocks. As a result it is reasonable to expect that common pool catches would increase form those in FY 2010 and 2011. This would increase fishing mortality for these stocks. Catches would not be allowed to exceed ACLs for these stocks, however, since other measures are in place to limit catches. Beginning in FY 2012 the common pool AMs will include trimester TACs for most species, allowing strict control of catches in-season. Other measures are also in place that would allow NMFS to keep catches below ACLs. As a result, while this measure might increase fishing mortality when compared to Option 1/No Action, mortality targets are not likely to be exceeded.

Impacts on other species

Option 2 removes the RGAs that affect groundfish fishing activity by common pool vessels in certain defined areas. The gears that are required typically have reduced catches of bottom-dwelling species and would be expected to reduce catches of monkfish, skates, and dogfish while fishing on groundfish trips. Conceptually the expected result would be increased fishing mortality for these species that would result from groundfish fishing activity. Common pool vessels represent only a small part of the fishery, however, so it is not likely these impacts would be noticeably different from the impacts of Option 1/No Action. This is particularly true given the information in section 5.4.1.1 that suggests that compliance is poor.

6.1.2.5 Accountability Measures

Option 1: No Action

Impacts on regulated groundfish

If this option is adopted the primary AM for ocean pout, both windowpane flounder stocks, Atlantic halibut, Atlantic wolffish, and SNE/MA winter flounder would be the trimester “hard” TAC system that applies to common pool vessels beginning in FY 2012. This measure may not be an effective control on fishing mortality for these stocks for several reasons. First, the AM applies only to common pool fishing vessels and does not constrain vessels fishing in sectors. As a result only part of the catches will be affected by the AMs. In FY 2010, common pool catches of these stocks as a percent of total groundfish catches ranged from a minimum of 1.2% for GOM/GB windowpane flounder to a maximum of 28.4% for SNE/MAB windowpane flounder (Table 39). This suggests that a perfectly implemented common pool AM could only account for an overage of the groundfish sub-ACL of a similar amount. In FY 2010 the commercial groundfish sub-ACL was only exceeded for GOM/GB windowpane flounder (see section xxx for a summary of FY 2010 catches) and the common pool clearly could not account for a similar overage in the future. A perfectly implemented common pool AM might be able to account for a groundfish sub-ACL overage of around 10 percent for the other stocks. With respect to total catches, the common pool percentage was smaller, only exceeding ten percent for Atlantic wolffish. It is unlikely an AM on the common pool alone could account for substantial overage of the total ACL.

Table 39 – Common pool and sector catches of six stocks. Data from NERO ACL monitoring reports for FY 2010.

Stock	FY 2010 ACL Catch Estimates (mt) Total	Commercial Groundfish	Sector	Common Pool	Common Pool as % of Commercial Groundfish
SNE/MA Winter Flounder	363.2	47.4	42.3	5.1	10.8%

Northern Windowpane	162.1	153.5	151.7	1.8	1.2%
Southern Windowpane	534	73.6	52.7	20.9	28.4%
Ocean Pout	90.3	65.2	56.5	8.7	13.3%
Halibut	36	27.8	25.6	2.2	7.9%
Wolffish	22.5	22.4	18.9	3.5	15.6%

At issue, however, is the design of the AMs under Option 1/No Action for certain stocks. For ocean pout, Atlantic halibut, and the two windowpane flounder stocks the hard TAC AM that will be implemented in FY 2010 calls for adjusting trip limits if the sub-ACL is exceeded. The management plan already prohibits landing windowpane flounder and ocean pout so this restriction would not be effective in reducing fishing mortality for these stocks. There would be some reduction in mortality expected to result from reducing the Atlantic halibut trip limit form one fish to 0 if some of the fish survive that are discarded as a result of the measure. For SNE/MA winter flounder the Option 1/No Action alternative limits common pool fishing activity in the SNE/MA winter flounder stock area, which will reduce fishing mortality. If combined with a prohibition on landing by all vessels, this AM will effectively control fishing mortality for this stock. Indeed, in FY 2009 and 2010, possession of SNE/MA winter flounder was prohibited and fishing mortality was below F_{MSY} for the first time in recent years and was well-below the ACL – this suggests the Option 1/No Action AM might be effective. Similarly, with Atlantic wolffish, exceeding a trimester ACL results in a closure of statistical areas 513/514/521/522 to trawl, sink gillnet, and longline groundfish fishing activity. Whether this reduces mortality depends in part on timing. Few wolffish are caught in the winter months so if the AM is implemented at that time there would likely be little impact on fishing mortality. At other times of the year this measure would be very effective in reducing wolffish catches.

Overall, if this measure would be adopted, the controls on fishing mortality for ocean pout and windowpane flounder stocks would not be as effective as the other options. For Atlantic halibut, the controls would be similar to Option 3 but less effective than Option 2. Over the long-term this may lead to higher fishing mortality rates that might exceed mortality targets. The control for Atlantic wolffish would be better since fishing activity is actually reduced if the ACL is exceeded. For SNE/MA winter flounder, this measure would be effective because it restricts common pool fishing activity if the ACL is exceeded. This would reduce encounters with the stock – the other options reduce retention but there would be more fishing activity expected to continue and some dead discards would result.

Impacts on other species

This measure would not be expected to have any direct impacts on other species. This is primarily because the AMs only apply to common pool vessels which represent only a fraction of groundfish fishing activity. The AMs for ocean pout, windowpane flounders, and halibut would not be expected to have any real impacts on even that small amount of activity. The AMs for SNEM/MA winter flounder and wolffish would, if triggered, reduce common pool fishing but given the limited nature of that activity it is not likely the impacts on the mortality of other species would be noticeable. When compared to Option 2 this measure would result in higher fishing mortality rates for other species but the difference may not be measureable.

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

Impacts on regulated groundfish

This AM would impose area-based restrictions if the total ACL for any of these stocks is exceeded. The restrictions are designed to apply at certain times and in certain areas. If an AM is triggered either selective gear is required in an area or the area is closed to fishing with particular gear. Details are provided in section 3.2.5. It is important to note that this AM affects all groundfish fishing activity, sector and common pool, unlike Option 1/No Action.

The identification of the areas is described in detail in Appendix XXX but the following general overview will aid in understanding the biological impacts of the measure. Observer data and landings data were combined to determine where these stocks were being caught. For windowpane flounders and ocean pout most of the catch is discarded so landings data were not significant, but for Atlantic halibut and wolffish landings data were also examined. An estimate of catches (discards only for windowpane and ocean pout, landings and discards for other stocks) in each ten minute square was developed for each stock and for the appropriate gear types (generally just trawl gear for ocean pout and windowpane flounder; trawl, longline, and sink gillnet for wolffish and halibut). There are limitations to the data that are described in the appendix that create uncertainties in this approach. While observer data can be accurately binned to relatively small areas, VTRs are the only source of landings data and there are known to be errors in the accuracy of the information reported by fishermen (see Palmer et al.XXX). The results should not be viewed as being precise estimates because of these errors.

Once the catch data were binned by ten-minute square a test was applied to identify areas with statistically significant higher catches than the immediate area and the stock area as w hole. These areas were used to select the AM areas where appropriate restrictions would be adopted. The size of the areas was selected based on the amount of catches that need to be affected. In addition, qualitative consideration was given to the data limitation previously described, the probability that effort may be displaced into other areas, and the likelihood that the measures may not be perfectly effective (see section 5.4.1.1 for a discussion of compliance with Amendment 16 restricted gear areas).

In general, the proposed AM areas, if implemented, would be expected to reduce trawl catches of the targeted stocks by requiring selective gear. These gears have been shown to reduce catches of flatfish, the major target of these AMs, in several experiments. It is likely that there would be some effort displacement that would reduce the effectiveness of the measures: rather than use selective gear in the AM area, some fishermen may continue to use non-selective trawls and shift their effort into other areas to target the species they would lose when using the selective gear. For sink gillnet and longline gear the proposed measure would prohibit fishing in the defined AM areas. While this would make the AM more effective in these areas for these gears, it is more probable that effort would be displaced into other areas.

There are two sub-options for timing of this AM. If sub-option A is adopted an estimate of catches is made late in the fishing year and if the estimate exceeds the sub-ACL the AM is implemented at the start of the fishing year that immediately follows. The advantage of this option would be that if there is an overage measures are implemented very quickly to prevent additional overage. This would be expected to have a more immediate effect on fishing mortality and would make it more likely that mortality targets would be achieved. This is only true if the estimated catch is accurate. If the catch is under-estimated in-season then the AMs would not be triggered when necessary and the response to an overage would be delayed. Sub-option B attempts to address this concern by delaying the implementation of AMs until year 3 for an overage in year 1. This provides more time to receive and reconcile data and confirm catch estimates before restricting the fishery. The experience with monitoring FY 2010 catches supports this approach: catches for several stocks were initially over-estimated and needed to be revised.

As compared to Option 1/No Action and Options 3 and 4, this measure would be expected to lead to more control on groundfish fishery catches of ocean pout, Atlantic halibut, and windowpane flounders because fishing effort is constrained. Even if the selective gear is not perfectly effective the fact that both common pool and sector vessels are constrained by the AM makes it more likely that the measure will be sufficient to control catches to the ACLs. Because of the increased controls on catches it is more probably that this option will help to achieve mortality targets. It would be less effective for Atlantic wolffish than Option 1/No Action since fishing in the AM area is not prohibited for trawl gear and the AM area is smaller than the area that is closed in Option 1/No Action. It would be more effective for Atlantic wolffish than Option 4.

Impacts on other species

Option 2, if adopted, and if the AMs are triggered, may result in reduced fishing mortality for non-groundfish species that are caught on groundfish fishing trips. This is because the AMs either require use of selective trawl gear or close areas to sink gillnet and longline gear. The selective trawl gear would be expected to reduce catches of skates and monkfish in the AM areas. Similarly, closing areas to sink gillnet or longline gear would likely reduce catches of skates and dogfish. Mortality of these stocks under this measure would be expected to be lower than under any of the other options, including Option 1/No Action. These differences would only occur of the AMs are triggered because an ACL is exceeded.

<u>Option 3: Atlantic halibut No Possession AM</u>

Impacts on regulated groundfish

If adopted this measure would prohibit landing Atlantic halibut if the sub-ACL would be exceeded. On the surface this measure appears similar to the Option 1/No Action alternative which allows for adjustments to the Atlantic halibut trip limit when a percentage of the TAC/ACL is projected to be caught. But unlike the No Action alternative, this measure would prohibit possession by both sector and common pool vessels. Since a greater percentage of the catch would be subject to this measure the control of fishing mortality would be more effective than under the No Action alternative. When compared to Option 2, this measure would likely be less effective. Unlike Option 2, which restricts fishing activity in certain areas if the ACL is exceeded, this measure does not restrict activity and similar amounts of halibut would be expected to be caught both before and after the AM is implemented. The effectiveness of this measure in reducing mortality would be due to the portion of the discarded catch that survives once the AM is implemented.

Impacts on other species

This measure would be unlikely to have any effect on fishing mortality for other species caught on groundfish fishing trips. This is because halibut is not a target species and even if the AM is triggered it is not likely to change groundfish fishing effort. If the AM is triggered, the impacts of this option on other species would be similar to Option 1/No Action and would have less effect on fishing mortality than Option 2. It cannot be compared to Option 4 because that measure is for a different species.

<u>Option 4: Atlantic Wolffish No Possession AM</u>

Impacts on regulated groundfish

If adopted this measure would prohibit landing Atlantic wolffish if the sub-ACL would be exceeded. Unlike the No Action alternative, this measure would prohibit possession by both sector and common pool vessels at all times as a pro-active approach to an AM. When compared to Option 2, this measure would likely be less effective. Unlike Option 2, which restricts fishing activity in certain areas if the ACL is exceeded, this measure does not restrict activity and similar amounts of wolffish would be expected to be caught both before and after the AM is implemented. The effectiveness of this measure in reducing mortality would be due to the portion of the discarded catch that survives once the AM is implemented.

This measure would not have any impacts on Atlantic wolffish fishing mortality unless commercial fishing vessels would be allowed to retain one fish as proposed in section 3.2.3.2. If possession is prohibited already this measure may be an effective tool to limit catches, but if there is an overage of the ACL there is no automatic response to implement additional measures.

Impacts on other species

This measure would be unlikely to have any effect on fishing mortality for other species caught on groundfish fishing trips. This is because halibut is not a target species and even if the AM is triggered it is not likely to change fishing effort. If the AM is triggered, the impacts of this option on other species would be similar to Option 1/No Action and would have less effect on fishing mortality than Option 2. It cannot be compared to Option 34 because that measure is for a different species.

6.2 Essential Fish Habitat Impacts

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

The area that is potentially affected by the proposed TACs has been identified to include EFH for species managed under the following Fishery Management Plans: NE Multispecies; Atlantic Sea Scallop; Monkfish; Atlantic Herring; Summer Flounder, Scup and Black Sea Bass; Squid, Atlantic Mackerel, and Butterfish; Spiny Dogfish; Tilefish; Deep-Sea Red Crab; Atlantic Surfclam and Ocean Quahog; Atlantic Bluefish; Northeast Skates; and Atlantic Highly Migratory Species. This proposed action makes relatively minor adjustments in the context of the fishery as a whole, and, for the reasons stated above, is not expected to have any adverse impact on EFH. Furthermore, the proposed action does not allow for access to the existing habitat closed areas on GB that were implemented in Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP and therefore it continues to minimize the adverse impacts of bottom trawling and dredging on EFH. Overall, there are likely to be only minor differences between the EFH impacts of this measure those of Option 2.

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

6.2.1.1 Revised Status Determination Criteria for Winter Flounders and Gulf of Maine Cod

Option 1: No Action

Adoption of the No Action alternative would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be the criteria adopted in Amendment 16.

Option 2: Revised Status Determination Criteria

Adoption of Option 2 would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be based on the most recent benchmark assessments and would be based on the best available science, consistent with M-S Act requirements.

From a habitat perspective, the SDC themselves are less important than the catch limits that result from implementing those criteria to generate annual catch limits (ACL). Qualitatively, it is assumed that revised criteria based on the most recent scientific advice will result in increases in stock size over the long term, which hopefully should lead to increased catch per unit effort (CPUE), and therefore reduce seabed area swept. However, many factors interact to produce the seabed area swept in a particular fishery, such that the effect of changing SDC on the amount of habitat impacts is uncertain at best.

6.2.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

Option 1: No Action

This option would maintain the rebuilding strategy adopted for this stock in FW 45, which calls for rebuilding by 2016 with a median probability of success. Assessment results from TRAC 2011 indicate that the stock cannot rebuild by 2016 even in the absence of all fishing mortality. Thus, if this strategy is continued, fishing mortality would have to be kept as close to 0 as possible. It is likely that catch limits associated with a near-zero fishing mortality rate would lead to decreases in fishing effort and thus decreases in seabed impacts, but the magnitude of such changes is difficult to predict.

Option 2: Revised rebuilding Strategy for GB Yellowtail Flounder

These sub-options would modify the rebuilding strategy for GB yellowtail flounder, targeting a fishing mortality rate that will rebuild with a median probability of success by a specific date (2021 for sub-option A, and 2032 for sub-option B).

These extended rebuilding strategies and their associated higher fishing mortalities are likely to have associated increases in effort and seabed area swept as compared to No Action. However, although it is difficult to predict the magnitude of change, yellowtail flounder are caught in deeper, sandy portions of GB that are less vulnerable to fishing impacts.

6.2.1.3 Identification of Additional Sub-Annual Catch Limits

6.2.1.4 U.S./Canada Resource Sharing Understanding TACs

TBD

6.2.1.5 Mixed Stock Exception for SNE/MAB Windowpane Flounder

6.2.1.6 Administration of Scallop Fishery Sub-ACLs

Option 1: No Action

If this option is adopted there would be no changes in the way scallop fishery sub-ACLs are administered. Currently, AMs are implemented for the scallop fishery if that fishery exceeds its sub-ACL whether or not the overall ACL is exceeded.

Option 2: Changes to Scallop Fishery Sub-ACL Administration

If Option 2 is adopted, then scallop fishery catches of groundfish stocks would continue to be compared to the sub-ACLs, but the AM would only be triggered if the overall ACL was exceeded. Whatever the trigger, it is assumed that the area-closure AMs provide sufficient incentive to avoid catching sub-ACL stocks (GB yellowtail and SNE/MA yellowtail) in the scallop fishery. If these AMs are avoided, fishing effort, area swept, and EFH impacts are unlikely to change as a result of implementing this alternative. If the AMs are triggered, scallop fishing effort and thus EFH impacts will be redistributed spatially during the closure months. The possible increase or decrease in EFH impacts under seasonal AM closures is difficult to predict.

6.2.1.7 Annual Catch Limit Specifications

Option 1: No Action

This option would maintain the specifications (OFLs/ABC/ACLs) for FY 2012 at the same levels adopted by FW 44 and FW 45. It would also maintain the distribution of the catches to various fisheries sub-components.

The specification of ACLs is an administrative measure that is usually not expected to have direct impacts on essential fish habitat. The ACLs are consistent with the fishing mortality targets adopted by Amendment 16. These targets form the basis for the effort controls that apply to the common pool vessels and the amount of catch that can be taken by vessels that join sectors. The specification of ACLs, however, does have indirect impacts on essential fish habitat because they limit the total catches that can be harvested by fishermen and thus provide a constraint on fishing effort. The distribution of the ACLs can affect not only total groundfish fishing effort but also the distribution of that effort into the various groundfish stock areas. While in earlier years the ACLs did not have a direct impact on common pool vessels because those vessels are subject to effort controls, beginning in FY 2012 common pool vessels are subject to hard TACs for most stocks.

Implementation of Option 1/No Action would mean that specifications would not be changed from levels specified in FW 44 and FW 45. As a result fishing effort would be expected to be similar to that of the past two years and there would not likely be changes to impacts on EFH.

Overall, twelve of the ACLs in this option are identical to those in Option 2. The ACL for GB winter flounder is slightly smaller, the ACL for GOM winter flounder is much smaller, the ACL for SNE/MA winter flounder is larger, and the GB yellowtail flounder ACL is larger, and the GOM cod ACL may be either larger or smaller. Generally these differences would not be expected to result in major shifts in fishing effort that might result in impacts on EFH that differ from Option 2. The exception to this general conclusion might be if the GO M cod ACL is significantly different in Option 2 than in Option 1/No Action. If the Option 1 ACL is larger, then when compared to Option 2 there may be more fishing effort in the GOM. Most GOM cod is caught by small vessels, so it is not likely that when compared to Option 2 there would be a shift of fishing activity by larger offshore vessels into the GOM. It is not likely any changes would result in differential impacts on EFH between the two options.

This option adopts a specific allocation of yellowtail flounder for the scallop and groundfish fisheries. In FY 2012 the allocation may reduce scallop effort if the scallop fleet is unable to reduce incidental catches and loses access as a result. Such differences are likely to be minor, and if the scallop fishery further reduces incidental catch rates they may not occur. It is also possible that the fishery may be forced to reduce effort in one area but will respond by redirecting that effort to other areas. There are no differences in the scallop fishery allocation between this option and Option 2, so there would not likely be any differential impacts to EFH between the options.

For the groundfish fishery, a larger ACL for GB yellowtail flounder would be adopted by this option than would be adopted by Option 2. For sector vessels, increased access to yellowtail flounder would be less likely to immediately constrain fishing activity and reduce fishing effort, while for common pool vessels the impacts may be delayed until an AM is triggered. In both cases the indirect impacts for EFH are likely to be minor. This provision only affects a small portion of the groundfish fleet, and yellowtail flounder fishing usually does not occur on complex, sensitive habitats.

<u>Option 2: Revised Annual Catch Limit Specifications</u>

Option 2 would adopt new ABCs for the following: GOM winter flounder, GB winter flounder, SNE/MA winter flounder, GB yellowtail flounder, GOM cod, GOM/GB windowpane flounder, SNE/MA windowpane flounder, and ocean pout. The ACL for GB winter flounder is slightly smaller, the ACL for GOM winter flounder is much smaller, the ACL for SNE/MA winter flounder is larger, and the GB yellowtail flounder ACL is larger, and the GOM cod ACL may be either larger or smaller. Changes in windowpane flounder and ocean pout ACLs are not likely to affect the distribution of fishing effort because these stocks cannot be retained and they are not targeted. Other specifications would remain as adopted by FW 44 and FW 45.

Generally the differences in ACLs between this option and Option 1/No Action would not be expected to result in major shifts in fishing effort that might result in impacts on EFH that differ from Option 1. The exception to this general conclusion might be if the GO M cod ACL is significantly different in Option 2 than in Option 1/No Action. If the Option 1 ACL is larger, then when compared to Option 2 there may be more fishing effort in the GOM. Most GOM cod is caught by small vessels, so it is not likely that a small ACL under Option 2 would lead to a shift of fishing activity by smaller vessels into the GB area. It is not likely any changes would result in differential impacts on EFH between the two options.

This option adopts a specific allocation of yellowtail flounder for the scallop and groundfish fisheries. In FY 2012 the allocation may reduce scallop effort if the scallop fleet is unable to reduce incidental catches and loses access as a result. Such differences are likely to be minor, and if the scallop fishery further reduces incidental catch rates they may not occur. It is also possible that the fishery may be forced to reduce effort in one area but will respond by redirecting that effort to other areas. There are no differences between the scallop fishery allocation between this option and Option 1 and so there would not likely be any differential impacts to EFH between the options.

