UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

OCT 20 2009

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA), we enclose for your review the Final Environmental Impact Statement (FEIS) for Amendment 16 to the Northeast Multispecies Fishery Management Plan.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA proceeding with measures that would continue to rebuild overfished stocks through the development of new rebuilding programs, days-at-sea allocation and usage restrictions, gear-restricted areas, trip limits, and sector management. In addition, this action would implement annual catch limits and accountability measures that would bring the FMP into compliance with recent amendments to the Magnuson-Stevens Fishery Conservation and Management Act.

Additional copies of the FEIS may be obtained from the Responsible Program Official identified below. The document is also accessible electronically through the New England Fishery Management Council's website at http://www.nefmc.org/nemulti/index.html.

NOAA is not required to respond to comments received during the agency's 60-day comment period as a result of the issuance of the FEIS. However, comments received by **December 29, 2009,** will be reviewed and considered for their impact on issuance of a record of decision (ROD). Please send comments to the responsible official identified below. The ROD will be made available publicly following final agency action on or after **December 29, 2009**.

Responsible Program Official: Patricia A. Kurkul
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Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

FINAL

Amendment 16

To the

Northeast Multispecies Fishery Management Plan

Including a

Environmental Impact Statement
And
Initial Regulatory Flexibility Analysis

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

Date Draft Submitted: April 15, 2009
Date Final Submitted: October 16, 2009
Date Approved:

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COVER SHEET

RESPONSIBLE AGENCIES:

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

New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

PROPOSED ACTIONS:

Adoption, approval, and implementation of Amendment 16 to the Northeast Multispecies Fishery Management Plan.

FOR FURTHER INFORMATION CONTACT:

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TYPE OF STATEMENT:

( ) DRAFT (X) FINAL

ABSTRACT:

The New England Fishery Management Council and the NOAA Assistant Administrator for Fisheries propose to adopt, approve, and implement Amendment 16 to the Northeast Multispecies Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (the Act). The EIS presents the details of a management program designed to ensure compliance with the Act. It proposes measures to continue formal rebuilding programs for overfished stocks and to end overfishing on those stocks where it is occurring. Appropriate management measures will be adopted to implement these rebuilding programs. The Amendment includes measures that address a wide range of other management issues.

DATE BY WHICH COMMENTS MUST BE RECEIVED: ______________________

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1.0 Executive Summary

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Act (M-S Act). The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. The FMP has been updated through a series of amendments and framework adjustments. The most recent multispecies amendment, published as Amendment 13, was approved by the National Marine Fisheries Service in March, 2004 and became effective on May 1, 2004. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act. Included in Amendment 13 was a plan to evaluate rebuilding progress and implement measures in fishing year 2009 as necessary to continue rebuilding. This action is the result of that decision.

For several groundfish stocks, the mortality targets adopted by Amendment 13 represented substantial reductions from existing levels. For other stocks, the mortality targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design measures that will selectively change mortality for individual species. The management measures adopted by Amendment 13 to reduce mortality where necessary were also expected to reduce fishing mortality unnecessarily on other, healthy stocks. As a result of these lower fishing mortality rates, yield from healthy stocks is sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation. Amendment 13 created opportunities to target these healthy stocks. The FMP restricts the number of days that vessels can fish by allocating each limited access permit a specific amount of days-at-sea (DAS). Amendment 13 further defined three categories of DAS. The DAS categories are:

- Category A: These DAS can be used to target any regulated groundfish stock, subject to the restrictions on gear, areas, and landing limits that are defined by the FMP.
- Category B: These DAS are used to target healthy groundfish stocks – that is, stocks that are not overfished and that are not subject to overfishing. Programs to use Category B DAS prescribe specific conditions for their use.
- Category C: These DAS cannot be used, but remain associated with a permit. As stocks rebuild, in the future some of these DAS may be re-allocated into other categories and may be used.

Since the adoption of Amendment 13, four framework adjustment actions (Frameworks 40A, 40B, 41, and 42) were adopted specifically to address groundfish fishing issues. The earlier frameworks created opportunities to use Category B DAS in Special Access Programs or through the Category B (regular) DAS Pilot Project in order to target healthy stocks. Framework 42, on the other hand, was a more extensive action that imposed major changes to the fishery. Some of the changes included:

- Adoption of a Georges Bank yellowtail flounder rebuilding strategy
- Implementation of differential DAS counting in Southern New England and the Gulf of Maine
- Changes in trip limits
- A change in ratio of A DAS and B DAS allocations and extension of the B DAS program paired with a reduction in the total number of days that could be used
- Changes to Special Management Programs
- Establishment of the GB Cod Fixed Gear Sector
- Extension of the DAS leasing program and modifications to the DAS transfer program
- Mandatory installation of a Vessel Monitoring System (VMS) for all limited access DAS groundfish vessels
- Changes in gear standards.

Because of delays in developing this amendment, the proposed management measures were not implemented on May 1, 2009. As a result, the Secretary of Commerce announced interim measures that took effect on May 1, 2009, and will remain in effect until May 1, 2010 when Amendment 16 is implemented.

Proposed Action

This action implements a broad range of measures designed to achieve mortality targets, provide opportunities to target healthy stocks, mitigate (to the extent possible) the economic impacts of the measures, and improve administration of the fishery. Details of the measures summarized below can be found in section 4.0. The measures being considered associated with major changes to management of the fishery include:

- New status determination criteria developed by the New England Fishery Science Center (NEFSC) during its 2008 assessment are adopted, as are control rules for setting Acceptable Biological Catch (ABC). Revisions to mortality targets to achieve rebuilding based on the recent stock assessments are also implemented. Formal rebuilding programs are proposed for witch flounder, GB winter flounder, pollock, northern windowpane flounder, and Atlantic wolffish.

  The revised status determination criteria adopt the best available science as the basis for the management programs. These criteria identify the target biomass levels (usually SSBMSY or its proxy) as well as the limit fishing mortality rates (usually FMSY or its proxy) for all multispecies stocks. When combined with estimates of current stock size, this information is used to establish fishing mortality rates that will comply with statutory requirements to prevent overfishing and/or rebuild overfished stocks. For overfished stocks, the mortality targets are designed to accomplish the rebuilding strategy adopted by the Council in Amendment 13, FW 42, or this action. Mortality targets are also constrained by the adopted ABC control rules, so in the absence of more precise estimates of uncertainty, fishing mortality rates are constrained to no more than 75 percent of FMSY (or its proxy). Table 1 summarizes stock status and rebuilding periods that are targeted by this Amendment. The management measures are designed to meet these objectives.

  Once the desired fishing mortality rates are known, an estimate is made of the changes in fishing mortality needed to achieve the desired rates. In some cases a rebuilding mortality cannot be determined because the stock projections are considered unreliable. The target fishing mortality rates used in the preparation of this amendment are shown in Table 2. Stock projections for SNE/MA winter flounder indicate that the stock cannot be expected to rebuild by 2014 even in the absence of all fishing mortality. This amendment targets a fishing mortality rate as close to 0 as possible for this stock.

Table 1 - Stock status summary and targeted rebuilding dates (based on GARM III, DPWG). Bold-faced target dates are adopted in this action.
(1) Overfishing status based on GARM III. Recent assessments (TRAC 2009) indicate overfishing is no longer occurring on this stock.

Species	Stock	Overfishing?	Overfished?	Rebuilding Date
Cod	GB	Yes	Yes	2026
Cod	GOM	Yes	No	2014
Haddock	GB	No	No	Rebuilt
Haddock	GOM	No	No	Rebuilt
Yellowtail Flounder	GB	Yes(1)	Yes	2014
Yellowtail Flounder	SNE/MA	Yes	Yes	2014
Yellowtail Flounder	CC/GOM	Yes	Yes	2023
American Plaice	GB/GOM	No	No	2014
Witch Flounder		Yes	Yes	***2017***
Winter Flounder	GB	Yes	Yes	***2017***
Winter Flounder	GOM	Unknown	Unknown	
Winter Flounder	SNE/MA	Yes	Yes	2014
Redfish		No	No	2051
White Hake	GB/GOM	Yes	Yes	2014
Pollock	GB/GOM	Yes	Yes	***2017***
Windowpane Flounder	GB/GOM	Yes	Yes	***2017***
Windowpane Flounder	SNE/MA	Yes	No	2014
Ocean Pout		No	Yes	2014
Atlantic Halibut		No	Yes	2055
Atlantic Wolffish		Unknown	Yes	

Table 2 – Summary of rebuilding reductions needed to achieve desired fishing mortality.

Species	Stock	2007 Fishing Mortality	Targeted Fishing Mortality (either $F_{rebuild}$ or 75% of F_{MSY})	2008 F from 2008 Estimated Catch	% Change in F necessary to achieve targeted mortality	% Change in Exploitation
Cod	GB	0.300	0.184	0.410	-55%	-50%
Cod	GOM	0.456	0.18	0.300	-40%	-37%
Haddock	GB	0.230	0.26	0.079	229%	**202%**
Haddock	GOM	0.350	0.32	0.250	28%	24%
Yellowtail Flounder	GB	0.289	0.109	0.130	-16%	-15%
Yellowtail Flounder	SNE/MA	0.413	0.072	0.120	-40%	-39%
Yellowtail Flounder	CC/GOM	0.414	0.18	0.289	-38%	-34%
American Plaice	GB/GOM	0.090	0.14	0.099	41%	39%
Witch Flounder		0.290	0.15	0.296	-49%	-46%
Winter Flounder	GB	0.280	0.20	0.131	49%	48%
Winter Flounder	GOM	0.417	N/A	Unk	n/a	Unk
Winter Flounder	SNE/MA	0.649	0.000	0.265	-100%	-100%
Redfish		0.005	0.03	0.008	275%	271%
White Hake	GB/GOM	0.150	0.084	0.065	29%	28%
Pollock	GB/GOM	10.464	4.245	15.516	-73%	-73%
Windowpane	GOM/GB	1.960	n/a	n/a	n/a	
Windowpane	SNE/MA	1.850	n/a	n/a	n/a	
Ocean Pout		0.380	n/a	n/a	n/a	
Atlantic Halibut		0.065	0.044	0.060	-27%	-26%
Atlantic Wolffish		Unk		Unk	n/a	

- *Annual Catch Limits (ACLs) and Accountability Measures (AMs)*: Revisions to the M-S Act in 2006 require the Council to determine ACLs and AMs for each stock in the management complex. This action implements a process for calculating an ACL in addition to the Overfishing Level (OFL) and Acceptable Biological Catch (ABC) for each stock. Recommendations for these figures will come from the Plan Development Team (PDT), the ABC is set by the Science and Statistical Committee, and the Council will approve final ACL numbers. ACLs may be broken into sub-components for different segments of the fishery. Two AM options are adopted for the commercial vessels that do not join sectors. For Fishing Years (FY) 2010 and 2011, DAS reductions and/or more strict differential DAS counting would be put into place in the year following an ACL overage. For FY 2012 and beyond, a "hard TAC" backstop is adopted, under which the fishery will be suspended upon reaching the year's ACL for a stock. For the recreational fishery, AMs under consideration include adjustments to season, adjustments to minimum size, or adjustments to bag limits. Separate AMs will be determined for the private boat and party/charter components of the recreational fishery, and AMs will be implemented at the end of the year following a year with an overage. A three-year average of recreational catch will be compared to a three-year average of the ACL to determine whether an overage has occurred.

- *Implementation of Sectors:* Additional sectors for the commercial fishery are implemented by this amendment. Seventeen new sectors are proposed throughout the New England region. Sectors are self-selecting and largely self-regulating. Administrative measures revised to support sector implementation include methods for drafting and submitting formation proposals, operations plans, and sector monitoring plans; revise enforcement provisions, and clarification of the interaction of sectors with Special Management Programs. Sectors are required to submit supporting NEPA documents with their application and Operations Plan. Any changes in fishery regulations or fishing practices that may result on the basis of sector-based management will be addressed in the regulations that implement a particular sector, and in the EIS or EA corresponding to the creation or continuation of that sector. Such NEPA documents prepared by the sectors (an EA or EIS) will be tiered from the Amendment 16 EIS.

  The sectors will receive exemptions from many of the common pool effort control measures in exchange for a sector TAC for each species in the management plan. These TACs are called Annual Catch Entitlements, or ACE. The sectors conduct fishing activity according to their own business plans. In order to assure that sector ACEs are not exceeded, a new system of at-sea and dockside catch monitoring is proposed. It is proposed that a sector be able to carry up to 10 percent of unused ACE forward into the next fishing year, and sector can exchange ACE with other sectors.

  For each permit that is eligible to join a sector, the permit's Potential Sector Contribution (PSC) is calculated. The ACE that is allocated to a sector is based on the sum of the PSCs for the permits that join the sector. This action adopts two methods to calculated PSC. For most permits, the PSC for each stock is based on the landing history of the permit for the years 1996-2006. For permits committed to ne of the two existing sectors as of March 1, 2008, the PSC for GB cod is base don landings history for the period 1996-2001. Allocation of resources, including special allocations for the Eastern U.S./Canada area, provisions for sector overages, methods for permit history calculation, and joint and several liability of sectors are also considered.

- *Commercial Fishery Mortality Measures*:
  - *Option 3A* is adopted to control fishing mortality from commercial vessels that do not join sectors. This is a suite of measures that would eliminate differential DAS counting areas, reduce Category A DAS by 50 percent from the FW 42 allocations, and count all DAS in 24-hour increments. It also adopts restricted gear areas where fishing is only allowed using specific gear that should minimize the catch of rebuilding stocks. The category A/Category B DAS split that would result is 27.5%/72.5%. Most other current measures would remain, including seasonal and rolling closures and gear requirements. Trip limits are modified. Landing windowpane flounder, ocean pout, and SNE/MA winter flounder is prohibited.
  - A pilot program is proposed to facilitate targeting GOM haddock with six-inch gillnets. This program has a limited season and other requirements designed to facilitate monitoring.
  - The minimum size for haddock is reduced to 18 inches.

- *Recreational Fishery Measures*:

  - A specific allocation of GOM cod and GOM haddock between the commercial and recreational fisheries is adopted, as is guidance for considering allocations for other stocks in the future. An allocation will not be made if the recreational harvest, after accounting for state waters catches outside the management plan, is less than five percent of the removals. In those cases that meet the requirements to establish an allocation, a defined time period will be used to calculate the allocation.

- This action also removes the requirement that recreational fishermen be limited to two hooks per line.
- It allows recreational fishermen to land fillets with most of the skin off except for two square inches of skin on the fillet.
- In order to reduce recreational mortality on GOM cod, it extends the closed season for two weeks into April.
- The minimum size for haddock is reduced to 18 inches.

Other measures being adopted by the amendment include the following:

- Atlantic wolffish is added to the management unit. A description of the stock and status are included, as well as status determination criteria and essential fish habitat (EFH. This action prohibits retention of the wolffish by all commercial vessels and recreational vessels, due to its low stock size. This prohibition is expected to contribute to rebuilding because research shows wolffish have a high survival rate when discarded from trawl gear.

- An increase in the minimum size of Atlantic halibut is adopted, bringing the size to 41 inches, in order to match the median length at maturity for female haddock in the Gulf of Maine. This applies to both commercial and recreational fishing activity.

- The conservation tax on DAS transfers is eliminated, and permits in the confirmation of permit history (CPH) category no longer need to be activated in order participate in the DAS leasing or transfer programs. The cap on the number of DAS a permit can lease is removed.

- The periodic adjustment process is modified so that all measures adopted can be adjusted on a framework action.

- This action will allow a vessel to simultaneously hold a limited access scallop and multispecies permit, even of the vessel did not qualify for a multispecies combination permit. This would allow a vessel to possess a both permits even if the scallop dredge vessel did not qualify for a limited access multispecies vessel combination permit.

- Additional reporting requirements are adopted to facilitate the monitoring of ACLs and sectors. One requirement is area-specific reporting in which any vessel will need to declare in which of four broad areas it will fish so that all groundfish catch may be allocated to the appropriate stock. In order to link this information on area fished and catch to dealer data, each vessel operator will be required to report a VTR serial number for the trip via VMS at a time specified by NMFS. Also, for non-sector vessels in the commercial fishery, a discard rate, by gear, will be determined and applied to the landings for each trip. NMFS may apply this discard estimate in one of two ways: either based on the total landings of a stock, by gear, or on a trip-by-trip basis. The discard rate will be based by either the most recent assessment for the stock, using a gear-specific estimate if available, or on observer data for the previous year.

- Special management programs are also modified. Category B DAS can no longer be used to target pollock. The CAI Hook Gear Haddock SAP will have an extended season and expanded area. The Eastern U.S./Canada Haddock SAP is reauthorized indefinitely, with the additional rule that trawl gear fishing in the SAP can use codends with a minimum mesh size of six inch square or diamond mesh. The CAII Yellowtail Flounder SAP is modified to allow targeting of GB haddock even when the area is not open for targeting yellowtail flounder. Finally, the SNE/MA Winter Flounder SAP is suspended until stock conditions warrant its re-implementation.

- The Council adopted as a policy that catch history will not accrue to any vessel, permit, or component of the fishery after implementation of Amendment 16.

Summary of Environmental Consequences
The environmental impacts of this action are discussed in detail in section 7.0. Estimating the impacts of the Proposed Action is difficult because of the complexity of the measures. This action essentially results in the commercial groundfish fishery being managed under two different regimes: sectors and effort controls. The impacts will depend on how many vessels choose to operate in each. While there is a current estimate of the maximum number of vessels that will be in sectors, the final actual number will not be known until the start of Fishing Year 2010 (FY 2010) because vessels can choose to fish outside of sectors until that date.

Biological impacts are described in section 7.2, impacts on endangered and other protected species are described in section 7.3, impacts on essential fish habitat are described in section 7.4, the economic impacts are described in section 7.5, and social impacts are described in section 7.6. Cumulative effects are described in section 7.8. Summaries of the impacts are provided in the following paragraphs.

Biological Impacts
The complex suite of measures that constitutes the Proposed Action is designed to achieve the rebuilding objectives for the Northeast Multispecies fishery. The most important biological impact of the proposed measures is that they will control fishing mortality on Northeast Multispecies stocks in order to prevent (or end) overfishing and rebuild overfished stocks. The critical measures for these impacts are the adoption of revised status determination criteria, the identification of new mortality targets based on those criteria (including the adoption of new formal rebuilding programs where required), the design of controls on fishing mortality for the commercial and recreational components of the fishery, and the adoption of an Annual Catch Limit (ACL) and Accountability Measure (AM) system.

The fishing mortality targets identified in the amendment are expected to meet almost all rebuilding targets consistent with the adopted rebuilding strategies. In some cases, because the rebuilding mortality is actually higher than the mortality called for by the ABC control rule, rebuilding of the stock may be achieved earlier than called for by the rebuilding program. In the case of SNE/MA winter flounder, the stock will not rebuild by the by the end of the period even in the absence of all fishing mortality; the expected impacts of the measures indicate that the stock should rebuild by 2017. Table 3 below summarizes the estimated rebuilding dates *should the mortality targets of this amendment be achieved*. Actual rebuilding dates may differ if mortality targets are not achieved and if observed recruitment, selectivity, weight-at-age, etc. does not match the assumptions used in the projections.

Table 3 – Expected dates for achieving rebuilding targets should mortality targets be achieved

1. There are two assessment runs for GB yellowtail flounder that give different results.
2. Projections are unreliable.

Species	Stock	Expected Rebuilding Date (Probability)
Cod	GB	2026/50%
Cod	GOM	2010
Haddock	GB	NA (rebuilt)
Haddock	GOM	NA (rebuilt)
Yellowtail Flounder	GB	2012(75%)/2015(77%)[1]
Yellowtail Flounder	SNE/MA	2014/50%
Yellowtail Flounder	CC/GOM	2014/61%
American Plaice	GB/GOM	2011/73%
Witch Flounder		2015/75%
Winter Flounder	GB	2016/76%
Winter Flounder	GOM	NA (status unknown)[2]
Winter Flounder	SNE/MA	2017/85%
Redfish		2012/50%
White Hake		2014/50%
Pollock		2017[2]
Windowpane	GOM/GB	Unk[2]
Windowpane	SNE/MA	Unk[2]
Ocean Pout		Unk[2]
Atlantic Halibut		2055/50%
Atlantic Wolffish		Unk[2]

The amendment proposes measures to attain the target fishing mortality rates. For commercial fishing vessels there are two approaches to control fishing mortality. The most straightforward is that the amendment expands the use of sectors that have their catch limited by a quota. As long as quotas are set consistent with the target fishing mortality rates and sectors are adequately monitored so that catch does not exceed the allocated quota, target mortality should be achieved. For vessels that do not choose to join a sector, the Proposed Action uses the effort controls developed in Option 3A. The effect of these measures on fishing mortality depends on how many vessels do not join sectors. Since this information is unknown, the measures were analyzed as if all commercial groundfish vessels remained outside of sectors and were subject to effort controls. It is possible some permit holders may base their decision on sector membership on the choice of an effort control alternative. This means that there is more uncertainty over the impacts of the effort control measures than when analyzed in previous management actions. Second, there are some elements of the options that cannot be reliably quantified. For example, the use of restricted gear areas in two of the options may result in additional changes in fishing mortality but the magnitude and direction are uncertain.

The proposed measures are expected to change exploitation as shown in Table 4. The analytic tool used to estimate these changes cannot provide estimates for halibut and wolffish. As can be seen from this table, the effort controls that are adopted are expected to achieve the needed reductions for all stocks except SNE/MA winter flounder, where they will not eliminate all fishing mortality. There is, however, considerable uncertainty over these estimates because sector participation is unknown. It is important to note, however, that with the Proposed Action the number of allocated DAS will be less than the DAS used in recent fishing years.