For the groundfish fishery, a smaller ACL for GB yellowtail flounder would be adopted by this option than would be adopted by Option 1. For sector vessels, decreased access to yellowtail flounder would be more likely to immediately constrain fishing activity and reduce fishing effort, while for common pool vessels the impacts may be delayed until an AM is triggered. In both cases the indirect impacts for EFH are likely to be minor. This provision only affects a small portion of the groundfish fleet, and yellowtail flounder fishing usually does not occur on complex, sensitive habitats.

6.2.2 Commercial and Recreational Fishery Measures

6.2.2.1 Management Measures for SNE/MA Winter Flounder

Option 1: No Action

If adopted, the prohibition on landing SNE/MA winter flounder would continue. SARC 52 estimated very low fishing mortality during May-Dec 2009 and during 2010, and that catches were only 9% of the groundfish sub-ACL during fishing year 2010. If the prohibition continues, it is expected that there would be little fishing for SNE/MA winter flounder and associated species, such that habitat impacts would remain similar to those in recent years.

Option 2: Allocate SNE/MA winter flounder to the fishery

If adopted, this option would allow the landing of SNE/MA winter flounder by both common pool and sector vessels within the groundfish fishery sub-ACL. This would probably lead to an increase in targeted fishing effort on the stock, and thus an increase in habitat impacts, but the magnitude of this increase would be limited as fishing effort would still be capped by the sub-ACL.

6.2.2.2 Scallop Catch of Yellowtail Flounder in GB Access Areas – Modification of Restrictions

Option 1: No Action

If adopted, scallop fishery catches of yellowtail flounder in the CAI, CAII, and NLCA access areas would continue to be limited to 10 percent of the TAC (GB stock) or ACL (SNE/MA stock). This would not limit the potential total catches of yellowtail flounder by the scallop fishery beyond the limits set by the sub-ACL, but it would maintain the 10% limit for catches from within closed areas.

Option 2: Eliminate cap on yellowtail flounder caught in the GB access areas

If adopted, this option would remove the 10% cap, but the scallop fishery would still be subject to the scallop fishery sub-ACL for each stock. This option would provide added flexibility for the scallop fishery to use its sub-ACL within either access areas or open areas within the GB and SNE/MA yellowtail stock areas. The likelihood of exceeding the sub-ACL will vary by year based on the size of the sub-ACL, the number of access trips allocated and the distribution of scallop access trips by area, so it is not possible to say whether this measure would affect the amount and location of scallop fishing effort in any particular year. However, it is generally accepted that scallop fishery EFH impacts will be reduced if fishing effort is concentrated in access areas, where scallop catch rates are higher and area swept is therefore lower for a given amount of catch. Therefore, to the extent that this option increases the likelihood that scallop fishing will occur in access areas because the 10% cap is removed, it is expected that impacts to EFH would be reduced as compared to No Action.

6.2.2.3 Atlantic Wolffish Landing Limit

Option 1: No Action

If adopted, the zero possession limit for Atlantic wolffish would be maintained.

Option 2: Revised Atlantic Wolffish Possession Limit

If adopted, commercial vessels would be allowed to land one wolffish per trip. Wolffish is a very minor component of groundfish catches and an increase in the possession limit to one wolffish per trip is unlikely to have a large influence on fishing behavior, i.e., it is not expected that this measure would cause vessels to target wolffish. Thus, no changes in fishing location or the amount of fishing effort are expected, and no changes in EFH impacts would result from this measure. Impacts on EFH would not be any different than those expected under Option 1/No Action.

6.2.2.4 Common Pool Restricted Gear Areas

Option 1: No Action

If adopted, the Western GB Multispecies RGA and the Southern New England Multispecies RGA would be maintained.

Option 2: Removal of Common Pool Restricted Gear Areas

If adopted, the Western GB Multispecies RGA and the Southern New England Multispecies RGA would be removed. This change would be expected to lead to increased fishing activity by common pool vessels that might target flatfish species, including SNE/MA winter flounder, SNE/MA yellowtail flounder, etc. However, as catches of these species would still be limited by their ACLs, any increases in EFH impacts would likely be minimal.

6.2.2.5 Accountability Measures

Option 1: No Action

If adopted, AMs for Atlantic halibut, ocean pout, windowpane flounder, and Atlantic wolffish will remain as specified by Amendment 16. For wolffish, exceeding the ACL results in an area closure for common pool vessels; for the other species possession limits are decreased.

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

Windowpane flounder and ocean pout:

If adopted, this option would implement trawl gear restrictions in certain areas during either year 2 or year 3 based on ACL overages that occurred in year 1. Windowpane and ocean pout currently have zero possession limits and are therefore not target species. Implementing more restrictive area-based AMs might encourage increased avoidance of these species, but only negligible shifts in the magnitude or location of fishing effort and therefore in the magnitude of EFH impacts are expected.

Atlantic halibut:

If adopted, this option would (1) require the use of selective trawl gear in specified trawl halibut AM areas, (2) restrict entirely sink gillnet and longline vessel operation in specified fixed gear halibut AM areas, and (2) set a zero possession limit for all vessels. Because halibut is not a target species, shifting from a lower possession limit to a zero possession limit/gear-area restriction AM is only expected to cause negligible shifts in the magnitude or location of fishing effort and therefore in the magnitude of EFH impacts.

Atlantic wolffish:

If adopted, this option would (1) require the use of selective trawl gear in specified trawl wolffish AM areas, and (2) restrict entirely sink gillnet and longline vessel operation in specified fixed gear wolffish AM areas. The measures would not be in effect during January, February, or March because wolffish next guarding behavior makes them generally unavailable to the fishery at that time. Because wolffish are such a small component of groundfish catches, shifting from a common-pool area closure to a gear/area restriction AM is not expected to cause large shifts in the magnitude or location of fishing effort and therefore in the magnitude of EFH impacts.

Option 3: Atlantic Halibut No Possession AM

This option would implement a zero possession limit for all vessels if the wolffish ACL is exceeded. Because wolffish are such a small component of groundfish catches, shifting from a common-pool area closure to a seasonal possession limit AM is only expected to cause negligible shifts in the magnitude or location of fishing effort and therefore in the magnitude of EFH impacts.

Option 4: Atlantic Wolffish No Possession AM

This option would implement a zero possession limit for all vessels if the wolffish ACL is exceeded. Because wolffish are such a small component of groundfish catches, shifting from a common-pool area closure to a seasonal possession limit AM is not expected to cause large shifts in the magnitude or location of fishing effort and therefore in the magnitude of EFH impacts.

6.3 Impacts on Endangered and Other Protected Species

6.3.1 Updates to Status Determination Criteria, Formal rebuilding Programs, and Annual Catch Limits

6.3.1.1 Revised Status Determination Criteria for Winter Flounder and GOM cod

Option 1: No Action

This option would keep existing SDCs for the three winter flounder stocks and GOM cod. There would be no changes to expected catch levels over the long-term. The impacts of the fishery to protected species may not change as a result of the continuation of the rebuilding plan, however this option would be inconsistent with the requirements of the M-S Act, specifically National Standard 2.

Option 2: Revised Status Determination Criteria for Georges Bank, Gulf of Maine, and Southern New England Winter Flounder and Gulf of Maine Cod

This option would adopt new SDCs for these stocks based on recent (or soon to be completed) assessment results. These new criteria determine the amount of catch that is available in both the short and long-term. The new SDCs result in a small increase in the GB winter flounder MSY and about a 20 percent increase in the SNE/MA winter flounder MSY. The increase for GOM cod is not yet known and the MSY value for GOM winter flounder is unknown. Over the long-term this measure could result in increased groundfish fishing activity in the SNE/MA winter flounder stock area but this will not occur until the stock is rebuilt. This could increase interactions between the groundfish fishery and endangered and protected species n this area. These revised criteria, however, comply with the M-S Act requirement to use the best available science.

6.3.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

Option 1: No Action

This option would rebuild this stock more quickly than the other options under consideration by targeting rebuilding by 2016 with a 50 percent probability of success. The 2011 assessment of this stock (TRAC 2011) indicated that a fishing mortality of F=0 would need to be adopted to achieve this goal (although the assessment noted that goal could not be achieved even under this fishing mortality). A fishing mortality of F=0 would mean all fishing would cease, and would likely result in a benefit for protected species by reducing any potential interaction with groundfish fishing gear in all areas at all times.

Option 2: Revised Rebuilding Strategy for Georges Bank Yellowtail Flounder

This option considers two different rebuilding periods: sub-option A would rebuild by 2023 and sub-Option B would rebuild by 2032. Either option would allow for greater catches during rebuilding than would be the case under Option 1/No Action.

Compared to the Option 1/No Action alternative, these sub-options would possibly result in more effort exerted by the fishery; and may therefore result in more possible gear interactions for protected species, such as harbor, hooded and harp seals. Although not directly correlated, the greater the fishing effort, the more interactions with protected species may occur. Sub-option A has less probability of gear interaction with protected species than sub-option B as it has the lowest target fishing mortality rate. Effort in the fishery may or may not result in area shifts; it is unclear how fishermen may react to the target mortality rates. Overall it is important to note that the differences in impact on protected species between the sub-options are likely to be minor, and the target fishing mortality values may change in future years if stock conditions differ from the projection results. In all cases the impact to protected species is likely to be negative but inconsequential. The uncertainty in the location and amount of effort exerted by the fishery, however, makes it difficult to calculate the amount of impact that the four sub-options may have on protected species, from impacts such as forage availability to encounters with fishing vessels.

6.3.1.3 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

Under this option no TACs would be implemented for GB cod, GB haddock, and GB yellowtail in the U.S./Canada area for FY 2012 in opposition to the recommendation of the TMGC. The impacts to protected species may be positive, as there would be less effort in the area, which would reduce the likelihood of fishery encounter with protected species. However, No Action would also lengthen the rebuilding time of the stock, which could decrease the amount of forage available for protected species. Overall, the impacts are expected to be negligible and similar to Option 2.

Option 2: U.S./Canada TACs

This option would adopt the TMGC recommendations for GB cod, GB haddock, and GB yellowtail in the U.S./Canada area for FY 2012. The FY 2012 TACs would be lower than the FY 2011 TACs and would maintain the rebuilding schedule for the pertinent stocks, which may increase potential forage and reduce the probability of fishery encounters with protected species. The FY 2012 TACs under this option would be higher than the No Action alternative, which would not specify any TACs for the three stocks. Therefore, the impacts to protected species under this alternative may increase slightly compared to the No Action alternative. However, the rebuilding schedule for the pertinent stocks would be faster, and forage species may be more readily available. Changes in the distribution of fishing effort in the U.S./Canada Management Area as a result of this action are unknown, though the impacts are expected to be negligible as a result of this action.

The effect of a zero allocation of trips in the CA II SAP is difficult to evaluate because fishing effort would still be allowed in CA II under the expanded access allowed for haddock from August 1 through January 31. There would likely be an increase in fishing effort in the Eastern U.S./Canada Management Area in FY 2012 compared to years priors to FY 2010 due to the opportunity to fish in CA II.

Compared to fishing years prior to FY 2010, there is likely to be an increase in fishing effort in the Eastern U.S./Canada Area due to the opportunity to fish in CA II, which had not been accessible to the groundfish fishery since 2004. An increase in effort would have limited effect on ESA-listed cetaceans given the measures that are already in place under the ALWTRP for the use of gear in the groundfish fishery, and would have limited effect on ESA-listed sea turtles given their distribution and abundance on Georges Bank.

Delay of the use of trawl gear in the U.S./Canada Management Area until August 1, 2012 would benefit protected species, such as small cetaceans, that occur in the management area and can be captured in trawl gear. A delay in the use of trawl gear would not change the effects on large cetaceans since these species are not captured in trawl gear. The delay would also not likely change the effects on sea turtles because of the relatively low abundance and distribution of sea turtles in the U.S./Canada Management Area.

6.3.1.4 Administration of Scallop Fishery Sub-ACLs

Option 1: No Action

If Option 1/No Action is adopted there would not be any changes to the administration of scallop fishery sub-ACLs of groundfish stocks. The impacts on endangered and other protected species depends in large measure on which stocks have scallop fishery sub-ACLs. At present there are only two: GB yellowtail flounder and SNE/MA yellowtail flounder. The sub-ACLs have the potential to impact the distribution of scallop fishing effort because if exceeded scallop fishing activity is limited the following year.

When compared to Option 2 there is the possibility that the AMs will be triggered more frequently if this option is adopted. This is because the only criterion that must be met is for the scallop sub-ACL to be exceeded. The impacts on protected species depend on which AM is triggered. If only the GB yellowtail flounder AM is triggered it is possible the scallop fishing effort may shift into the SNE area where interactions with turtles are more common. If only the SNE yellowtail flounder AM is triggered effort may shift out if the SNE area. The major concern would be if effort shifts in ways that were not expected when scallop fishing measures were adopted. If that were to occur then the impacts on protected and endangered species may be different than that analyzed in the scallop action implementing the measures. These impacts could be either positive or negative.

With respect to Option 3, if Option 1/No Action is adopted any uncaught part of the GB yellowtail flounder sub-ACL for the scallop fishery would remain uncaught. As a result groundfish fishing effort on GB might be marginally smaller than if Option 3 is adopted. This may provide minor benefits to protected and endangered species but the difference in groundfish fishing effort are likely to be small and any benefits may be undetectable.

Option 2: Changes to Scallop Fishery Sub-ACL Administration

If Option 2 is adopted the scallop AMs would only be implemented if one of two criteria were met: either the overall ACL is exceeded or the scallop fishery exceeds its sub-ACL by 50 percent or more. These changes make it less likely that the AMs will be implemented. As a result, when compared to Option 1/No Action, there are less likely to be unexpected shifts in the distribution of scallop fishing effort that could lead to unforeseen impacts on protected and endangered species. As a result this option would be expected to be beneficial to these species.

This option is not directly comparable to Option 3.

Option 3: Re-Estimation of Scallop Fishery GB Yellowtail Flounder Sub-ACL

If this option is adopted then it is less likely that there will be uncaught GB yellowtail flounder. This is because if the scallop fishery does not catch all of its sub-ACL, the amount is re-estimated and any difference is made available to the groundfish fishery. Generally the groundfish fishery catches nearly lap of the GB yellowtail flounder that is available. As a result, there may be slightly more fishing effort on GB than would be the case if Option 1 is adopted. Although not directly correlated, the greater the fishing effort, the more interactions with protected species may occur. Any changes are likely to be minor and are not likely to jeopardize endangered or other protected species. The scallop fishery sub-ACL for GB yellowtail flounder is typically a few hundred metric tons and if only part of this is made available to the groundfish fishery it would not lead to major changes in fishing effort.

6.3.1.5 Annual Catch Limit Specifications

Option 1: No Action

This No Action option does not modify the OFLs/ABCs/ACLs for GB cod, GB haddock, GB yellowtail flounder, white hake, and pollock that were adopted by FW 44 (NEFMC 2010) and FW 45 (NEFMC 2011). All of the elements of the ACLs would remain the same, such as the allocations of GB and SNE/MA yellowtail flounder to the scallop fishery that were adopted in that same action.

No major protected species impacts would be expected to occur as a result of the No Action option. As such, the provision should not result in impacts beyond those analyzed and discussed in FW 44 (NEFMC 2010) and FW 45 (NEFMC 2011). As summarized from those actions the specification of ACLs was not expected to have direct impacts on protected species, and was consistent with the fishing mortality targets adopted by Amendment 16.

Option 2: Revised Annual Catch Limit Specifications

This option proposes to adopt new specifications and ACLs for FY 2012 for twelve stocks and for FY 2012- 2014 for the remainder. This measure includes the identification of ACLs, OFLs, and ABCs as required by the M-S Act and as implemented by Amendment 16. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS.

As was mentioned in the analysis of the previous options, the greater the fishing effort, the more possibility that interactions with protected species may occur. The ACLs for twelve stocks do not differ from that for the Option 1/No Action alternative. The ACLs for GB and GOM winter flounder and SNE/MAB windowpane flounder are larger, while the ACLs for ocean pout, GOM/GB windowpane flounder, and SNE/MA winter flounder are smaller. Because the majority of the ACLs are not different than those in Option 1/No Action, the impacts of the ACLs to protected species under this option are not expected to differ from that described under the No Action alternative.

One ACL that may have an impact on endangered and protected species is the ACL for GOM cod. If the ACL for this stock is drastically smaller than that in Option 1/No Action there could be beneficial impacts on endangered or protected species in the GOM. GOM cod is a key target species for sink gillnet vessels that have interactions with harbor porpoise and seals. A drastically reduced ACL for GOM cod would be expected to reduce sink gillnet activity and result in fewer interactions between this gear and these species. Conversely if the ACL is much larger than that in Option 1/No Action, it would be expected to result in more interactions.

It is important to note that all of the options which could cause increases or decrease in interactions with the fishery the overall impact to protected species are likely to be negligible, and the impacts are uncertain as quantitative analysis has not been performed. The quantitative consequences of these changes are unknown, but could be positive if effort is reduced in seasonal high use areas and the reduction overlaps with the distribution of protected resources. Catches in the fishery will still be constrained by other limitations placed on the fishery, such as those relating to the catch of other co-managed species and bycatch, thereby mitigating the impacts of the potential changes.

6.3.2 Commercial and Recreational Fishery Measures

6.3.2.1 Management Measures for SNE/MA Winter Flounder

Option 1: No Action

If this option is adopted landing SNE/MA winter flounder would continue to be prohibited. When compared to Option 2 this may lead to reduced groundfish fishing effort in the SNE/MA winter flounder stock area as vessels may move to other areas or fisheries on order to avoid this stock. Whether this will benefit or harm endangered and other protected species is difficult to predict because it depends on the exact nature of the effort shifts that occur. The changes in effort are also unlikely to be large and any impacts would be expected to be negligible.

Option 2: Allocate SNE/MA Winter Flounder to the Groundfish Fishery

If Option 2 is adopted commercial groundfish fishing vessels would be allowed to land SNE/MA winter flounder. When compared to Option 1 this may result in an increase in groundfish fishing effort in the stock area. Most of an effort increase would likely be with trawl gear. Increases in effort would be expected to lead to the possibility of increased interactions. The ACLs for this stock, however, are very low and any increases in effort resulting from this measure would be slight. It is not likely that if adopted this measure would have detectable impacts on endangered or other protected species. The impacts of this measure may be to increase interactions when compared to Option 1 but the differences would likely be so slight as to be undetectable.

6.3.2.2 Scallop Catch of Yellowtail Flounder in Access Areas – Modification of Restrictions

Option 1: No Action

This option would not modify the administration of AMs for scallop fishery catches of yellowtail flounder in the CAI, CAII, and NLCA access areas. As a result it is more likely that the access area cap might be exceeded and AMs triggered. The AM immediately shifts effort out of the access areas. These shifts in effort may affect the interaction of the scallop fishery with endangered and other protected species. While the exact nature of these shifts is difficult to predict any shifts of effort out of the CA or CAII access areas into SNE might increase interactions with turtles. Such changes are more likely under this option than under Option 2.

Option 2: Eliminate Cap on Yellowtail Flounder Caught in the GB Access Areas

This option would remove the cap on yellowtail flounder that can be caught in access areas. When compared to Option 1this removes the possibility that scallop fishing in the access areas might be stopped due to excessive yellowtail flounder catches, leading to a redirection of effort into other areas. This makes it easier for scallop management actions to predict the distribution of scallop fishing activity and means that realized impacts on endangered and protected species will be consistent with those analyzed in the scallop action. When compared to Option 1, endangered and protected species will benefit from the ability to more accurately consider the effects of scallop fishing activity on these species.

6.3.2.3 Atlantic Wolffish Landing Limit

Option 1: No Action

Possession of Atlantic wolffish would continue to be prohibited if this option is adopted. Atlantic wolffish is identified by NOAA a species of concern: a species for which NOAA has concerns regarding status but there is not information that indicates a need to list the species under the Endangered Species Act. A petition for listing wolffish under the ESA was reviewed and in November, 2009 NMFS made the decision that a listing as threatened or endangered was not warranted. When compared to Option 2, this measure would be expected to benefit wolffish (a species of concern) because some fish that are caught and discarded would be expected to survive, particularly if discarded from trawl gear. It would not be expected to have any impacts on endangered or other protected species; wolffish is not a target species so this measure would not affect fishing effort, and as a result there would not be expected to be any difference in groundfish fishing effort between this option and Option 2.

Option 2: Revised Atlantic Wolffish Possession Limit

Commercial vessels would be allowed to land one wolffish per trip if this option is adopted. Atlantic wolffish is identified by NOAA a species of concern: a species for which NOAA has concerns regarding status but there is not information that indicates a need to list the species under the Endangered Species Act. A petition for listing wolffish under the ESA was reviewed and in November, 2009 NMFS made the decision that a listing as threatened or endangered was not warranted. When compared to Option 1, this measure would be expected to increase fishing mortality for wolffish (a species of concern) because fish that are retained would die whereas those fish would be discarded under Option 1 and some of those discard fish would survive. It would not be expected to have any impacts on endangered or other protected species; wolffish is not a target species so, this measure would not affect fishing effort, and as a result there would not be expected to be any difference in groundfish fishing effort between this option and Option 1/No Action.

6.3.2.4 Common Pool Restricted Gear Areas

Option 1: No Action

If this option is adopted then the RGA measures adopted in Amendment 16 would remain in effect. These measures require the use of selective gear in an area of western GB and an area of SNE. The measure only applies to common pool vessels fishing on groundfish trips and may deter some of those vessels from fishing in the RGAs. Because common pool vessels represent only a small part of groundfish fishing activity there this measure does not significantly affect groundfish fishing effort. While fishing effort and interactions with endangered and protected species are not directly correlated, the limited impacts of this measure on overall groundfish fishing activity make it unlikely that it will have any impacts on endangered or other protected species. There are not likely any differences between this option and Option 2.

Option 2: Removal of Common Pool restricted Gear Areas

If this option is adopted then the RGA measures adopted in Amendment 16 would be eliminated. As a result some common pool vessels may increase their groundfish fishing activity in the existing RGAs. Because common pool vessels represent only a small part of groundfish fishing activity there this measure does not significantly affect groundfish fishing effort. While fishing effort and interactions with endangered and protected species are not directly correlated, the limited impacts of this measure on overall groundfish fishing activity make it unlikely that it will have any impacts on endangered or other protected species. There are not likely any differences between this option and Option 1/No Action.

6.3.2.5 Accountability Measures

Option 1: No Action

If this option is adopted, whether there would be any impacts on endangered or other protected species depends on whether the AM is implemented or whether fishing behavior is changed in anticipation of the AM.

The AMs for ocean pout, windowpane flounder, wolffish, and halibut under this option allow adjustments to trip limits but possession is already prohibited for three of these species and only one halibut per trip can be landed. This AM would not be expected to affect fishing activity in any way and would not be expected to have direct impacts on endangered and other protected species. When compared to Option 2 this measure would not result in any changes in fishing effort and would not be expected to have any differential impacts on endangered and other protected species. The effects would likely be similar to Options 3and 4, which also use a prohibition on possession for halibut and wolffish AMs.

The AMs for wolffish and windowpane flounder, if triggered, result in closures of certain areas to common pool fishing activity. Particularly in the GOM this could benefit harbor porpoise and various seals since the areas they are found in the areas that would be closed. Common pool fishing activity is a small fraction of overall groundfish fishing activity so it is not clear that these impacts will be measureable. When compared to Option 2 the benefits would be expected to be less since under Option 2 more vessels would be affected and more effort would be displaced from the AM areas in those options (which are smaller than the areas in this option).

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

This option would constrain fishing activity in defined areas if ACLs for these stocks are exceeded. Vessels using trawl gear are required to use selective gear and fixed gear (sink gillnet and longlines) are prohibited in the areas.

The AMs in this option, if triggered may result in shifts in distribution of fishing activity. Because they affect both common pool and sector vessels the effort shifts would be expected to be larger than those that may occur under Option 1. The most likely shifts will be for gillnets and longline vessels because the AMs actually close areas if the wolffish or halibut AMs are triggered. The specific areas are relatively small, however, and it is not likely that any impacts on endangered or other protected species are likely to be measureable. With respect to the trawl gear AMs the areas are larger but some activity is still allowed within the areas. Again it is not likely that effort shifts will result in measureable impacts – either positive or negative – on endangered or other protected species. When compared to Option 1/No Action this Option would not be expected to have nay differential impacts on these species. When compared to Option 3 and 4 there may be manor differences since neither of those options would be expected to result in any changes in fishing effort, but the magnitude will be slight and the direction cannot be determined.

Option 3: Atlantic Halibut No Possession AM

If this option is adopted, whether there would be any impacts on endangered or other protected species depends on whether the AM is implemented or whether fishing behavior is changed in anticipation of the AM.

Until this AM is triggered, only one halibut per trip can be landed and as a result halibut is not a target species and does not determine fishing activity. The AM for halibut under this option prohibits landing this species of the ACL is exceeded. This AM would not be expected to affect fishing activity in any way and would not be expected to have direct impacts on endangered and other protected species. When compared to Options 1 or 2 this measure would not result in any changes in fishing effort and would not be expected to have any differential impacts on endangered and other protected species.

Option 4: Atlantic Wolffish No Possession AM

If this option is adopted, whether there would be any impacts on endangered or other protected species depends on whether the AM is implemented or whether fishing behavior is changed in anticipation of the AM. Wolffish cannot be landed even if this AM is triggered. As a result , this AM would not be expected to affect fishing activity in any way and would not be expected to have direct impacts on endangered and other protected species. When compared to Options 1 or 2 this measure would not result in any changes in fishing effort and would not be expected to have any differential impacts on endangered and other protected species.

6.4 Economic Impacts

6.4.1 Updates to Status Determination Criteria, Formal rebuilding Programs, and Annual Catch Limits

6.4.1.1 Revised Status Determination Criteria for Winter Flounder and GOM cod

Option 1: No Action

In the near-term, economic impacts of status determination criteria (SDC) are transmitted through the affect these changes have on setting OFLs, ABCs, and ultimately on ACLs. For an analysis of the economic impact of ACLs associated with this option see section 1456.4.1.5.

Over the long term, the specification of SDCs provides a limit on the potential harvest from the fishery. The Option 1/No Action values of MSY are lower than Option 2 for GB winter flounder (200 mt) and SNE/MA winter flounder (1,986 mt). Based on the average price of $2.00 per pound for winter flounder in FY 2010 this option would result in potential revenues that are about $9.6 million less than if Option 2 is adopted. Similar calculations cannot yet be performed for GOM cod until the assessment is completed, and an MSY value has not been estimated for GOM cod.

Option 2: Revised Status Determination Criteria for Georges Bank, Gulf of Maine, and Southern New England. Mid –Atlantic Winter Flounder Stocks and GOM cod

Economic impacts of status determination criteria are transmitted through the affect these changes have on setting OFLs, ABCs, and ultimately on ACLs. For an analysis of the economic impact of ACLs associated with this option, see section 6.4.1.5.

Over the long term, the specification of SDCs provides a limit on the potential harvest from the fishery. The Option values of MSY are higher than Option 1/No Action for GB winter flounder (200 mt) and SNE/MA winter flounder (1,986 mt). Based on the average price of $2.00 per pound for winter flounder in FY 2010 this option would result in potential revenues that are about $9.6 million more than if Option 2 is adopted. Similar calculations cannot yet be performed for GOM cod until the assessment is completed, and an MSY value has not been estimated for GOM cod. Whether this additional revenue is realized would depend on rebuilding progress for these stocks.

6.4.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

Option 1: No Action

This option would maintain a rebuilding strategy that targets rebuilding the stock by 2016 with a median probability of success. A recent assessment shows that this is not possible even in the absence of all fishing mortality. If this option is adopted the management goal would likely be to reduce fishing mortality to as close to zero as possible. The present value of the revenues streams from this stock for the

No Action rebuilding strategy are shown in Table 40. These revenues are based on the value of GB yellowtail flounder and do not consider impacts on other species. If the TAC is as close to zero as possible this would constrain scallop fishing on GB since that fishery is subject to a GB yellowtail flounder sub-ACL. In addition, sector vessels may not be able to fish in the GB yellowtail flounder stock area if they do not have enough ACE of this stock to account for discards. Because of these factors, Option 1/No Action, if adopted, would result in large reductions in revenues from the groundfish fishery and the scallop fishery that are only partially captured by Table 40.

Option 2: Revised Rebuilding Strategy for GB Yellowtail Flounder

The economic impacts of the different rebuilding strategies were estimated by calculating the present value of the stream of potential revenues for each rebuilding strategy. Net Present Value

Comparison of alternative benefit streams over time requires discounting future benefits to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the social rate of time preference (NOAA 1999). Net present values are calculated through 2032, the approximate terminal rebuilding date for the longest-recovery duration option. The economic analysis included an option of fishing at F_{MSY} , which is not a measure that is included as a possible action because it does not achieve SSB_{MSY},.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to the potential Georges Bank yellowtail flounder landings. To calculate this average price, a Monte Carlo approach was used. Because fish prices are elastic--that is, price varies with quantity--a range of potential prices was generated using the average monthly yellowtail flounder prices from 1996-2010 based on NMFS dealer data (Figure 14). From this range of prices one value is randomly drawn for each iteration of a given quantity and year, with the following decision rule: if the quantity is above 4K mt's, the price is randomly drawn from the bottom half of the observed price distribution; if the catch is below 4K mt's the price is drawn from the top half of the distribution. Results are based on 500 random draws and the mean value and 5% and 95% confidence intervals are reported.

Of the analyzed rebuilding approaches, the Fmsy strategy provides the highest landed net present value based on this analysis. However, this strategy fails to achieve the biomass rebuilding target. Of the approaches analyzed that achieve the biomass rebuilding target, both the F_43200 and F_10% strategies provide the highest NPV, roughly $234 million ($205 million under the Rho-adjusted approaches) in 2032. This is approximately 5% higher than the NPV of the default control rule (75%Fmsy) approach for both the non-Rho and Rho-adjusted options.

This measure considers two alternatives to Option 1/No Action. The first, sub-option A, is based on a rebuilding period determined by how long it would take to rebuild form the current assessment when fishing at 75% of F_{MSY} . This result is explicitly included in Table 40, and gives a mean NPV of $222.3 million. Sub-option B is reflected by the last two columns of the table and results in about $234 million in NPV, a value that is 5 percent larger than sub-Option A. Either alternative provides far greater returns than the No Action alternative.

Figure 14 – Price and quantity relationship for yellowtail flounder, 1996-2010 (NMFS dealer data)

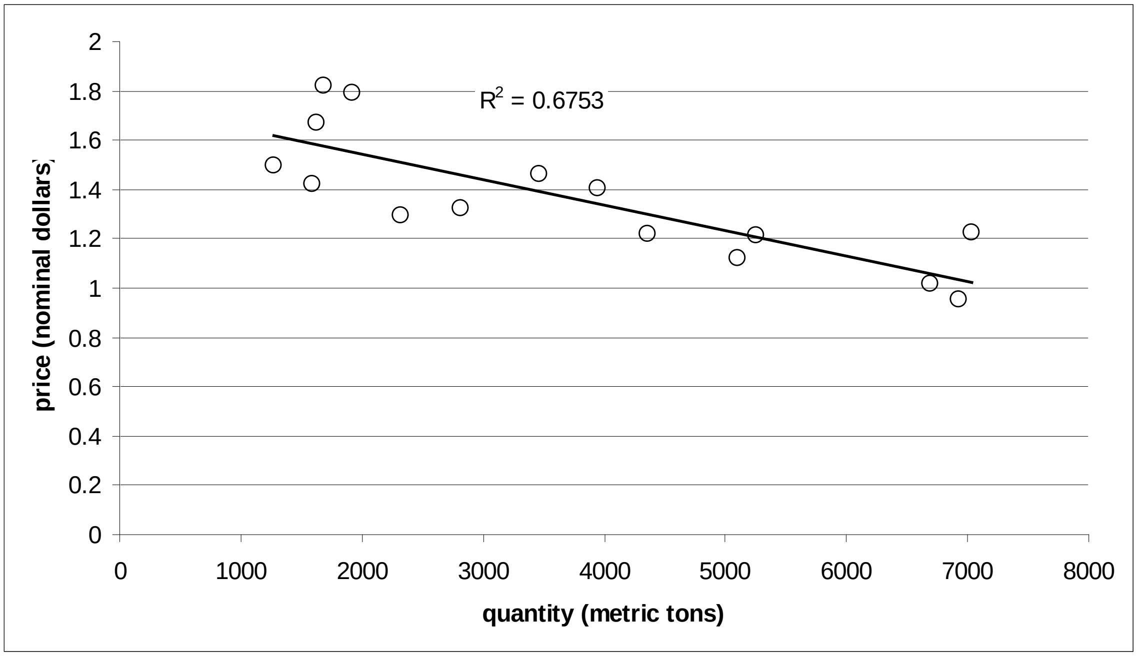
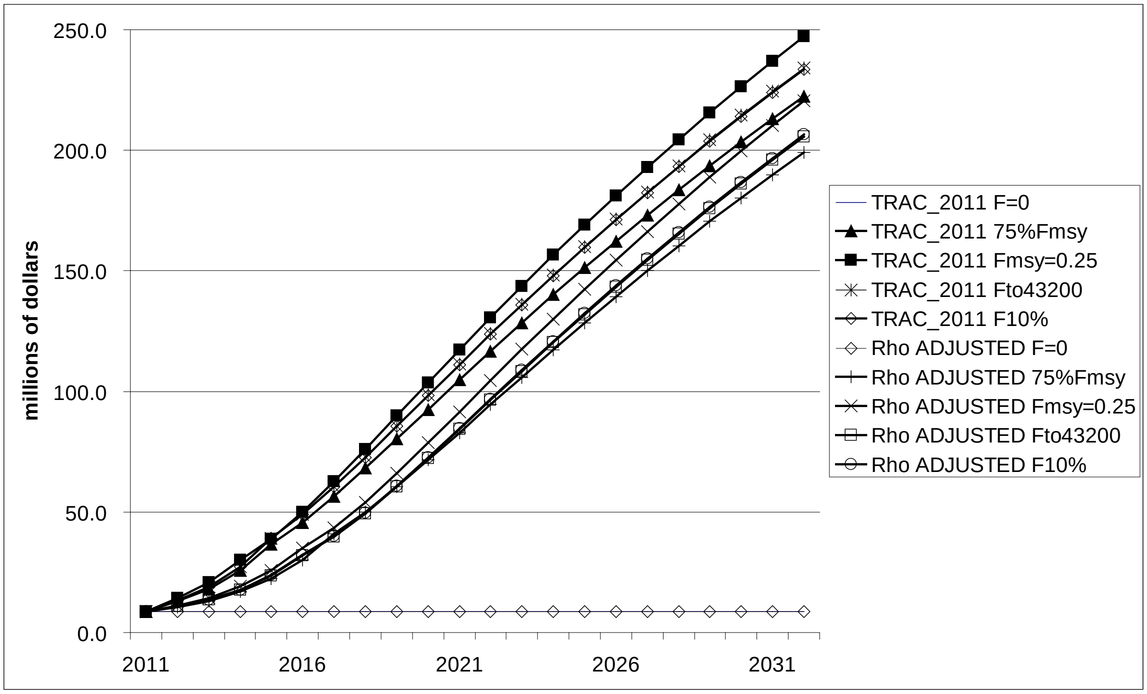


Table 40 – Net present value estimates for various rebuilding approaches

Terminal year	Discount rate	Value			TRAC_2011		
			F=0	75%Fmsy	Fmsy=0.25	Fto43200	F10%
		5% CI	7.4	178.1	197.5	187.6	187.2
2032	3%	*Mean*	8.8	222.3	247.2	234.2	233.7
		95% CI	10.3	259.0	287.8	272.8	272.2
					Rho ADJUSTED		
			F=0	**75%Fmsy**	**Fmsy=0.25**	**Fto43200**	**F10%**
		5% CI	7.4	160.0	176.5	164.7	165.3
2032	3%	*Mean*	8.8	199.2	220.4	205.7	206.5
		95% CI	10.3	232.1	256.7	239.6	240.5

Figure 15 – Net present value of Georges Bank yellowtail flounder rebuilding approaches



Economic Impacts on the scallop fishery

This measure influences the size of the sub-ACL of GB yellowtail flounder allocated to the scallop fishery and thus could indirectly affect scallop fishing effort on GB.

If this option would be adopted the expectation is that GB yellowtail flounder specifications would be set at higher levels than Option 1/No Action. This could increase the amount of fishing activity on GB when compared to Option 1/No Action. If the sub-ACL is set higher it would be less likely that it would be exceeded triggering AMs, which cause effort shifts to less optimal areas with potential negative impacts on the scallop fishery. The fewer the constraints on the scallop fishery, the greater the potential to harvest all available scallop catch, the less impacts will be on fishing costs resulting in positive impacts on the revenues, profits and total economic benefits from the scallop fishery.

6.4.1.3 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

The No Action Alternative, under which specification of U.S./Canada TACs would not occur, would result in greater revenue in FY 2012 than under the proposed alternative (Option 2). The catch of haddock and cod would not be limited in the Eastern U.S./Canada Area, so that there would be greater opportunity to catch available fish. Because there would still be Annual Catch Limits for GB cod and haddock (stock-wide ACLs), the amount of catch from the Eastern U.S./Canada Area would still be limited. There would be greater overall revenue in FY 2012 as a result of the increased access to other stocks in the Eastern U.S./Canada Area, under the No Action Alternative. The No Action Alternative would essentially represent a management strategy that does not address the transboundary aspect of cod,

haddock, and yellowtail flounder, and the likely resulting level of fishing mortality on the transboundary stocks would be higher, and may be unsustainable. The long term economic impacts of the No Action Alternative are more likely to be negative than the proposed Alternative, due to the increase biological risk associated with the No Action Alternative. Stock rebuilding and the associated revenue that is likely to result from an increasing stock size could be jeopardized by the No Action Alternative.
In contrast with the No Action Alternative, the Preferred Alternative would have short term negative economic impacts, due to the fact that the harvest of the shared stocks would be constrained by the TACs.

Option 2: U.S. /Canada TACs

The economic impacts that result from the use of hard TACs for the shared stocks of GB stocks can best be described in terms of five different effects: 1) Hard TACs for cod, haddock, and yellowtail flounder will limit the total amount of catch of these stocks (landings and discards) allowed by law; 2) Associated rules such as gear restrictions, trip limits, and closures that may be implemented in order to prevent catch from exceeding the TACs will impact when and how such access to these stocks occurs; 3) Access restrictions implemented to control catch of one particular stock may indirectly impact access to other stocks; 4) Discarded fish count against the TAC; and 5) The timing and rate of landing of these stocks may impact the market for these species. These effects are described in more detail in the following section. This discussion builds upon the information contained in the affected environment, the description of the GB groundfish fishery.

The economic impacts of the proposed hard TACs are difficult to predict because the five effects noted above, the fact that the Amendment 16 regulations that implemented substantial changes in the fishery will still be relatively new in FY 2012, and the fact that these effects interact in a complex manner. The amount of fish landed and sold will not be equal to the sum of the TACs, but will be reduced as a result of discards, and may be further reduced by limitations on access to stocks that may result from the associated rules. Reductions to the value of the fish may result from fishing derby behavior and potential impact on markets.

The FY 2012 TACs for Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder are lower than those specified in FY 2011 (Table 41). A portion of the U.S. TAC for GB yellowtail flounder would be allocated to the scallop fishery, which would reduce the amount of the TAC available to the commercial groundfish fishery. Based on the expected catch of GB yellowtail flounder by the scallop fishery in FY 2012, the scallop fishery would be allocated approximately 56 percent of the U.S. TAC. In FY 2011, the scallop allocation was approximately 14 percent of the U.S. TAC. As a result in the decrease of the GB yellowtail flounder TAC, and the allocation formula which is based on the expected scallop catch, the proportion of the U.S. TAC available to the groundfish fishery is reduced in FY 2012.

Table 41 - Comparison of the Proposed FY 2012 U.S. TACs and the FY 2011 U.S. TACs (mt)

Stock	U.S. TAC		Percent Change
	FY 2012	FY 2011	
Eastern GB cod	162	200	– 19 %
Eastern GB haddock	6,880	9,460	– 27 %

Stock	U.S. TAC		Percent Change
	FY 2012	FY 2011	
GB yellowtail	564	1,458	– 61 %

Providing an estimate of possible catch levels and the associated revenue, based upon multiple assumptions, may be the most useful way of estimating economic impacts. Table 42 contains estimates of FY 2009, 2010, and partial FY 2011 revenue from the U.S./Canada Management Area based on 'matched' dealer data and extrapolations based on total trip length to trip length on matched trips. Total revenue from the U.S./Canada Management Area was slightly lower in FY 2010 compared to FY 2009. Although the number of distinct vessels fishing in the U.S./Canada Area increased in FY 2010 from FY 2009, the total number of trips decreased (see also Section 5.4.1.2). The 2010 TACs were also lower than 2009, which may have contributed to the reduced revenue. In FY 2010, the total revenue from GB yellowtail was substantially lower than FY 2009, and the total revenue from Eastern GB cod, Eastern GB haddock, and GB yellowtail was approximately 1.8 million less than FY 2009.

Table 42 - Revenue from the U.S./Canada Management Area for FY 2009-2011

Stock or Species	Revenue		
	FY 2009	FY 2010	FY 2011*
Eastern GB Cod	1,079,952	884,630	364,433
Eastern GB Haddock	4,960,804	4,189,696	1,811,624
GB Yellowtail Flounder	2,585,099	1,778,235	893,533
Total revenue from U.S./Canada Stocks	8,625,855	6,852,561	3,069,590
Total revenue from all species**	37,250,820	34,467,030	18,360,422

*FY 2011 revenue includes partial fishing year information through November 3, 2011.
**Includes revenues from U.S./Canada stocks, other groundfish stocks, and non-groundfish species

There are likely increased efficiencies and decreased discards as a result of sectors, which may increase revenue and/or profitability; however, the reduced TACs in FY 2012 would likely result in reduced overall revenue. This reduced revenue would be due to both the decrease in potential landings of cod and yellowtail, as well as a loss of revenue from other stocks caught on trips to the Eastern U.S./Canada Area if vessels lose access to this area when a pertinent TAC is projected to be caught. Although the TAC will not likely limit haddock catch in the Eastern U.S./Canada Area, access to haddock may be impacted by the reduced cod and yellowtail TACs. GB winter flounder is the second most valuable stock caught in the Eastern U.S./Canada area (after haddock). If vessels are able to harvest more haddock than in previous years, some of the decreased revenue described above may be recouped through increases in haddock landings.