Table 4 – Option 3A changes in exploitation (needed difference for pollock reflects impacts of changes to the Category B regular DAS program)

Spec	AREA	Needed Difference	Proposed Action - Option 3A % Difference
COD	GBANK	-50%	-54%
COD	GM	-37%	-52%
HADDOCK	GBANK	202%	-53%
HADDOCK	GM	24%	-54%
WINTER	GBANK	48%	-52%
WINTER	GM		-45%
WINTER	SNEMA	-100%	-67%
PLAICE	ALL	39%	-56%
WITCH	ALL	-46%	-56%
WHK	ALL	28%	-63%
WINDOWPANE	NORTH		-59%
WINDOWPANE	SOUTH		-61%
YTF	CCGOM	-34%	-57%
YTF	GBANK	-15%	-59%
YTF	SNEMA	-39%	-39%
POLLOCK	ALL	-66%	-61%
REDFISH	ALL	271%	-62%

For recreational fishing vessels the proposed measures are only designed to reduce fishing mortality on GOM cod. The needed reduction in mortality for GOM cod is 40 percent, but this is mitigated for the recreational fishery by the decision to provide a separate allocation to the commercial and recreational components of the groundfish fishery. Because the recreational component in recent years has been catching less than its proposed allocation, the reduction needed is only 25 percent. Data limitations prevent an exact estimate of the impacts of the proposed two-week extension of the season when GOM cod cannot be landed by recreational vessels. If the season was extended for the entire month of April, the reduction would be expected to be 40 percent, so the two-week extension is expected to achieve about half that.

The final key component for meeting mortality targets is the adoption of an ACL and AM system for this fishery. By defining ACLs on a periodic basis, catch levels are adopted that are consistent with rebuilding objectives. Unlike the target TAC system used in the past, these ACLs are linked to AMs that automatically adjust management measures to ensure that catches remain below target levels. For the commercial fishery in FY 2010 and 2011, vessels in sectors will be subject to quotas while vessels not in sectors will be subject to DAS adjustments (primarily through differential DAS counting in appropriate stock areas). Beginning in FY 2012 the entire commercial fishery will be subject to quotas. Recreational fishery AMs will also control recreational catch through the use of bag limits, seasons, and minimum size limits.

There are numerous other measures included in the action; many of these are administrative in nature (changes in reporting requirements, the periodic adjustment process, etc.) and are not expected to have any biological impacts, others may have relatively minor effects. For example, changes to the CAI Hook Gear Haddock SAP, extending the Eastern U.S./Canada Haddock SAP, modifying the CAI Yellowtail Flounder SAP, and reducing the minimum size for haddock are all likely to increase fishing mortality on GB haddock, but will not result in overfishing. Incorporating Atlantic wolffish into the management unit and prohibiting its possession should reduce fishing mortality for this stock.

Essential Fish Habitat (EFH) Impacts

No adverse impacts on EFH are expected to result from the Proposed Action. The primary impact on EFH expected to be beneficial to EFH is the overall reduction in effort due to the reduction in Category A DAS and 24-hour clock for non sector vessels, and the expected effort reduction as a result of more efficient operations for non-sector vessels. These reductions are expected to benefit habitat by reducing the interaction of groundfish fishing vessels with EFH. Other changes are expected to have either neutral or beneficial effects on EFH.

Impacts on Endangered and Other Protected Species
None of the measures proposed in Amendment 16 are likely to produce impacts to protected species beyond those described in previous regulations. While not quantifiable, the impacts are expected to be beneficial as a result of overall reductions in groundfish fishing effort. In the case of the Proposed Action, particular effort reductions will occur in the GOM and in SNE, which are relative high use areas for several large whale species, small cetaceans and pinnipeds, resulting in more distinct benefits to protected resources compared to the status quo.

Economic Impacts
The Proposed Action will affect any commercial groundfish vessel with a limited access permit and a DAS baseline greater than zero. In general, any measure that places limits on fishing effort will have negative economic impacts in the near future, while other measures are designed to mitigate economic stress on the fishery. Sectors in particular are considered to provide economic relief for adversely impacted fishermen since they will gain the ability to make more personal business decisions. Determining the impacts on vessel revenues of the proposed effort control Option 3A is difficult for the same reasons comparing biological impacts is difficult: potential sector membership is unknown and some data are not clearly understood. However, unlike with biological impacts, most of the administrative measures proposed in the amendment (including ACLs and reporting requirements) will have economic effects as they increase management and transaction costs.

The following tables summarize changes in total revenue (Table 5) and groundfish revenue (Table 6) by homeport state under the Proposed Action effort control option for the commercial fishery. For the fishery as a whole, the Proposed Action - Option 3A - has the least impact on total and groundfish revenues of the alternatives to No Action that were considered. These estimates are often greeted with skepticism as under-estimating the true revenue impacts of the large changes in allocated DAS. Many groundfish fishing permits, however, have not used all their allocated DAS even under the restrictive allocations of recent actions and so they are not as affected by the large change as it would appear. In addition, increasing trip limits as proposed will probably benefits many vessels, and removing differential DAS counting areas also mitigates to some extent the DAS reductions for some vessels. While these tables estimate the revenue impacts on the fishery as a whole, impacts on individual vessels can be greater (or less). Generally, vessels that are more dependent on groundfish for a high percentage of total fishing revenues can expect to have larger impacts than indicated here.

Comparing alternatives based on overall impacts does not provide information on the distribution of impacts across the fishery. For this reason the vessel level impacts are broken down into percentile groups, and the average impacts for each group are reported. Examining the impacts in this way reveals that the different alternatives affect fishermen in different ways; there was no single alternative to No Action considered that is best or worst for all vessel categories. Table 7 summarizes vessel level impacts on gross revenues. The Proposed Action - Option 3A - has a broad range of average adverse impacts; one interpretation is that this option has very different impacts on different vessels while within the other options considered the impacts are more similar across different groups of vessels.

Table 5 - Change in Total Revenue (by homeport state)

State	Proposed Action – Option 3A
CT	-11.0%
MA	-11.5%
ME	-8.1%
NH	-15.4%
NJ	-6.3%
NY	-8.0%
RI	-8.3%
Other	-2.7%
Total	-9.8%

Table 6 - Change in Groundfish Trip Revenue

State	Proposed Action – Option 3A
CT	-22.1%
MA	-14.3%
ME	-9.0%
NH	-18.5%
NJ	-23.1%
NY	-28.3%
RI	-22.8%
Other	-8.7%
Total	-15.2%

Table 7 – Comparison of vessel level impacts of gross revenues for effort control options

	Option 3A	
Impact Category	Number of Vessels	Average Adverse Impact
No Adverse Impact	58	-8%
Up to 20th Percentile	91	2%
20th Percentile to Median	135	8%
Median to 80th Percentile	135	15%
Above 80th Percentile	90	36%

Social Impacts

Overall, the Proposed Action is likely to have a negative effect on the important social factors identified by Amendment 13 in the short-term. The further reductions in DAS, 24-hour clock, additional trip limits, and restricted gear areas will make it more difficult for fishermen to maintain daily routines, operate in a safe manner, and maintain a positive attitude towards the management program. Landings and revenues have generally been declining for several years; there should be gradual increases in the next few years if stocks rebuild as expected. The economic impacts of this action communities are expected to be severe and in some cases may threaten the existence of fishing businesses in some communities. Social impacts will be primarily the result of commercial effort control measures and formation of sectors. The impacts will fall most heavily on vessels and communities that are most dependent on groundfish. These tend to be the Maine, New Hampshire, and Massachusetts ports adjacent to the Gulf of Maine, though New Bedford is also a port that will be adversely affected.

There are some communities where the impacts may not be as severe due to elements of the action that attempt to mitigate impacts. The implementation of sectors, the elimination of the DAS transfer tax, and changes to SAPs may help some vessels and their communities adapt to the restrictions in this action. These benefits may prove localized to small groups of vessels, however, and are unlikely to change the overall perception that the social impacts of this action, in the short term, are largely negative. In part, the extent to which fishery participants will join sectors will determine overall social impacts of this action. Sectors provide a way for fishermen to fish more efficiently and with more control over their daily activities. Extensive or increased sector participation may prove beneficial to important social factors as groundfish rebuilding continues. Successful rebuilding of groundfish stocks should lead to future benefits for fishermen and their communities but it is not clear that current fishery participants will reap those benefits.

Cumulative Effects

When considering the long-term positive trends in rebuilding in combination with further effort control measures designed to maintain or achieve sustainable stocks, the cumulative impact of this action would be positive. While the short-term impacts, particularly to the human communities VEC, continue to be negative primarily due to economic losses, in the future as the status of the fishery improves and stocks recover, the industry and communities that rely on fisheries will incur positive impacts.

The long-term trend for cumulative biological impacts has been positive. Among the groups of measures considered in this action (updates to status determination criteria and formal rebuilding programs, fishery program administration, and measures to meet mortality objectives), very few of the alternatives would actually increase effort and among those that do, the increase is often on stocks such as haddock, that are not overfished nor have overfishing occurring.

The primary impact of alternatives in this amendment on protected species is driven by the magnitude and breadth of changes in fishing effort that are required. This also is typically the case for the cumulative impacts to protected species and change in effort was the primary factor used in determining the cumulative impact of the measures. Mostly positive cumulative impacts would be expected as a result of the measures to reduce commercial fishing effort. This is because all of these measures would involve substantial effort reductions which should reduce gear interactions, particularly when factored into past effort reductions and management actions taken through the ESA, MMPA and Magnuson-Stevens Act. Other measures with positive cumulative impacts include the preferred alternatives to implement several additional sectors and modify existing sectors, which should lead to more efficient fishing operations and ultimately fewer gear interactions with protected species.

While the environmental impacts analysis of this document is focused on the direct and indirect impacts of this action on EFH, the cumulative effects assessment also considers non-fishing impacts such as those summarized in Appendix I and factored into the baseline and summarized in Table 302. Overall, the impact of non-fishing factors is difficult to measure. Because many groundfish species move throughout the entire management area and spend a small or no portion of their life in the near-shore areas where non-fishing impacts are most acute, the effects are thought to be insignificant when viewed in the context of cumulative impacts. However, species with greater inshore habitat reliance are likely more negatively impacted. Another non-fishing factor that appears to have a negative impact on groundfish and other fisheries resources is climate change. Although it is not possible to factor in the exact role that climate change may be having on the groundfish fishery, when impacts such as increased acidification and rising water temperatures are factored into the unsustainable mortality that has occurred at times in the past, it is possible that the combined cumulative impacts have been negative.

Unlike other Valued Ecosystem Components VECs, there are very few measures that do not impact human communities in some way. For measures found under updates to status determination criteria and formal rebuilding programs, revised criteria are thought to have a positive cumulative impact because when combined with past and current actions, overall revenues should increase when compared to the cumulative impacts from the corresponding no action alternatives. Measures to control commercial fishery effort would have the greatest negative cumulative impact, along with constrictions on recreational catches of GOM cod and haddock, an increase in the Atlantic halibut minimum size, and a prohibition on the retention of wolffish. However, the implementation of additional sectors, by providing improved efficiency and flexibility, along with the long-term impact that the implementation of AMs could have on rebuilding and maintaining sustainable stocks, would have positive cumulative impacts.

Alternatives to the Proposed Action

For each case that a measure is proposed, the Council considered the No Action alternative. Many other alternatives or options were considered for each element. These are briefly described below.

- *Revised Status Determination Criteria, ABC Control Rules, and Mortality Targets*: The Council considered not adopting revised status determination criteria and ABC control rules. This alternative does not comply with the M-S Act requirement to use the best available science. The Council also considered not revising mortality targets; choosing that alternative would mean that for many stocks rebuilding requirements would not be met.

- *Annual Catch Limits*: The Council considered not adopting ACLs (the No Action alternative). This would not comply with M-S Act requirements.

- *Atlantic Wolffish*: The Council considered not adding Atlantic wolffish to the management unit. This would not comply with M-S Act requirements to rebuild overfished stocks. Two alternatives were considered for EFH.

- *Sector administration*: The Council considered not revising sector policies (the No Action alternative). In addition, the Council considered not allowing CPH permits to join sectors, not allowing ACE transfers, and different options for enforcement and monitoring requirements. There were three alternatives considered for calculating PSCs (in addition to No Action): one option used landings history and a capacity factor for stocks caught, another used landings history and a capacity factor for all stocks, and a third used landings history and allocated DAS for all stocks.

- *Reporting Requirements*: The Council considered not adopting area-specific reporting requirements, and not accounting for discards when monitoring non-sector vessel catch.

- *Commercial and Recreational Component Allocation*: The Council considered not making an allocation (the No Action alternative). It also considered the period 1996-2006 as the basis for the allocation, and considered making an allocation for Georges Bank cod, Gulf of Maine winter flounder, pollock, and Southern New England/Mid-Atlantic winter flounder.

- *DAS Transfer and Leasing Programs*: The No Action alternative was considered, ,which would have retained the cap on the number of DAS a permit can acquire through leasing, the conservation tax on DAS transfers, and the prohibition that prevented a permit in the CPH category from participating in either program. The Council also considered applying the same conservation tax to DAS leases as is used in the transfer program; and considered removing the conservation tax on DAS transfers only for a defined period.

- *Special Management Programs*: The Council considered the No Action alternative. This included not modifying the Category B DAS program to reflect current stock status, not extending the Eastern U.S./Canada haddock SAP, not expanding the area or season for the CAI Hook Gear Haddock SAP, and not modifying the CAI Yellowtail Flounder SAP.

- The Council considered not modifying the periodic adjustment process, and not allowing the simultaneous possession of a limited access multispecies and scallop permit. The Council also considered allowing catch history to accrue to the permit that lands the fish after implementation of Amendment 16. All of these are No Action alternatives.

- *Measure to Control Fishing Mortality*:
  - For commercial vessels that do not join sectors, the Council considered the following effort control systems:
    - *No Action*: This would result in a change in the Category A and Category B DAS split (45/55), or an 18 percent reduction in allocated Category A DAS) unless certain conditions are met: overfishing is not occurring on any stock and additional fishing mortality reductions are not needed to rebuild any stock.
    - *Option 2A:* A combination of differential DAS and trip limits on some stocks. The default change in the Category A/Category B DAS split that will be implemented May 1, 2009 is retained. The existing year round, rolling, seasonal, or habitat closed areas would not be modified. Gear requirements while fishing on a Category A DAS would remain in effect. Further measures may be needed to meet pollock rebuilding requirements. In order to meet pollock rebuilding objectives, the Council also considered a different version of this option that would have reduced DAS by 30 or 35 percent, and would have adjusted trip limits and differential DAS counting areas.
    - *Option 4:* A reduction in Category A DAS by 40 percent from FW 42 allocations, paired with the addition of an area in southern New England where only specific gear can be used while fishing on a groundfish DAS. This results in a Category A/Category B DAS split of 33/67. In the gear areas, gear may be restricted to those gears that do not catch yellowtail flounder and winter flounder. Most other current measures would remain, including seasonal and rolling closures and gear requirements. Further measures would have been needed to meet pollock rebuilding requirements.
  - The Council considered requiring trawl vessels to use a net equipped with drop chains in the SNE area by any vessel using a net with a codend of less than six and a half inches. An exception was included for vessels using a net with large mesh panels in the front of the net.
  - The No Action alternative was considered that would have not reduced the minimum size of haddock, and that would not have adopted the GOM Sink Gillnet Haddock Pilot Program.
  - The Council considered not implementing additional sectors and not modifying the two existing sectors.

  - Recreational Measures:
    - The No Action alternative would not have allowed landing of fillets with the skin off, would not reduce the haddock minimum size, and would not alter the season for landing GOM cod.
    - Subject to the decision on the recreational/commercial component allocation, the Council considered increasing the minimum size for GOM cod, reducing the bag limit to six fish, and reducing the season by one month. For GOM haddock, increasing the minimum size to 21 inches, a bag limit of nine fish, and reducing the minimum size to 18 inches and imposing a seven fish bag limit were considered.
    - The Council considered allowing the landing of fillets with the skin off but with fillets meeting the minimum legal size.

  - *Accountability Measures (AMs)*: The Council considered not adopting AMs for either the commercial or recreational fishery. For the recreational fishery, the Council considered two different processes for implementing AMs. The first would have allowed NMFS to implement AMs without Council input, while the second would have required the Council to submit the AMs to NMFS.

Impacts of Alternatives to the Proposed Action

As already noted, several of the alternatives would not have met current requirements of the M-S Act. Specific impacts are described in section 7.0. Only major biological and economic impacts are highlighted below.

Biological Impacts

Certain measures, such as not adopting the adoption of revised status determination criteria, will have impacts that vary among stocks. For some stocks, the target biomass would be lower than the value in the Proposed Action, however, for others the Amendment 13 value is higher. Not adopting these criteria, and not revising mortality targets to meet them, would mean rebuilding would not be achieved.

Each of the effort control options for the commercial fishery will have different impacts on each stock. With respect to the effort control measures for vessels that do not join sectors, the No Action alternative and Option 4A would not have met the mortality objectives of the amendment. Option 2A would only meet the objectives if it was modified with additional DAS reductions, changes to differential DAS counting areas, and modified trip limits (Table 7).

Table 8 – Summary of changes in exploitation expected from effort control options

Species	AREA	Needed Difference	No Action % Difference	Option 2A Action % Difference	Option 2A W/30% reduction in DAS	Option 2A W/35% reduction in DAS	Option 4 Action % Difference
COD	GBANK	-50%	-17%	-51%	-45.9%	-49.8%	-41%
COD	GM	-37%	-16%	-22%	-46.9%	-50.8%	-34%
HADDOCK	GBANK	202%	-19%	-45%	-42.1%	-46.4%	-42%
HADDOCK	GM	24%	-18%	-22%	-50.4%	-54.3%	-39%
WINTER	GBANK	48%	-19%	-34%	-41.2%	-45.6%	-36%
WINTER	GM		-15%	-14%	-34.1%	-38.8%	-35%
WINTER	SNEMA	-100%	-20%	-73%	-67.5%	-70.3%	-60%
PLAICE	ALL	39%	-16%	-38%	-56.1%	-59.2%	-36%
WITCH	ALL	-46%	-16%	-36%	-52.6%	-56.0%	-37%
WHK	ALL	28%	-17%	-40%	-63.9%	-66.7%	-39%
WIND	NORTH		-19%	-30%	-43.0%	-47.0%	-43%
WIND	SOUTH		-21%	-44%	-43.5%	-48.1%	-56%
YTF	CCGOM	-34%	-18%	-39%	-50.3%	-54.5%	-47%
YTF	GBANK	-15%	-20%	-32%	-37.6%	-42.4%	-41%
YTF	SNEMA	-39%	-18%	-55%	-45.4%	-48.7%	-45%
POLLOCK	ALL	-66%	-17%	-40%	-61.4%	-64.1%	-38%
REDFISH	ALL	271%	-18%	-41%	-63.5%	-66.3%	-39%

Not adopting changes to sector policies, and not implementing additional sectors, would result in a less effective sector management program and fewer vessels operating under the hard quotas adopted by sectors. This would increase the uncertainty associated with achieving mortality targets and could delay rebuilding.

If ACLs and the accompanying AMs were not adopted, the lack of a system to identify appropriate catch levels and rapidly adjust measures should they be exceeded (or to prevent them from being exceeded) would also make it less likely that rebuilding of groundfish stocks would be achieved, and that overfishing would be ended.

Economic Impacts

With respect to economic impacts of the alternatives to the Proposed Action, there is little doubt that in some instances the No Action alternative would lead to higher revenues for the commercial fishery in the short term. For example, as shown in Table 9 and Table 10, the No Action effort control alternative for non –sector vessels has less impact on total revenues than the other effort control options. Options 2A and 4 have more impacts than the Proposed Action. The No Action alternative would also have fewer economic impacts on recreational vessels in the short term, as opportunities to target GOM cod would not be reduced. But because the No Action alternative would delay or perhaps prevent rebuilding, these short term gains may not exceed the benefits of the rebuilding program.

Table 9 - Change in Total Revenue (by homeport state)

State	No Action	2A	4
CT	-6.1%	-11.7%	-14.8%
MA	-9.7%	-19.6%	-23.1%
ME	-10.6%	-22.4%	-25.8%
NH	-9.6%	-10.3%	-22.0%
NJ	-3.3%	0.5%	-8.3%
NY	-3.6%	-5.5%	-8.8%
RI	-4.5%	-7.5%	-10.7%
Other	-3.2%	-7.3%	-7.9%
Total	-7.7%	-14.7%	-18.5%

Table 10 - Change in Groundfish Trip Revenue

State	No Action	2A	4
CT	-12.3%	-23.4%	-29.7%
MA	-12.1%	-24.5%	-28.9%
ME	-11.8%	-24.8%	-28.6%
NH	-11.5%	-12.3%	-26.4%
NJ	-12.2%	1.8%	-30.4%
NY	-12.8%	-19.5%	-31.1%
RI	-12.4%	-20.8%	-29.5%
Other	-10.3%	-23.4%	-25.1%
Total	-12.1%	-22.9%	-28.9%

If revisions to sector policies were not adopted, and additional sectors were not implemented, then the mitigating benefits of sectors would be available to fewer vessels. While it is accurate that under the No Action alternative sectors would also not be subject to the increased costs of the enhanced sector reporting systems, this would not matter to the fishery as a whole because only the two existing sectors would benefit.

2.0 Contents

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2.2 Tables

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2.4 List of Acronyms

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CAI	Closed Area I
CAII	Closed Area II
CC	Cape Cod
CPUE	catch per unit of effort
DAM	Dynamic Area Management
DAS	days-at-sea
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FAAS	Flexible Area Action System
FEIS	Final Environmental Impact Statement
FMP	fishery management plan
FSCS	Fisheries Scientific Computer System
FW	framework
FY	fishing year
GAMS	General Algebraic Modeling System
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
GRT	gross registered tons/tonnage
HAPC	habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
I/O	input/output
IFQ	individual fishing quota
ITQ	individual transferable quota

IVR	interactive voice response reporting system
IWC	International Whaling Commission
LOA	letter of authorization
LPUE	landings per unit of effort
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MARFIN	Marine Fisheries Initiative
MEY	maximum economic yield
MMC	Multispecies Monitoring Committee
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MRFSS	Marine Recreational Fishery Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	maximum sustainable yield
NAA	No Action Alternative
NAPA	National Academy of Public Administration
NAS	National Academy of Sciences
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NFMA	Northern Fishery Management Area (monkfish)
NLCA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSTC	Northern Shrimp Technical Committee
NT	net tonnage
NWA	Northwest Atlantic
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SAP	Special Access Program

SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SFMA	Southern Fishery Management Area (monkfish)
SIA	Social Impact Assessment
SNE	southern New England
SNE/MA	southern New England-Mid-Atlantic
SSB	spawning stock biomass
SSC	Social Science Committee
TAC	total allowable catch
TED	turtle excluder device
TEWG	Turtle Expert Working Group
TMGC	Transboundary Management Guidance Committee
TMS	ten minute square
TRAC	Transboundary Resources Assessment Committee
TSB	total stock biomass
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VEC	Valued Ecosystem Component
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
WGOM	Western Gulf of Maine
WO	weighout
YPR	yield per recruit

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3.0 Background and Purpose

3.1 Brief History of Prior Management Actions

The Northeast Multispecies FMP was adopted in 1986 to manage key groundfish stocks from Maine to Cape Hatteras. Management actions under this FMP were summarized in Amendment 5, adopted in 1994. The key actions leading to this action since Amendment 5 are summarized below.