Potential revenue from the FY 2012 proposed TACs was estimated using an assumed price per pound, percentage of TAC caught, and an assumed discard-to-catch ratio (Table 43). Assumed discards in FY 2012 were estimated based on FY 2012 catch information, and was assumed to be 6 percent for cod, 1

percent for haddock, and 13 percent for GB yellowtail flounder. Past fishing years and FY 2010 catch information were utilized to estimate two scenarios for the percentage of TAC caught. Average price estimates are based on 2010 dealer reports submitted to the NMFS Fisheries Statistics Office. Catch and landings data are based upon VMS and dealer report data, and adjusted according to the methods described at the following internet address:
http://www.nero.noaa.gov/nero/regs/infodocs/DiscardCalculations.pdf.

Table 43 - FY 2012 Revenue Estimates from Landings of Shared Stocks from the U.S./Canada Management Area

Stock	2012 U.S. TAC	Price per lb	Scenario 1		Scenario 2	
			% of TAC Caught	FY 2012 Estimated Revenue	% of TAC Caught	FY 2012 Estimated Revenue
Eastern GB Cod	162	$1.52	75%	$382,721	100%	$510,294
Eastern GB Haddock	6,880	$1.05	15%	$2,150,036	30%	$4,300,072
GB Yellowtail Flounder	564	$1.18	75%	$957,361	100%	$1,276,482

The estimated revenues for FY 2012 are substantially lower from the FY 2010 revenues in Scenario 1, which is likely due to the reduction of the FY 2012 TACs. However, because the FY 2012 TACs are lower, a larger proportion of the U.S. TAC may be caught in FY 2012. In Scenario 2, the estimated revenues for FY 2012 are less than FY 2010 for Eastern GB cod and GB yellowtail flounder. However, the revenues for Eastern GB haddock increase compared to FY 2010 if more of the U.S. TAC is caught.

When considering the revenue associated with the landings of cod, haddock, and yellowtail flounder from the U.S./Canada Area, and the impact of interannual fluctuations in the size of the TACs, it is important to note that many other species are landed from trips to the U.S./Canada Area. If the time period during which vessels have access to the area is prolonged, there would also be increased landings of other groundfish and non-groundfish species, resulting in additional revenue. Due to the implications of catching a TAC for either the common pool or sector vessels on access to resources in addition to cod, haddock and yellowtail flounder, the reduced size of the 2012 TACs will affect total revenue in 2012. However, it is very difficult to estimate the potential revenue for *other stocks* caught on trips to the U.S./Canada Area for FY 2012 due to the fact that the number of vessels that will be fishing in the common pool and in sectors in FY 2012 is not finalized. Furthermore, it is too soon to draw conclusions regarding the impact of the Amendment 16 management regime on the U.S./Canada Area fishery. The current (2011) fishing year, which is only the second in which the majority of the groundfish fishery is fishing in sectors, is only half completed at the time of this analysis. The U.S./Canada TACs will be divided between the common pool and sectors. When the common pool cod, haddock, or yellowtail flounder TAC is projected to be caught, common pool vessels may no longer fish in the Eastern U.S. Canada Area, and lose all fishing opportunity in the Eastern Area. If the yellowtail flounder TAC is caught, a common pool vessel may still fish in the Western U.S./Canada Area, but may not retain yellowtail flounder. When a particular sector catches its TAC of Eastern U.S. cod or haddock the implications are the same (as for a common pool vessel), however when a sector catches its TAC (ACE) for GB yellowtail flounder they lose fishing opportunity throughout the yellowtail stock area. It should be noted that the amount of haddock that has been harvested from the U.S./Canada Area has been increasing since 2004, but it is unknown whether this trend will continue.

In comparison to the No Action Alternative, the Proposed Action would have short term negative economic impacts, due to the fact that the harvest of the shared stocks would be constrained by the TACs.

6.4.1.4 Administration of Scallop Fishery Sub-ACLs

Option 1: No Action

The current sub-ACL structure can have negative impacts on the scallop fishery if AMs are triggered and effort shift to those areas and/or seasons with lower scallop catch rates and meat weights. This could have a negative impact on the scallop resource and scallop landings and would increase the fishing costs as scallop vessels fish in less optimal areas. Scallop revenues would decline further if the effort is moved to areas with a higher percentage of smaller scallops that are usually sold at a lower price compared to larger scallops. Therefore, current sub-ACL management could result in lower profits, lower crew incomes and less economic benefits from the scallop fishery than would be expected as a result of adopting Option 2 and/or Option n3.

Option 2: Changes to Scallop Fishery Sub-ACL Administration – AM Implementation

This option would not be expected to have economic impacts on the groundfish fishery.

This option is expected to have positive economic impacts on the scallop fishery. If the scallop fishery exceeds their sub-ACL by less than 50% and the total ACL is not exceeded, then AMs would not trigger for the scallop fishery. This would have positive impacts on scallop fishery by preventing the effort shifts to less optimal areas and into seasons with lower meat weights. As a result, when compared to Option 1 , Option 2 would minimize the negative impacts on scallop landings, revenues and fishing costs by eliminating the AM trigger mechanism when scallop fishery does not exceed their sub-ACL by 50% or more and when total yellowtail ACL is not exceeded. There is inherent error in the projection of YT catch in the scallop fishery and this measure would allow the system to be more flexible and account for projection errors without compromising the overall catch of groundfish.

Option 3: In-Season Re-Estimation of Scallop Fishery GB Yellowtail Flounder Sub-ACL

This option would be expected to have positive economic benefits for the groundfish fishery and the nation. Any benefits would be limited to the years when the scallop fishery does not harvest its entire sub-ACL and the sub –ACL is re-estimated, with the result that additional quota made available to the groundfish fishery late in the year. This would increase revenues for the groundfish fishery because the amount of yellowtail flounder is likely to increase and more of the available catch will be harvested than would be the case if Option 1/No Action is adopted.

When compared to Option 1, there is the potential for negative impacts to the groundfish fishery from this measure if the in-season re-estimate is in error and projected scallop fishery catch for the year is under-estimated. Since the re-estimated sub-ACLs will be determined in mid-January and the groundfish fishery would be expected to catch all of its new sub-ACL, the total catches for the year might exceed the U.S. share of the U.S./Canada quota. Under the terms of the U.S./Canada Resource Sharing Understanding, any overage would be immediately deducted from the following year's ACL and would result in an immediate reduction in the catch available to the groundfish fishery. This is because the amount allocated to the scallop fishery is set in advance and does not vary with changes in the overall ACL. There are some elements of the ACL system that mitigate against this possibility. First, there is a buffer for management uncertainty that reduces the amount allocated to the fisheries by three percent. Second, sub-ACLs are re-specified only if the difference between the scallop fishery catch and its sub-ACL is determined to be more than 10 percent. Third, a small amount (4 percent) of the ACL is allocated to other sub-components and in FY 2010 this entire amount was not caught.

This option would re-estimate the GB yellowtail flounder sub-ACL for the scallop fishery based on data from the current fishing year. If the data show that less than 90 percent of the sub-ACL will be caught the sub-ACL would be re-specified and the underage made available to the groundfish fishery. There are no direct impacts of this measure on the scallop fishery. As long as the scallop fishery is still allocated what the fishery is expected to catch (or more, as was the case in some situations), then scallop fishing should not be constrained by YTF bycatch limits. If the scallop fishery is able to reduce YTF catch or ends up catching less YTF than projected based on a re-estimation near the end of the scallop fishing year (by January 15), than making that catch available to the groundfish fishery should not have any economic impact on the scallop fishery when compare to Option 1.

6.4.1.5 Annual Catch Limit Specifications

This measure considers two options. Option /No Action would leave the specifications as adopted by FW 44 and FW 45. Option 2 would adopt new specifications for the three winter flounder stocks, the two windowpane flounder stocks, ocean pout, GB yellowtail flounder, and GOM cod. Because specifications for GOM cod will not be determined until the assessment results are available in January 2012, this action considers a range of ABCs for GOM cod.

GOM cod is a key component of the catches from the GOM and the size of the GOM cod ABC may influence the ability to catch other stocks. For this reason, the analyses presented here are conducted for three levels of GOM cod catches: Option 1 (No Action), Option 2 (Revised ACLs, Low), and Option 2 (Revised ACLs, High). This analysis will focus on Sector vessels, which constitute greater than 98% of the commercial groundfish fishery. Most ACE allocations will remain relatively stable from 2011 to 2012 for all options, but stocks such as Georges Bank yellowtail flounder and, potentially, Gulf of Maine cod, will see important decreases in FY 2012 (Table 44).

Overall, Option 1 and Option 2-High are predicted to have net positive economic impacts in aggregate, though Rhode Island and New York may see declines in gross revenues from groundfish under both Options. Option 2-Low will have negative economic impacts across all ports, size classes and gear types. Small vessels in the inshore Gulf of Maine are predicted to be most adversely affected. Under this Option, New Hampshire is predicted to lose over 90% of its gross revenues relative to FY 2010 though some of that lost revenue will be compensated by ACE leasing and declines in operating expenses as vessels chose not to fish.

Table 44 – Preliminary Sector ACE allocations FY2010 – 2012, live pounds

SPECIES	STOCK	Sector ACE		Sector ACE 2012		
		2010	*2011*	*Option 1*	*Option 2-Low*	*Option 2-High*
American plaice		5,836,518	6,697,766	6,761,576	7,063,609	7,063,609
Cod	GB	7,008,304	9,277,222	10,244,878	9,934,027	9,934,027

	GOM	9,355,985	10,408,214	10,414,634	577,611	23,097,825
Haddock	GB	83,914,795	67,575,126	56,458,165	60,120,042	60,120,042
	GOM	1,683,057	1,717,432	1,388,912	1,426,390	1,426,390
Halibut						
Ocean pout						
Pollock		34,156,917	30,530,173	27,826,739	27,597,458	27,597,458
Redfish		14,109,702	16,545,996	17,727,366	18,265,293	18,265,293
White hake		5,292,674	6,494,937	6,896,058	7,169,431	7,169,431
Windowpane	North					
	South					
	GB	3,980,218	4,393,893	4,909,693	7,416,348	7,416,348
Winter flounder	GOM	288,899	330,699	291,010	1,496,938	1,496,938
	SNEMA					
Witch flounder		1,745,117	2,669,847	3,099,699	3,128,359	3,128,359
Wolffish						
	CCGOM	1,581,720	2,012,857	2,151,711	2,239,896	2,239,896
Yellowtail flounder	GB	1,738,477	2,473,632	1,467,617	471,789	471,789
	SNE	504,685	890,684	1,216,973	1,289,727	1,289,727
GRAND TOTAL		**171,197,068**	**162,018,479**	**150,855,030**	**148,196,919**	**170,717,133**

Analyzing impacts using a quota change model

To analyze potential impacts on vessels enrolled in the Sector program a linear programming technique is used, where a model attempts to maximize the catch of all stocks conditioned on the technology, fishing practices and jointness of production across stocks that existed during FY 2010. An approach like this is necessary because it is not enough to assume that all allocated ACE will be converted into catch and scale anticipated revenues accordingly. Performance during the first year of quota-based fishing demonstrated that either existing technology is insufficient to allow for targeting stocks with excess ACE capacity, or alternatively ACE allocations exceed resource availability (

Table 45).

Nor should we assume that changes in aggregate ACE allocations will scale linearly with revenues—that merely allocating more fish (or less) will result in generating more or less gross revenues. For example, critical stocks such as white hake and GOM cod, both of which were somewhat constraining in FY2010, may see ACE allocations moving in opposite directions under Option 2-Low, with white hake increasing and GOM cod decreasing by nearly 95%. Option 1, which maintains allocations for most stocks, contains a roughly 40% reduction in the GB yellowtail flounder allocation. Option 2-High, on paper perhaps the most liberal of the three Options, includes an 80% reduction for this important stock. Jointness of production (the catch of several stocks simultaneously) ensures that increases and/or restrictions on the catch of one stock will have impacts on the catchability of all others, though technologies such as modified gears and improved electronics may help to overcome some of these limitations.

Table 45 – FY 2010 ACE allocations and catch for sector vessels

SPECIES	STOCK	ACE	2010 Catch	Utilization
American plaice		5,836,518	3,336,272	57%
Cod	GB	7008304	6,000,952	86%
	GOM	9,355,985	7,911,669	85%
Haddock	GB	83,914,795	18,266,338	22%
	GOM	1,683,057	818,239	49%
Halibut				
Ocean pout				
Pollock		34,156,917	11,483,386	34%
Redfish		14,109,702	4,702,621	33%
White hake		5,292,674	4,951,889	94%
Windowpane	North			
	South			
Winter flounder	GB	3,980,218	3,048,553	77%
	GOM	288,899	176,784	61%
	SNEMA			
Witch flounder		1,745,117	1,540,038	88%
Wolffish				
Yellowtail flounder	CCGOM	1,581,720	1,233,481	78%
	GB	1,738,477	1,632,512	94%
	SNE	504,685	351,362	70%
GRAND TOTAL		**171,197,068**	**65,454,096**	**38%**

The basic method of analysis used here is to draw from existing (FY 2010) fishing trips in an effort to predict future catch and gross revenues based on the proposed changes in ACE allocations. VTR data is adjusted by average sector-specific discard rates and landed/live pound conversions such that every VTR trip has a corresponding catch, the sum of landings and discards, and gross revenue. Metrics such as gear type, vessel size and hailing port/state are maintained. These records are scaled to match official dealer reporting on a species and stock level. The model simulates one year of fishing by randomly selecting and arraying trips from the database and summing the catches until one allocated stocks hits its limit. At this point the total landings for all stocks are recorded. 100 simulated fishing years are run, and the results are reported at the 95^{th} percentile. Results are reported in terms of gross groundfish revenues, and constant 2010 dollars.

The model is tested in two ways. First the 2010 fishing year was modeled. The model was able to recreate the fishing year almost perfectly at the stock level, but the hail port/state distributions vary somewhat from official statistics for ports in Maine and New Hampshire. There are two reasons for this discrepancy. One is error inherent in randomly drawing trips from the year—some trips may be selected multiple times while others are not selected at all. The second is from the level of reporting—VTR in the case of the model, and DEALER for official statistics. These data seldom match perfectly.

For the purposes of model verification, the limits were set at actual catches but were relaxed for the two haddock stocks and both SNE/MA winter and yellowtail flounders.

Table 46 – Predicted and actual catch across stocks, quota change model

# runs = 100		CATCH			GROSS REVENUE	
SPECIES	**STOCK**	**PREDICTED**	**REALIZED**	***pct***		**PREDICTED**
American plaice		3,333,569	3,336,272	*99.9%*	$	4,326,759
Cod	GB	5,901,463	6,000,952	*98.3%*	$	15,216,177
	GOM	7,563,990	7,911,669	*95.6%*	$	10,896,663
Haddock	GB	18,088,804	18,266,338	*99.0%*	$	19,955,918
	GOM	886,730	818,239	*108.4%*	$	756,419
Halibut		59,816	59,822	*100.0%*	$	257,315
Ocean pout		134,992	138,861	*97.2%*	$	1,354
Pollock		11,061,692	11,483,386	*96.3%*	$	9,635,132
Redfish		4,698,527	4,702,621	*99.9%*	$	2,451,241
White hake		4,595,906	4,951,889	*92.8%*	$	4,487,637
Windowpane	North	333,465	333,507	*100.0%*	$	74,719
	South	238,302	238,387	*100.0%*	$	1,495
Winter flounder	GB	3,041,799	3,048,553	*99.8%*	$	5,805,730
	GOM	172,953	176,784	*97.8%*	$	306,702
	SNEMA	137,031	130,332	*105.1%*	$	885,233
Witch flounder		1,506,511	1,540,038	*97.8%*	$	3,507,958
Wolffish		37,444	38,315	*97.7%*	$	346
Yellowtail flounder	CCGOM	1,232,875	1,233,481	*100.0%*	$	679,399
	GB	1,630,973	1,632,512	*99.9%*	$	3,153,248
	SNE	348,320	351,362	*99.1%*	$	86,656
GRAND TOTAL		**65,005,162**	**66,393,320**	***97.9%***		***97.9%***
				Realized gross revenue:	***$***	***83,293,667***
						(99%)

To assess the model's predictive ability, we attempted to predict FY2011 fishing catches to date. The model was run to predict a complete year of data starting in September 2010 and running through the beginning of September 2011—approximately five months of data from the new fishing year. In aggregate the model was able to predict 90% of the catches and revenues realized during this timeframe. It overestimated GB haddock and SNE winter flounder while underestimating GOM cod and white hake. This is likely due to seasonality, as May-May data are being used to predict a Sept-Sept fishing event. Nonetheless, the ability to predict a reasonable portion of out-of-sample data is important.

Table 47 – Model prediction of September 2010 – September 2011 catches and revenues.

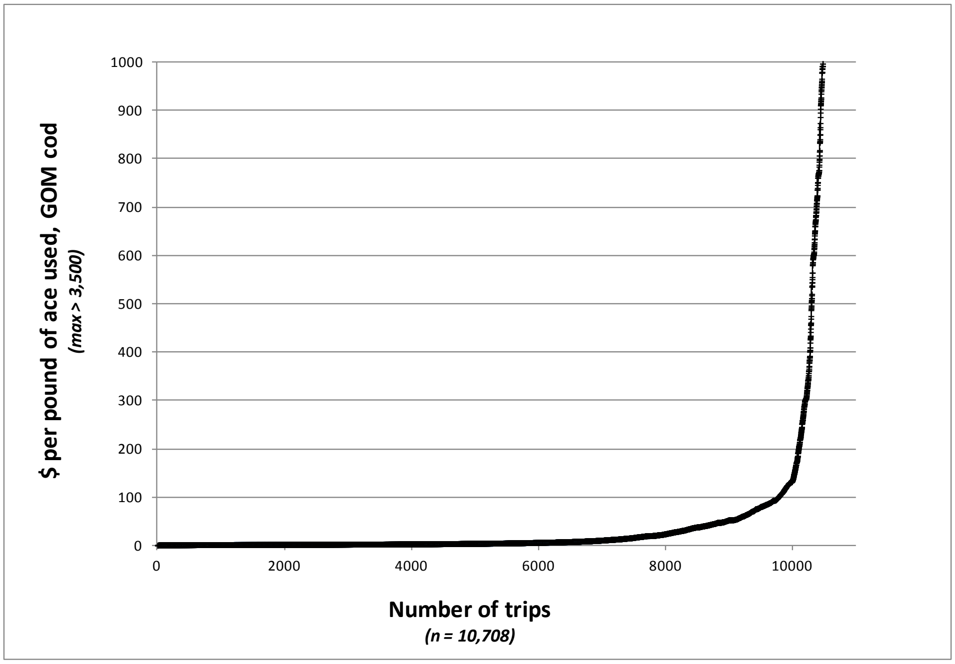
# runs = 100		CATCH			GROSS REVENUE		
SPECIES	**STOCK**	**PREDICTED**	**REALIZED**	***pct***	**PREDICTED**	**REALIZED**	***pct***
American plaice	all	1,485,980	1,485,998	*100%*	$ 1,886,735	$ 1,656,503	*114%*
Cod	GB	2,661,290	3,860,998	*69%*	$ 6,216,661	$ 9,919,553	*63%*
	GOM	3,795,779	4,650,138	*82%*	$ 5,225,442	$ 6,500,409	*80%*
Haddock	GB	9,453,456	6,323,512	*149%*	$ 9,586,750	$ 6,325,455	*152%*
	GOM	248,073	218,691	*113%*	$ 184,840	$ 170,196	*109%*
Halibut	all	31,108	31,290	*99%*	$ 134,642	$ 221,798	*61%*
	all						
Ocean pout	all	61,617	69,473	*89%*	$ -	$ 9	*0%*
Pollock	all	4,842,664	6,008,281	*81%*	$ 3,943,598	$ 5,028,640	*78%*
Redfish	all	2,363,609	2,374,441	*100%*	$ 1,176,396	$ 1,205,454	*98%*
White hake	all	1,422,817	2,357,638	*60%*	$ 1,471,277	$ 2,481,970	*59%*
Windowpane	North	149,280	166,308	*90%*	$ 2,035	$ 93,038	*2%*
	South	106,002	143,916	*74%*	$ 47	$ 13,641	*0%*
Winter flounder	GB	2,119,578	3,531,225	*60%*	$ 4,060,937	$ 4,629,856	*88%*
	GOM	44,022	95,404	*46%*	$ 88,335	$ 143,061	*62%*
	SNEMA	78,450	67,447	*116%*	$ 654,854	$ 234,099	*280%*
Witch flounder	all	623,055	847,002	*74%*	$ 1,547,061	$ 1,547,901	*100%*
Wolffish	all	19,237	23,531	*82%*	$ -	$ 3	*0%*
Yellowtail flounder	CCGOM	345,835	449,372	*77%*	$ 172,618	$ 178,947	*96%*
	GB	731,394	1,150,234	*64%*	$ 1,151,655	$ 1,602,819	*72%*
	SNE	109,298	76,523	*143%*	$ 14,089	$ 2,157	*653%*
	GRAND TOTAL	**30,692,546**	**33,931,422**	***90%***	**$ 37,517,971**	**$ 41,955,505**	***89%***

Marginal changes in quota allocations on the order of 15% or less are relatively straightforward to model as they are not likely to induce significant changes in fishing behavior or the use of technology. Rather we would expect to see continuous improvements in how fishermen use their quota and improve their fishing practices under the quota-based management system. However, two non-marginal changes in the proposed Options stand out. The first is the GB yellowtail flounder allocation, which is reduced by 40% from FY 2011 under Option 1 and 81% under Options 2 Low and High. The second is the 95% reduction in GOM cod allocations under Option 2-Low.

Both of these changes are drastic. To model such non-marginal changes is difficult at best. However, it is logical that fisherman will change their behavior to whatever degree they are able in order to redirect their efforts on stocks for which they have ample quota. First we then need to understand to what degree fisherman can avoid these two stocks while still fishing. To do this, we look at the ratio of GOM cod and/or GB yellowtail ACE expended to the gross revenue from all species generated by that quota. Essentially the question is "how much money can be generated per pound of ACE?"

Figure 16 shows how fisherman used their cod ACE in 2010. A few things stand out. First, the more than 70% of GOM cod trips generate less than $7.50 for every pound of GOM cod ACE. This indicates that most vessels catching GOM cod are targeting it rather than using it to leverage catches of other stocks. A small minority of trips, on the order of 20%, generate more than $10 per pound of GOM cod ACE. Under a drastically reduced GOM cod quota, these are the trips that are most likely to continue. To re-calibrate the model to accommodate such a dramatic change in available quota, all trips that generated less than $12.50 per pound of GOM cod ACE were assumed not to occur in FY 2012. This was the level that optimized the catch of all other stocks conditioned on both this and the GB yellowtail constraints. Put another way, fisherman will in all likelihood need to generate on the order of $12.50 per pound of GOM cod ACE or more to effectively target other stocks.

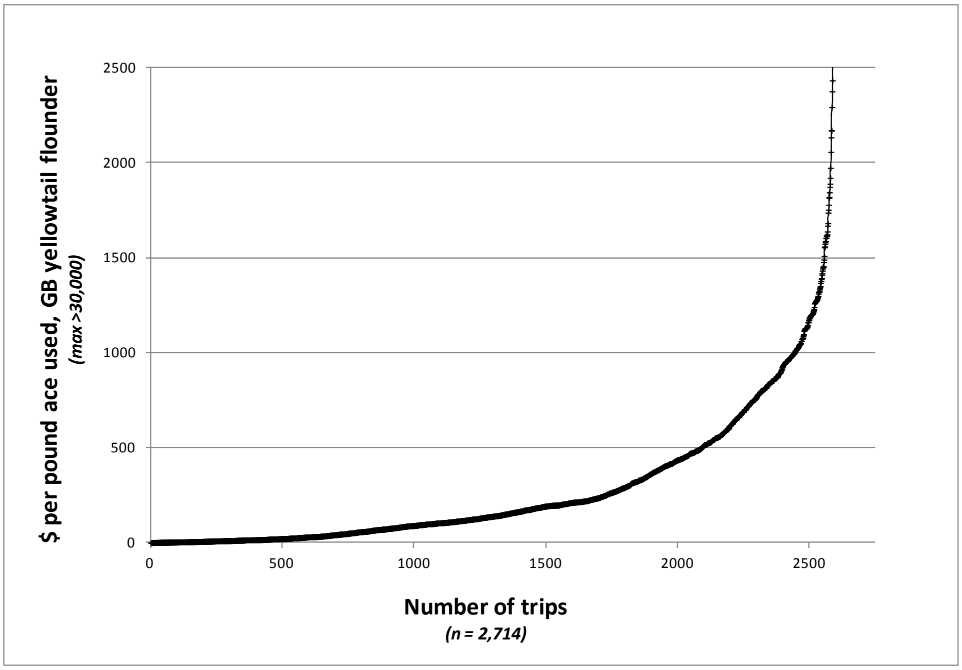
Figure 16 – Dollars generated per pound of GOM cod ACE for all trips catching GOM cod in FY 2010.



A similar problem is posed by GB yellowtail flounder. However, Figure 17 shows that fisherman on Georges Bank use their yellowtail flounder ACE much differently than GOM fishermen use their cod ACE. Only about 15% of trips on Georges Bank generated $10 or less in gross revenue per pound of yellowtail ACE exhausted. As previously stated, the equivalent percentage for GOM cod was 70%. This indicates that far more fishing trips are able to leverage their GB yellowtail flounder quota in the service of catching other stocks. In fact, on over half the trips reported as taking place on Georges Bank, fisherman were able to generate in excess of $100 per pound of yellowtail ACE. GB yellowtail is, then, much easier to avoid than GOM cod. To optimize the catch of other stocks, we use $25 generated per pound of ACE as the threshold for excluding trips from the model for both Option 2-Low and High. Importantly, when trips are omitted from the model other included trips will be selected with a higher probability, changing not only the distribution of the catch but the distribution of the vessels catching it.

No other quota changes were significant enough to warrant modifications of the FY 2010 data set of fishing trips for use in the model.

Figure 17 – Dollars generated per pound of GB yellowtail flounder ACE for all trips catching GB yellowtail flounder in FY 2010.



Analysis of aggregate impacts

Option 1 is predicted to generate the highest gross groundfish revenue at $112 million, assuming prices remain constant at 2010 levels. Option 2-High is estimated to generate about 12% less gross revenue from groundfish than Option 1, at $101.5 million. Both options are predicted to generate positive economic impacts in aggregate. Higher quotas for binding stocks like white hake and GOM cod translate into 20-30% higher gross groundfish revenues relative to the most recent completed fishing year. (FY 2010, $83 million).

Option 2-Low is estimated to have a negative economic aggregate impact, reducing gross groundfish revenues by approximately 15% relative to FY2010 and 30-40% relative to Option 1.

It is difficult to determine whether or not these estimates are too high or too low. At first glance it may unbelievable that Option 2-Low could result in sustained catches for other GOM species such as plaice and witch flounder and produce only 15% less gross revenue from groundfish than observed in FY 2010. Yet the existing trip information indicates it is possible. The conditions that allowed those high-revenue-per-cod trips to happen (environmental, abundance, etc.) must obviously persist, or be replicable. Further, there is every reason to believe that given as strong an incentive to avoid GOM cod as Option 2 will provide fishermen will become even more adept at maximizing their cod ACE-to-revenue ratio, using improved technology and/or skill to allow even higher catches of non-binding stocks than the model predicts.

Option 2-High may be even the most difficult to predict, though for an opposing reason--there are simply not enough trips with high GOM cod catch to allow the model to catch 23 million pounds. Without assuming significant increases in catch per unit effort on this stock (which seem unlikely given the targeted nature of most cod fishing in the Gulf of Maine) the model simply could not catch all the cod.

Table 48 – Predicted catch and gross revenue, Options 1, 2 Low and 2 High.

		OPTION 1				OPTION 2 LOW				OPTION 2 HIGH			
# runs = 100		CATCH			GROSS	CATCH			GROSS	CATCH			GROSS
SPECIES	STOCK	*PREDICTED*	*SECTOR ACE*	*pct*	REVENUES	*PREDICTED*	*SECTOR ACE*	*pct*	REVENUES	*PREDICTED*	*SECTOR ACE*	*pct*	REVENUES
American plaice		4,822,499	6,761,576	*71%*	$ 6,271,162	3,545,266	7,063,609	*50%*	$ 4,608,540	4,554,893	7,063,609	*64%*	$ 5,918,026
Cod	GB	7,916,731	10,244,878	*77%*	$ 20,344,819	6,803,282	9,934,027	*68%*	$ 17,678,416	7,534,167	9,934,027	*76%*	$ 19,527,021
	GOM	10,414,442	10,414,634	*100%*	$ 15,074,938	577,603	577,611	*100%*	$ 826,033	10,701,119	23,097,825	*46%*	$ 15,390,570
Haddock	GB	24,948,425	56,458,165	*44%*	$ 26,924,999	18,907,998	60,120,042	*31%*	$ 20,137,124	20,312,801	60,120,042	*34%*	$ 22,022,103
	GOM	1,331,674	1,388,912	*96%*	$ 1,124,007	645,639	1,426,390	*45%*	$ 555,180	1,173,556	1,426,390	*82%*	$ 1,026,876
Halibut		84,449			$ 360,648	58,431			$ 237,261	81,111			$ 352,324
Ocean pout		189,695			$ 1,757	153,152			$ 1,608	177,656			$ 1,566
Pollock		15,578,262	27,826,739	*56%*	$ 13,506,027	10,110,477	27,597,458	*37%*	$ 8,849,414	15,408,084	27,597,458	*56%*	$ 13,495,630
Redfish		7,045,882	17,727,366	*40%*	$ 3,629,334	5,644,703	18,265,293	*31%*	$ 2,858,427	7,050,889	18,265,293	*39%*	$ 3,634,853
White hake		6,225,543	6,896,058	*90%*	$ 6,044,100	4,798,539	7,169,431	*67%*	$ 4,708,894	6,350,804	7,169,431	*89%*	$ 6,179,330
Windowpane	North	481,062			$ 55,444	354,577			$ 42,825	474,925			$ 92,639
	South	356,100			$ 2,002	299,979			$ 2,471	336,432			$ 2,189
Winter flounder	GB	4,227,531	4,909,693	*86%*	$ 8,043,640	2,858,196	7,416,348	*39%*	$ 5,426,941	2,964,973	7,416,348	*40%*	$ 5,647,281
	GOM	250,448	291,010	*86%*	$ 442,608	91,817	1,496,938	*6%*	$ 160,978	237,595	1,496,938	*16%*	$ 419,087
	SNEMA	199,372			$ 1,290,378	169,424			$ 1,295,627	184,312			$ 1,125,741
Witch flounder		2,116,493	3,099,699	*68%*	$ 4,935,618	1,550,693	3,128,359	*50%*	$ 3,524,562	2,085,729	3,128,359	*67%*	$ 4,881,267
Wolffish		53,032			$ 463	37,895			$ 235	51,003			$ 351
Yellowtail flounder	CCGOM	1,787,264	2,151,711	*83%*	$ 965,802	983,072	2,239,896	*44%*	$ 530,171	1,776,040	2,239,896	*79%*	$ 970,142
	GB	1,432,490	1,467,617	*98%*	$ 2,374,412	470,806	471,789	*100%*	$ 608,926	471,779	471,789	*100%*	$ 675,362
	SNE	472,514	1,216,973	*39%*	$ 105,075	416,763	1,289,727	*32%*	$ 106,587	486,469	1,289,727	*38%*	$ 117,826
GRAND TOTAL		**89,933,909**	**150,855,030**	***60%***	**$ 111,497,230**	**58,478,314**	**148,196,919**	***39%***	**$ 72,160,221**	**82,414,338**	**170,717,133**	***48%***	**$ 101,480,182**

Distributional impacts

Option 1 and Option 2-High are both likely to have positive net benefits relative to FY 2010 across all hailing ports and states with the exception of Rhode Island and New York, which are predicted to lose roughly 30-70% of gross revenues under these two options. The loss of a commercial fishery for SNE winter flounder appears to continue to affect the medium sized vessels (50-70 feet) from this port, and may be the reason for the substantial predicted under-harvest of SNE yellowtail flounder. The model predicts that the largest size class vessels may see a nearly 50% reduction in gross groundfish revenues but the reason for this is unclear. Impacts across vessel size classes and gear types appear to be uniformly positive for these two Options.

Option 2-Low will have a negative economic impact across all size classes, gear types and nearly all hailing ports. The exception to this appears to be Chatham, which is predicted to essentially maintain its revenue from groundfish. Behind Chatham, Boston is the only other port that is predicted to see a decline in gross groundfish revenues of less than 25%. New Hampshire is predicted to be the hardest hit by the GOM cod quotas, losing over 90% of its gross revenues. In all likelihood these nominal losses represent a shift in fishing from smaller inshore vessels. While Massachusetts as a whole is predicted so suffer only a 33% loss in gross revenues, Gloucester in particular is predicted to see over a 40% gross groundfish revenue loss. In particular it appears to be the 30-50 foot vessel size class that is likely to be most adversely affected as fishing in the GOM shifts from the nearshore areas west of the Western GOM closed area to the deeper waters further east (Figure 18). Gillnetters appear to be most negatively affected gear type.

Table 49 – Summary of impacts by hail State, relative to FY2010.

	Option 1	Option 2-Low	Option 2-High
CONNECTICUT	-	-	-
MASSACHUSETTS	27%	-33%	20%
MAINE	30%	-54%	30%
NEW HAMPSHIRE	32%	-91%	29%
NEW JERSEY	-	-	-
NEW YORK	-34%	-55%	1%
RHODE ISLAND	-48%	-63%	-71%
OTHER	-	-	-

Figure 18 – Fishing locations for high (red) and low (blue) cod trips. VTR is + and Observer is <>.

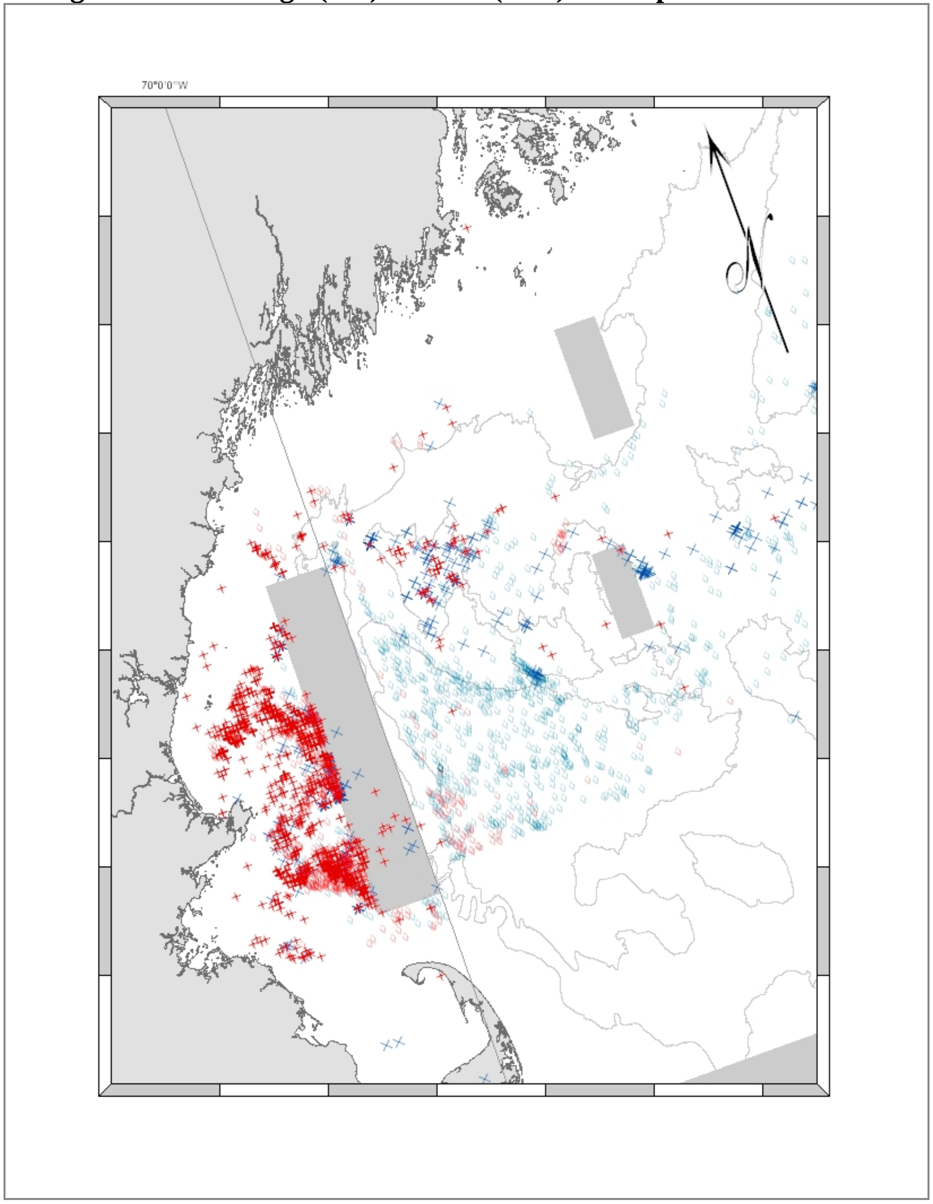


Table 50 – Predicted gross groundfish revenues and proportions by gear type.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
Otter trawl	$72,000,240	$97,498,651	$48,870,927	$87,833,867
Gillnet	$8,161,313	$11,425,231	$2,577,757	$11,030,181
Longline	$1,817,210	$2,524,453	$1,220,758	$2,505,092
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
Otter trawl	87.8%	87.5%	92.8%	86.6%
Gillnet	10.0%	10.3%	4.9%	10.9%
Longline	2.2%	2.3%	2.3%	2.5%
	100.0%	100.0%	100.0%	100.0%

Table 51 – Predicted gross groundfish revenues and proportions by size class.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
>30	$48,089	$74,808	$3,755	$69,715
30-50	$11,645,812	$17,248,859	$4,275,971	$16,636,091
50-75	$27,834,554	$37,365,622	$16,720,612	$34,155,658
>75	$42,450,307	$56,759,047	$31,669,103	$50,507,676
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
>30	0.1%	0.1%	0.0%	0.1%
30-50	14.2%	15.5%	8.1%	16.4%
50-75	34.0%	33.5%	31.7%	33.7%
>75	51.8%	50.9%	60.1%	49.8%
	100.0%	100.0%	100.0%	100.0%

Table 52 – Predicted gross groundfish revenues and proportions by hail State.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
CONNECTICUT	$8,923	$8,546	$5,392	$13,255
MASSACHUSETTS	$73,951,733	$101,981,159	$49,824,769	$92,212,150
MAINE	$3,550,153	$5,099,528	$1,642,897	$5,086,295
NEW HAMPSHIRE	$1,685,361	$2,473,340	$149,597	$2,383,963
NEW JERSEY	$7,854	$5,339	$3,946	$5,448
NEW YORK	$96,561	$72,322	$43,089	$97,882
RHODE ISLAND	$2,678,150	$1,808,081	$999,740	$1,570,126
OTHER	$28	$21	$12	$20
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
CONNECTICUT	0.0%	0.0%	0.0%	0.0%
MASSACHUSETTS	90.2%	91.5%	94.6%	91.0%
MAINE	4.3%	4.6%	3.1%	5.0%
NEW HAMPSHIRE	2.1%	2.2%	0.3%	2.4%
NEW JERSEY	0.0%	0.0%	0.0%	0.0%
NEW YORK	0.1%	0.1%	0.1%	0.1%
RHODE ISLAND	3.3%	1.6%	1.9%	1.5%
OTHER	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%

Table 53 – Predicted gross groundfish revenues by hail State, major Port and size class.

# runs = 100	ACTUAL	MODEL			
	FY2010	**FY2010**	**Status Quo**	**Option_2_low**	**Option_2_high**
CONNECTICUT	**$13,316**	**$8,923**	**$8,546**	**$5,392**	**$13,255**
MASSACHUSETTS	**$73,336,890**	**$73,951,733**	**$101,981,159**	**$49,824,769**	**$92,212,150**
>30		$4,110	$7,633	$0	$6,114
30-50		$14,838,013	$20,563,103	$7,593,161	$17,345,782
50-75		$24,703,780	$34,297,936	$15,375,585	$31,224,937
>75		$41,357,898	$55,902,469	$31,185,773	$49,730,577
Boston	*$11,598,490*	*$12,825,790*	*$18,149,891*	*$9,562,867*	*$17,771,721*
Chatham	*$2,165,564*	*$2,277,540*	*$3,375,373*	*$2,097,439*	*$3,270,683*
Gloucester	*$27,777,488*	*$23,256,440*	*$33,461,825*	*$13,974,987*	*$32,509,232*
New Bedford	*$29,072,251*	*$33,066,241*	*$43,346,898*	*$23,317,921*	*$35,111,931*
MAINE	**$4,738,143**	**$3,550,153**	**$5,099,528**	**$1,642,897**	**$5,086,295**
>30					
30-50		$2,104,266	$3,109,502	$832,612	$3,072,312
50-75		$1,166,854	$1,609,258	$580,683	$1,657,666
>75		$279,033	$380,768	$229,601	$356,316
Portland	*$3,853,628*	*$2,824,570*	*$3,997,903*	*$1,385,831*	*$4,036,373*
NEW HAMPSHIRE	**$3,268,992**	**$1,685,361**	**$2,473,340**	**$149,597**	**$2,383,963**
>30					
30-50		$1,618,523	$2,372,689	$149,587	$2,289,562
50-75		$66,839	$100,651	$9	$94,402
>75					
NEW JERSEY	**$29,035**	**$7,854**	**$5,339**	**$3,946**	**$5,448**
NEW YORK	**$293,257**	**$96,561**	**$72,322**	**$43,089**	**$97,882**
RHODE ISLAND	**$1,611,478**	**$2,678,150**	**$1,808,081**	**$999,740**	**$1,570,126**
>30					
30-50		$20,817	$15,303	$9,038	$15,166
50-75		$1,851,655	$1,324,525	$741,744	$1,146,517
>75		$804,661	$467,577	$248,544	$407,793
Point Judith	*$1,508,615*	*$2,671,392*	*$1,803,489*	*$996,910*	*$1,565,711*
OTHER	**$2,556**	**$28**	**$21**	**$12**	**$20**
GRAND TOTAL	**$83,293,667**	**$81,978,763**	**$111,448,336**	**$52,669,441**	**$101,369,140**

Option 1: No Action

Option 2: Revised Annual Catch Limit Specifications

6.4.2 Commercial and Recreational Fishery Measures

6.4.2.1 Management Measures for SNE/MA Winter Flounder

Option 1: No Action

If this option is adopted groundfish fishing vessels will not be allowed to land NE/MA winter flounder. No revenues will result from any catches of this stock as all will be discarded. The economic impacts of this measure are primarily the lost revenues that result from this prohibition. Based on a value of $2/ per pound for winter flounder in FY 2010, over the three years covered by the specifications proposed in 3.1.7.2, winter flounder landings of 1,081 mt would be foregone with potential revenues of about $4.7 million. This likely underestimates the loss in revenue as the prohibition may lead to reduced groundfish fishing activity and the loss of revenues from other species caught on those trips. When compared to Option 2, this option would result in reduced groundfish fishing revenues for vessels with federal permits.