Sustainable Fisheries Act

Despite the efforts taken in Amendment 5 and the cutbacks made by the industry during the following years, new legislation in 1996 set the standards for effective management even higher. The Magnuson-Stevens Act was amended with the adoption of the Sustainable Fisheries Act (SFA) in 1996. The SFA placed new demands on fishery management plans to reduce bycatch, identify and protect Essential Fish Habitat, and minimize adverse effects of fishing on EFH to the extent practicable. It also initiated new National Standards in the MSFCMA that emphasized minimizing impacts to fishing communities, improving safety at sea, significantly reducing bycatch and improving the collection and use of fishery and biological data.

Amendment 7

The amendment accelerated the DAS effort reduction program established in Amendment 5, eliminated significant exemptions from the current effort control program, and provided incentives to fish exclusively with mesh larger than the minimum required, broadened the area closures to protect juvenile and spawning fish, and increased the haddock possession limit to 1,000 pounds. It established a rebuilding program for Georges Bank (GB) and Southern New England (SNE) yellowtail flounder, GB and GOM cod, and GB haddock based primarily on days-at-sea (DAS) controls, area closures, and minimum mesh size. Additionally, the amendment changed existing permit categories and initiated several new ones, including an open access multispecies permit for limited access sea scallop vessels. Amendment 7 also created a program for reviewing the management measures annually and making changes to the regulations through the framework adjustment process to insure that plan goals would be met. Of all the major changes to the Northeast Multispecies Plan prior to 2000, Amendments 5 and 7 had the greatest impact on the fishery, both for stock rebuilding and in shaping the socio-economic conditions of the industry and fishing communities.

Amendment 9

Amendment 9 (1999) had a significant impact on the fishery, establishing new status determination criteria (overfishing definitions) and setting the Optimum Yield (OY) for twelve groundfish species to bring the plan into complete compliance with the SFA.

Amendment 11 and Essential Fish Habitat

This amendment adopted essential fish habitat (EFH) for New England groundfish stocks. However, according to a 2000 ruling in *American Oceans Campaign et al. v. Daley et al.* [Civil Action No. 99-982(GK)], EFH considerations continued to be inadequate in fishery management plans. The prosecution contested the adequacy of evaluations of fishing gear impacts on EFH and challenged NMFS approval of amendments and management plans which did not fully address the impacts of fishing on habitat. The U.S. District Court for the District of Columbia found that the agency's decisions on the subject EFH amendments were in accordance with the Magnuson-Stevens Act, but found that the EAs for the Councils' amendments were inadequate and in violation of NEPA. The court determined that the EAs prepared for the EFH provisions of the fishery management plans did not fully consider all relevant alternatives. The court specifically criticized several of the EAs for evaluating only two options for the EFH amendments: either approval of the amendment or status quo. Additionally, the decision noted that the descriptions and analyses of the environmental impacts of the Proposed Actions and alternatives were vague or not fully explained. The court ordered NMFS to complete a new and thorough NEPA analysis for each EFH amendment named in the suit. Amendments 11 and 12 addressed the SFA requirements for designating EFH for all managed species and for managing whiting (silver hake), red hake and offshore hake through a separate small-mesh multispecies management plan implemented in 2000.

Amendment 13 Development and Implementation

Work on Amendment 13 began in February 1999, when the Council published a Notice of Intent recognizing the need for rebuilding plans that would be compliant with the SFA and new status determination criteria adopted by Amendment 9. In December 2001, during the drafting of the Amendment and immediately following the implementation of Framework 33, Conservation Law Foundation and other organizations successfully filed suit against NMFS alleging that the rebuilding plans NMFS had implemented were not consistent with Amendment 9 overfishing definitions (*Conservation Law Foundation et al. v. Evans et al.*). Additionally, they charged that there had been a consistent failure in management plans to assess bycatch reporting and establish measures to minimize bycatch and bycatch mortality (when bycatch is unavoidable). The plaintiffs prevailed on the issue that the rebuilding plans failed to implement a Standardized Bycatch Reporting Methodology. After a long series of negotiations among various parties, interim measures were adopted by the court and NMFS was instructed to submit a management plan to comply with the law. Amendment 13, which went into effect on May 1, 2004, met the requirements for compliance with that court order.

The main purpose of Amendment 13 was to end overfishing on groundfish stocks and to rebuild all of the groundfish stocks that were overfished. The Amendment addressed stock rebuilding issues, greatly reduced fishing effort and capacity in the multispecies fishery, included measures to minimize bycatch, instituted improved reporting and recordkeeping requirements, and implemented additional measures to specifically address habitat protection. The Amendment also mandated a periodic review of stock data midway through the implementation period, and called for a correction in management figures if necessary.

During the period of Amendment 13 development, the relationship between the multispecies fishing industry and the scientific community underwent some important changes. In September 2002, a Cape Cod fisherman convinced federal scientists that the trawl warps used to tow the groundfish survey gear used by the Northeast Fisheries Science Center were of different lengths, a fact that was confirmed. A series of workshops took place to assess how the warp length discrepancy and confounding structural problems with the otter trawl doors and footrope may have affected data quality. Issues surrounding the trawl warps, reference point estimates, and a trawl survey experiment were evaluated by Payne et al. (2003) and the general conclusion was that the information available was suitable for management. Payne et al. (2003) also provided numerous recommendations for further investigation of the issues raised. It is likely that in the future, greater emphasis will be placed on collaborative efforts in fisheries research in order to improve communication and understanding among fishermen and scientists, and to collect more comprehensive and complete data for management of the fishery.

Framework Adjustments and Interim Rule

The Northeast Multispecies FMP has been subject to many additional changes since its inception. Besides the 12 amendments implemented prior to development of Amendment 13, the multispecies plan has been altered multiple times since 1994.

The Council has held four annual reviews and made eight adjustments to the FMP to address Amendment 7 rebuilding needs (Frameworks 20, 24, 25, 26, 27, 30 and 33). In 1999, the Council submitted Framework 27 as the primary annual adjustment framework. Both Frameworks 27 and 30 contained trip limits for GOM and GB cod. In both cases, the Regional Administrator was authorized to reduce the trip limit when 75 percent of the target TAC for each stock was reached. On May 28, 1999, the Regional Administrator reduced the GOM cod limit implemented on May 1, 1999 of 200 pounds per day to 30 pounds per day, just three weeks into the fishing year. However, even before the trip limit was reduced, fishermen reported excessive discards of cod as seasonal closures ended. NMFS announced on July 29, 1999 that it disapproved the 30-day closure on Georges Bank proposed in Framework 30, but it approved the trip limit, which took effect on August 15. Framework 30 established a GB cod trip limit of 2,000 pounds per day/20,000 pounds maximum possession limit.

The Council submitted Framework 31 on October 14, 1999, which addressed discards in the Georges Bank and Gulf of Maine cod fisheries. NMFS approved an increased GOM cod trip limit on January 5, 2000, but it disapproved the change to the GB cod trip limit program that would have eliminated the authority of the Regional Administrator to make mid-season adjustments to the trip limit when 75 percent of the target TAC is reached.

Framework 33 was implemented on June 1, 2000 to reduce or maintain fishing mortality rates for the five critical stocks below fishing mortality rebuilding targets established by Amendment 7. This framework maintained some seasonal closures and implemented new ones, maintained or reduced trip limits, and mandated that party and charter vessels obtain a letter of authorization to fish in any of the GOM closed areas. The Council also proposed changes to the large mesh permit category, but these were not approved by NMFS. Implementation of Framework 33 was immediately followed by the CLF lawsuit mentioned earlier.

Framework 36 was completed in December 2001, but the Council did not adopt the framework and it was not submitted. Frameworks 37 and 38 instituted changes to management of the whiting fishery.

Framework 39 was drafted jointly with the scallop fishery and addressed scallop area management in parts of the groundfish closed areas, specifically portions of the Nantucket Lightship Area and Closed Areas I and II. Area closures had occurred to achieve groundfish mortality and rebuilding objectives, resulting in increased scallop biomass. The purpose of the Framework was to allow access to those scallop resources while providing measures to minimize and control bycatch of groundfish, including when and where scallop fishing could occur, as well as a limit on how much bycatch was to be allowed.

Framework 40A was created in order to mitigate economic and social impacts from the effort reductions imposed by Amendment 13. It was intended to provide additional opportunities for vessels in the fishery to target healthy stocks. The framework instituted the Category B (Regular) DAS Pilot Program, the Eastern US/Canada Haddock SAP Pilot Program, and the Closed Area I Hook Gear Haddock Special Access Program, a program that allows longline vessels to fish in Closed Area I to target haddock. The SAP program was only partially approved and did not allow participation by vessels that are not members of the GB Cod Hook Sector. In addition, FW 40-A relieved an Amendment 13 restriction that prohibited vessels from fishing both in the Western U.S./Canada Area and outside that area on the same trip, and allowed for increase in incidental TACs.

Following Framework 40A, the Council sought to improve the effectiveness of the Amendment 13 effort control program, including the opportunities developed to use effort to target healthy stocks and other measures that were adopted to facilitate adaptation to the amendment's effort reductions. In Framework 40B, the Council considered measures to clarify the DAS allocations and provide a small allocation to all permit holders, to modify the DAS leasing and transfer programs, to improve opportunities to target healthy stocks, and to adjust the Georges Bank cod hook sector provisions in order to meet those purposes. The framework also included measures developed to address interactions between the herring fishery and regulated groundfish, since catches of groundfish that occur in the herring fishery are wasted and do not contribute to optimum yield in the groundfish fishery. Some of the actions in the framework included revising the Days-at-Sea (DAS) Leasing and Transfer Programs, modifying provisions for the Closed Area

(CA) II Yellowtail Flounder Special Access Program (SAP), changing the allocation criteria for the Georges Bank (GB) Cod Hook Sector (Sector), establishing a DAS credit for vessels standing by an entangled whale, implementing new notification requirements for Category 1 herring vessels, and removing the net limit for trip gillnet vessels.

The purpose of Framework 41 was to revise the Closed Area 1 Hook Gear Haddock SAP, which was implemented in Framework 40A, to allow participation by non-sector vessels. The program, like many of the measures in Framework 40A was intended to help mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

Framework 42 introduced several measures to achieve rebuilding of fishing mortality targets. It included measures to implement the biennial adjustment, anticipated by Amendment 13, to the Northeast Multispecies FMP. The Framework instituted a wide range of changes included a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, and an extension of the DAS leasing program. Additionally, it introduced the differential DAS system, where DAS are counted at the rate of 2:1 in certain areas in the Gulf of Maine (GOM) and Southern New England (SNE).

Framework 43 imposed a haddock catch cap for the herring fishery. Large haddock year classes had been leading to increased haddock bycatch by mid-water herring trawlers, particularly on Georges Bank. The Framework included a catch cap for haddock, an incidental catch allowance for other regulated multispecies, and a monitoring program for the catch cap. The existing classification of herring midwater trawl and purse seine gear relative to the multispecies fishery were also modified through the action.

Magnuson-Stevens Fishery Conservation and Management Reauthorization Act

In 2006, the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act was passed, which updated the original Magnuson-Stevens Act (MSA) as well as the Sustainable Fisheries Act of 1996. The bill reauthorized the MSA for Fiscal Years 2007 through 2013.

The MSA reauthorization contained several provisions that introduced new legal requirements for fishery management. Some of the key changes include:

- A firm deadline to end overfishing in America by 2011. For stocks that are currently experiencing overfishing, the deadline for ending that overfishing is 2010. Two key approaches are included to achieve this mandate:
    - The reauthorization requires the use of Annual Catch Levels (ACLs) to prevent overfishing. Every management plan must contain an ACL, which is set at a level to ensure that overfishing does not occur in the particular fishery. The ACL is required to be set at or below the Acceptable Biological Catch (ABC) of the fishery. Furthermore, the Councils are directed to follow the recommendations of the Scientific and Statistical Committee (SSC), and the ACL cannot exceed the SSC’s recommendation for ABC.
    - Accountability Measures (AMs) are required in each management plan that detail what actions will be taken in the event of an overage of harvest level.
- A Limited Access Privilege Program (LAPP) provision.
    - In the MSA, the term "limited access privilege" means a Federal permit, issued as part of a limited access system under section 303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery that may be received or held for exclusive use by a person; and: (a) includes an individual fishing quota; but (b) does not include community development quotas as described in section 305(i).

- Much of the responsibility for the development of LAPPs, and their requirements, was delegated to the Councils, including what types of LAPPs can best meet the needs of a specific fishery, eligibility criteria for participation in a LAPP, and procedures for allocating harvest privileges among participants in a fishery. Questions have been raised about what entities qualify as LAPPs.

One more requirement in the MSA reauthorization applies specifically to New England fisheries. The Act states that the NEFMC, "may not approve or implement a fishery management plan or amendment that creates an individual fishing quota program, including a Secretarial plan, unless such a system, as ultimately developed, has been approved by more than 2⁄3 of those voting in a referendum among eligible permit holders…". Thus, a system for creating a referendum and determining voting eligibility would need to be formulated if the Council chose to pursue IFQs as a management tool.

FW 42 Lawsuit
The Commonwealth of Massachusetts and State of New Hampshire filed suit against the Secretary of Commerce over FW 42 provisions. Two of the counts bear on this action. First, the lawsuit argued that the Closed Area Model (CAM) used to develop measures did not comply with National Standard 2 requirements to use the best available science. Second, the lawsuit argued that measures were more stringent than necessary because the Council and NMFS failed to consider the "mixed stock exception" during the design of measures. This exception allows overfishing to continue under certain limited conditions.

On January 26, 2009, the U.S. District Court in Massachusetts issued an order in the case. The order affirmed the use of the CAM and rejected the argument that its use was not the "best available science." The court also said "The court temporarily suspends Framework 42 pending serious consideration and analysis of the Mixed-Stock Exception by Defendant." The court's order led to considerable confusion over the management measures that remained in place. After filings by the parties in the suit, the court issued a subsequent ruling on February 17, 2009 that said (in part): "Framework 42 is hereby reinstated except for those provisions relating to the 2:1 DAS counting system, which remains suspended for thirty-eight (38) days from the date of this order."

The impacts of this liberalization of fishing rules are uncertain. It may result in increased fishing mortality for stocks caught in the differential DAS counting areas. These include inshore GOM stocks (GOM cod, CC/GOM yellowtail flounder, pollock, plaice, GOM winter flounder, white hake, and witch flounder) and SNE/MA yellowtail flounder and SNE/MA winter flounder. It is not clear whether this will result in more stringent regulations under the interim rule or will increase the magnitude of the mortality reductions needed in this action.

On February 23, 2009, the court extended the suspension of DAS counting provisions until April 10, 2009 so that the Council could review a NMFS filing on the applicability of the mixed stock exception; other FW 42 measures were reinstated. On April 10, 2009, the court reinstated FW 42 in its entirety.

Interim Rule
Because Amendment 16 was not implemented on May 1, 2009, NMFS issued an interim rule that took effect on that date (*74 FR 17030*). The measures are designed to reduce fishing mortality to lower levels until Amendment 16 is implemented. Interim regulations for commercial vessels include the Amendment 13 default DAS change (an 18 percent reduction in available Category A DAS) and expansion of the differential DAS counting area in Southern New England. Landing SNE/MA winter flounder, northern windowpane flounder, and ocean pout were prohibited, and a trip limit was adopted for witch flounder. The SNE/MA winter flounder SAP was eliminated for the duration of the rule, as was the state waters winter flounder exemption. The interim regulation includes mitigation measures such as a reduction in the

minimum size for haddock, removal of the conservation tax for DAS transfers, liberalization of the DAS leasing program, extension of the Eastern U.S./Canada haddock SAP, and modifications to the CAI Hook Gear Haddock SAP. Recreational measures include an extension of the seasonal closure for GOM cod, a 10-fish bag limit on GB cod for party/charter vessels, a lowering of the minimum size for haddock, and a prohibition on retention of winter flounder in the SNE/MA stock area.

The interim regulation is effective for 180 days, but it is expected it will be extended for the entire fishing year (FY 2009).

3.1.1 Other actions affecting the fishery

3.1.1.1 Actions to Minimize Interactions with Protected Species

Many of the factors that serve to mitigate the impacts of the groundfish fishery on protected species are currently being implemented in the Northeast Region under either the Atlantic Large Whale Take Reduction Plan (ALWTRP) or the Harbor Porpoise Take Reduction Plan (HPTRP). In addition, the Northeast Multispecies FMP has undergone repeated consultations pursuant to Section 7 of the Endangered Species Act (ESA), with the most recent Biological Opinion dated June 14, 2001. In that Opinion, NMFS concluded that the continued authorization of the Northeast multispecies FMP would jeopardize the continued existence of ESA-listed right whales as a result of entanglement in gillnet gear. A Reasonable and Prudent Alternative (RPA) was provided to remove the likelihood of jeopardy, and the RPA measures were implemented, in part, through the ALWTRP. On April 2, 2008, NMFS reinitiated section 7 consultation on the continued authorization of the Northeast Multispecies FMP for two reasons: (1) new information on the number of loggerhead sea turtles captured in bottom otter trawl gear used in the fishery, and (2) changes to the ALWTRP that will result in the elimination of measures that were incorporated as a result of the RPA for the June 14, 2001, Opinion on the continued authorization of the Northeast Multispecies FMP. The new consultation is on-going but is not complete as of the drafting of this document.

3.1.1.2 Harbor Porpoise Take Reduction Plan

The Harbor Porpoise Take Reduction Plan (HPTRP) was developed pursuant to Section 118(f) of the Marine Mammal Protection Act (MMPA) to reduce the level of serious injury and mortality of the Gulf of Maine/Bay of Fundy (GOM/BOF) stock of harbor porpoises due to incidental interactions with commercial gillnet fishing gear. Prior to the development of the HPTRP, the bycatch estimate of the GOM/BOF stock of harbor porpoises was estimated at 1,500 animals taken per year in U.S. commercial gillnet fisheries between 1994 and 1998. This exceeded the stock’s potential biological removal (PBR) level by more than threefold. Under the MMPA, NMFS was required to take action to reduce the serious injury and mortality of harbor porpoises from incidental interactions with gillnet gear. Thus, NMFS formed two take reduction teams – one to address interactions in the Gulf of Maine, and the other to address interactions in the Mid-Atlantic. Both provided NMFS with recommended measures for reducing these incidental interactions.

The HPTRP regulations, implemented on December 2, 1998 (63 FR 66464), are separated into two components – Gulf of Maine (GOM) and Mid-Atlantic. The GOM component of the HPTRP manages commercial gillnet gear that catches or is capable of catching multispecies through time and area regulations throughout New England, from Maine to Rhode Island, during the months of August through May. This includes seasonal gillnet closures during the peak months of the year during which harbor porpoises are most concentrated in four of the six GOM management areas. During several other times of the year when harbor porpoise concentrations are considered to be less than at the peak time periods, the

HPTRP management areas require the seasonal use of acoustic deterrent devices, known as pingers, on all sink gillnet gear. Pingers are placed approximately every 300 ft (91.4 m) on a string of gillnets and broadcast a ten kilohertz (kHz) sound at 132 decibels every four seconds to alert and/or deter harbor porpoises. Before using pingers on gillnet gear inside HPTRP management areas, fishing vessel operators must complete pinger training administered by NMFS to review the current HPTRP management measures and ensure that pingers are properly deployed and maintained. Those who complete the training are required to carry on board their vessel a NMFS-issued pinger training authorization in order to fish in management areas that require pingers.

The Mid-Atlantic component of the HPTRP manages commercial gillnet fishing through time and area regulations from New York through North Carolina from January through April. In lieu of pinger requirements, the Mid-Atlantic component of the HPTRP established large and small mesh gear specification requirements in which fishermen set gear that is less likely to result in harbor porpoise entanglement. Large mesh gillnets include gillnets with a mesh size of seven to 18 inches (18 – 46 cm) and small mesh gillnets include gillnets with a mesh size of greater than five to less than seven inches (13 -18 cm). Gear specification requirements for Mid-Atlantic gillnets include measures specifying a net limit per net string, twine size, net size, number of nets per vessel, and tie-down provisions. The three management areas of the Mid-Atlantic component of the HPTRP also include seasonal gillnet closures to coincide with high abundances of harbor porpoises.

After implementation of the HPTRP, harbor porpoise bycatch decreased and remained below PBR until 2004. However, bycatch showed an increasing trend after 2001, and again exceeded PBR beginning in 2004. From 2001 through 2005, the average annual mortality was 652 harbor porpoises per year in U.S. commercial fisheries, exceeding the PBR of 610 animals.

Based on this information, NMFS was required to take further action to reduce harbor porpoise takes in gillnet fisheries. As such, NMFS reconvened the Harbor Porpoise Take Reduction Team (HPTRT) in December 2007 to review and discuss the most recent harbor porpoise abundance and bycatch information and to evaluate additional potential measures that may be necessary to reduce harbor porpoise bycatch back to levels below PBR. NMFS is currently in a rule-making to propose modifications to the HPTRP, developed through consultation with the HPTRT, which are intended to reduce harbor porpoise mortalities and serious injuries in Northeast and Mid-Atlantic commercial gillnet fisheries to levels that are again below PBR, thus satisfying NMFS' responsibilities under the MMPA. A proposed rule was published on July 21, 2009 (74 *Federal Register* 36058), with the comment period ending August 20, 2009. A final decision is pending.

3.1.1.3 Atlantic Large Whale Take Reduction Plan

The ALWTRP contains a series of regulatory measures designed to reduce the likelihood of fishing gear entanglements of right, humpback, fin, and minke whales in the North Atlantic. The main tools of the plan include a combination of broad gear modifications and time/area closures (which are being supplemented by progressive gear research), expanded disentanglement efforts, extensive outreach efforts in key areas, and an expanded right whale surveillance program to supplement the Mandatory Ship Reporting System.

Key regulatory changes implemented in 2002 included: 1) new gear modifications; 2) implementation of a Dynamic Area Management system (DAM) of short-term closures to protect unexpected concentrations of right whales in the Gulf of Maine; and 3) establishment of a Seasonal Area Management system (SAM) of additional gear modifications to protect known seasonal concentrations of right whales in the southern Gulf of Maine and Georges Bank.

On June 21, 2005, NMFS published a proposed rule (70 *Federal Register* 35894) for changes to the ALWTRP, and published a final rule on October 5, 2007 (72 *Federal Register* 57104). The new ALWTRP measures expand the gear mitigation measures by: (a) including additional trap/pot and net fisheries (*i.e.*, gillnet, driftnet) to those already regulated by the ALWTRP, (b) redefining the areas and seasons within which the measures would apply, (c) changing the buoy line requirements, (d) expanding and modifying the weak link requirements for trap/pot and net gear, and (e) requiring (within a specified timeframe) the use of sinking and/or neutrally buoyant groundline in place of floating line for all fisheries regulated by the ALWTRP on a year-round or seasonal basis.

3.1.1.4 Atlantic Trawl Gear Take Reduction Team

The first meeting of the Atlantic Trawl Gear Take Reduction Team (ATGTRT) was held in September 2006. The ATGTRT was convened by NMFS as part of a settlement agreement between the Center for Biological Diversity and NMFS to address the incidental mortality and serious injury of long-finned pilot whales, short-finned pilot whales, common dolphins, and Atlantic white-sided dolphins in several trawl gear fisheries operating in the Atlantic Ocean. Incidental takes of pilot whales, common dolphins and Atlantic white-sided dolphins have occurred in fisheries operating under the Atlantic Mackerel, Squid, and Butterfish FMP, as well as in mid-water and bottom trawl fisheries in the Northeast. The last meeting of the TRT was in April 2007 and work is ongoing.

3.1.1.5 EFH Omnibus Amendment

The NEFMC is currently developing an Omnibus Essential Fish Habitat Amendment for all of its FMPs. The amendment is being completed in two phases. Phase I, completed in 2007, reviewed and updated FH designations and considered identification of HAPCs. Phase II will review and update the gear effects evaluation and consider alternatives for optimizing management measures for minimizing the adverse effects of fishing on EFH across all FMPs. Implementation is expected in 2010/2011.

3.2 Purpose and Need for Action

This amendment is designed to meet all the requirements of the Magnuson-Stevens Act for the Northeast Multispecies Fishery, and is prepared by the New England Fishery Management Council (NEFMC; Council). After the Proposed Action is reviewed, the Amendment will be approved and implemented by the National Marine Fisheries Service (NMFS). Fifteen species of groundfish are managed under this plan. Twelve species are managed as large mesh species, based on fish size and type of gear used to harvest the fish: Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout and white hake. Three species — silver hake (whiting), red hake, and offshore hake — are managed under a separate small mesh multispecies program, Amendment 12 to the Northeast Multispecies FMP. Several large mesh species are managed as two or more separate stocks, based on geographic region. For example, Atlantic cod is managed as two stocks: Georges Bank cod and Gulf of Maine cod. This action considers including an additional stock in the management unit (Atlantic wolffish).

Several groundfish stocks are either overfished, have been declared overfished in the past, or are experiencing overfishing and are currently rebuilding under programs that do not meet the requirements of the M-S Act. While many stocks will continue to increase under current fishing mortality rates – indeed, some will increase to levels not observed in the last thirty years – most stocks will not achieve levels that will support maximum sustainable yields.

In the 1996 reauthorization of the Magnuson-Stevens Act, Congress recognized that one of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. To ensure habitat considerations receive increased attention for the conservation and management of fishery resources, the amended Magnuson-Stevens Act included new EFH requirements, and each fishery management plan must now include specific EFH provisions. Section 303(a)(7) of the Magnuson-Stevens Act requires that each FMP describe and identify EFH for the fishery based on the guidelines established by the Secretary (50 CFR part 600, Subpart J), minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. The description and identification of EFH is applied as included in Amendment 13 to the Northeast Multispecies FMP of 1998.

Need	*Purpose*
Rebuild overfished fisheries by continuing programs adopted in Amendment 13 and, if necessary, adopt additional rebuilding programs for the 13 stocks determined to be overfished by GARM III	• Measures to reduce effort, including DAS reductions, trip limit reductions, and area closures • If necessary, adjust mortality targets for rebuilding programs
End overfishing by 2010/2011 consistent with the status of the stock and the requirements of the MSA of 2006	• Implement Annual Catch Limits and Accountability Measures in FY 2010 • Adjust effort controls as necessary to reduce fishing mortality
Implement additional tools to meet mortality objectives prescribed by the MSA of 2006 or existing rebuilding plans	• Implement additional sectors • Adjust effort control program for non-sector vessels
Minimize, to the extent practicable, the adverse effects of fishing on essential fish habitat to comply with section 303(a)(7) of the Magnuson-Stevens Act	• Minimize, to the extent practicable, adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH.
Minimize bycatch and minimize mortality of bycatch that cannot be avoided in accordance with National Standard 9 (MSA §301(a))	• Implement additional sectors • Consider increases in trip limits
Provide meaningful alternatives for reducing harvesting capacity in accordance with 40 CFR 1508.9(b) and NAO 216-6 Section 5.04b.1	• Measures to reduce effort, including DAS reductions, trip limit reductions, and area closures
Address numerous issues with respect to the administration of the fishery in order to promote efficiency and improve management capabilities	• Implement additional sectors and address monitoring, enforcement, and transparency • Define Annual Catch Limits • Changes to the DAS Transfer and DAS Leasing programs • Address reporting requirements • Consider SAP revisions

3.3 Notice of Intent and Scoping Process

The Council announced its intent to prepare Amendment 16 and an Environmental Impact Statement (SEIS) on November 6, 2006 (71 *Federal Register* 64941). The scoping period extended from that date until December 29, 2006. The announcement stated that Amendment 16 will adjust management measures to continue the formal stock rebuilding programs adopted by Amendment 13 and achieve optimum yield. The Council said that it would consider alternative management systems in addition to adjustments to the existing effort control system. The notice also announced that wolffish and cusk may be added to the fishery management unit. This decision was to be made after assessments scheduled for 2008, but the assessment for cusk was postponed and was not completed in time to incorporate results into this action.

At the beginning of the scoping period, the Multispecies Oversight Committee met with the Groundfish Advisory Panel and the Recreational Advisory Panel to develop standards that new management systems should meet. The recommendations from this meeting were considered by the Council. The Council published the following guidance for alternative management system proposals:

- Any new management system should clearly state the method of allocation proposed for individual, gear, or other sectors, and area TAC distributions for all Category A Days-at-Sea permit holders in the Gulf of Maine, Georges Bank, and Southern New England managed under the Northeast Multispecies FMP.
- Proposed management concepts may be less dependent upon input controls such as effort closures and trip limits and create a closer link between allocation and catch.
- A new management proposal should include a mechanism for accountability, for all permit holders, of all catch of all stocks (managed under the Northeast Multispecies FMP) caught during his/her fishing operation regardless of allocation.
- Any new management system that is narrow in focus relative to gears, areas/sub-regions or permit categories and is absent detail for application to the Gulf of Maine, Georges Bank, and Southern New England areas should not be considered for inclusion as a management system proposal. (Such narrowly focused concepts may be considered as a component of a comprehensive management system at a later point in this process).

A scoping document with this guidance was published on the Council's web page (www.nefmc.org) and distributed at scoping hearings.

The Council conducted eight hearings to receive public comments (Ellsworth and Portland, Maine, Portsmouth, New Hampshire, Gloucester and Fairhaven, Massachusetts, South Kingstown, Rhode Island, Riverhead and New York City, New York). Notice of the scoping hearings was mailed to over 1,800 interested parties. This notice also announced the availability of the scoping document and listed four ways to submit comments: in person at any of the hearings, or in writing submitted through mail, facsimile, or email. Attendance was light, with only one attendee at one hearing and fewer than ten speakers at several. More comments were received in writing.

Comments identified issues for consideration. Perspectives on each of the issues varied widely. The major issues identified and discussed are summarized below. This summary does not reflect every scoping comment received. Comments are grouped into broad categories, but in some cases the specific comments overlapped several of these categories. Refer to the letters and scoping meeting summaries to gain a better perspective on individual comments, ideas, and suggestions. The Council received suggestions for three new management systems, often with several variations. Changes were suggested to the existing effort control system, and comments were received on other topics as well.

Days-at-Sea (DAS)

- Comments supported and opposed to the existing effort control system based on DAS.
- A written comment provided an extensive list of proposed changes to the DAS system, including: counting DAS as a minimum of twenty-four hours, eliminating spawning block days out of the fishery, altering closed areas (including seasonal or rolling closures), modifying gear requirements, creating additional SAPs or modifying existing SAPs, modifying the DAS leasing and transfer programs, and re-examining all exempted fisheries to determine if they continue to meet groundfish bycatch restrictions.

- A written comment proposed modifying the effort control system to charge differential DAS based on landed catch rather than area fished.
- A comment suggested that if the Council abandons the DAS system then vessels that leased DAS to other vessels will be at a disadvantage if future access is based on recent fishing history.
- One comment suggested continuing to use DAS, but also defining an inshore and offshore area. Fishermen would declare into an area for the fishing year, and DAS might be charged at a differential rate in each area.

Hard TACs/Output Controls/ITQs

- Comments both supported and opposed the use of quotas (hard TACs) in this fishery.
- A proposal suggested quotas for all groundfish species and all species caught by groundfish vessels. This proposal suggested alternatives for allocating these quotas to various gear, vessel size, and temporal periods. It also suggested real-time landings reporting and a mandated level of observer coverage.
- One comment suggested using quotas (hard TACs) as a backstop for any management system adopted to manage groundfish. This proposal also suggested using quotas (bycatch caps) and other measures to minimize bycatch.
- An Individual Transferable Fishing Quota (ITQ) proposal was received from an organization. This organization prefers the DAS system, but argued that if quotas were adopted an ITQ was the only way to make them effective. The proposal detailed options for initial allocation of catch based on a combination of DAS and permit catch history, limits on ownership and acquisition of quota, transfers of quota, and management responses to an underage or overage of catch.
- One comment suggested using a system called "stewardship shares." While similar to an ITQ, it differs in that the share owned by permit holders also represents a share of the stock biomass. An analogy is that the share of the resource represents a capital account and the share of the annual TAC is the interest produced. Permit holders can, within limits, withdraw from either in a given fishing year.
- One comment suggested using ITQs only on weak stocks, while continuing to use the DAS system for other stocks.

Area Management

- A proposal from a coalition of organizations and individuals proposed area management. Elements of this proposal included defining management areas that reflect ecological and biological uniqueness. Each area would have a finite, annual limit of fish that can be harvested from that area. Area-specific management rules would be developed with the participation of fishermen and local stakeholders from the area. Over time, local governance structures would be developed that would be nested within the current management system. Boundaries would be permeable – vessels could fish in more than one area. Real-time catch reporting would be developed. As an example of how this system could work, an additional submission proposed a specific area management structure and measures for an area off eastern Maine.
- Comments were received from a variety of individuals and organizations that supported the area management concept.

Point System

- An organization proposed a management system titled the "point system." Each permit would be allocated a quantity of points based on its DAS allocation, baseline characteristic of the vessel, and past fishing history. These points would be the currency charged for landing regulated groundfish. For each regulated stock, point values (based primarily on the biological status of the stock) would be established. Generally, point values would be higher for stocks in poor condition, which would encourage fishermen to target stocks in healthy condition. Point values would be adjusted on a periodic basis over the course of the fishing year so that the catches do not exceed the target TACs for each stock. The proposal suggested mechanisms to track catch and points, free transferability of points, and retention of all legal-sized groundfish. Interactions with other management systems (sectors, area management) were also described.

- Numerous comments and petitions supported the point system.

Sectors

- Two organizations indicated their intent to submit applications for establishing new sectors. Subsequent to the scoping period, one of these organizations withdrew its interest.
- A research organization suggested changes to the sector provisions of the management plan. These included simplifying the process for submission and approval of new sectors, establishing a fixed time period for determining catch history, allowing sectors to trade catch allocations with other sectors, changing or eliminating the cap on sector allocations, and allowing sectors to define how catch histories are treated for vessels in the sector.
- Two organizations suggested establishing a fixed time period for determining catch histories. One of these organizations suggested allowing sectors to receive an allocation of all stocks caught, with a provision for a default allocation for stocks that are rarely caught.
- One comment opposed the creation of sectors in the groundfish fishery.

Recreational Measures

- Several comments supported the creation of an allocation for recreational vessels (including party/charter vessels).
- Two comments supported creation of a limited entry system for party/charter vessels fishing in the Gulf of Maine.
- Several comments objected to the seasonal prohibition on catching cod in the Gulf of Maine.

Miscellaneous Comments

- One comment suggested changing the General Category Scallop Exempted Fishery east of Cape Cod to allow fishing year-round.
- Several comments supported allowing a vessel to possess a scallop dredge permit and a limited access multispecies permit at the same time.
- One comment suggested allowing the scallop closed area access program yellowtail flounder incidental catch TAC to be allocated to different sectors of the scallop industry.
- One comment suggested renegotiating the U.S./Canada Resource Sharing Understanding to better take into account U.S. concerns.
- Several comments suggested creating a research set-aside in the groundfish fishery.
- One comment suggested incorporating the findings of several research papers into the management program, including a suggestion that fishery stocks should be managed as a portfolio with the goal of providing the greatest benefits over time.

Response to Scoping Comments

Summaries of the scoping hearings and all written scoping comments were provided to all Council members. These documents, as well as recordings of the scoping hearings, were made available to the public. The Council reviewed these comments over a six month period. The Groundfish Plan Development Team (PDT) reviewed the major management proposals on two separate occasions and provided comments and concerns on the proposals. The Multispecies (Groundfish) Committee reviewed the proposals over the course of three separate meetings, and the full Council discussed the comments at two meetings. Many of the scoping comments were incorporated into the alternatives considered in this action. The Council took the following action on the major scoping comments that were not developed into alternatives:

Days at Sea

- The Council decided to include only the following modifications to adjust the DAS system in Amendment 16:
  - count DAS as a minimum of 24 hours;
  - consider adjustments in differential DAS program;
  - trip limit triggers on stocks with trip limits;
  - adjustments to Category A, B and C DAS split as a tool for adjustments to the DAS program.
- The Council decided to consider as an alternative a conservation tax on DAS leasing equal to or greater than the tax on consolidation.

Hard TACs/Output Controls/ITQs

- The Council decided not to pursue an ITQ proposal because recent changes to the M-S Act impose a requirement for an industry referendum before an ITQ can be implemented. The Council does not believe there is enough time available to develop a proposal and complete the referendum in time for a May 1, 2009 implementation date.
- The Council decided not to pursue a "stand-alone" hard TAC alternative – that is, a management system that relies on hard TACs alone to control mortality. Past experiences with these systems have shown that they are fraught with problems that are difficult to solve (Morgan, 1997).
- The Council directed the Groundfish Committee to consider hard TACs for the common pool as a means for mortality control. *(It was clarified that the intent of this motion is for the hard TAC to be developed as a backstop to the effort control system, and not as a stand-alone hard TAC alternative).*
- The Council voted to include in Amendment 16, as an alternative for complying with ACL/AM requirements, a hard TAC backstop based on Amendment 13 hard TAC options and direct the Groundfish Committee to develop mitigating plans to avoid Olympic fishing and hard shutdowns.

Area Management and Point System

- Due to limited time and resources, the Council designated Amendment 17 as the mechanism to further develop all management options including but not limited to area management, DAS performance plan, point system, ITQ management, party/charter limited entry, and approval of any new sector proposals or adjustments or modifications to existing sectors. Amendment 17 should also develop and establish a complete allocation system for the groundfish fishery. That Amendment will be developed following the completion of work on Amendment 16.

Sectors

- The Council decided to continue to pursue the development of sectors and approval of additional sectors in Amendment 16.

Miscellaneous Comments

- The Council supported expansion of the General Category Scallop exemption east of Cape Cod to a year-round fishery should an ongoing experiment demonstrate that this can be done without substantial impacts on yellowtail flounder. The Council believes this change can be made under existing NMFS authority without requiring a Council management action.
- The Council referred to the Scallop Oversight Committee suggestions that the scallop industry be allowed to allocate closed area incidental catch TACs to different segments of the scallop fleet. The Council and NMFS do not believe this decision requires a multispecies action and can be done in a scallop management action.
- The Council made a request that NMFS evaluate VMS requirements and determine if other processes, such as the "legacy code" and/or IVR, would be more practical than current practices.

- The Council voted to advance the concept of the running clock to the Enforcement Committee to see if enforcement problems cited in the past still exist.

3.4 Goals and Objectives

The goals and objectives of this amendment remain as described in Amendment 13:

Goal 1: Consistent with the National Standards and other required provisions of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law, manage the northeast multispecies complex at sustainable levels.

Goal 2: Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.

Goal 3: Maintain a directed commercial and recreational fishery for northeast multispecies.

Goal 4: Minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.

Goal 5: Provide reasonable and regulated access to the groundfish species covered in this plan to all members of the public of the Untied States for seafood consumption and recreational purposes during the stock rebuilding period without compromising the Amendment 13 objectives or timetable. If necessary, management measures could be modified in the future to insure that the overall plan objectives are met.

Goal 6: To promote stewardship within the fishery.

Objective 1: Achieve, on a continuing basis, optimum yield (OY) for the U.S. fishing industry.

Objective 2: Clarify the status determination criteria (biological reference points and control rules) for groundfish stocks so they are consistent with the National Standard guidelines and applicable law.

Objective 3: Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the Sustainable Fisheries Act.

Objective 4: Implement rebuilding schedules for overfished stocks, and prevent overfishing.

Objective 5: Adopt measures as appropriate to support international transboundary management of resources.

Objective 6: Promote research and improve the collection of information to better understand groundfish population dynamics, biology and ecology, and to improve assessment procedures in cooperation with the industry.

Objective 7: To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.

Objective 8: Develop biological, economic and social measures of success for the groundfish fishery and resource that insure accountability in achieving fishery management objectives.

Objective 9: Adopt measures consistent with the habitat provisions of the M-S Act, including identification of EFH and minimizing impacts on habitat to the extent practicable.

Objective 10: Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

3.5 Context of Existing Management System

Because of the complexity of groundfish management, this section will describe in general terms the existing management program. This provides the public and reviewers an overview to place the proposed changes in context. The NEPA requires that the No Action alternative be included when considering changes to the management program. Subsequent sections will specifically identify the elements of the No Action alternative as an option so that the choices considered by the Council are explicit. This section briefly identifies key elements of No Action alternatives to provide context to this discussion.

The current management system for the Northeast Multispecies Fishery includes a wide range of measures that have been adopted since the mid-1980s. In 1994, Amendment 5 adopted a moratorium on groundfish permits and an effort control system that is the underpinning of the current measures (see section 3.1 for additional details on past actions). The existing management measures for the Northeast Multispecies Fishery were most recently altered by Amendment 13, FW 40A, FW 40B, FW 41 and FW 42. Regulations that may be implemented as part of an interim action, emergency action, or court order are not considered part of the existing system and are not considered elements of any No Action alternatives. Current implementing regulations can be found at 50 CFR 648 Subpart F.

The most recent amendment to the Northeast Multispecies FMP that is focused on groundfish fishing activities was Amendment 13, implemented May 1, 2004. The Amendment 13 measures can be sorted into the following broad categories:

- Clarification of status determination criteria: overfishing definitions
- Rebuilding programs: fishing mortality trajectories designed to rebuild overfished stocks. These trajectories serve as the fundamental basis for management measures.
- Fishery administration measures: reporting requirements, provisions for sector allocation and special access programs (SAPs), the U.S./Canada Resource Sharing Understanding, permit requirements, DAS leasing, etc.
- Measures to control capacity: a DAS transfer program that allows the permanent transfer of DAS, and the categorization of DAS based on vessel fishing history during the period FY 1996 through FY 2001.
- Measures to minimize, to the extent practicable, the adverse effects of fishing on essential fish habitat (EFH).
- Measures to meet fishing mortality targets: measures for the commercial and recreational fishery designed to control fishing mortality.

Subsequent to Amendment 13, a series of framework actions modified the measures. The following discussion summarizes the most important elements of the management program as it existed during consideration of this action. The discussion is organized into the broad categories identified.

Status Determination Criteria (Overfishing Definitions)

Amendments to the M-S Act in 1996 adopted a requirement that every management plan specify objective and measurable criteria for determining when a stock is overfished and when it is subject to overfishing. Often referred to as overfishing definitions, these status determination criteria were first adopted for the Multispecies FMP with the approval of Amendment 9 in 1999. During the development of Amendment 13, the criteria were re-evaluated by the NEFSC (NEFSC 2002a). These new criteria were adopted in Amendment 13. They include estimates of SSB_{MSY}, MSY, and $F_{MSY,}$ and target fishing mortality rates (or appropriate proxies when these parameters cannot be determined). Amendment 13 also adopted a process to adopt revised parameters and/or their numerical estimates. Amendment 13 also reiterated the definition of OY applicable for each stock in this FMP. The amendment also called for a re-evaluation of the status determination criteria in 2008 so that any necessary changes could be made at the beginning of the 2009 fishing year.

Under the No Action alternative, these status determination criteria and their numerical estimates would remain the same. The Amendment 13 parameters and their estimates are shown in Table 30.

Rebuilding Programs

“Overfished” stocks are those that are at low biomass levels. Amendment 13 and FW 42 adopted formal rebuilding programs for regulated groundfish stocks that are overfished. Stocks also need a rebuilding program if they were previously identified at low biomass levels and have not yet finished rebuilding. These programs take the form of a strategy that identifies target fishing mortality rates for these stocks. Since management measures are designed to achieve the fishing mortality rates specified in the rebuilding programs for overfished stocks, the rebuilding programs are a critical element of the management program.