Option 2: Allocate SNE/MA Winter Flounder to the Groundfish Fishery

If this option would be adopted, vessels with federal groundfish permits could potential land an additional 1,081 mt of winter flounder during FY 2012- 2014. Based on FY 2010 prices, this would increase revenues by about $4.7 million when compared to Option 1/No Action. This may under-estimate the increase in revenues as other species may be caught on additional trips that are taken to target winter flounder.

6.4.2.2 Scallop Catch of Yellowtail Flounder in Access Areas – Modification of Restrictions

6.4.2.2.1 Option 1/No Action

According to the current regulations, when the Georges Bank access area catches equal the 10% yellowtail flounder TAC set aside, the area is closed to further scallop fishing. This bycatch cap increases incentive of derby fishing having negative impacts on the scallop fishery. Some of these negative impacts are reduced because the plan compensates vessels for unused access area trips if an area closes, by allowing vessels with unused trips to transfer all or a portion of them to fish for scallops in open areas. However, the allocation of DAS for the unused trips do not usually provide a full compensation for the access area pounds and have resulted in losses for vessels that were not able to take their access area trips before the areas are closed. This factor has led to derby fishing and resulted in the premature closure of GB access areas several years (for example, in 2006, 2008 and 2009) as the yellowtail catches reached 10% of the TAC set-aside within a short period of time. The increase in the supply of scallops within a short time frame lowered the scallop ex-vessel prices, reduced revenues and economic benefits from the scallop fishery.

Allocation of open area DAS for unused trips does not always eliminate derby fishing because the number of open area DAS are determined according to a prorated amount to achieve an equal amount of scallop mortality per DAS. Unless the scallop biomass and mortality could be predicted with certainty and were equivalent in open versus access areas, DAS compensations are bound to either fall short of or exceed the amount of pounds (18,000 lb.) that could be landed from the access areas. For example, Framework 19 estimated that the compensation for Nantucket Lightship in 2008 would be 7.7 DAS and 7.9 DAS for Closed Area II trips in 2009. According to the recent estimates, LPUE in open areas was 1,624 in 2008 fishing year and 2,065 in 2009 fishing year. Thus scallop pounds that could be landed in the open areas with the prorated DAS would be about 12,420 lb. in 2008 and 16,068 lb. in 2009, less than the 18,000 pounds that could be landed form access areas. This resulted in derby fishing by vessels trying to avoid losses from a potential area closing and consequent closing of NL in 2008 and then of CAII in 2009, when that area closed only two weeks after it opened to fishing. Derby fishing probably has played a major role in reducing the scallop ex-vessel prices to their lowest level ($6.29 versus $6.85 during the whole year) in 2009. Compared to Option 2 (elimination of the bycatch cap in access areas), the Option 1/No Action would be expected to have more negative impacts on the scallop fishery due to negative consequences of derby fishing.

6.4.2.2.2 Option 2: Eliminate the 10% Yellowtail Flounder Bycatch TAC in Scallop Access Areas on Georges Bank

This measure would not be expected to have economic impacts on the groundfish fishery.

The elimination of the 10% yellowtail bycatch TAC and in-season closure of the access areas would be expected to greatly reduce the incentive for derby fishing, thus this alternative would be expected to have positive impacts on the scallop fishery. There is still an overall YT sub-ACL the scallop fishery is limited to for both YT stocks, but it is not restricted to access area fishing, and includes YT bycatch from both access areas and open areas.

If the YT sub-ACL is exceeded, pre-identified areas are closed to the scallop fishery for a specified period of time based on the magnitude of the YT overage the year after an overage, not in-season. Implementation of the closure in the subsequent year, rather than in-season, are expected to greatly reduce the race to fish and minimize the negative impacts on prices and revenues associated with derby style fishing --as long as elimination of an in-season closure doesn't increase the yellowtail bycatch rate. Furthermore, with the AM closures, negative impacts on the scallop resource and landings could be minimized and the fishing costs could be reduced if the closure schedule is designed such that effort would shift to more optimal seasons and areas when the scallop meat weights are larger.

There may be an increased risk of exceeding the overall sub-ACL if the 10% bycatch TAC in access areas in eliminated and the scallop fishery catches more YT in access areas than projected. Without the in-season closure it is possible that total bycatch for the year would be higher triggering longer AM closures in the subsequent year. If this is the case, this alternative could cancel out the positive economic impacts of eliminating the 10% bycatch TAC in access areas. To minimize this risk, scallop vessels can continue to participate in voluntary bycatch avoidance programs in access areas as well as other non-regulated fishing practices that are expected to reduce bycatch such as: a reduction in the hanging ratio to 2:1, reduction of number of rings between the club stick and twine top, shorter tow distance/duration and hanging the dredge at the side of the vessel before haul back to allow yellowtail escapement. Despite the fact that elimination of the bycatch cap could increase the risk of exceeding the total sub-ACL and extend the length of AM closures the following year, this alternative would still be expected to have positive impacts on the scallop fishery compared to Option 1/No Action by reducing the incentive for derby fishing.

6.4.2.3 Atlantic Wolffish Landing Limit

Option 1: No Action

If this option is adopted the groundfish fishery will not benefit from any revenues from landing Atlantic wolffish. Based on the sub-ACL for the fishery that is proposed in section 3.1.7.2, the maximum landings that would be allowed before an AM is triggered would be 73 mt. Wolffish is a relatively low value species, so this option results in a loss of about $80,000. This species is not typically a target species so it is not likely that this measure would result in additional losses in revenues from changes in fishing effort. When compared to Option 2 this measure would result in less revenue for groundfish fishing vessels, but the revenues are so small it would have little effect on the industry.

Option 2: Revised Atlantic Wolffish Possession Limit

If adopted this measure would allow landing one wolffish per trip. The maximum revenues that are possible would be about $80,000 based on the groundfish ACL for this stock proposed in section 3.1.7.2. It is likely that revenues would be less than this if this measure was approved since only one fish per trip could be landed. While this measure would marginally increase revenues the differences between this option and Option n1/No Action are slight.

6.4.2.4 Common Pool Restricted Gear Areas

Option 1: No Action

This measure would continue the requirement that in large areas of SNE and on western GB, common pool vessels are required to use selective gear that reduces catches of flounders and cod. This measure makes fishing by common pool vessels less efficient. In the SNE area, the measure may be the primary reason that common pool vessels landed only 15 mt of SNE/MA yellowtail flounder and caught only 26 percent of their sub-ACL for this stock in FY 2010. If this option is adopted, common pool vessel revenues would continue to be restricted. Compared to Option 2 this measure would result in reduced revenues for groundfish fishing vessels.

This measure may also increase costs for common pool vessels since if the vessel operator wishes to fish in the RGAs certain gear is required.

Option 2: Removal of Common Pool Restricted Gear Areas

If adopted this measure would be expected to increase revenues for common pool fishing vessels when compared to Option 1, particularly for those vessels that fish in SNE. The most likely effect would be to increase common pool landings of SNE/MA yellowtail flounder; common pool vessels caught only 26 percent of this stock in FY 2010. Based on this percentage of catch and the ACLs proposed in section 3.1.7.2, adopting this measure might result in increasing landings of this stock by 129 mt in FY 2012, worth an estimated $370,000. It may also reduce costs since vessel operators would not be required to purchase selective gear to fish in these areas.

6.4.2.5 Accountability Measures

Option 1: No Action

If this measure is adopted any impacts of the AMs would be borne by common pool fishing vessels. The impacts of any AM depend not only on whether an ACL is exceeded and the AM is triggered but in the reaction of fishermen to the possibility that the AM will be implemented. If there is strong belief that this will occur it can lead to derby effects as fishermen rush to fish before the AM is implemented.

The AMs for ocean pout and both windowpane flounder stocks would not be expected to have any economic impacts. Possession of these stocks is prohibited and so the AM – which, as written, allows NMFS to adjust the trip limit for these stocks – would not have any economic impacts.

The AM for Atlantic halibut also allows NMFS to adjust trip limits. Since possession is limited to one fish per trip, the only trip limit adjustment would be to ban possession. Total common pool revenues from Atlantic halibut in FY 2010 were only $25,000, or about 1 percent of common pool groundfish revenues (see http://www.nero.noaa.gov/ro/fso/reports/Sector_monitoring/Table_9.pdf). This is the upper limit on the reduction in common pool revenues that could result from this AM. Because halibut is not a target species fishing effort is not likely to be redistributed ifs this AM is implemented and the existence of the AM is not likely to lead to derby effects.

The No Action AMs for Atlantic wolffish and SNE/MA winter flounder require closing of statistical areas to common pool groundfish fishing if they are implemented. Unlike the AMs for ocean pout, windowpane flounders, and Atlantic halibut, these AMs could lead to derby effects since fishing opportunities are severely constrained if the AM is implemented. The economic effects would likely be greatest if the wolffish AM is implemented.

If the wolffish ACL is exceeded, common pool fishing activity is prohibited using sink gillnets, trawls, or longlines in statistical areas 513, 514, 521, and 522. In CY 2009 and CY 2010 these areas accounted for about 50 percent of revenues on trips that landed regulated groundfish for vessels that joined the common pool (in FY 2010). The potential loss of such a large portion of revenues by common pool vessels would create a strong incentive to fish before the AM would be triggered, leading to derby effects. There are also limited alternatives in other fisheries for the vessels that fish in these areas. While only 30 percent of the wolffish ACL was caught in FY 2010 and it would appear that implementing the AM is unlikely the revenue losses would be large enough that fishermen may be unwilling to risk being closed out of these areas. While these impacts would be large for the vessels in the common pool, in FY 2010 common pool groundfish fishing revenues were only $2.1 million out of a total of $82.7 million, or 2.5 percent of groundfish revenues. For the fishery as a whole, then, this AM would have minor effects on groundfish revenues.

The AM for SNE/MA winter flounder closes six statistical areas in the SNE/MA winter flounder stock area (521,526,537,612,613), but only for common pool vessels. In CY 200 9and CY 2010 these areas accounted for about 32 percent of revenues on trips landing regulated groundfish that were taken by vessels that joined sectors in FY 2010. While there may be more opportunities to participate in other fisheries in these areas if the AM is implemented this still places a large part of common pool revenues at risk and may encourage derby fishing behavior. While as in the GOM the impacts on common pool groundfish revenues may be large the loss in revenues for the groundfish fishery as a whole would be expected to be minor.

When compared to the other options this measure would limit economic impacts to the small portion of the fleet that fishes in the common pool. If the common pool remains a small component of the fishery then the reductions in revenue should these AMs be implemented would be expected to be on the order of less than 2 percent of total groundfish revenues. For vessels that are in the common pool, however, the loss of up to 50 percent of revenues would be devastating.

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

Option 3: Atlantic Halibut No Possession AM

If this measure is adopted if the halibut ACL is exceeded in year 1 then possession would be prohibited in year 3. The maximum revenue losses from this measure would be the value of the ACL for the year when possession would be prohibited. In FY 2012-2014 the groundfish sub-ACL is 36 mt, or just under 80,000 pounds. Halibut is worth over $5/pound, so this would be equivalent to about $400,000 in groundfish revenues. This is larger than the revenue losses under Option 1 because the AM applies to the entire commercial groundfish fishery and not just common pool vessels. It would be less than the revenue losses expected under Option 2 because this AM has no effect on other fishing activity by groundfish fishing vessels.

As is the case with all option, this measure would not have any economic impacts on the fishery if the sub-ACL was not exceeded and the AM was not triggered.

Option 4: Atlantic Wolffish No Possession AM

This AM would not be expected to result would result in only minor revenue losses for the groundfish fishery if vessels are allowed to possess one Atlantic wolffish per trip (see section 3.2.3.2). In that case if the sub-ACL is exceeded and the AM is implemented in a following year there would be a maximum potential loss of the revenues from landing the wolffish sub-ACL. These losses would be on the order of $80,000 given the ACL for this stock and an approximate value. These losses would be less than those expected under either Option 1 or Option 2 since this measure is unlikely to affect other groundfish fishing activity.

6.5 Social Impacts

The need to assess social impacts emanating from federally mandated fishing regulations stems from National Environmental Protection Agency (NEPA) and M-S Act mandates that the social impacts of management measures be evaluated. NEPA requires the evaluation of social and economic impacts in addition to the consideration of environmental impacts. National Standard 8 of the M-S Act demands that “Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of over fishing 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(2)(8)). The analysis that follows provides a context for understanding possible social impacts resulting from the proposed measures in Framework 47.

Amendment 13 identified five social impact factors: regulatory discarding, safety, disruption in daily living, changes in occupational opportunities and community infrastructure, and formation of attitudes. All of these factors can be affected by changes in management measures. Fishermen find regulatory discarding both distasteful and wasteful of valuable fishery resources. Modifications to daily routines can make long-term planning difficult. New gear requirements such as netting and some equipment must be ordered months in advance resulting in changes to daily routines when these modifications cannot be met in a time and cost efficient manner. Further the cost of making such changes may prove to be a burden for some vessel owners. Changes in management measures that limit access to fishing may increase the likelihood of safety risks. Increased risk can result when fishermen spend longer periods at sea in order to minimize steam time to and from fishing grounds, operate with fewer crew, and fish in poor weather conditions. Formation of attitudes refers to the positive or negative feelings or beliefs expressed by members of the communities that will be affected by the Proposed Action. The effect of the Proposed Action on these factors will be discussed below.

Amendment 13 also the identified primary and secondary port groups that are most affected by changes in groundfish management. The criteria port groups identified for this action are discussed in Section 5.4. It not likely that this action would affect all of these port groups to the same extent. Those port groups that are more dependent on groundfish would likely have more social impacts than those that participate in a range of fisheries. Even among communities with similar dependence on groundfish, there are likely to be different impacts since some measures have localized impacts. The following discussion will also highlight the differences between port groups, where appropriate.

It is important to note that, as in the case with the biological and economic impacts analyses for this framework, social impacts are very difficult to predict. With the implementation of Amendment 16 in FY 2010, many new regulations and new sectors came into place, and the effects of the new regulations interact in a complex manner. While it is widely expected that there will be broad social impacts as a result of recent management actions (such as shifts in effort or increased consolidation), the exact impacts are still unknown. The social impacts to the fishery will be determined, in large part, by the number and makeup of permits that ultimately fish in sectors in upcoming years, as well as by the design and workings of the sectors themselves, which is outside of the Council’s purview. The Council is taking actions to monitor changes in the fishery including holding a “lessons learned” workshop on sector implementation in October

2011, and a more detailed analysis of potential changes in the fishery and possible mitigating measures to enhance fleet diversity are being considered in Amendment 18 to the FMP (in development).

6.5.1.1 Updates to Status Determination Criteria, Formal rebuilding Programs, and Annual Catch Limits

6.5.1.1.1 Revised Status Determination Criteria for Winter Flounders and Gulf of Maine Cod

Option 1: No Action

Adoption of the No Action alternative would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be the criteria adopted in Amendment 16. These values were based on the GARM III assessments completed in 2008. Since new benchmarks assessments have been completed for these stocks, and as part of those assessments new SDCs were determined, the use of GARM III values would conflict with M-S Act requirements to use the best available science.

Of the social impact categories defined above, failure to use the best available science would most affect *formation of attitudes* toward management. Many public comments have been received by the Council expressing frustration with the amount of time it takes to incorporate new science and new stock assessments into management measures. The failure to incorporate the most recent winter flounder and GOM cod assessments would only exacerbate that perception.

Option 2: Revised Status Determination Criteria

Adoption of Option 2 would mean the status determination criteria (SDC) for the three winter flounder stocks and GOM cod would be based on the most recent benchmark assessments and would be based on the best available science, consistent with M-S Act requirements.

The use of the best available science in setting status determination criteria for the winter flounders and GOM cod would continue the practice of updating SDCs in the first action that modifies the FMP after a new assessment is completed. While major social impacts are not expected as a result of this action, in comparison to the No Action alternative, it will at least maintain the standard practice and not undermine faith in the process of incorporating assessments into management by using the best available science as early as practicable.

6.5.1.1.2 Revised GB Yellowtail Flounder Rebuilding Strategy

Option 1: No Action

This option would maintain the rebuilding strategy adopted for this stock in FW 45. The strategy calls for rebuilding by 2016 with a median probability of success. Assessment results from TRAC 2011 indicate that the stock cannot rebuild by 2016 even in the absence of all fishing mortality.

As a result, if this strategy would be continued then fishing mortality would have to be kept as close to zero as possible.

While the setting of a rebuilding strategy in itself does not carry major social impacts aside from affecting attitudes about the process of its development, the ensuing measures that would be designed to achieve the rebuilding goals would. It can be predicted with certainty that any measures that would be designed to keep mortality on GB yellowtail flounder as close to zero as possible would require dramatic reductions in fishing effort, including through closures and/or reduced fishing time, and substantially decreased revenues. Setting a very low fishing mortality level for this stock would have severe social impacts on the groundfish industry as well as the scallop industry, which also catches this stock in its prosecution.

Option 2: Revised rebuilding Strategy for GB Yellowtail Flounder

There are two sub-options in this option, either of which would modify the rebuilding strategy for GB yellowtail flounder. The sub-options are designed to target a fishing mortality rate that will rebuild with a median probability of success by a specific data. In each case, the end date was selected to take into account the possibility that the retrospective pattern observed in the assessment in TRAC 2011 will continue and taking this into account gives a more accurate representation of stock conditions. Either sub-option would rebuild more slowly than Option 1/No Action.

Sub-option A would be expected to rebuild the stock by 2023 with a median probability of success. This estimate is based on fishing at 75 percent of F_{MSY} (the default ABC control rule). Sub-option B would be expected to rebuild the stock by 2032 with a median probability of success. All impacts discussed below would be expected to last as long as the rebuilding period, barring other changes to the FMP or specifications.

This option would have positive social impacts compared to the No Action alternative. It would result in increased effort and landing of this stock when compared to the No Action alternative, which would provide for some increased *occupational opportunities*, although the exact amount of the effort increase is difficult to predict in a mixed-stock fishery. An increase in available GB yellowtail flounder could enable sectors and the common pool to operate longer before reaching their ACE and ACL, which would help create a more stable market and facilitate long-range planning for industry participants. Adoption of these options will also instill a sense of fairness that the rebuilding plans were re-considered in a way that promoted economic growth and incorporated best available science to not be unreasonable restrictive. The magnitude of that effect will be determined by how much the chosen strategy increases available catch over the applicable time frame.

Sub-option B, in particular, may have additional positive social impacts related to attitudes toward management. It is based not only on fishing at the maximum mortality expected to rebuild to SSB_{MSY}, but was also calculated to achieve an average annual increase in SSB of about 10 percent. At meetings of the Council's Groundfish Committee in the development of this option, some fishery participants have stated that they see an approach based on annual growth as more sensible and more appropriate than the approach used in the past that simply set an end date and a probability of success based on the requirements of the law.

6.5.1.1.3 Identification of Additional Sub-Annual Catch Limits

MOVED TO CONSIDERED, BUT REJECTED CATEGORY

6.5.1.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

If no action is taken on specifications, the recommendations of the TMGC would also not be implemented and there would be no TAC for EGB cod, haddock, or GB yellowtail flounder in the U.S./Canada area for FY 2012.

This would be expected to have negative long-term social impacts, as it would be more difficult to meet rebuilding targets without a localized TAC. A slower rebuilding timeframe would lead to fewer *occupational opportunities* due to smaller stock size over the long term. Additionally, the failure of the U.S. to uphold their agreement with Canada could lead to poor *formation of attitudes* on a high level and could negatively impact future negotiations if the Canadian managers do not believe that agreements will be upheld.

Option 2: U.S./Canada TACs

This alternative would specify TACs for the U.S./Canada Management Area for FY 2012 for EGB cod, haddock, and GB yellowtail flounder. These TACs would be in effect for the entire fishing year, unless the FY 2011 catch of any stock in the area exceeds its specified TAC. If the TAC in a particular fishing year is exceeded, the TAC for the subsequent fishing year would be reduced by the amount of the overage. In order to minimize any disruption to the fishing industry, NMFS would attempt to make any necessary TAC adjustment in the first quarter of the fishing year.

The proposed hard TACs for the U.S./Canada area would not be expected to have significant social impacts in comparison to the No Action alternative. The TACs for each of the stocks were determined in the same way as has been done in recent years. TACs of the three co-managed species vary from year to year, and while the FW 47 numbers are low compared to the TACs set in recent years, they are roughly proportional to reductions across the entire stock for GB cod, haddock, and yellowtail flounder proposed in other sections of this framework. Although discarding may occur in the area as it does in the rest of the fishery, it is unlikely to be a special issue.

Although the Proposed Action would have short-term negative economic impacts in contrast to the No Action Alternative, the impacts should not be significantly different from those in the rest of the fishery in a way that would cause them to have unique social impacts. The long term impacts of the No Action Alternative are more likely to be negative than the Proposed Action. Stock rebuilding is likely to have positive social effects, as it will allow effort to increase in the area, and such rebuilding could be jeopardized by the No Action alternative.

6.5.1.1.5 Mixed Stock Exception for SNE/MAB Windowpane Flounder

MOVED TO CONSIDERED, BUT REJECTED CATEGORY

6.5.1.1.6 Administration of Scallop Fishery Sub-ACLs

Option 1: No Action

If Option 1/No Action were implemented there would not be any changes to the way scallop fishery sub-ACLs are administered. Under this option, when a sub-ACL is caught, the AMs that apply to the scallop fishery are implemented. The particular AMs are specified by the Atlantic Sea Scallop FMP. The AMs are implemented without regard to whether other components have caught their allocation and without regard to whether the overall ACL is exceeded.

The No Action alternative would not be expected to have significant social impacts. There is a pervasive attitude that it is unfair that accountability measures be imposed on one section of the fleet when the total ACL for a stock is not harvested (and therefore, no risk is posed to the overall health of a stock beyond what was considered in the ACL-setting process). The No Action alternative would perpetuate that attitude. However, this would be at least partially balanced by industry participants who feel that each portion of the fishery should be accountable for its own actions and not benefit from the failure of another fishery to fully harvest its ACL. The latter attitude conjures notions of fairness between fisheries.

It is important to note that if the AMs are triggered, there could be severe social impacts to the scallop fishery resulting from lost *occupational opportunities*. The No Action alternative increases the possibility that this could occur, but ultimately those impacts would be possible under either option.

Option 2: Changes to Scallop Fishery Sub-ACL Administration

If Option 2 is adopted, then scallop fishery catches of groundfish stocks would continue to be compared to the sub-ACLs, but the AM would only be triggered if the overall ACL was exceeded. As a result, in any given year it is possible that the scallop fishery might exceed its ACL, but AMs would not be triggered if total catches did not exceed the overall ACL.

This option would be expected to have two types of social impacts: *formation of attitudes* because many industry participants perceive it to increase fairness, and a reduced chance of *loss of occupational opportunities* when compared to the No Action alternative.

As mentioned in the discussion of the No Action alternative, there is a pervasive attitude that it is unfair that accountability measures be imposed on one section of the fleet when the total ACL for a stock is not harvested (and therefore, no risk is posed to the overall health of a stock beyond what was considered in the ACL-setting process). Since the purpose of AMs is to prevent overfishing, and this option only implements the scallop fishery AMs when – based on catches exceeding the ACL – overfishing is likely to have occurred, it may be considered more fair than the No Action option. However, there is also a slight risk that some industry participants may feel that it is unfair for the scallop fishery to benefit from the groundfish fishery's potential failure to fully harvest its ACL, which would somewhat offset some of the positive views on fairness.

If the AMs are triggered, there could be severe social impacts to the scallop fishery resulting from lost *occupational opportunities*. This option decreases the possibility that that could occur, in comparison to the No Action alternative, but ultimately those impacts would be possible under either option.

Option 3: In-Season Re-estimation of Scallop Fishery GB Yellowtail Flounder Sub-ACL

This option would require NMFS to re-estimate the expected scallop fishery catch of GB yellowtail flounder by January 15 of the fishing year and increase the sub-ACL to the groundfish fishery if the scallop fishery is not projected to be able to catch its allocation. Initially, the allocation of GB yellowtail flounder to the scallop fishery is based on an estimate of the amount of GB yellowtail flounder the scallop fishery is expected to catch if it harvests all of the available scallops. This initial estimate is based on past fishing activity and projected changes in stock size for both yellowtail flounder and scallops, and includes some amount of uncertainty.

This option, similar to Option 2, would be expected to have positive social impacts in comparison to the No Action alternative. As mentioned previously, there is a pervasive attitude that it is unfair that accountability measures be imposed on one section of the fleet when the total ACL for a stock is not harvested (and therefore, no risk is posed to the overall health of a stock beyond what was considered in the ACL-setting process). In this case, this applies to the potential of triggering AMs in the common pool groundfish fishery and the possibility of sectors being unable to continue fishing because they have reached their allocation of this stock. Since the purpose of AMs is to prevent overfishing, and this option would potentially re-allocate groundfish back to the groundfish fishery in order to defer AMs to the point when – based on catches exceeding the ACL – overfishing is likely to have occurred, it may be considered more fair than the No Action option.

6.5.1.1.7 Annual Catch Limit Specifications

Option 1: No Action

This option would maintain the specifications (OFLs/ABC/ACLs) for FY 2012 at the same levels as adopted by FW 44 and FW 45. It would also maintain the distribution of the catches to various fisheries sub-components. If this option would be adopted, the specifications would only be identified for FY 2012 for all stocks except pollock, and not later years. The specifications would not reflect the recent assessments of the three winter flounder stocks, GB yellowtail flounder, and GOM cod.

The No Action alternative for specifications, if adopted, would entail the failure by the Council to adopt ACLs for the fishery based on the best available science, as well as a lack of TACs for the U.S./Canada area. A description of the social impacts of using ACLs in the management of the groundfish fishery can be found in Amendment 16.

Of the social impact categories defined above, failure to use the best available science would most affect *formation of attitudes* toward management. Many public comments have been received by the Council expressing frustration with the amount of time it takes to incorporate new science and new stock assessments into management measures. The failure to adopt ACLs based on the most recent assessments and analyses would only exacerbate that perception.

Because the ACLs are simply caps on the amount of catch that can occur for each stock in the fishery, maintaining the ACL numbers from FW 44 and FW 45 itself does not have major social impacts. There would therefore likely be few social impacts of adopting No Action. Catches are limited, they may be viewed as conservative limits, and the complexity of setting the limits may deter participation in the management process. The relatively minor differences in catch levels are not likely to substantially alter the perception of the management program.

Option 2: Revised Annual Catch Limit Specifications

Option 2 would adopt new ABCs for the three winter flounder stocks, GB yellowtail flounder, GOM cod, and the three stocks assessed with a survey index. The ABCs for other stocks are the same as in Option 1/No Action and so these impacts are not summarized again.

This measure includes the identification of ACLs based on the best available science as required by the M-S Act and as implemented by Amendment 16. It also incorporates adoption of the TACs for Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder that are applicable to the U.S./Canada Resource Sharing Understanding.

Implementation of ACLs as required by the Magnuson-Stevens Act may have social impacts that are difficult to define. Since it cannot be determined whether the use of ACLs will change effort levels or allocation of the resource, the most likely type of impact is a change in the formation of attitudes toward the management process. The standardization of a process to determine fishing levels may lend a sense of legitimacy to fisheries management in the eyes of the public. However, the process for setting ACLs is quite complicated and technical, and some would-be public participants could be deterred from engaging in management forums.

Compared to the No Action alternative, some of the ACLs being adopted are more permissive than those set in Frameworks 44 and 45, while others are more restrictive. The adoption of the more restrictive ACLs may lead to concerns that the fishery is being managed in an overly conservative manner. This could affect attitudes towards the management program since it will be viewed as limiting occupational opportunities unnecessarily. However, the more permissive ACLs proposed in this option are likely to have the opposite effect: they can increase *occupational opportunities* and reduce *regulatory discarding* that may occur if trip limits are imposed on stocks with low ACLs. These effects are expected to be minor. Because this is a mixed-stock fishery, an increase in ACLs for certain stocks, such as pollock, is tempered by the fact that catches may still be limited by bycatch or concurrent catch of other species managed in the FMP.

Because the ACLs are simply caps on the amount of catch that can occur for each stock in the fishery, the adoption of ACLs numbers itself does not have major social impacts. Rather, low ACLs drive conservative management strategies, and the methods for reducing effort or allocating the ACL are the largest contributors to impacts of a social nature. The sector and effort control systems currently in place were adopted in Amendment 16 and updated in subsequent frameworks, and impacts of each measure were described in those documents. Impacts of alternatives that would change allocations and management measures in FW 47 are analyzed in this document.

However, in light of the discussion above, there is likely to be little difference between the social impacts of the Proposed Action and No Action. Under both circumstances, catches are limited, they may be viewed as conservative limits, and the complexity may deter participation in the management process. The relatively minor differences in catch levels are not likely to alter the perception of the management program.

6.5.1.2 Commercial and Recreational Fishery Measures

6.5.1.2.1 Management Measures for SNE/MA Winter Flounder

Option 1: No Action

Landings of SNE/MA winter flounder would continue to be prohibited under this option. Because landing is prohibited there would likely be little groundfish fishing for this stock or other stocks that are caught with SNE/MA winter flounder. The prohibition on landing this stock has been in effect for all of 2010 and eight months of 2009. Catches were well below the groundfish sub-ACL in FY 2010, with only 9 percent of the sub-ACL caught. As noted in the biological impacts section, this measure would indirectly affect the ability to assess this stock by reducing the number of fish that can be obtained for biological sampling by port agents. Over time this would result in a decreased understanding of changes in the stock and would increase assessment uncertainty.

This option, as a continuation of the status quo, would be unlikely to have significant social impacts. When it was adopted, it was seen as a way to allow sectors to continue to operate without binding them to very low quotas of this stock. Because of that perception, it was received positively by the industry. If the stock size increases so that it may be landed and treated in a manner similar to other groundfish stocks, it seems that *formation of attitudes* could be negatively impacted if it is perceived as unfair or unjustifiable in regard to the treatment of other stocks. Also, any increase in uncertainty could negatively affect the other social impact categories. Uncertainty in assessments can lead to lower allowed catches, which could reduce *occupational opportunities* and negative *attitudes* about the assessment and management processes.

Option 2: Allocate SNE/MA winter flounder to the fishery

If adopted, this option would allow the landing of SNE/MA winter flounder by both common pool and sector vessels. Catches would still be limited to the ACL that was established and in particular the groundfish fishery would be limited to its sub-ACL. Because landing would be allowed, however, it would be expected that catches would increase when compared to Option 1/No Action and would probably exceed the 9 percent of the sub-ACL caught in FY 2010. An indirect impact of this option is that allowing landing of this stock will provide increased opportunities for biological sampling of the catch, and therefore increase certainty in future assessments of this stock.

This option overall would be expected to have positive social impacts in comparison to the No Action alternative, if the stock size were sufficient in order to allow landings without compromising the ability of sector participants to harvest the ACL of other allocated stocks. Assuming that were the case, it should be perceived as fair to treat the stock like most of the other regulated groundfish stocks. It would also provide for increased *occupational opportunities* if the overall landings were increased, and if sector fishermen were able to sell the SNE/MA winter flounder they catch. However, is this measure were to endanger sectors' ability to harvest the ACL of other stocks in the mixed-stock fishery, and as a result sector participants had to stop fishing because the allocation, there would be a substantial risk of decreased *occupational opportunities*.

This option could also improve attitudes about management and about the scientific process in fisheries management if it were to lead to increased certainty in future assessments for this stock. A better understanding of the stock condition could lead to more regularity in its management, narrower interannual fluctuations in allowable catch levels, and an increased ability to plan fishing and business opportunities.

6.5.1.2.2 Scallop Catch of Yellowtail Flounder in GB Access Areas – Modification of Restrictions

Option 1: No Action

If adopted, scallop fishery catches of GB and SNE/MA yellowtail flounder in the CAI, CAII, and NLCA access areas would continue to be limited to 10 percent of the ACL of the relevant stock. This would not limit the potential total catches of yellowtail flounder by the scallop fishery but it would limit the amount of the sub-ACL that is taken within closed areas. Because this measure could constrain scallop fishing effort within the access areas, it may also reduce catches of other groundfish stocks within these areas.

This option would not be expected to have significant social impacts, as it continues the status quo in the access areas. Since the overall cap of yellowtail flounder caught by the scallop fishery is set with a hard limit, it is commonly viewed as unfair, or "micro-managing", to limit the portion of that catch that can be taken in the access areas.

Option 2: Eliminate cap on yellowtail flounder caught in the GB access areas

This option would remove the restriction on the amount of the scallop fishery sub-ACL for either SNE/MA or GB yellowtail flounder that can be caught the CAI, CAII, or NLCA access areas. This measure could result in more of the catch of these two stocks being caught in a relatively small part of the stock area, and possibly during a narrowly defined part of the year since the access areas are not open year-round at present.

In general this option would have positive social impacts in comparison to the No Action alternative, as it is widely viewed by industry participants as fair to reduce effort controls on fisheries that are capped by a hard limit on allowable catch. The biological impacts of these localized catches are uncertain, and to some extent the social impacts may partially depend on the realized biological impacts. As discussed in the biological impacts section, this measure has the potential to increase or decrease the overall rebuilding rate for these stocks. If rebuilding is compromised, *occupational opportunities* for participants who fish for and gain income from these fish may be reduced. However, if spawning fish are avoided as a result of this option and rebuilding occurs faster than it otherwise would, *occupational opportunities* will be increased.

6.5.1.2.3 Atlantic Wolffish Landing Limit

Option 1: No Action

If this option is adopted, possession of Atlantic wolffish would continue to be prohibited. Both recreational and commercial fishermen would be required to return fish to the sea with a minimum of harm. This measure reduces the incentive to target Atlantic wolffish, reducing fishing mortality, but this species is not typically caught in large enough quantities that active targeting is common. Those fish that are incidentally caught would also not be retained and some would be expected to survive.

Overall, this option would not be expected to have significant social impacts, as it maintains the status quo for this stock. The zero-possession rule is one of the major factors that led to a determination that Atlantic wolffish should not be listed under the Endangered Species Act, and this compromise has been viewed positively by many stakeholders from different backgrounds.

One indirect impact of this measure is that, compared to Option 2, it reduces the number of wolffish that are landed. This means little fishery-dependent data is available to monitor the condition of this stock, making future assessments more uncertain. Any increase in uncertainty could negatively affect some social impact categories. Uncertainty in assessments can lead to lower allowed catches, which could reduce *occupational opportunities* and negative *attitudes* about the assessment and management processes.

Option 2: Revised Atlantic Wolffish Possession Limit

If this option is adopted, commercial fishing vessels would be allowed to retain one Atlantic wolffish. Recreational fishing vessels would not be allowed to retain any Atlantic wolffish. This measure, when compared to Option 1/No Action, would be expected to lead to a slight increase in Atlantic wolffish fishing mortality. However, any impacts on fishing mortality are likely to be slight and probably undetectable.

This option would not be expected to have major social impacts. While commercial fishing vessels would be allowed to land one wolffish per fishing trip, it is unlikely that any major financial benefit would be achieved. It is possible that *safety* would be slightly increased, since anecdotal reports suggest that wolffish are dangerous to handle delicately, and if a fishing operator were to catch one wolffish they could opt to kill it and land it, rather than trying to return it to sea alive. Also, there is a slight possibility this measure could be perceived as unfair, since only commercial fishing vessels would be allowed to retain a wolffish and recreational vessels would not.

In contrast to Option 1/No Action, more fish would be available for biological sampling and the ability to monitor the stock would be improved. This could also improve attitudes about management and about the scientific process in fisheries management if it were to lead to increased certainty in future assessments for this stock. A better understanding of this data-poor stock condition could lead to more closely tailored regulations and an increased ability to plan fishing and business opportunities.

6.5.1.2.4 Common Pool Restricted Gear Areas

Option 1: No Action

If this option were to be adopted, the common pool restricted gear areas (RGAs) adopted in Amendment 16 would remain in effect. These areas and the applicable regulations are described in section 3.2.4.1. The RGAs were implemented primarily to reduce catches of several flatfish species by requiring the use of gear that typically is not effective at catching them. The areas were positioned to reduce catches of SNE/MA winter flounder, SNE/MA yellowtail flounder, SNE/MAB windowpane flounder, witch flounder, and plaice. When compared to Option 2, this measure would be expected to reduce fishing mortality for several groundfish stocks even if compliance is weak.

Overall, this option would not be expected to have significant social impacts, as it maintains the status quo. However, the low compliance rate may raise questions of fairness between fishery participants who abide by the restricted areas and those who do not. While reduced fishing mortality on several vulnerable flatfish stocks is overall seen as desirable, it is also widely viewed by industry participants as fair to reduce effort controls on fisheries that are capped by a hard limit on allowable catch. The perception is that the hard limits protect the stock status, and that effort controls should be removed so that fishing vessel operators can make business plans that best suit them. However, the imposition of the trimester TAC accountability measures mean that if the common pool catches their allocation of a stock, the fishery will shut down, so fears of a derby fishery persist.

Option 2: Removal of Common Pool Restricted Gear Areas

This option would remove the restricted gear area provisions adopted by Amendment 16 and described in section 3.2.4.1. When compared to Option 1/No Action this measure would be expected to lead to increased fishing activity by common pool vessels that might target SNE/MA winter flounder, SNE/MA yellowtail flounder, and several other stocks. As a result it is reasonable to expect that common pool catches would increase from those in FY 2010 and 2011.

This option, compared to the No Action alternative, would be expected to have positive social impacts unless the common pool allocation was reached before the end of the fishing year. The ability of fishing vessel operators to choose the times and areas in which they fish would increase business planning, *occupational opportunities*, and *safety*. However, beginning in FY 2012 the common pool AMs will include trimester TACs for most species, allowing strict control of catches in-season. This could have the result of a common pool fishery shut-down during the year. A fishery shut-down would negatively impact each of the social impact categories by eliminating fishing opportunities entirely for the duration of the trimester in which the TAC was reached.

6.5.1.2.5 Accountability Measures

Option 1: No Action

If this option is adopted the primary AM for ocean pout, both windowpane flounder stocks, Atlantic halibut, Atlantic wolffish, and SNE/MA winter flounder would be the trimester "hard" TAC system that applies to common pool vessels beginning in FY 2012. This measure may not be an effective control on fishing mortality for these stocks for several reasons. First, the AM applies only to common pool fishing vessels and does not constrain vessels fishing in sectors. As a result only part of the catches will be affected by the AMs.

Overall, this option would not be expected to have significant social impacts, as it maintains the status quo as adopted in Amendment 16. However, it has the potential to create perceptions of unfairness since one portion of the fishery is effectively penalized for an overage by any other portion.

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

This AM would impose area-based restrictions if the total ACL for any of these stocks is exceeded. The restrictions are designed to apply at certain times and in certain areas. If an AM is triggered either selective gear is required in an area or the area is closed to fishing with particular gear. Details are provided in section 3.2.5.2. It is important to note that this AM affects all groundfish fishing activity, sector and common pool, unlike Option 1/No Action.

There are some minor positive social impacts associated with this option, in comparison to the No Action alternative. Because the proposed closures would create effective AMs for both the sector and common pool components of the fishery, it could help to promote perceptions of equity and fairness among the two fleets.

Despite that potential positive impact, if the AMs are triggered this option could be expected to have overall negative social impacts. Social impacts of closed areas may tend to be more far-reaching in nature than social impacts from other management measures that are more administrative in nature, although the impacts are not as great as those that would result from very low catch limits or reductions in days at sea.

Area closures tend to have the most significant impacts on *disruption in daily living* and *changes in occupational opportunities and community infrastructure*. Area-based restrictions such as these, compared to the No Action alternative, are likely to cause effort to be shifted to other areas, which could change opportunities and infrastructure in homeports and ports of landing. Reductions in groundfish fishing opportunities in this area compromise vessels' flexibility and can have direct impacts on fishing activity within a port, consequently impacting the shoreside facilities that are dependent on the affected vessels. If vessels in certain areas choose to relocate or not to operate as a result of these closures, social impacts associated with economic loss could occur including increased uncertainty and instability in the fishery and/or community, problems finding and keeping crew members on a year-round basis, social impacts related to family and business financial problems, overall increased stress at the individual, family, and community level, and reductions in perceptions about job satisfaction. Given the limited nature of the potential closures, however, the loss of business is expected to be minor and therefore these effects will not be substantial. Note that the most significantly impacted communities will be those that are geographically proximate to the area or that serve as the homeport for vessels that fish there.

Option 3: Atlantic Halibut No Possession AM

If adopted this measure would prohibit landing Atlantic halibut if the sub-ACL would be exceeded. On the surface this measure appears similar to the Option 1/No Action alternative which allows for adjustments to the Atlantic halibut trip limit when a percentage of the TAC/ACL is projected to be caught. But unlike the No Action alternative, this measure would prohibit possession by both sector and common pool vessels. Since a greater percentage of the catch would be subject to this measure the control of fishing mortality would be more effective than under the No Action alternative. When compared to Option 2, this measure would likely be less effective at controlling fishing mortality.

This measure would be expected to have overall similar, but slightly positive social impacts when compared to the No Action alternative. Because the proposed prohibition on landing would apply to both the sector and common pool components of the fishery, it could help to promote perceptions of equity and fairness among the two fleets. The more effective control of fishing mortality would also lead to long-term increased *occupational opportunities* as the stock can rebuild more quickly.

Option 4: Atlantic Wolffish No Possession AM

If adopted, this measure would prohibit landing Atlantic wolffish if the sub-ACL would be exceeded. Unlike the No Action alternative, this measure would prohibit possession by both sector and common pool vessels at all times as a proactive approach to an AM. When compared to Option 2, this measure would likely be less effective. Unlike Option 2, which restricts fishing activity in certain areas if the ACL is exceeded, this measure does not restrict activity and similar amounts of wolffish would be expected to be caught both before and after the AM is implemented. The effectiveness of this measure in reducing mortality would be due to the portion of the discarded catch that survives once the AM is implemented.