Analyses in Amendment 13 demonstrates that if these fishing mortality rates are achieved, the overfished stocks should rebuild to a biomass that will support maximum sustainable yield, and will do so within the time period required by the M-S Act. The following stocks have formal rebuilding programs, though some of these stocks are no longer overfished and the rebuilding fishing mortality target is higher than current fishing mortality:

- GOM cod
- GB cod
- GB yellowtail flounder
- Plaice
- GB haddock
- GOM haddock
- CC/GOM yellowtail flounder
- SNE/MA yellowtail flounder
- SNE/MA winter flounder
- Windowpane flounder (south)
- White hake
- Redfish

- Ocean pout
- Atlantic halibut

Amendment 13 also provided for a mid-course evaluation of rebuilding progress and changes to the rebuilding programs as necessary. Changes might be necessary if the status determination criteria change or if rebuilding progress is behind or ahead of schedule.

Under the No Action alternative, the rebuilding programs and the associated target fishing mortality rates adopted by Amendment 13 and FW 42 would not be changed, regardless of stock conditions or any changes to status determination criteria.

Fishery Administration

The management program includes measures that address a wide range of issue. These include monitoring of catches and other fishing activity, measures to mitigate the social and economic impacts of rebuilding programs, procedures for periodic adjustments to the management program, and other needs. The major elements are briefly summarized below:

- Reporting requirements: Dealers are required to file weekly electronic reports of the purchase of groundfish. Vessel operators report catches on paper forms that must be submitted within fifteen days of the end of a month. Limited access vessels using a DAS are required to use a Vessel Monitoring System (VMS) that reports position on an hourly basis. Vessel operators also use VMS to report several types of fishing activity.
- Periodic adjustments: The FMP calls for a review of stock status and measures every two years, with the submission of management changes as may be necessary. The FMP also describes the types of measures that can be adjusted through these periodic adjustments, called framework actions.
- DAS leasing: Vessel operators are allowed to temporarily acquire DAS from other vessels through a leasing program. The maximum number of DAS that can be leased is limited. Vessels can only be leased to vessels of similar size (i.e. within the vessel upgrade restrictions for the permit).
- Special Access Programs (SAP): These programs relax regulatory restrictions in order to provide opportunities for vessels to target healthy groundfish stocks. For most programs, there are stringent requirements that include limits on catch of other species, additional reporting requirements, and gear restrictions. The current SAPs are:
    - Eastern US/CA Haddock SAP: Vessels using approved gear can fish for haddock in the Eastern US/CA Area while using Category B or Category A DAS. Vessels are allowed to fish in a small part of CAII. The SAP is open from August 1 through December 31. Vessels report catch daily through VMS. Catches of stocks of concern are limited by TACs.
    - CAI Hook Gear Haddock SAP: Longline vessels using specific bait (to reduce cod catches) are allowed to target haddock inside part of CAI. The total catch of haddock is limited by a TAC, as are the catches of stocks of concern. The area is open from October 1 through December 31. The open season is divided between sector and non-sector vessels. Vessels report catch daily through VMS.
    - CAII Yellowtail Flounder SAP: Vessels are allowed to target yellowtail flounder inside the southern part of CAII from July 1 through December 31. Vessels using trawl gear must use a haddock separator trawl or a flounder net. There is a limit on the maximum number of trips allowed each year, on the number of trips a vessel can make each month, and on the amount of yellowtail flounder that can be caught each trip. There are limits on the catches of stocks of concern and daily reporting via VMS. This SAP is only open when the TAC

for GB yellowtail flounder can support access to this area. This SAP has only been allowed once (in 2004) because of the status of yellowtail flounder.

- SNE/MA Winter Flounder SAP: In order to reduce discards of winter flounder in the fluke fishery, this SAP allows retention of up to 200 pounds of winter flounder while fishing without using a DAS. The vessel must be fishing west of 72° 30' W. longitude, must use mesh allowed under the summer flounder regulations, and the amount of winter flounder landed cannot exceed the amount of summer flounder landed.

- Category B (regular) DAS Program: This program allows vessels to use Category B (regular) DAS to target healthy stocks. In general, there are fewer restrictions on this program than on SAPs. The number of DAS that can be used each quarter is limited. Catches of stocks of concern are limited by hard TACs. Trawl vessels must use a separator trawl or other approved gear. Daily catch reporting is required.
- U.S./Canada Resource Sharing Understanding: The stock areas for GB yellowtail flounder, GB cod, and GB haddock straddle the international boundary between the U.S. and Canada. In order to develop a consistent management strategy for these stocks, Amendment 13 incorporated a process for the two countries to agree on annual harvest levels. The agreement applies to the entire GB yellowtail flounder stock area and part of the stock areas for cod and haddock. In order to implement the understanding, the U.S. adopted a suite of management measures that apply to the relevant management units. These include hard TACs on the catches, gear restrictions, and additional reporting requirements. The Regional Administrator has broad authority to make in-season adjustments as necessary to achieve the TACs.

Measures to Control Capacity

Amendment 13 adopted two measures intended to control capacity in the multispecies fishery. These two measures are embedded in the management approach, and could be considered elements of the measures to achieve rebuilding.

- DAS allocations: Amendment 13 categorized the DAS allocated to each vessel based on fishing history during fishing years 1996 through 2001. The DAS allocated were also assigned to one of three categories. Category A DAS can be used to fish for any groundfish stock under the requirements of the FMP. Category B DAS can only be used to target healthy stocks. One sub-category (called Category B (reserve) DAS) can only be used in approved SAPs. Category C DAS cannot be used at present but remain assigned to the permit. This categorization of DAS is a critical element of the existing management program.
- DAS Transfer Program: Vessel operators are allowed to make permanent transfers of DAS from one permit to another, subject to a number of restrictions. DAS from one of the vessels involved in the transfer are reduced by twenty percent (a "conservation tax" intended to reduce the number of DAS available and to account for the possibility DAS will move to more efficient vessels). Transfers can only be made between vessels of similar size. FW 42 adopted additional policy guidance designed to clarify the DAS transfer reprocess.

Measure to Meet Rebuilding Mortality Targets

A primary management tool in the multispecies fishery is the control on the amount of days (days-at-sea, or DAS) that fishing vessels can fish. Amendment 13 changed how the DAS assigned to a limited access multispecies permit can be used. For each limited access permit, Amendment 13 evaluated the fishing history of the permit during the period FY 1996 through FY 2001. For the years when the permitted vessel landed at least 5,000 pounds of regulated groundfish, the number of DAS used during a qualifying fishing year (not to exceed the permit's FY 2001 allocation) was defined as the vessel's "effective effort." Sixty percent of the permit's effective effort was defined as Category A DAS, while the other forty percent was defined as Category B DAS (evenly divided between Category B (regular) and Category B (reserve) DAS). The difference between the permit's effective effort and its 2001 allocation were then defined as Category C DAS. Amendment 13 specified that unless certain conditions are met, the ratio of Category A to Category B DAS for each permit would change to 45/55 on May 1, 2009.

FW 42 introduced a significant change to the DAS system: the counting of DAS at different rates in different areas. DAS are counted at a 2:1 rate in a large area in the inshore Gulf of Maine (GOM) and another area in Southern New England (SNE).

Amendment 13 established limitations on the different DAS categories. Category A DAS can be used to target any groundfish stock, subject to the limitations of Amendment 13 (including landing limits, gear requirements, closed areas, reporting requirements, etc.). Category B DAS can only be used in specific programs that are designed to target healthy groundfish stocks. Category C DAS cannot be used at this time, but may be made available at some time in the future. The number of DAS that can be used (whether Category A or Category B) can affect the rebuilding programs. The management measures in Amendment 13 were designed to achieve the target fishing mortality rates, but were based on Category A DAS use only. Programs that allow for the use of Category B DAS must be carefully designed so that they do not unacceptably increase the risk that rebuilding fishing mortality targets will not be met (mortality will be too high). A primary management measure used to prevent the use of Category B DAS from unacceptably raising mortality rates are incidental catch TACs first adopted by FW 40A, and modified in FW 40B, FW 41, and FW 42. These incidental catch TACs would not be modified if the No Action alternative is adopted.

Amendment 13 adopted two programs that facilitate the exchange of DAS between limited access permit holders. The DAS leasing program allows the temporary transfer of DAS from one permit to another. The vessels exchanging DAS must have similar vessel lengths and horsepower. The DAS transfer program allows for the permanent transfer of DAS between two vessels. For the transfer program, the two vessels involved must have similar length, horsepower, gross, and net tonnage. Under the No Action alternative, there would not be any changes to either of these programs.

Amendment 13 provided a mechanism for a group of fishermen to operate as a sector, and established the GB Cod Hook Sector. FW 42 implemented an additional sector, the Fixed Gear Sector. Under the No Action alternative, only these two sectors would be allowed to operate but without any changes, and there wouldn't be any changes to existing sector policies.

Numerous gear requirements have been adopted over the course of these actions. Current requirements are listed in Table 11. There are numerous trip limits in effect as well; these are summarized below.

Trip limits: The following trip limits apply when not participating in SAPs, the Category B (regular) DAS program, or when not altered by regulations for the U.S./Canada area.

GOM cod: 800 lbs./DAS up to 4,000 lbs./trip
GB cod: 1,000 lbs./DAS up to 10,000 lbs./trip
CC/GOM yellowtail flounder: 250 lbs./DAS up to 1,000 lbs./trip
SNE/MA yellowtail flounder: 250 lbs./DAS up to 1,000 lbs./trip
GB yellowtail flounder: 10,000 lbs./trip
GB winter flounder: 5,000 lbs./trip
White hake: 1,000 lbs./DAS up to 10,000 lbs./trip
Atlantic halibut: one fish per trip

Handgear A permit: 300 lbs./cod per trip
Handgear B Permit: 75 lbs./cod per trip

Existing regulations provide opportunities to target healthy groundfish stocks by establishing three SAPs and one program to use Category B (regular) DAS. GB haddock can be targeted using longline gear through the CAI Hook Gear Haddock SAP, and by vessels using trawl gear in the Eastern U.S./Canada Haddock SAP Pilot Program (other gear could be approved for this SAP as well). Each of these programs controls the catch of cod and haddock through a hard TAC supported by additional reporting and gear requirements. The CAII Yellowtail Flounder SAP provides an opportunity to target GB yellowtail flounder in CAII when that stock is healthy. The Category B (regular) DAS Pilot Program was adopted for one year to allow vessels to target healthy stocks while using Category B (regular) DAS. For all of these programs, the catch of stocks of concern is limited by hard TACs (referred to as "incidental catch TACs") that are monitored through additional reporting requirements. Under the No Action alternative, the Eastern U.S./CA Haddock SAP Pilot Program would end in December, 2008. Incidental catch TACs would not be specified for FY 2010 and beyond, since they have only been specified through FY 2009.

Table 11 – Gear requirements under the existing management system

<table>
<tr><th></th><th>GOM</th><th>GB</th><th>SNE</th><th>Mid-Atl</th></tr>
<tr><td colspan="5">MINIMUM MESH SIZE RESTRICTIONS FOR GILLNET GEAR</td></tr>
<tr><td rowspan="2">NE Multispecies
Day Gillnet Category*</td><td>Roundfish nets
6.5" (16.5 cm) mesh;
50-net allowance</td><td rowspan="2">All nets
6.5" (16.5 cm) mesh;
50-net allowance</td><td rowspan="2">All nets
6.5" (16.5 cm) mesh;
75-net allowance</td><td>Roundfish nets
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td>Flatfish nets
6.5" (16.5 cm) mesh;
100-net allowance</td><td>Flatfish nets
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td>NE Multispecies
Trip Gillnet Category*</td><td>All nets
6.5" (16.5 cm) mesh;
150-net allowance</td><td>All nets
6.5" (16.5 cm) mesh;
150-net allowance</td><td>All nets
6.5" (16.5 cm) mesh;
75-net allowance</td><td>All gillnet gear
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td rowspan="2">Monkfish Vessels**</td><td colspan="4">10" (25.4 cm) mesh/150-net allowance</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="5">MINIMUM MESH SIZE RESTRICTIONS FOR TRAWL GEAR</td></tr>
<tr><td>Codend only
mesh size*</td><td colspan="2">6.5" (16.5 cm) diamond or square</td><td>7.0" (17.8 cm) diamond or 6.5" (16.5 cm) square</td><td>6.5" (16.5 cm) diamond or square</td></tr>
<tr><td>Large Mesh Category -
entire net</td><td colspan="3">8.5" (21.59 cm) diamond or square</td><td>7.5" (19.0 cm) diamond or 8.0" (20.3 cm) square</td></tr>
<tr><td colspan="5">MAXIUM NUMBER OF HOOKS AND SIZE RESTRICTIONS FOR HOOK-GEAR***</td></tr>
<tr><td rowspan="3">Limited access
multispecies vessels</td><td>2,000 hooks</td><td>3,600 hooks</td><td>2,000 hooks</td><td>4,500 hooks (Hook-gear vessels only)</td></tr>
<tr><td colspan="4">No less than 6" (15.2 cm) spacing allowed between the fairlead rollers</td></tr>
<tr><td colspan="3">12/0 circle hooks required for longline gear</td><td>N/A</td></tr>
</table>

4.0 Proposed Action

4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and ABC Control Rules

4.1.1 Revised Status Determination Criteria

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 13 adopted status determination criteria for regulated groundfish stocks. It also provided that these criteria would be reviewed in 2008. This amendment adopts new status determination criteria.

In 2008, the Northeast Fisheries Science Center (NEFSC) conducted assessments of all nineteen regulated groundfish stocks. The results of those assessments included revisions to status determination criteria. This action adopts the revised status determination criteria. This option does not revise the types of changes that require Council action, as described in Amendment 13. It also does not change the definition of optimum yield.

This action adopts the status determination criteria determined by GARM III (NEFSC 2008) and, in the case of Atlantic wolffish, the DPWG (2009). The GARM III and DPWG reports include a full description of the data and models used to determine the criteria. The parameters are described in Table 12. Numerical estimates for these parameters are shown in Table 13. For the stocks that use an index-based method to evaluate stock status (either AIM or other index-methods) the criteria is based on a moving average calculated as described by the latest applicable benchmark assessment. For ocean pout and pollock, this is a three-year, centered average as described in the first Reference Point Working Group (NEFSC 2002) unless changed in a later assessment. For windowpane flounder stocks, the average is a three-year lagged average unless changed in a later assessment. In all cases, the minimum biomass threshold – that is, the point that determines when a stock is overfished – is one-half the BMSY shown in Table 13.

Note that in this option a fishing mortality target is not specified, a change from Amendment 9 (NEFMC 2008). Section 4.2.1 describes the process for setting Annual Catch Limits (ACLs). In effect, the fishing mortality target is the mortality that results from the defined ACL.

This Proposed Action was Option 2 in the draft amendment document.

Table 12 – Proposed action status determination criteria

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
GOM Cod	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GB Cod	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GB Haddock	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GOM Haddock	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
GB Yellowtail Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
Cape Cod/GOM Yellowtail Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
SNE/MA Yellowtail flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
American Plaice	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
Witch Flounder	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
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
Acadian Redfish	SSBMSY: SSB/R (50%MSP)	½ Btarget	F50%MSP
White Hake	SSBMSY: SSB/R (40%MSP)	½ Btarget	F40%MSP
Pollock	External	½ Btarget	Rel F at replacement
Windowpane Flounder (North)	External	½ Btarget	Rel F at replacement
Windowpane Flounder (South)	External	½ Btarget	Rel F at replacement
Ocean Pout	External	½ Btarget	Rel F at replacement
Atlantic Halibut	Internal	½ Btarget	$F_{0.1}$
Atlantic Wolffish	SSBMSY: SSB/R (40%MSP)	1/2 Btarget	F40% MSP

Table 13 - Numerical estimates of revised status determination criteria from GARM III assessment meetings and the Data Poor Working Group

Species	Stock	Model	Bmsy or proxy (mt)	Fmsy or proxy	MSY (mt)
Cod	GB	VPA	148,084	0.25	31,159
Cod	GOM	VPA	58,248	0.24	10,014
Haddock (1)	GB	VPA	153,329	0.35	33,604
Haddock	GOM	VPA	5,900	0.43	1,360
Yellowtail Flounder	GB	VPA	43,200	0.25	9,400
Yellowtail Flounder	SNE/MA	VPA	27,400	0.25	6,100
Yellowtail Flounder	CC/GOM	VPA	7,790	0.24	1,720
American Plaice	GB/GOM	VPA	21,940	0.19	4,011
Witch Flounder		VPA	11,447	0.20	2,352
Winter Flounder	GB	VPA	16,000	0.26	3,500
Winter Flounder	GOM	VPA	3,792	0.28	917
Winter Flounder	SNE/MA	VPA	38,761	0.25	9,742
Redfish		ASAP	271,000	0.04	10,139
White Hake	GB/GOM	SCAA	56,254	0.13	5,800
Pollock	GB/GOM	AIM	2.00 kg/tow	5.66 c/i	11,320
Windowpane Flounder	GOM/GB	AIM	1.40 kg/tow	0.50 c/i	700
Windowpane Flounder	SNE/MA	AIM	0.34 kg/tow	1.47 c/i	500
Ocean Pout		Index Method	4.94 kg/tow	0.76 c/i	3,754
Atlantic Halibut		Replacement Yield	49,000	0.07	3,500
Atlantic Wolffish(2)		SCALE	1747 – 2202 mt	< 0.35	278 – 311 mt

(1) GB haddock values for B_{MSY} and MSY reflect corrected values reported in Dr. Nancy Thompson's (Northeast Fisheries Science Center) letter to the New England Fishery Management Council dated November 14, 2008. GARM III reported BMSY as 158,873 mt (SSB) and MSY as 32,746 mt.
(2) Atlantic wolffish values are based on the revised Atlantic wolffish working paper prepared after the Data Poor Working Group. Values in this document differ from those in the summary report of the review panel.

4.1.2 ABC Control Rules

Background: After adoption of the Sustainable Fishery Act amendments to the M-S Act in 1996, the National Standard Guidelines (NSGs) suggested that management plans should include MSY control rules. The control rules specified the fishing mortality rates used to manage the fishery. Amendment 9 (NEFMC 1998) adopted MSY control rules for the Northeast Multispecies FMP. These control rules were modified in Amendment 13 (NEFMC 2003). When the M-S Act was reauthorized in 2006, additional requirements were imposed for Councils to adopt Annual Catch Limits (ACLs) (see section 4.2.1 for additional details). As part of this process, the Science and Statistical Committee (SSC) of the Council first specifies an acceptable biological catch, or ABC. The ACL set by the Council cannot exceed the ABC established by the SSC.

When Amendment 16 was initiated, the Council did not intend to modify the MSY control rules adopted by Amendment 13. The draft Amendment 16 document assumed that the Amendment 13 control rules would continue to guide the fishery management plan. The existing MSY control rules were incorporated into the setting of ACLs.

Two events occurred during the development of the amendment that led the Council to reconsider this decision. First, the NMFS published revised National Standard guidelines to implement the changes to the M-S Act that were adopted when it was reauthorized in 2006 (see 50 CFR 600.310 published in 73 *Federal Register* 32526). Published just before the Council approved the draft amendment document, the revised guidelines outline the implementation of requirements to set ABCs and ACLs in all management plans. The guidelines revise and expand the concept of control rules and suggest that management plans should adopt ABC control rules. These are similar to the original MSY control rules, and it is feasible that the plan could follow the new guidelines simply by renaming the Amendment 13 MSY control rules.

The second event was the SSC review of the plan for setting ABCs and ACLs. The draft amendment proposed that ABCs would be based on the fishing mortality called for by the control rule or Frebuild (for stocks in a formal rebuilding program). The ABC would also consider elements of scientific uncertainty. The Council's Plan Development Team (PDT) proposed an approach to evaluate these uncertainties and presented it to the SSC in July 2008. The SSC agreed with the concept but suggested the PDT test the approach by applying it to several stocks based on assessments completed in 2005. The results of this test (reviewed by the SSC in May, 2009) indicated that the PDT's approach would not have ended overfishing if used for three stocks to set catch levels for 2005 through 2007. As summarized by the SSC, the PDT's review highlighted the following (Cadrin, pers. comm.):

1. Medium to long term probabilistic stock projections are highly uncertain,
2. Accurately estimating probabilities at the tails of probability distributions (either high or low probabilities) is particularly difficult,
3. Even if projections are unbiased and probabilities are accurately estimated, some fish stocks will not be rebuilt by the end of the rebuilding period.
4. The available data is inadequate to conduct probabilistic projections for some stocks.

As a result, the SSC recommended a simpler approach to take into account scientific uncertainty when setting ABCs in the absence of better information that more accurately describes scientific uncertainty. To quote the SSC recommendation: "The SSC concluded that in the absence of better information on what an appropriate buffer should be between the OFL and the ABC, a relatively simple ABC and robust specification could be applied to all groundfish stocks, in all stages of rebuilding or long-term maintenance of optimum yield." The SSC recommended modifying the control rules used in the fishery from those adopted in Amendment 13. The Council accepted the SSC's recommendation at its June, 2009 Council meeting.

Action: The MSY control rules adopted by Amendment 13 are replaced by the ABC control rules listed below. These ABC control rules will be used in the absence of better information that may allow a more explicit determination of scientific uncertainty for a stock or stocks. If such information is available – that is, if scientific uncertainty can be characterized in a more accurate fashion -- it can be used by the SSC to determine ABCs. These ABC control rules can be modified in a future Council action (an amendment, framework, or specification package):

a. ABC should be determined as the catch associated with 75% of F_{MSY}.
b. If fishing at 75% of F_{MSY} does not achieve the mandated rebuilding requirements for overfished stocks, ABC should be determined as the catch associated with the fishing mortality that meets rebuilding requirements ($F_{rebuild}$).

c. For stocks that cannot rebuild to B_{MSY} in the specified rebuilding period, even with no fishing, the ABC should be based on incidental bycatch, including a reduction in bycatch rate (i.e., the proportion of the stock caught as bycatch).
d. Interim ABCs should be determined for stocks with unknown status according to case-by-case recommendations from the SSC.

4.1.3 Revised mortality targets for formal rebuilding programs

Amendment 13 adopted formal rebuilding programs for overfished groundfish stocks. The amendment also called for an evaluation of rebuilding progress and an adjustment in mortality targets to achieve rebuilding, if necessary. Mortality targets are adjusted as necessary to meet the rebuilding dates and probability of success adopted by Amendment 13 and Framework 42. This section assumes that there will not be any changes in the rebuilding time period or probability of success used to determine the target fishing mortality rates.

According to the GARM III assessments, the following stocks achieved their B_{MSY} level (or its proxy) prior to submission of this document, and this action acknowledges completion of the rebuilding programs in the year shown:

- GB haddock (2006)
- GOM haddock (2000)

4.1.3.1 Revised Rebuilding Mortality Targets

After the assessments of all regulated groundfish stocks were completed in August 2008, an evaluation was made as to whether adjustments to the rebuilding fishing mortality targets are necessary. For the draft amendment, revised rebuilding fishing mortality targets were calculated based on estimates of stock status in 2008, revisions to status determination criteria (if any), and the rebuilding timelines and probabilities of success adopted by Amendment 13 and FW 42. These revised mortality targets are shown in Table 14. In the case of GOM cod and American plaice, the rebuilding fishing mortality exceeded $F_{MSY.}$ Since fishing at a higher level than F_{MSY} constitutes overfishing, the mortality target for these stocks was shown as F_{MSY} in the draft amendment.

Subsequent to Council approval of the draft amendment, the Council adopted new ABC control rules recommended by the SSC. A full description is provided in section 4.1.2. With the Council's adoption of the new ABC control rules, some of the mortality targets for this action were changed from those proposed in the draft amendment. If Frebuild is higher than 75% of FMSY, the latter is used for the target. This changed the mortality targets for GOM cod, plaice, witch flounder, GB haddock, GOM haddock, CC/GOM yellowtail flounder, and redfish. Revised mortality targets guiding this management action are reflected in Table 15.

It should be noted that in the case of overfished stocks these fishing mortality targets implement a particular rebuilding strategy. The strategy consists of the time period for rebuilding and the probability of success used to determine a rebuilding fishing mortality rate. When stock status is determined it can be compared to the rebuilding program and the rebuilding fishing mortality can be recalculated. While this is normally done every few years based on the assessment cycle and changes are included in a management action, if assessments are available more frequently and a mechanism exists to implement a different fishing mortality rate then the revised rate can be implemented without a management action. At present, this is a possibility for GB yellowtail flounder since the stock is assessed every year through the TRAC and is managed through a hard TAC. It may be possible in the future to use this approach for other stocks.

SNE/MA Winter Flounder
Amendment 13 adopted a phased rebuilding strategy for this stock. The strategy called for an evaluation of rebuilding progress in 2008 and an adjustment to the rebuilding fishing mortality target to achieve rebuilding by 2014. The rebuilding target for SNE/MA winter flounder shown in Table 15 calls for a fishing mortality of 0. The target fishing mortality shown in this table should be interpreted as "as close to 0 as practicable."

There have been changes in the scientific basis for the rebuilding plan since Amendment 13. The GARM III assessment selected a different assessment model than that used in GARM I as the basis for the Amendment 13 rebuilding plan, though estimates of stock size and fishing mortality do not differ appreciably between the two models. The target biomass for this stock increased from 30,100 mt in 2004 to 38,761 mt in this action, a twenty-nine percent increase. Projections based on the GARM III assessment estimate that the stock will not rebuild by 2014 even absent all fishing mortality, but would achieve the earlier rebuilding target in 2014 with very low fishing mortality.

The M-S Act says that a rebuilding period should be as short as possible "…taking into account the needs of fishing communities…" and not exceed ten years "…except in cases where the biology of the stock of fish…dictate otherwise." While the NSG advisory guidance is to interpret the reference to "biology of the stock of fish" to refer only to the mean generation time of a stock and to only be considered when designing a rebuilding program, there is no such language in the statute. Clearly, the biology of SNE/MA winter flounder will not allow the stock to rebuild by the end of the rebuilding period even in the absence of fishing mortality and the rebuilding period will need to be longer than ten years. This situation was reached not just due to changes in the understanding of stock status but because fishing mortality exceeded the rebuilding target from 2004 through 2008. Fishing mortality exceeded the target at least in part because the actual recruitment observed for 2004 – 2008 was less than half that assumed when the Amendment 13 measures were designed (see NEFMC 2004; GARM III). This is beyond the control of managers or the fishing industry.

The NSGs do not provide guidance on how management should react when it is determined that a rebuilding plan cannot achieve its goal by the end of the rebuilding period. They do, however, provide guidance if a stock is not rebuilt at the end of the period: the Council should continue to target the rebuilding fishing mortality rate or a fishing mortality that is 75 percent of F_{MSY}, whichever is lower. By targeting a fishing mortality as close to zero as practicable, the Council is proposing a more precautionary adjustment than would be allowed by the NSGs if 2009 was the end of the rebuilding period and the stock was not yet rebuilt. The impacts on the length of the rebuilding period will be described in section 7.2.1.1.3.

Atlantic Halibut
Amendment 13 adopted a formal rebuilding program for Atlantic halibut. At the time, while the stock was known to be overfished, assessment information was insufficient to calculate a fishing mortality rate for rebuilding. In 2008 an analytic assessment was completed at GARM III. This enables the calculation of a preliminary rebuilding period and fishing mortality rate. Since the stock cannot be rebuilt within ten years in the absence of fishing mortality, the ending date of the rebuilding period is 2055 and a target fishing mortality rate is shown below. This initial attempt to define the rebuilding period may be modified as the assessment is improved in the future.

Additional Rebuilding Programs
In addition to these revisions to existing rebuilding programs based on the results of GARM III, the fall 2008 fall trawl survey, and a Data Poor Working Group meeting (DPWG 2009), additional formal rebuilding programs are required for:

- Witch flounder
- Georges Bank winter flounder
- Northern windowpane flounder
- Pollock
- Atlantic wolffish

For the new rebuilding strategies identified below, and consistent with M-S Act requirements to rebuild as quickly as possible subject to various constraints, the Council is considering strategies that rebuild in less time than the maximum allowed under the M-S Act and at a higher level of probability than required (the minimum allowed is greater than a fifty percent probability). These choices will provide additional flexibility should stock increases lag behind the planned rebuilding trajectory. Should rebuilding lag in the future, the Council may adjust the rebuilding program by reducing fishing mortality to meet the strategy targets, or by extending the rebuilding period, or by changing the probability of achieving the target in the time period, or through any combination of these or other options that are consistent with the legal requirements of the M-S Act. Any changes will be adopted either through a framework action, plan amendment, or specifications package adjustment.

Witch Flounder
The Council is adopting the following rebuilding program for witch flounder:

> Fishing mortality will target rebuilding of the stock with a 75 percent probability of success by 2017.

Georges Bank Winter Flounder
The Council is adopting the following rebuilding program for GB winter flounder:

> Fishing mortality will target rebuilding of the stock with a 75 percent probability of success by 2017.

Northern Windowpane Flounder
The Council is adopting the following rebuilding program for Northern windowpane flounder:
The goal is to rebuild this stock by 2017. No probability is associated with this goal since it is an index-based stock and the projection methodology is deterministic. In addition, the Council has not identified a specific rebuilding mortality target because the GARM III panel concluded that given the high uncertainty of index-based assessments, it was not appropriate to calculate F rebuild for this stock.

Pollock
GARM III reported that pollock was approaching an overfished condition. This transboundary stock is currently assessed with an index-based assessment. The results of the 2008 fall trawl survey determined the stock is overfished. A joint U.S./Canada assessment is being considered for 2010. This joint assessment may adopt a different assessment model and may adopt a different stock definition. Until this assessment is completed, the rebuilding plan for this stock is based on the index-based assessment and Pollock Rebuilding Option 2: rebuild by 2017.

Completion of a new assessment in 2010 may result in a need to revisit this rebuilding plan if the assessment model is revised and if the understanding of stock status changes.

Atlantic Wolffish
DPWG (2009) reported that Atlantic wolffish is overfished. The life history of this species is not well understood and the assessment is uncertain ("There is considerable uncertainty in several life history traits critical to the evaluation of BRPs and stock status, including M, maximum age, the maturity schedule and

fecundity. Current estimates of maturity patterns used in the model have not been adequately developed for the northwest Atlantic coastal shelf ecosystem and for the Gulf of Maine region in particular."). The DPWG report included the following statement: "The Panel believed that stock projections would be unreliable and should not be undertaken." For these reasons it is not possible to estimate rebuilding time periods or rebuilding fishing mortality rates. The DPWG panel also recommended that catches remain low because of evidence of poor recruitment. For these reasons, the initial rebuilding plan for wolffish will focus on reducing fishing mortality to the extent practicable without a defined rebuilding period or target fishing mortality rate.

Other stocks

GOM Winter Flounder

The 2008 assessment of GOM winter flounder was not accepted. In the words of the review panel GARM III):

> "Given the problems encountered, the Panel agreed that none of the models put forth gave a clear picture of the status of the resource. Further, the Panel noted that until these issues were resolved, the proposed analysis could not be used to provide management advice nor stock projections.
>
> While the Panel was unable to determine the stock's status relative to the BRPs, it agreed that the current trend in the population was very troubling. The Panel generally agreed that it is highly likely that biomass is below B_{MSY}, and that there is a substantial probability that it is below ½ B_{MSY}. The Panel noted that other stocks in the area of this mixed fishery were also at low levels."

Given the conclusion of the panel, this stock is clearly in need of additional rebuilding but a formal rebuilding program cannot be estimated. The area for this stock is similar to that for GOM cod, CC/GOM yellowtail flounder, and part of the witch flounder stock area. Measures designed to reduce mortality on those stocks are expected to reduce mortality on GOM winter flounder as well. While a specific rebuilding plan cannot be determined at this time (and it is not clear that a formal rebuilding plan is actually required), this stock will be closely monitored and a plan will be developed as more information becomes available and if it is determined that the stock is overfished.

Rationale: Modifications to rebuilding plans are needed in order to make sure rebuilding programs consider the best available science. Additional formal rebuilding plans are required to comply with M-S Act requirements for those stocks recently determined to be overfished.

The rebuilding strategies proposed in this section do not invoke the NSG provision referred to as the "mixed stock exception." 50 CFR 600.310(m) (published in 73 *Federal Register* 32526) provides guidance for limited exceptions to the requirement to end overfishing immediately. A key element of the guidance is that "The Council may decide to allow this type of overfishing **if the fishery is not overfished**…" (emphasis added). According to GARM III, the DPWG, and other scientific information used to prepare this document, fourteen of the twenty groundfish stocks are overfished and based on the language of the NSGs the mixed stock exception cannot be applied to those stocks. Of the remaining six stocks, only two are subject to overfishing: GOM cod and southern windowpane flounder. Both stocks are still in rebuilding plans adopted by Amendment 13. In the case of GOM cod, the fishing mortality that will achieve the rebuilding target is slightly higher than F_{MSY} but the Council is choosing to end overfishing immediately as required by the M-S Act. In the case of SNE/MA windowpane flounder, a specific rebuilding mortality cannot be calculated.

Table 14 – Option 2 – draft Amendment 16 revised rebuilding fishing mortality rates based on current stock status.
Boldfaced italics identify phased reduction strategies; other rebuilding programs use the adaptive strategy.

SPECIES	STOCK	Rebuilt Year / Probability of Success	Fishing mortality rates for adopted rebuilding programs in year:									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cod	***GB***	2026/50%	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***
	(add ten years)		***0.184***	***0.185***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***			
		2014/50%	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Haddock	GB	2014/50%	*No formal rebuilding program require*									
		2014/50%	*No formal rebuilding program required*									
Yellowtail Flounder	GB	2014/75%	0.109	0.109	0.109	0.109	0.109					
		2014/50%	***0.072***	***0.072***	***0.072***	***0.072***	***0.072***					
	CC/GOM	2023/50%	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***	***0.238***
	(add ten years)		***0.238***	***0.238***	***0.238***	***0.238***						
American Plaice		2014/50%	***0.190***	***0.190***	***0.190***	***0.190***	***0.190***					
Witch Flounder	GOM	2017/75%	0.162	0.162	0.162	0.162	0.162	0.162	0.162	0.162	0.162	
Winter Flounder	GB	2017/75%	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205	
GOM			*Unable to determine stock status; cannot calculate a rebuilding mortality if overfished*									
SNE/MA		2014/50%	0	0	0	0	0	0	0			
Redfish		2051/50%	.038	.038	.038	.038	.038	.038	.038	.038	.038	.038
White Hake		2014/50%	***0.084***	***0.084***	***0.084***	***0.084***	***0.084***					
Pollock		2020	4.838	4.838	4.838	4.838	4.838	4.838	4.838	4.838	4.838	4.838
		2017	4.564	4.564	4.564	4.564	4.564	4.564	4.564	4.564	4.564	
Windowpane Flounder	North GOM		*Unable to calculate rebuilding mortality*									
	SNE/MA	2014/50%	*Unable to calculate rebuilding mortality*									
Ocean Pout		2014/50%	*Unable to calculate rebuilding mortality*									
Atlantic Halibut		2056/50%	0.044 through 2055									

South

Table 15 – Final Amendment 16 revised rebuilding fishing mortality rates based on current stock status and revised ABC control rules. Boldfaced italics identify phased reduction strategies; other rebuilding programs use the adaptive strategy.

SPECIES	STOCK	Rebuilt Year / Probability of Success	Fishing mortality rates for adopted rebuilding programs in year:									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cod	***GB***	2026/50%	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***
	(add ten years)		***0.184***	***0.185***	***0.184***	***0.184***	***0.184***	***0.184***	***0.184***			
		2014/50%	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Haddock	GB	2014/50%					*75% FMSY: 0.26*					
		2014/50%					*75% FMSY: 0.32*					
Yellowtail Flounder	GB	2014/75%	0.109	0.109	0.109	0.109	0.109					
		2014/50%	***0.072***	***0.072***	***0.072***	***0.072***	***0.072***					
	CC/GOM	2023/50%	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***
	(add ten years)		***0.18***	***0.18***	***0.18***	***0.18***						
American Plaice		2014/50%	***0.14***	***0.14***	***0.14***	***0.14***	***0.14***					
GOM Witch Flounder		2017/75%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
Winter Flounder	GB	2017/75%	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
GOM			*Unable to determine stock status; cannot calculate a rebuilding mortality if overfished*									
SNE/MA		2014/50%	0	0	0	0	0	0	0			
Redfish		2051/50%	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
White Hake		2014/50%	***0.084***	***0.084***	***0.084***	***0.084***	***0.084***					
Pollock		2017	4.245	4.245	4.245	4.245	4.245	4.245	4.245	4.245	4.245	4.245
Windowpane Flounder	North	2017					*Unable to calculate rebuilding mortality; 75% of MFSY*					
GOM		2014/50%					*Unable to calculate rebuilding mortality; 75% of MFSY*					
SNE/MA **Ocean Pout**		2014/50%					*Unable to calculate rebuilding mortality; 75% of MFSY*					
Atlantic Halibut		2056/50%					0.044 through 2055					
Atlantic wolfish							*Unable to calculate rebuilding mortality; 75% of MFSY*					

South

4.1.3.2 Mortality Reductions to Achieve Rebuilding Targets

Management measures in this action are designed to reduce fishing mortality to the targeted fishing mortality for each stock as shown in Table 15. The Council's approach to determine the needed mortality reductions for Amendment 16 is similar to that used for FW 42. Catch in 2008 was estimated using six months of preliminary landings statistics provided by NERO (a full year of data was used for pollock and GB winter flounder), the ratio of discards to landings in 2007 from the GARM, Canadian quotas for GB cod, haddock, and yellowtail flounder, 2008 Canadian catch for pollock, and 2007 recreational catches for GB cod, GOM cod, GOM haddock, pollock, SNE/MA winter flounder, and GB winter flounder. Estimates were not made for the four stocks with very low landings because such estimates are unreliable. Using the estimated catch, fishing mortality in 2008 is estimated and the measures are designed to reduce mortality from the 2008 estimate to the Amendment 16 target. *While the method used to estimate 2008 catch has performed adequately in the past, it is not without uncertainty. Changes in discard rates, recreational catch, and commercial fishing patterns could result in actual catches that differ from these estimates.* Table 16 summarizes the mortality reductions believed necessary to achieve the desired fishing mortality rates. The derivation of these values is explained in section 7.2.1.1.3.2.

Projections for SNE/MA winter flounder indicate that it is unlikely to rebuild by 2014 in the absence of any fishing mortality, and so Table 15 indicates that fishing mortality must be completely eliminated. Since this stock is caught as bycatch in other large mesh fisheries, small-mesh fisheries, and the scallop dredge fishery, the only way to do this is to eliminate all fishing activity in the SNE/MA winter flounder stock area. This would entail closing the fluke, black sea bass, scup, scallop, herring, mackerel, monkfish, and other fisheries from off Cape Cod to the Maryland coast. Hundreds of millions of dollars in yield would be sacrificed for a relatively small change in the projected rebuilding period for a stock that at MSY will produce less than 10,000 mt of yield. This is viewed as unnecessarily draconian and impracticable, since even without any fishing mortality this stock would not be rebuilt within the Amendment 13 timelines (i.e., by 2014) and is projected to be rebuilt between fishing years 2015 and 2016. In addition, there is considerable fishing on this stock within state waters, beyond the jurisdiction of these management measures. Further, with the implementation of management measures proposed under Amendment 16, this stock will no longer be subject to overfishing. Therefore, to impose such measures and still not achieve the objectives of rebuilding this stock by 2014 is contrary to the objectives of the Magnuson-Stevens Act and would subject groundfish vessels to severe economic impacts without sufficient benefits. For these reasons, this action is designed to eliminate targeting of this stock and, reduce discards in other trawl fisheries in order to reduce fishing mortality to the extent practicable.

Table 16 – Summary of rebuilding reductions needed to achieve desired fishing mortality.

Species	Stock	2007 Fishing Mortality	Targeted Fishing Mortality (either $F_{rebuild}$ or 75% of F_{MSY})	F_{msy}	2008 F from 2008 Estimated Catch	% Change in F necessary to achieve targeted mortality
Cod	**GB**	0.300	0.184	0.2466	0.410	-55%
Cod	**GOM**	0.456	0.18	0.237	0.300	-40%
Haddock	**GB**	0.230	0.26	0.350	0.079	229%
Haddock	**GOM**	0.350	0.32	0.430	0.250	28%
Yellowtail Flounder	**GB**	0.289	0.109	0.254	0.130	-16%
Yellowtail Flounder	**SNE/MA**	0.413	0.072	0.254	0.120	-40%
Yellowtail Flounder	**CC/GOM**	0.414	0.18	0.239	0.289	-38%
American Plaice	**GB/GOM**	0.090	0.14	0.190	0.099	41%
Witch Flounder		0.290	0.15	0.200	0.296	-49%
Winter Flounder	**GB**	0.280	0.20	0.260	0.131	49%
Winter Flounder	**GOM**	0.417	N/A4	0.283	0.317	n/a
Winter Flounder	**SNE/MA**	0.649	0.000	0.248	0.265	-100%
Redfish		0.005	0.03	0.038	0.008	275%
White Hake	**GB/GOM**	0.150	0.084	0.125	0.065	29%
Pollock	**GB/GOM**	10.464	4.245	5.66	15.516	-73%
Windowpane	**GOM/GB**	1.960	n/a	0.50	n/a	n/a
Windowpane	**SNE/MA**	1.850	n/a	1.47	n/a	n/a
Ocean Pout		0.380	n/a	0.760	n/a	n/a
Atlantic Halibut		0.065	0.044	0.073	0.060	-27%
Atlantic Wolffish		Unk			Unk	n/a

4.2 Fishery Program Administration

4.2.1 Annual Catch Limits

While this action will specify the process for Annual Catch Limits (ACLs), they will be implemented as required by the M-S Act (FY 2010 or 2011 based on whether a stock is subject to overfishing or not).

Revisions to the M-S Act in 2006 require that fishery management councils "develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its scientific and statistical committee or the peer review process…" This option implements that requirement for the Northeast Multispecies FMP.

There are several steps that must be specified to set ACLs. In some cases, the M-S Act requires certain steps to be performed by specific entities (generally either the Council or the Science and Statistical Committee (SSC)). These requirements will be discussed in more detail later in this section.

- Appropriate fishing mortality references must be identified.
- Current stock size must be estimated.
- Available catches must be estimated for the appropriate fishing mortality references at current, or projected, stock sizes, taking into account biological and management uncertainty and risk.
- For some data-poor stocks, available catch may have to be determined without benefit of fishing mortality estimates or targets, or stock size estimates.
- Available catch will need to be allocated to different components of the fishery (sectors/common pool vessels, commercial/recreational), or to other fisheries (Scallop dredge, midwater trawl, etc.).
- Council decisions will need to be reviewed, discussed, and published.

This section will describe the process for all of these steps. This action adopts Option 2 from the draft amendment.

4.2.1.1 Definitions

The following definitions define terms used in this section. Table 17 summarizes this information.

OFL: Overfishing level. The catch that results from applying the fishing mortality rate that defines overfishing to a current or projected estimate of stock size. This is usually F_{MSY} or its proxy. Catches that exceed this amount would be expected to result in overfishing.

ABC: Acceptable biological catch. The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. ABC can never exceed the OFL. ABC will be based on $F_{control\ rule}$ for stocks that are not in a rebuilding program, and will be based on the rebuilding fishing mortality (F_{reb}) rate for stocks that are in a rebuilding program. The determination of ABC will consider scientific uncertainty.

ACL: Annual catch limit. The catch level selected such that the risk of exceeding the ABC is consistent with the management program. ACL can be equal to but can never exceed the ABC. ACL should be set lower than the ABC when necessary due to uncertainty over the effectiveness of management measures.

The ACL serves as the level of catch that determines whether accountability measures (AMs) are implemented.