This option is not expected to have significant social impacts, in comparison to the No Action alternative. Because the proposed prohibition on landing would apply to both the sector and common pool components of the fishery, it could help to promote perceptions of equity and fairness among the two fleets. The more effective control of fishing mortality would also lead to long-term increased *occupational opportunities* as the stock can rebuild more quickly. As is the case with the No Action alternative on the Atlantic wolffish landing limit measure, this measure would reduce the number of wolffish that are landed, meaning that little fishery-dependent data is available to monitor the condition of this stock, making future assessments more uncertain. Any increase in uncertainty could negatively affect some social impact categories. Uncertainty in assessments can lead to lower allowed catches, which could reduce *occupational opportunities* and negative *attitudes* about the assessment and management processes.

6.6 Cumulative Effects Analysis

THIS SECTION WILL BE UPDATED AFTER THE NOVEMBER COUNCIL MEETING

6.6.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Framework 44 together with past, present, and reasonably foreseeable future actions that affect the groundfish environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

Valued Ecosystem Components (VEC)

As noted in Section **Error! Reference source not found.** (Description of the Affected Environment), the VECs that exist within the groundfish fishery are identified and the basis for their selection is established. Those VECs were identified as follows:

1. Regulated groundfish stocks (target and non-target);
2. Non-groundfish species (incidental catch and bycatch);
3. Endangered and other protected species;
4. Habitat, including non-fishing effects; and
5. Human Communities (includes economic and social effects on the fishery and fishing communities).

Temporal Scope of the VECs

While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery, rather than foreign fleets. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, this analysis examines the period between implementation of this amendment (May 1, 2011) and the anticipated rebuilding of the fishery in 2026. This date was chosen because after the fishery is rebuilt, changes to the management of groundfish that are not possible to predict at this time are likely.

Geographic Scope of the VECs

The geographic scope of the analysis of impacts to regulated groundfish stocks, non-groundfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment section of the document (Section **Error! Reference source not found.**). 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 5.3).

Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (Section **Error! Reference source not found.**) from the U.S.-Canada border to, and including, North Carolina.

Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; PLUS (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); PLUS (3) impacts from the Proposed Action and alternatives.

A description of past, present and reasonably foreseeable future actions is presented immediately below in

Table 54. The baseline conditions of the resources and human community are subsequently summarized although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this framework is included. The culmination of all these factors is considered when making the cumulative effects assessment.

6.6.2 Past, Present and Reasonably Foreseeable Future Actions

Table 54 summarizes the combined 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.

Note that most of the actions affecting this framework and considered in

Table 54 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management - the reauthorized Magnuson-Stevens Act. That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the act stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

Table 54 – Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Framework 45

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Regulated Groundfish Stocks	**Mixed** Combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary. However, some stocks remain overfished	**Positive** Current regulations continue to manage for sustainable stocks	**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks	**Short-term Negative** Several stocks are currently overfished, have overfishing occurring, or both **Long-Term Positive** Stocks are being managed to attain rebuilt status
Non-Groundfish Species	**Positive** Combined effects of past actions have decreased effort and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species	**Positive** Future actions are anticipated to continue rebuilding and target healthy stocks, thus limiting the take of discards/bycatch	**Positive** Continued management of directed stocks will also control incidental catch/bycatch
Endangered and Other Protected Species	**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Positive** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions	**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions
Habitat	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Human Communities	**Mixed** Fishery resources have supported profitable industries and communities but increasing effort and catch limit controls have curtailed fishing opportunities	**Mixed** Fishery resources continue to support communities but increasing effort and catch limit controls combined with non-fishing impacts such as rising 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** Lower revenues would likely continue until stocks are fully rebuilt **Long-term Positive** Sustainable resources should support viable communities and economies

<u>Impact Definitions:</u>
-Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size
-Habitat: positive=actions that improve or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat
-Human Communities: positive=actions that increase revenue and well being of fishermen and/or associated businesses and negative=actions that decrease revenue and well being of fishermen and/or associated businesses

6.6.3 Baseline Conditions for Resources and Human Communities

For the purposes of a cumulative effects assessment, the baseline conditions for resources and human communities is considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. The following table (Table 55) summarizes the added effects of the condition of the VECs (i.e., status/trends from section **Error! Reference source not found.**) and the sum effect of the past, present and reasonably foreseeable future actions (from

Table 54 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straightforward quantitative metrics of the baseline conditions are only available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECS are complex and varied. As such, the reader should refer to the characterizations given in Sections **Error! Reference source not found.** and **Error! Reference source not found.**, respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions below in Table 55.

Impact Definitions for Table 55 below:

Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species	Positive = actions that increase stock size Negative = actions that decrease stock size
Habitat	Positive = actions that improve or reduce disturbance of habitat Negative = actions that degrade or increase disturbance of habitat
Human Communities	Positive = actions that increase revenue and well being of fishermen and/or associated businesses Negative = actions that decrease revenue and well being of fishermen and/or associated businesses
All VECs	Mixed=both positive and negative

Table 55 – Cumulative effects assessment baseline conditions of the VECs

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 54)	Combined CEA Baseline Conditions
Regulated Groundfish Stocks	**Georges Bank Cod**	Overfished and overfishing is 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 Amendment 16, stocks are expected to rebuild in the future
	Gulf of Maine Cod	Not overfished but overfishing is occurring.		
	Georges Bank Haddock	Not overfished and overfishing is not occurring.		
	Gulf of Maine Haddock	Not overfished and overfishing is not occurring.		
	Georges Bank Yellowtail	Overfished and overfishing is occurring.		
	SNE/Mid-Atlantic Yellowtail	Overfished and overfishing is occurring.		
	Cape Cod-Gulf of Maine Yellowtail	Overfished and overfishing is occurring.		
	American Plaice	Not overfished and overfishing is not occurring.		
	Witch Flounder	Overfished and overfishing is occurring.		
	Georges Bank Winter Flounder	Overfished and overfishing is occurring.		
	Gulf of Maine Winter Flounder	Overfished and overfishing is occurring.		
	SNE/Mid-Atlantic Winter Flounder	Overfished and overfishing is occurring.		
	Acadian Redfish	Not overfished and overfishing is not occurring.		
	White Hake	Overfished and overfishing is occurring.		
	Pollock	Not overfished and overfishing is not occurring.		
	Northern Windowpane	Overfished and overfishing is occurring.		
	Southern Windowpane	Not overfished but overfishing is occurring.		
	Ocean Pout	Overfished but overfishing is not occurring.		
	Atlantic Halibut	Overfished but overfishing is not occurring.		

Table 55 continued

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 54)	Combined CEA Baseline Conditions
Non-groundfish Species (principal species listed in section Error! Reference source not found.**)**	**Monkfish**	Not overfished and overfishing is not occurring.	**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.	**Positive** – Although prior groundfish management measures likely contributed to redirecting effort onto non-groundfish species, as groundfish rebuild this pressure should lessen and all of these species are also managed through their own FMP.
	Dogfish	Not overfished and overfishing is not occurring.		
	Skates	Winter, thorny and smooth skates are overfished and thorny is also subject to overfishing. Barndoor skate is not overfished and is rebuilding toward biomass target. Little skate is not overfished, although it is close to the overfished biomass threshold. Clearnose and rosette skates are not overfished and overfishing is not occurring.		
Habitat		Fishing impacts are complex and variable and typically adverse (see section 5.1.4); Non-fishing activities had historically negative but site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities.	**Mixed** - reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as global warming, could increase and have a negative impact.
Protected Resources	**Sea Turtles**	Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened.	**Positive** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact	**Positive** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.
	Large Cetaceans	Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MSA and with the exception of minke whales, all are listed as endangered under the ESA.		
	Small Cetaceans	Pilot whales, dolphins and harbor porpoise are all protected under the MSA. The most recent stock assessment for harbor porpoise shows that takes are increasing and nearing PBR.		
	Pinnipeds	ESA classification: Endangered, number of nesting females below sustainable level; taken by *Loligo* trawl		

Table 55 continued

VEC	Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 54)	Combined CEA Baseline Conditions
Human Communities	Complex and variable (see Section **Error! Reference source not found.**). Although there are exceptions, generally groundfish landings have decreased for most New England states since 2001. Declines in groundfish revenues since 2001 have also generally occurred.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities	**Negative –** short term: lower revenues would continue until stocks are sustainable **Positive** – long term: sustainable resources should support viable communities and economies

6.6.4 Summary Effects of Framework 47 Actions

To Be Completed

7.0 Applicable Law

THIS SECTION WILL BE UPDATED AFTER THE NOVEMBER COUNCIL MEETING

7.1 Magnuson-Stevens Fishery Conservation and Management Act

7.1.1 Consistency with National Standards

Section 301 of the Magnuson-Stevens Act requires that regulations implementing any fishery management plan or amendment be consistent with the ten national standards listed below.

Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

Conservation and management measures shall be based on the best scientific information available.

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.

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.

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.

Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

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.

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.

Conservation and management measures shall, to the extent practicable, promote safety of human life at sea.

7.1.2 Other M-SFCMA requirements

Section 303 (a) of FCMA contains 14 required provisions for FMPs. These are discussed below. It should be emphasized that the requirement is imposed on the FMP. In some cases noted below, the M-S Act requirements are met by information in the Northeast Multispecies FMP, as amended. Any fishery management plan that is prepared by any Council, or by the Secretary, with respect to any fishery, shall—

(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. The measures in this management plan are designed to prevent overfishing and rebuild overfished stocks. There is one international agreement that is germane to multispecies management. On December 20, 2010, the International Fisheries Clarification Act stipulated that the U.S./Canada Resource Sharing Understanding, implemented through Amendment 13, can be considered an international agreement for the purposes of setting ACLs. The proposed measures are consistent with that Understanding.

(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 provides a summary of that information and additional relevant information about the fishery in Section **Error! Reference source not found.**.

(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 5.2. Likely future conditions of the resource are described in Section **Error! Reference source not found.**. Impacts resulting from other measures in the management plan other than the specifications included here can be found in Amendment 16. The maximum sustainable yield for each stock in the fishery is defined in Amendment 16 and optimum yield for the fishery is defined in Amendment 9.

(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 and 45. 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 will also be allowed to carry forward a small amount of ACE into the next fishing year. This will help sectors react should adverse weather interfere with harvesting the entire ACE before the end of the year. Neither of these practices requires consultation with the Coast Guard.

(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 stocks in an earlier action. A summary of the EFH can be found in Section 5.1.3.

(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;

Scientific and research needs are not required for a framework adjustment. Current research needs are identified in Amendment 16.

(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;

Impacts of this framework on fishing communities directly affected by this action and adjacent areas can be found in Section 6.5.

(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,

(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;

~~A Standardized Bycatch Reporting Methodology omnibus amendment was adopted by the Council in June 2007. That methodology applies to this framework. None of the measures in this framework are expected to increase bycatch beyond what was considered in Amendment 16.~~

(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 is updated and summarized in this document (Section **Error! Reference source not found.**).

(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.

This proposed action does not allocate harvest restrictions or stock benefits to the fishery. Such allocations were adopted in Amendment 16, while this action adjusts catch limits for some stocks within the existing allocation structure. This action also proposes that PSC from canceled permits is redistributed to all remaining permits in the fishery; while not considered an allocative measure, that action does benefit all participants in the fishery equally.

(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.

7.1.3 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

7.1.3.1 Description of Action

The purpose of the Framework 45 (Northeast Multispecies FMP) Proposed Action is to adopt modifications to management measures that will incorporate new information relative to effective program administration and setting catch levels that are necessary to achieve the fishing mortality targets required by Amendment 16.

In general, the activity described by this Proposed Action, fishing for groundfish species, occurs off the New England and Mid-Atlantic coasts within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

The Proposed Action is described in Section **Error! Reference source not found.**. The Proposed Action includes the following general measures:

7.1.3.2 Assessing the Potential Adverse Impacts

Refer to the Habitat Impacts of the Proposed Action (Section **Error! Reference source not found.**, summarized in Section **Error! Reference source not found.**) for a tabular look at the summary impacts of the proposed measures. Nearly all measures are expected to have neutral impacts on habitat.

Measures with Potential Negative Effects on EFH

Measures with Potential Positive Effects on EFH

7.1.3.3 Minimizing or Mitigating Adverse Impacts

Section **Error! Reference source not found.** (habitat impacts of Proposed Action) demonstrates that the overall habitat impacts of all the measures combined in this action have neutral impacts relative to the baseline habitat protections established under Amendment 13 to the Northeast Multispecies FMP. As such, additional measures to mitigate or minimize adverse effects of the multispecies fishery on EFH beyond those established under Amendment 13 are not necessary.

7.1.3.4 Conclusions

7.2 National Environmental Policy Act (NEPA)

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the M-S Act and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its agency policy and procedures for NEPA in NAO 216-6 §5.04b.1. All of those requirements are addressed in this document, as referenced below.

7.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b) and NAO 216-6 §5.04b.1. They are included in this document as follows:

- The need for this action is described in Section 2.2;
- The alternatives that were considered are described in Sections **Error! Reference source not found.** (Proposed Action) and **Error! Reference source not found.** (alternatives to the Proposed Action);
- The environmental impacts of the Proposed Action are described in Section **Error! Reference source not found.**;
- The agencies and persons consulted on this action are listed in Section 7.2.4.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An Executive Summary can be found in Section **Error! Reference source not found.**.
- A table of contents can be found in Section **Error! Reference source not found.**.
- Background and purpose are described in Section 1.0.
- A summary of the document can be found in Section **Error! Reference source not found.**.
- A brief description of the affected environment is in Section **Error! Reference source not found.**.
- Cumulative impacts of the Proposed Action are described in Section 6.6.
- A determination of significance is in Section 7.2.2.
- A list of preparers is in Section 7.2.3.
- The index is in Section **Error! Reference source not found.**.

7.2.2 Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides nine criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below:

(1) *Can the Proposed Action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?*

Response:

(2) *Can the Proposed Action reasonably be expected to jeopardize the sustainability of any non-target species?*

Response:.

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

Response:

(4) *Can the Proposed Action be reasonably expected to have a substantial adverse impact on public health or safety?*

Response:

(5) *Can the Proposed Action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

Response:

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

Response:

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

Response

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

Response:

(9) *Can the Proposed Action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?*

Response:
(10) *Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

Response:
(11) *Is the Proposed Action related to other actions with individually insignificant, but cumulatively significant impacts?*

Response:

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

Response: The Proposed Action is not likely to affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cultural, or historical resources. The only object in the fishery area that is listed in the National Register of Historic Places is the wreck of the steamship *Portland* within the Stellwagen Bank National Marine Sanctuary. The current regulations allow fishing within the Stellwagen Bank National Marine Sanctuary. The Proposed Action would not regulate current fishing practices within the sanctuary. However, vessels typically avoid fishing near the wreck to avoid tangling gear on the wreck. Therefore, this action would not result in any adverse affects to the wreck of the *Portland*.

(13) *Can the Proposed Action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

Response: This action would not result in the introduction or spread of any non-indigenous species, as it would not result in any vessel activity outside of the Northeast region.

(14) *Is the Proposed Action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

Response: No, the Proposed Action is not likely to establish precedent for future actions with significant effects. The Proposed Action adopts measures that are designed to react to the necessity to reduce fishing mortality for several groundfish stocks in order to achieve the fishing mortality targets adopted by Amendment 16 and Framework 44 and to fine-tune the sector administration program in order to make it more effective. As such, these measures are designed to address a specific problem and are not intended to represent a decision about future management actions that may adopt different measures.

(15) *Can the Proposed Action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?*

Response: The Proposed Action is intended to implement measures that would offer further protection of marine resources and would not threaten a violation of Federal, state, or local law or requirements to protect the environment.

(16) *Can the Proposed Action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?*

<u>Response:</u>

FONSI STATEMENT: In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Framework Adjustment 45 to the Northeast Multispecies Fishery Management Plan, it is hereby determined that Framework Adjustment 45 will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not required.

_____________________________________ ______________________

Northeast Regional Administrator, NOAA Date

7.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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7.2.4 Agencies Consulted

The following agencies were consulted in the preparation of this document:

- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council, which includes representatives from the following additional organizations:
  - Connecticut Department of Environmental Protection
  - Rhode Island Department of Environmental Management
  - Massachusetts Division of Marine Fisheries
  - New Hampshire Fish and Game
  - Maine Department of Marine Resources
- National Marine Fisheries Service, NOAA, Department of Commerce
- United States Coast Guard, Department of Homeland Security

7.2.5 Opportunity for Public Comment

The Proposed Action was developed during the period June 2010 through November 2010 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

7.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 16 Environmental Impact Statement.

The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 16. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 45.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see Section **Error! Reference source not found.** of this document.

7.4 Marine Mammal Protection Act

The NEFMC has reviewed the impacts of the Proposed Action on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the multispecies management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section **Error! Reference source not found.** of this document.

7.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to Section 930.36(c) of the regulations implementing the Coastal Zone Management Act, NMFS made a general consistency determination that the Northeast Multispecies Fishery Management Plan (FMP), including Amendment 16, and Framework Adjustment 45, is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This general consistency determination applies to the current NE Multispecies Fishery Management Plan (FMP), and all subsequent routine Federal actions carried out in accordance with the FMP such as Framework Adjustments and specifications. A general consistency determination is warranted because Framework Adjustments to the FMP are repeated activities that adjust the use of management tools previously implemented in the FMP. A general consistency determination avoids the necessity of issuing separate consistency determinations for each incremental action. This determination was submitted to the above states on October 21, 2009. To date, the states of North Carolina, Rhode Island, Virginia, Connecticut, New Hampshire, and Pennsylvania have concurred with the General Consistency Determination. Consistency was inferred for those states that did not respond.

7.6 Administrative Procedure Act

This action was developed in compliance with the requirements of the Administrative Procedure Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

7.7 Data Quality Act

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

7.7.1 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. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.

This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page in PDF format. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

7.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

7.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. These update assessments were reviewed by the SAW 50 (NEFSC 2010), the Groundfish Assessment Review Meeting III (GARM III; NEFSC 2008), and the Northeast Data Poor Stocks Working Group (DPWG 2009), which all included participation by independent stock assessment scientists. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team/Monitoring Committee.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Proposed Action were conducted using information from the most recent complete calendar years, through 2009, and in some cases includes information that was collected during the first eight months of calendar year 2010. Complete data were not available for calendar year 2010. The data used in the analyses provide the best available information on the number of harvesters in the fishery, the catch (including landings and discards) by those harvesters, the sales and revenue of those landings to dealers, the type of permits held by vessels, the number of DAS used by those vessels, the catch of recreational fishermen and the location of those catches, and the catches and revenues from various special management programs. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the groundfish fishery.

The policy choices are clearly articulated, in Section **Error! Reference source not found.** of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section **Error! Reference source not found.** of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service Headquarters. The Center’s technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

7.8 Executive Order 13132 (Federalism)

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in FW 45. 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.

7.9 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

7.10 Paperwork Reduction Act

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

FW 45 continues existing collection of information requirements implemented by previous amendments to the FMP that are subject to the PRA, including:

- Reporting requirements for SAPs and the Category B (regular) DAS Program
- Mandatory use of a Vessel Monitoring System (VMS) by all vessels using a groundfish DAS
- Changes to possession limits, which will change the requirements to notify NMFS of plans to fish in certain areas
- Provisions to allow vessel operators to notify NMFS of plans to fish both inside and outside the Eastern U.S./CA area on the same fishing trip

7.11 Regulatory Impact Review

7.11.1 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 7.11 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action, in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is a not "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

- 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;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The discussion below describes the anticipated economic impacts of the proposed action and is limited only to a determination of whether the action would have a significant impact based on economic criteria alone.

A more detailed discussion of economic impact is provided in Section **Error! Reference source not found.**. The discussion to follow provides a summary of those findings. The proposed action would change the reference points for several stocks, would adopt a new rebuilding program for GB yellowtail flounder, would set FY 2011 ACLs for all stocks as well as set the TACs for stock subject to the U.S./Canada resource sharing agreement and make yellowtail founder allocations to the scallop fishery. The proposed action would implement several new sectors all of which would be lease-only and all but one would be state run permit banks. Finally the proposed action would make a number of fishery administration changes including eliminating dockside monitoring costs as well as delaying the requirement for industry funding of at-sea monitoring.

7.11.1.1 Summary of Impacts on Fishing Revenue

7.11.1.2 Determination of Significance

7.11.2 Regulatory Flexibility Act

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8.0 References

8.1 Glossary

Adult stage: One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect: Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation: A group of animals or plants occurring together in a particular location or region.

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual Catch Entitlement (ACE): Pounds of available catch that can be harvested by a particular sector. Based on the total PSC for the permits that join the sector.

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship
S=1-A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define B_{MSY} and F_{MSY} reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1^+, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, $B_{threshold}$ is often defined as either $1/2B_{MSY}$ or 1/4 B_{MSY}. $B_{threshold}$ is also known as $B_{minimum}$.

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (B_{MSY} or proxy) as a management objective. The biomass threshold ($B_{threshold}$ or B_{min}) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.
Discards: animals returned to sea after being caught; see Bycatch (n.)

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exempt fisheries: Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses F_{MSY} or F_{MSY} proxy for $F_{threshold.}$ 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Lethrinids: Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A_{50} is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^+ mean biomass; mean biomass summed across ages 3 and over is 3^+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L_{25} is the length where 25% of the fish encountered are retained by the mesh. L_{50} is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Minimum spawning stock threshold: the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Potential Sector Contribution (PSC): The percentage of the available catch a limited access permit is entitled to after joining a sector. Based on landings history as defined in Amendment 16. The sum of the PSC’s in a sector is multiplied by the groundfish sub-ACL to get the ACE for the sector.

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats.*

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

Surplus production: Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Surplus production models: A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Two-bin (displacement) model: a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See *Phytoplankton.* Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

8.2 Literature Cited