Table 17 – Overview of definitions used in ACL process

Acronym	Definition	Considerations
OFL	Catch at F_{MSY}	Point estimates of F_{MSY} , stock size
ABC	Catch at $F_{ABC\ control\ rule}$ or $F_{rebuild}$	Scientific uncertainty over current stock size, estimate of F, or other parameters (growth, recruitment, selectivity, etc.)
ACL	<=ABC	Uncertainty from other sources, evaluation of risk to achieving management goals if ABC is exceeded

4.2.1.2 Administrative Process for Setting Multispecies ACLs

This section delineates the administrative steps for setting ACLs for multispecies stocks. The ACL process will become an element of the existing periodic adjustment process. The biennial adjustment process requires the PDT to prepare a SAFE report every year. Every two years, the PDT evaluates whether management measures need to be revised in order to meet mortality objectives. The PDT will review available data, including information on catch (landings and discards), DAS and other measures of fishing effort, estimates and forecasts from recent assessments about stock status and fishing mortality rates, enforcement and compliance with measures, and any other relevant information, such as trawl survey indices or other data. The PDT is required to submit suggested measures to the Council by September 1 if revisions are necessary. The Council will then consider adjustments over the course of two Council meetings. The first meeting, in September will be the first framework meeting for any revisions. The second framework meeting will take place in either October or November. An exception to this process will be made for the U.S./CA Resource Sharing Understanding, which determines TACs on an annual basis.

The PDT will develop recommendations for Acceptable Biological Catch (ABC) for each multispecies stock based on the definitions in Table 17. These recommendations form the basis for setting ACLs. The PDT recommendations will include the following elements:

- OFL estimates for the next three fishing years, based on the point estimates of F_{MSY} (or its proxy) and the point estimate of future stock size. While it is expected that OFLs will be determined every two years, the PDT will recommend them for three years in case of a delay in determining future values.
- As part of the biennial adjustment process, the PDT should evaluate whether rebuilding is proceeding as planned and whether adjustments are necessary to fishing mortality targets in order to maintain rebuilding trajectories.
- ABC recommendations for the next three fishing years, based on either $F_{control\ rule}$ (stocks not in a rebuilding program) or F_{reb} (stocks in a rebuilding program). The PDT recommendation should report the catch that results from the point estimates of the target fishing mortality rate and projected stock size. If the PDT recommends reducing the ABC from this amount, the recommendation should include an explicit discussion of the biological uncertainties that are taken into account in developing the recommendation. In order to evaluate these uncertainties, with the guidance of the SSC the PDT will develop an informal document that describes the issues that will be considered. This information will be provided for the consideration of the SSC and the Council and is not intended to be binding on either body. For some stocks, information may not be available to estimate fishing mortality or stock size; the PDT will develop a recommendation for those stocks

using any available data. While it is expected that ABCs will be determined every two years, the PDT will recommend them for three years in case of a delay in implementation.

- An evaluation whether the ABC's have been exceeded in earlier years.

The PDT will also develop a recommendation to the Council for setting ACLs. Similar to the setting of ACLs, the PDT will consider management uncertainty when developing this recommendation. In order to evaluate these uncertainties, the PDT will develop an informal document that describes the issues that will be considered. The Council may ask the SSC to comment on the PDT recommendations. Should the SSC recommend an ABC that differs from that originally recommend by the PDT, the PDT will revise its ACL recommendations if necessary to be consistent. The PDT's ACL recommendations will include:

- A summary indicating whether ACLs have been exceeded in recent years.
- A recommendation for setting ACLs for the next three years. The PDT will describe the uncertainties and risks considered when developing these recommendations. While it is expected that ACLs will be determined every two years, the PDT will recommend them for three years in case of a delay in implementation.
- When evaluating management uncertainty, the PDT will consider that uncertainty may be different for different sub-components of the ACL. For example, groundfish sectors may have more or less uncertainty than the recreational groundfish fishery; as a result, the ACL may be set lower or higher for this component. The PDT recommendation will specifically comment on the evaluation of the uncertainty for different sub-components.

The PDT recommendations for setting ABCs and ACLs will be provided to the SSC prior to the September Council meeting. Guided by terms of reference prepared by the Council, the SSC will review the PDT ABC recommendations and will either approve those recommendations or will provide an alternative recommendation. In either case, the SSC will explicitly describe the elements of scientific uncertainty that were considered in developing its recommendation. If requested by the Council, the SSC may comment on the uncertainty and risk that should be considered by the Council when setting ACLs and whether the PDT has identified those elements sufficiently for Council consideration. If the SSC recommends an ABC that differs from the PDT recommendation, the PDT will revise its ACL recommendations using the new ABCs.

This process will be modified for those stocks or management units that are subject to the U.S./Canada Resource Sharing Understanding. Assessments of these stocks or management units that are prepared by the Transboundary Resource Assessment Committee (TRAC), a peer-review process as envisioned by the M-S Act. For these stocks, the Transboundary Management Guidance Committee (TMGC) develops recommended catch levels on an annual basis. TACs are recommended for GB yellowtail flounder, eastern GB cod, and Eastern GB haddock. These are essentially ACLs as they take into account various types of uncertainty and risk but they cannot be characterized as ABCs. The new M-S Act requirements have the most implications for GB yellowtail flounder since this catch limit applies to the entire stock, whereas the TMGC only makes recommendations for part of the GB cod and haddock stocks. As a result the recommendations will be reviewed by the SSC to verify that they are consistent with the SSC recommendations for ABCs.

The Council will consider the ABC established by the SSC and the ACL recommendations of the PDT (and TMGC) and will make a decision on those recommendations prior to December 1. If the Council questions the SSC recommendation, it can ask for a more detailed explanation from the SSC, but the Council must establish ACLs that are equal to or lower than the ABC established by the SSC. When setting ACLs, the Council will consider the advice of the SSC and the PDT and will provide the rationale used for setting the ACLs.

Once the Council has approved ACLs, they will be submitted to NMFS prior to December 1 for approval and implementation. ACLs can be implemented in several ways. If the Council is submitting a management action as part of the periodic adjustment process, the ACLs can be included in that document. Alternatively, the ACLs can be submitted as part of a specification package supported by the appropriate NEPA document. It should be noted that in many instances ACLs merely reflect the catch associated with the mortality targets determined by the management plan and therefore the impacts are consistent with those evaluated when the mortality targets were adopted. For this reason, in those instances that an ACL is not revised, it is anticipated that there will not be a need for a new supporting NEPA document.

After receipt of the Council decision for ACLs – either as part of a new management action or as part of a specification package – NMFS will review the Council's decision and if consistent with applicable law will implement the ACL consistent with the Administrative Procedure Act (APA).

4.2.1.3 ACL Sub-Components

Before ACLs are determined, an adjustment will be made for the catch that is expected to be harvested within state waters by vessels that are not subject to the federal FMP. Calculations for ACLs will be described in the specifications package or management action adopting the ACLs, and its accompanying PDT guidance document. Once an overall ABC determined, the Council may divide it into ACL sub-components. These sub-components will facilitate management of the catch of a stock so that if catches are excessive measures can be designed for the portions of the fishery that are responsible for the excessive catch. In this context the term "sub-component" is used in two senses. First, to indicate that the overall ACL may be divided into smaller portions that is attributed to specific fisheries. These are considered "sub-ACLs" and are subject to AMs designed for these specific components. Second, there may also be sub-components that are not considered ACLs and are not subject to a specific AM.

There are two broad divisions that will be considered. The overall available catch is considered an ACL. It may be divided into sub-ACLs for specific fisheries or other sub-components. In the case of the sub-ACLs, AMs are required for these divisions. These AMs can be specified in either an action for the multispecies fishery or an, action in another management plan. Second, part of the available catch may be divided into sub-components that are not referred to as sub-ACLs and are not subject to the requirement that AMs be specified. In some instances – for example, state waters fisheries – these sub-components are outside the Council's jurisdiction but must still be considered when developing management plans. It is important to note that the controls on the portion of the fishery that is subject to AMs must be sufficient to prevent overfishing on the stock as a whole. The sub-components that are identified, and whether they are ACLs or not, and appropriate AMs, can be revised through the framework adjustment process or an amendment.

The distribution of the other sub-components and sub-ACLs is based on an analysis of available data by the Groundfish PDT. The Groundfish PDT analyzes the data to identify the components that are responsible for the catch and provides this information to the Council. The analyses that support this action are described in more detail in section 7.2.1.2.1; but the specification package implementing ACLs will further describe the calculations and may differ from the process described here. The Council then determines how to allocate the catch to the components. As these components can change over time, the exact amount available for a sub-component or sub-ACL may be revised through the specification process, a framework adjustment, or an amendment. In the case of a recreational sub-ACL, this action adopts a specific sub-ACL for only two stocks (GOM cod and GOM haddock), but the Council may establish sub-ACLs for future stocks consistent with section 4.2.5.

For those sub-components that are not ACLs, there are broad categories. This category does not include catches in state waters taken outside the federal management plan (as these are accounted for prior to this step) and does not include regulated groundfish landed by vessels using a federal groundfish permit. First, small amounts of regulated groundfish are caught in a variety of fisheries that occur in federal waters (for example, the fluke fishery, the northern shrimp fishery, etc.). Generally these fisheries are not allowed to land regulated groundfish, though this may change in the future as stocks rebuild. Where individually these elements are too small to reliably monitor, they are aggregated into an "Other non-specified" category. Second, some fisheries are specifically identified. For the category described as "other non-specified", catches will be monitored and if the catch rises above five percent accountability measures will be developed to prevent the overall ACL from being exceeded.

The proposed sub-components that will be adopted at the implementation of this amendment are shown in Table 18. In the case of transboundary stocks subject to the U.S./Canada Resources Sharing Understanding, this table is based on the catch available to U.S. fishermen. Where possible, the percentage of the sub-component that will be allocated to specific fisheries is shown. For some stocks this value cannot be determined in advance because they will be determined by Council future decisions on the scallop fishery ACL as explained below. The specific sub-components, and percentage assigned to each sub-component, may be changed through the specifications process or another management action (framework or amendment). Note that for the mid-water trawl ACL of haddock, the measure as implemented combines the amount from both stocks into one amount – it is not monitored on a stock-specific basis.

For the scallop fishery, all three stocks of yellowtail flounder will be initially treated as an "other sub-component" of the ACL. Scallop Amendment 15 will identify AMs for the catch of yellowtail flounder in the scallop fishery. Once these AMs are specified, yellowtail flounder caught in the scallop fishery will be considered a sub-ACL controlled by an AM. It is expected that the first groundfish fishing year that this will occur is FY 2011, after implementation of Scallop Amendment 15 in March, 2011. If scallop Amendment 15 adopts an in-season AM, then these AMs might be triggered in groundfish fishing year 2011; if in-season AMs are not adopted, then any overage of the FY 2011 ACL would be addressed by AMs implemented in scallop FY 2012. The specific value for a scallop fishery ACL is not specified because this will be determined as part of the biennial adjustment process. Catches of regulated groundfish in the scallop fisheries depend on a wide range of factors: scallop and groundfish abundance, the scallop rotational management program, etc. These factors are variable and cannot be predicted in this action. The amount of yellowtail flounder allowed for the scallop dredge fishery will, at a minimum, be consistent with the incidental catch amounts for the Closed Area access programs (ten percent of the GB yellowtail flounder and/or SNE/MA yellowtail flounder ACL when CAI, CAII, or the NLCA access programs are in effect).

4.2.1.4 Impacts of an ACL Overage

ACLs will be set every two years. If an ACL is exceeded in year one, the amount of the overage could be evaluated to determine if the ACL in year two should be adjusted in order to prevent overfishing. This is a separate issue from whether the management system requires a sub-component to account for an overage, as is the case with sectors. This is not as simple as it first appears. If there is only one component of the fishery, and the ACL is set exactly at ABC, an overage in year one would be expected to reduce stock size such that the ABC/ACL in year two should be adjusted to account for the lower stock size. But with more than one sub-component, and if ACLs are set lower than ABC, it is possible that an overage by one component and not the others may not lead to a depressed stock size that requires adjusting ACLs. In addition, the ACL setting approach under development by the PDT would likely set out-year ACLs at a lower level to account for the increased uncertainty of future catches. Simplistic "payback" provisions – reducing the ACL in year two by an overage in year one – may not be sufficient if stock size is expected to decline, and may unnecessarily sacrifice yield if a stock is growing. Finally, the time needed to evaluate and implement an adjustment to the ACL means it is unlikely to implemented in time to be effective in year two.

The Council may adjust sub-component ACLs so that, to the extent practicable, components not responsible for the overage are not subject to reductions in their ACL and resultant changes in fishing opportunities.

Table 18 – ACLs and sub-components for groundfish stocks. Scallop values to be determined during biennial adjustment process and other values for those stocks will be adjusted accordingly.

Notes: (1) Includes all catches by vessels using a federal groundfish permit, except for scallop vessels.
(2) These values will be estimated each time ACLs are set and may change as a result.

Stock	Sub-ACLs/Controlled by AM				Other Sub-Component Until AM Adopted through Scallop FMP	Other Sub-Components (2)	State Waters(2)
	Groundfish (1)	Commercial Groundfish (1)	Rec Groundfish	Herring MWT	Scallops(2)	Other Non-Specified	
GB Cod	95% - Y					5.0%	Y
GB Haddock	94.8% - Y			0.2%		5.0%	Y
GB YTF	95.0% - X				X	5.0%	
SNE/MA YTF	95.0% - X -Y				X	5.0%	Y
CC/GOM YTF	95.0% - X -Y				X	5.0%	Y
GOM Cod	85%	51.3%	33.7%			5.0%	10.0%
Witch	95.0% - Y					5.0%	Y
Plaice	95.0% - Y					5.0%	Y
GOM WFL	95.0% - Y					5.0%	Y
SNE/MA WFL	95.0% - Y					5.0%	Y
GB WFL	95.0%					5.0%	
White Hake	95.0% - Y					5.0%	Y
Pollock **ACL**	95.0% - Y					5.0%	Y
Redfish	95.0% - Y					5.0%	Y
Pout	95.0% - Y					5.0%	Y
GOM/GB Windowpane	70.0% - Y					30.0%	Y
SNE/MA Windowpane	70.0% - Y					30.0%	Y
GOM Haddock	67.3% - Y	67.3% - Y	27.5%	0.2%		5.0%	Y
Halibut	95.0% - Y					5.0%	Y
Atlantic Wolffish	95.0% - Y					5.0%	Y

4.2.2 Addition of Atlantic Wolffish to the Management Unit

This action adopts Option from the draft amendment. The stock of Atlantic wolffish (*Anarhichas lupus*) is added to the management unit for the Northeast Multispecies Fishery Management Plan. Status determination criteria are proposed in section 4.1.1. Essential fish habitat for this stock is proposed in section 4.2.2.2.2. Proposed management measures are in section 4.3.5. A description of the stock and stock status are provided in section 6.1.7.1.

Rationale: Atlantic wolffish is a demersal species that prefers complex habitat. They are occasionally caught by recreational and commercial groundfish fishermen, particularly in the Gulf of Maine and on Georges Bank. As described in section 6.1.7.1, this stock has declined in abundance since the mid-1980's and has not shown signs of recovery in spite of recent reductions in fishing effort. The stock was recently determined to be overfished (DPWG 2009). It is uncertain, however, whether fishing is the cause for this failure to rebuild. In order to adopt management measures that are specifically designed for this stock, it must be incorporated into the management unit.

4.2.2.1 Status Determination Criteria

Proposed status determination criteria for Atlantic wolffish were determined in the Data Poor Working Group Meeting (NEFSC 2009). They are included in Table 12 and Table 13.

4.2.2.2 Essential Fish Habitat

4.2.2.2.1 Introduction

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, known as the Sustainable Fisheries Act (SFA), emphasized the importance of habitat protection to healthy fisheries and strengthened the ability of the National Marine Fisheries Service (NMFS) and the Councils to protect and conserve the habitat of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed "essential fish habitat" (EFH) and is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity".

The essential fish habitat (EFH) provisions of the Sustainable Fisheries Act of 1996 require the Council to:

1. describe and identify the essential habitat for the species managed by the Council;
2. minimize to the extent practicable adverse effects on EFH caused by fishing; and,
3. identify other actions to encourage the conservation and enhancement of EFH.

As to the first provision above, the regulatory text of the Final Rule on the essential fish habitat provisions in the SFA (67 FR 2343) directs Councils to describe EFH for each species in text. This text must provide information on the biological requirements for each life history stage of the species (eggs, larvae, juveniles, and adults), and should include physical as well as oceanographic parameters. Specifically, the text descriptions include the general geographic area(s) preferred by the species, the preferred substrate (if demersal), and the ideal ranges of water temperature, depth, and salinity (where known). The descriptions should reflect the best available information on the species' habitat requirements collected from the scientific literature and observations made during research surveys.

The regulatory text of the Final Rule also directs Councils to map the general distribution and geographic limits of EFH for each life history stage. These maps are presented as fixed in space and time, but they encompass all appropriate known temporal and spatial variability in the distribution of EFH. The EFH maps are a means to visually present the EFH described in the amendment.

To summarize, there are two distinct but related components required to comply with the guidelines of the Final Rule. For each species and life stage:

1. text description of essential fish habitat; and
2. maps indicating the geographic extent of essential fish habitat.

The intent of the two-part EFH designation is for the map to indicate the geographical extent within which the text description applies. The text descriptions of essential fish habitat define the environmental parameters within the areas represented by the map designations.

NMFS regulations within the Final Rule require that the text description take precedence when the text and EFH maps differ. For example, if the map indicates that eastern Georges Bank is EFH for a particular species and the text description indicates that sandy habitats within a depth range of 50 – 100 meters is EFH, then only those portions of eastern Georges Bank that are sandy and have a depth between 50-100 m would actually be considered EFH.

The New England Fishery Management Council designated essential fish habitat for each species it manages in the 1998 Essential Fish Habitat Omnibus Amendment (Amendment 11 to the Multispecies FMP). Amendment 12 (2000) added offshore hake to the Multispecies FMP and designated EFH for the species. Among other measures, Amendment 16 to the Multispecies FMP adds Atlantic wolffish to the management unit and designates EFH for the species.

4.2.2.2.2 EFH Designation for Atlantic Wolffish

This action adopts Option 2 from the draft amendment. The Proposed Action designates all waters north of 41° N latitude and, for waters south of the southern New England coastline, east of 71° W longitude, from the shoreline to the boundary of the EEZ, as Atlantic wolffish EFH. This alternative represents a broad EFH designation, and thus would contain any habitats important to Atlantic wolffish for feeding, breeding, spawning, and growth to maturity.

Text descriptions

Eggs

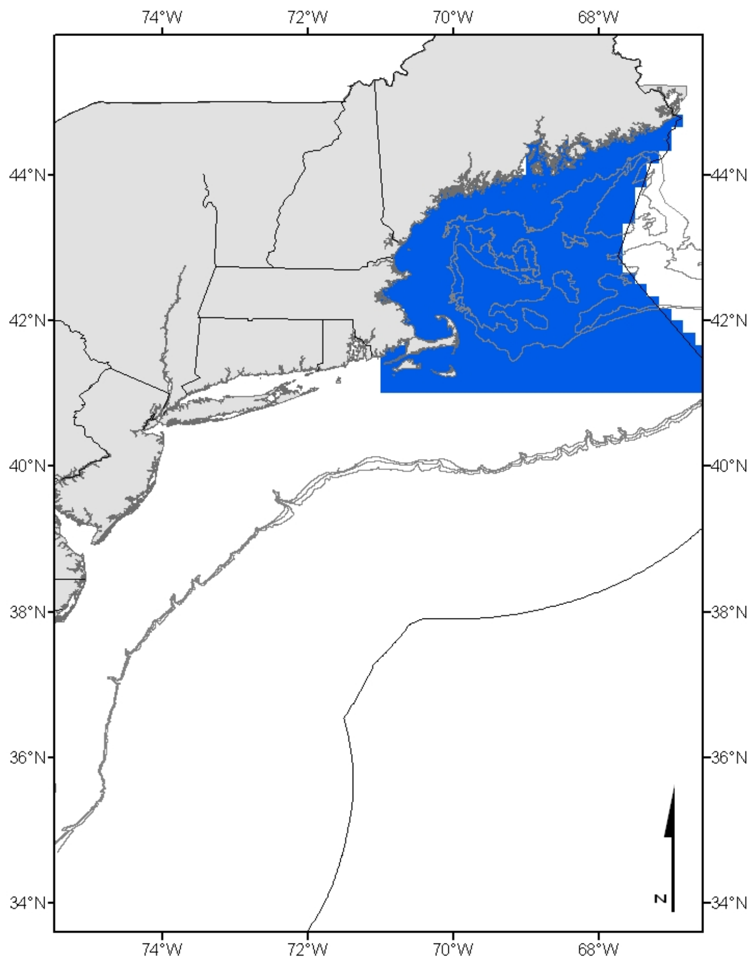
Essential fish habitat for wolffish eggs is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank between 40 and 240 meters. In the Gulf of Maine, spawning is thought to occur during September and October, and there is a 3-9 month incubation period prior to hatching; thus wolffish eggs are assumed to be present throughout most of the year. Wolffish eggs are deposited in rocky substrates and brooded in nests, which are guarded by males for some period but perhaps all the way until hatching. The temperature range for wolffish eggs is assumed to be the temperature range in which adult wolffish were captured in the NMFS trawl survey, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Larvae
Essential fish habitat for wolffish larvae is described as the surface to the seafloor across the predominant depth and distribution range identified for the species, 40 to 240 meters within the Gulf of Maine south to Cape Cod, and on Georges Bank. Larvae remain close to the bottom and the hatching site, presumably using rocky substrates for shelter. Because wolffish appear to be largely sedentary and the larvae do not appear to have a long (if any) pelagic stage, the temperature range for larval wolffish is assumed to be the temperature range in which adult wolffish were captured in the NMFS trawl survey, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Juveniles
Wolffish in the Gulf of Maine reach maturity at age 5-6 years, so fish younger than this age would be considered juveniles. Essential fish habitat for wolffish juveniles is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank. Substrate preferences range from large stones and rocks, used for shelter and nesting, to softer substrates where feeding occurs. The depth range of Atlantic wolffish in this region ranges from 40 to 240 meters. The preferred temperature range for adult wolffish is assumed to be the temperature range within which they were caught in the NMFS trawl surveys, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Adults
Essential fish habitat for wolffish adults is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank. Substrate preferences range from large stones and rocks, used for shelter and nesting, to softer substrates where feeding occurs. The depth range of Atlantic wolffish in this region ranges from 40 to 240 meters. The preferred temperature range for adult wolffish is assumed to be the temperature range within which they were caught in the NMFS trawl surveys, between 0 and 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Map 1 – Wolffish EFH Option 2, all life stages



4.2.3 Sector administration provisions

The management measures proposed in this section relate to the process for establishing sector allocations in the multispecies fishery. This section updates Section 3.4.16.1 of the final Amendment 13 SEIS (Sector Allocation). Rather than only identify changes to sector administration policies in this section, this section is a complete rewrite of the entire program. This section will serve as a summary of all groundfish sector policies in effect. All of the sector policy changes proposed in this section will be implemented at the beginning of fishing year 2010 (May 1, 2010).

A sector allocation system apportions part or all of groundfish fishery resources (denominated in terms of catch) to various industry sectors. While vessels might be assigned to sectors based on factors such as gear used, permit category, vessel size, homeport, area fished, etc., this measure allows vessels to form sectors of their own choosing. Such self-selected sectors might be based on common fishing practices, vessel characteristics, community organization, or marketing arrangements, but this would not be required. Since self-selection of sector membership would not necessarily be based on any common vessel or gear characteristics this alternative offers a great deal of flexibility in the formation of sectors. A group of permit holders would simply agree to form a sector and submit a binding plan for management of that sector's allocation of catch or effort. Allocations to each sector may be based on catch (hard TACs). Vessels within the sector would be allowed to pool harvesting resources and consolidate operations in fewer vessels if they desired. One of the major benefits of self selecting sectors is that they provide incentives to self-govern, therefore, reducing the need for Council-mandated measures. They also provide a mechanism for capacity reduction through consolidation.

When evaluating the alternatives described below for the sector allocation process and the determination of sector contributions, the Council will consider the following goals:

- Address bycatch issues;
- Simplify management;
- Give industry greater control over their own fate;
- Provide a mechanism for economics to shape the fleet rather than regulations (while working to achieve fishing and biomass targets); and
- Prevent excessive consolidation that would eliminate the day boat fishery.

The alternatives for modifying and expanding the current sector allocation program for the multispecies fishery are described in the subsections below. Where appropriate, the no action alternative is identified relative to each issue for which changes or additions are being considered.

4.2.3.1 Sector Definition/Formation of a Sector

This section clarifies the definition of a sector and sector formation and makes groundfish sectors consistent with the Council's sector policies.

Revisions to Sector Definitions/Formation of a Sector

A sector means a group of persons (three or more persons, none of whom have an ownership interest in the other two persons in the sector) holding limited access vessel permits who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted a TAC(s) in order to achieve objectives consistent with applicable FMP goals and objectives. In the formation of a sector, sector participants can select who may participate. Only vessels with a limited access multispecies permit are eligible to join a multispecies sector. If specified in a future Council action, monkfish limited access permits may be allowed to join a groundfish sector.

Confirmation of permit history (CPH) permits do not need to be activated in order to be associated with/join a sector (this is consistent with a change to the Groundfish DAS leasing and transfer programs proposed in section 4.2.6.2).

Participation in a self-selecting sector will be voluntary. Vessels that did not decide to join a sector will remain in a *common pool* which will fish under the constraints imposed by the Council. Individuals that wished to form a sector and receive an allocation of catch will be required to submit a proposal for formation of a sector and a legally-binding plan of operations which would require approval from the Regional Administrator (see below). These will be agreed upon and signed by all members of the sector.

The motivation to form or join a sector could be for several reasons: a desire of its members to consolidate operations in fewer vessels (reducing the cost of operations and possibly facilitating the profitable exit of some individual vessel owners from the fishery); assurance that the members of the sector would not face reductions of catch or effort as a result of the actions of vessels outside the sector (e.g., if the other vessels exceed their target TACs), and, potentially, freedom from restrictive regulations not needed to meet conservation objectives if the sector is constrained by a hard TAC (e.g., trip limits and potentially some time-area restrictions).

<u>Rationale</u>: Under regulations implementing Amendment 13, permits in the CPH category cannot join a sector. The rationale for this provision is unclear, but appears to relate to the idea that CPH permits did not contribute to fishing mortality during the period prior to Amendment 13 and thus should not contribute to sectors (or lease DAS) after the amendment's adoption. CPH is not a permanent category, however, and permits can be removed at any time. Vessel replacement regulations allow the permits to be placed on any vessel, including skiffs, at any time. This prohibition thus means only that there are administrative barriers to having a CPH permit join a sector (or lease DAS). Option 2 acknowledges the reality of this situation and removes the administrative barriers to having a CPH permit join a sector.

4.2.3.2 Preparation of a Sector Formation Proposal and Operations Plan

This section considers two options for the document that must be submitted in order to form a sector.

Requirements identified in Amendment 13:

- A list of all participants and a contract signed by all participants indicating their agreement to abide by the operations plan accompanying the proposal.
- With the implementation of Amendment 13, a sector's operations plan must detail the following:
    - A list of all vessels that would be part of the sector including an indication for each vessel of whether it would continue to fish;
    - The original distribution of catch history or TACs;
    - A detailed plan for consolidation of TACs or DAS, if any is desired, including a detailing of the quantity and duration of any redistribution of TAC or DAS within the sector;

- A plan and analysis to show how the sector will avoid exceeding their allocated TACs (or target TACs if the allocation is in terms of DAS). This plan should include provisions for monitoring and enforcement of the sector regulations, including documentation of both landings and discards;
- Rules for entry and exit to the sector (see more on this in next section) including procedures for removing or disciplining members of the sector who do not abide by its rules. Rules for entry and exit must also define how catch or DAS history that is developed by vessels participating in a sector is assigned to each vessel;
- Procedure for notifying NMFS if a member is expelled from the sector for violation of sector regulations.

Additional requirements adopted by this action are:

- Detailed information about overage penalties or other actions to be taken if the sector exceeds its ACE. An ACE overage means the catches by a sector's vessels exceed the ACE possessed by the sector after considering all ACE transfers that take place for the current fishing year (including those that occur up to two weeks into the following fishing year, as allowed by the ACE transfer provisions, see section 4.2.3.7);
- Detailed information about the sector's *independent third-party weighmaster system* that is satisfactory to NMFS for monitoring landings and utilization of ACE;
- Detailed information about a monitoring program for discards (see additional discussion of monitoring discards in Section 4.2.3.5).
- A list of all Federal and State permits held by vessels participating in the sector, as well as a requirement to notify NMFS if a member is expelled;
- A list of specific ports where members will land fish; specific exceptions should be noted (e.g., safety, weather) and allowed, provided there is reasonable notification of a deviation from the listed ports; this requirement is in addition to the requirement for detailed information about the sector's independent third-party weighmaster system.
- TAC thresholds and details regarding the sector's plans for notifying NMFS once the specified TAC threshold has been reached.
- Identify potential redirection of effort as a result of sector operations, and if necessary propose limitations to eliminate adverse effects of any redirection of effort.
- Describe how groundfish will be avoided while participating in other fisheries that have a bycatch of groundfish if the sector does not have ACE for the stocks caught. This is only required if the sector wishes to participate in those fisheries where the sector would normally be required to apply any groundfish catches against the sector's ACE (see section 4.2.3.4) and the sector does not anticipate being allocated ACE or acquiring the needed ACE through transfers.

An appropriate NEPA document assessing the impacts of forming the sector must be prepared. This will be written by the sector applicants, and submitted to NMFS through the Council. Any changes in fishery regulations or fishing practices that may result on the basis of sector-based management will be addressed in the regulations that implement a particular sector, and in the EIS or EA corresponding to the creation or continuation of that sector. Such NEPA documents prepared by the sectors (an EA or EIS) will be tiered from the Amendment 16 EIS. NMFS

Northeast Region NEPA staff developed specific guidance for sectors on the preparation of EAs. They are providing assistance to sector leadership in writing documents and developing sector plans that meet the relevant requirements of the law.

The sector operations plan must be reviewed and approval given before the sector can operate. A sector must submit its ***preliminary operations plan*** to the Council no less than one year prior to the date that it wants to begin operations. ***Final operations plans*** may cover a two-year period and must be submitted to NMFS no later than September 1 prior to the fishing year in which the sector will operate. NMFS may consult with the Council and will solicit public comment on the operations plan consistent with the Administrative Procedure Act (APA). Upon review of the public comments, the Regional Administrator may approve or disapprove sector operations, through a final determination consistent with the APA.

Rationale: Option 2 expands on the submission requirements to require that sectors provide the Council additional details on reporting and monitoring and participation in other fisheries so that the Council can better evaluate the impacts of the sector.

4.2.3.3 Allocation of Resources

This section describes how resources will be allocated to sectors. It is nearly a complete revision to the approach adopted in Amendment 13. The terminology of sector allocations is revised, different ways to determine each permit's share are considered, and sectors can no longer be allocated DAS.

4.2.3.3.1 General

Revised Allocation of Resource Guidance
Sectors will be allocated a hard TAC of all regulated groundfish stocks with the exception of halibut, ocean pout, windowpane flounder, Atlantic wolffish, and SNE/MA winter flounder. Allocation of the SNE/MA winter flounder stock can 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. The provisions in this amendment eliminate the 20% cap on TAC shares that was established in Amendment 13. There will be no limit on the share of a stock's TAC that can be allocated to a sector. Consistent with the mortality controls described in 4.2.3.4 – which require a sector to stop fishing in a stock's area when ACE for that stock is caught or exceeded – a sector can only fish in a particular stock area if it is allocated, or acquires through transfers, ACE for all stocks in that area.

The share of the annual TAC for a stock that is allocated to a sector will be calculated based on the history attached to each permit that joins the sector in a given year. This share may be adjusted due to penalties for exceeding the TAC in earlier years, or due to other violations of the management plan. When a sector's share of a stock is multiplied by the available catch, the result is the amount (weight) that can be harvested (landings and discards) that year. This amount (adjusted if necessary due to prior overages or penalties) will be referred to as the sector's ***Annual Catch Entitlement, or ACE***.

As discussed above, a sector's operations plan must show how the sector plans to avoid exceeding its ACE and must identify overage penalties and actions to be taken should the ACE be exceeded. In cases where a sector exceeds its ACE, overages will be paid back in pounds, on a pound per pound basis. An ACE overage means the catches by a sector's vessels exceed the ACE possessed by the sector after considering all ACE transfers that take place for the current fishing year (including those that occur up to two weeks into the following fishing year, as allowed by the ACE transfer provisions, see section 4.2.3.7).

NMFS will withhold 20 percent of each ACE at the beginning of the fishing year for a period of 61 days. This is to allow for time to process any end-of-year transfers of ACE and to determine whether any reductions in ACE are necessary due to overage in the previous year.

Rationale: This changes the sector provisions of Amendment 13 and clarifies how resources are allocated to a sector. Sectors can no longer request an allocation of groundfish DAS based on the DAS allocated to permits that join the sector. In addition, sectors fishing for groundfish must have an allocation of all regulated groundfish stocks for which they qualify except halibut, ocean pout, windowpane flounder, and SNE./MA winter flounder. This eliminates the situation where sectors could request allocations of selected regulated groundfish stocks and modify effort controls to facilitate targeting of other stocks.

TACs will not be allocated to sectors for Atlantic halibut, ocean pout, northern windowpane flounder, and southern windowpane flounder because these stocks have small TACs, and vessels have limited landings history. Allocating these stocks to sectors would complicate monitoring of sector operations and would require a different scheme for determining each permit's potential sector contribution. Rather than complicate sector administration, sectors will be limited to restrictions designed to discourage targeting of these stocks. For example, the catch of halibut is limited to one fish per trip (see section 4.2.3.4).

4.2.3.3.2 Guidance on Sector Overages

Amendment 13 addressed sector overages in broad terms but did not address the situation if a sector disbands or members leave a sector the year following an overage. To be clear, in the subsequent discussion the term "sector overage" means exceeding a TAC in year one after any ACE transfers have occurred with the result that the sector will receive a deduction of ACE in year two.

This action adopts Option 1, the alternative to No Action to address the treatment of overages should a sector a sector member leave the sector the year following an overage or if the sector completely disbands following an overage. This option expands on the current guidance.

- In the first situation, a vessel (or small number of vessels) leaves the sector but the remaining vessels have enough ACE to cover the overage deduction. Any impacts on departing members be specified and addressed by the sector operations plan and sector contract rather than by regulation. This provides the most flexibility and can be done through indemnification provisions and other legal constructs. Existing sectors have already incorporated provisions that address this situation (such as limiting fishing activity by the vessel if it leaves the sector the year after the overage). It also simplifies administration for NMFS.
- In the second, a sector disbands completely and no sector exists to cover the overage deduction, or there is insufficient ACE in year two to cover the year one overage. In this case, in order to account for the overharvested fish, individual permit holders are held responsible for reducing their catch the appropriate amount in the subsequent fishing year (rather than the sector, since it no longer exists). The deduction follows the individual

permits. If an individual permit joins another sector, the overage penalty follows that permit into the other sector. Each permit is responsible for part of the overage penalty, calculated as simply the overage penalty divided by the number of vessels. If a permit does not join a sector the permit receives a DAS penalty. Each permit receives a percentage reduction in DAS equal to the maximum percentage overage of the sector. Example; the sector goes 5% over on stock A and 10% on stock B each permit receives a 10% DAS reduction.

Rationale: If a sector exceeds its ACE in any given year, its allocation in the subsequent year is reduced to account for the overage. This section specifies how exit of vessels from the sector affects the overage provision.

4.2.3.3.3 U.S./Canada Area

Amendment 13 was silent on how sectors interact with the management program in the U.S./Canada area. This action adopts Option 2, separate allocations for U.S./Canada are stocks.

For stocks that are managed under the terms of the US/CA Resource Management Understanding, sectors will be provided a specific ACE for those stocks that have a TAC that is specific to the Eastern US/CA area. At present, this applies to GB cod and GB haddock, but this measure is intended to apply to other stocks if an area-specific TAC is defined. If a TAC is defined for the Eastern US/CA area by the understanding, and that stock is caught both inside this area and outside this area, a separate allocation of ACE will be made for each portion of the stock. These allocations are not interchangeable; they can only be taken from the appropriate area. The allocation of ACE will be the same percentage as the sector's overall allocation for these stocks: if a sector receives ten percent of the GB haddock, then it will receive ten percent of the Eastern GB haddock.

With sectors receiving specific allocations of EGB cod and haddock, coupled with the guidance on the interaction of sectors with common pool vessels (see section 4.2.3.9), management of the US/CA areas (both Eastern and Western) can be modified to emphasize the responsibility of each component of the fishery for its own catch. A component will be allowed to continue fishing in the area as long as it has not exceeded its allocation even if overages by other components result in the overall quota for the area being exceeded. As an example, if catches of yellowtail flounder by the scallop fishery result in the total catch exceeding the quota for the area, common pool and sector groundfish vessels will be allowed to continue fishing in the area as long as they have the allocations needed. Similarly, if the common pool vessels overharvest their quota for a US/CA stock, sectors would be allowed to continue fishing as long as they have the ACE needed to fish in the area (including ACE for stocks other than EGB cod, EGB haddock, and GB yellowtail flounder, as necessary). Given the measures used to control catches in the US/CA areas, it is unlikely that such a situation will occur. The measures include adjustments to the quota in future years should an overage occur.

Rationale: This measure ensures that common-pool and sector fishing vessels fishing in the Eastern US/CA area do not adversely impact each other. It prevents one group from catching the entire TAC in the area, closing it to the other group. At present, specific eastern US/CA area allocations will only be made for Eastern GB cod and Eastern GB haddock, but is written so that it can be applied to other stocks in the future if necessary. The concept that catches by one component do not affect access to the area by other components applies to all stocks managed by a TAC for the US/CA area (at implementation of this action, GB yellowtail flounder, EGB cod, and EGB haddock).

4.2.3.3.4 Sector Baseline Calculations/Potential Sector Contributions

This section is a new section that adopts different options for determining the amount of resources allocated to sectors. Amendment 13 addressed this issue in a section labeled "Allocation of resources" and adopted a specific time period for determining the share of a TAC that each permit brings to a sector. This section also introduces new terms that better define the different elements used to determine sector allocations and clarifies several issues with respect to the calculation of landings history (for example, that live weight is used).

In order to allocate a share of the available catch to a sector, the potential sector contribution (PSC) (commonly referred to as permit history) for each permit must be calculated. Unless changed by a future action, once a permit's PSC is calculated in accordance with the selected PSC options, that PSC is permanent. *The Council cautions that regardless which method is used to determine permit history in this management action, the Council may choose a different method for calculating permit history in the future.*

Note that ACE would be allocated to the sector as a whole and not necessarily to individual vessels within the sector. The self-selecting sector would then have to develop its own set of rules to distribute the sector's allocation among its membership. Allocation of TACs must be consistent with the measures adopted for the remainder of the fishery. If measures designed for the rest of the fishery will reduce mortality of a species well below its target, it may be inappropriate to base the TAC for a sector on the target fishing mortality.

Closed Area 1 Hook Gear Haddock SAP landings can be used to determine potential sector contributions in all of the alternatives described below. This is a change from earlier sector policies which said these landings would not be considered.

For all options considered, when calculating the proportion of a permit's PSC that is based on landings, landed weight will be converted to live weight so that the PSC that results is consistent with the way TACs are allocated to sectors (sector allocations are based on live weight). This is also necessary so that landings of different products (dressed or whole) are evaluated on a consistent basis.

4.2.3.3.4.1 Option 1 - Landings History Only FY 1996 – FY 2006

Under the Proposed Action, PSC will be based on the landings history of each permit during the time period FY 1996 – FY 2006. Landings history will be based on the information in the NMFS commercial dealer database. For each permit, the landings for each stock will be summed over the time period. This value will be divided by the total landings by permits eligible to join sectors (as of April 30, 2008) during the same period. This includes limited access permits (including Handgear A permits) and limited access permits that are in the confirmation of permit history category. The landings history for each permit that is included in the denominator is all landings during the qualification period that can be attributed to that permit; for Handgear A permits, it includes landings by the permitted vessel during the period FY 1996 through FY 2003, prior to the adoption of the Handgear A permit category. The result will be the share of each stock for each permit. Discards will not be counted when calculating permit history, even though both discards and landings are counted against a sector's ACE.

<u>Rationale</u>: This option is based on the concept that vessel landing history reflects current participation in the fishery. An eleven year period is used to mitigate regulatory changes and their

impacts on individual vessels. A date is specified for calculating history (the end of FY 2007) so that the calculation is only done once and the resulting shares become fixed. This date was selected as it is the last day that a vessel can renew its permit for FY 2007.

4.2.3.3.4.2 Option 5 – GB Cod PSCs for Existing Sectors

For any permits that committed to either the GB Cod Hook Gear Sector or the Fixed Gear Sector, the PSC of GB cod will be calculated as adopted by Amendment 13. That is, the sector share will be calculated based on landings of GB cod during the period FY 1996-FY 2001, divided by the total landings of GB cod during that period. This calculation will only apply to those permits that committed to either of the sectors as of March 1, 2008. For any permits that were not committed to either of the sectors as of that date the PSC will be calculated as adopted by this action. For all other stocks, the PSC will be calculated as adopted by this action. In effect, this option applies the No Action alternative for GB cod to those permits that previously committed to either the GB Cod Hook Sector or the GB Cod Fixed Gear Sector.

As with other PSC calculations, once a permit has its GB cod PSC determined using this allocation option, that PSC remains with the permit regardless whether the permit remains in one of the two existing sectors, joins a new sector, or exits all sectors and fishes in the common pool.

<u>Rationale</u>: This option recognizes that vessels that committed to one of these sectors as of March 1, 2008 made investment decisions based on the qualification criteria adopted by Amendment 13. To change the allocation method might disadvantage those vessels. A fixed pool of vessels has to be identified for this provision or else each time a vessel enters or exits one of these sectors, the potential sector contribution for all permits must be recalculated.

4.2.3.4 Mortality/Conservation Controls

This section is nearly a complete rewrite of a similar section that was in Amendment 13. It addresses several issues that are raised by the adoption of ACLs and clarifies which elements of groundfish catch are counted against a sector allocation.

<u>Option 1</u> – Revisions to Mortality/Conservation Controls
This action proposes additional details on the mortality and conservation controls required of sectors. Sectors are required to ensure that ACEs are not exceeded during the fishing year. Sectors should project when its ACE will be exceeded and should cease fishing operations prior to exceeding it. If the sector's ACE for a stock is exceeded, the sector must cease operations in that stock area until it can acquire additional ACE through a transfer to balance the catch, and the sector also must comply with other overage penalties that may be applicable.

It will be necessary to establish appropriate restrictions on catch or effort for each sector to ensure that they do not exceed their ACE (through landings or discards). Hard annual TACs by species will be allocated to the sector as a whole. The sector will be required to submit an Operations Plan for approval by the Regional Administrator. The Operations Plan should detail the allocation of ACE within the group, how the catch of the sector would be monitored, and a plan for operations or stopping once the ACEs of one or more species are taken. TAC thresholds and details regarding the sector's plans for notifying NMFS once the specified TAC threshold has been reached also must be part of the operations plan. The plan must provide assurance that the sector would not exceed the ACEs allocated to it (either through landings or discards). See Section 4.2.3.1 for specific requirements of the sector Operations Plan.

A sector is expected to monitor catch and stop fishing in the appropriate stock areas before ACE available to the sector is exceeded. In the event a sector exceeds its ACE in spite of this requirement, sector vessels must stop fishing in the applicable stock area. Sector vessels may resume fishing in the stock area if additional ACE is acquired that supports additional fishing activity.

The ACE allocated to sectors applies to all catches of those stocks by sector vessels, whether caught during directed groundfish fishing trips or on other trips, unless the groundfish is an element of another ACL or ACL sub-component. For example, groundfish caught while targeting skates or monkfish applies to the sector's groundfish TAC because these landings are not subject to another ACL and landings on these types of trips contributed to a permit's PSC. If the sector does not have ACE available, then its vessels cannot participate in these other fisheries unless the sector can demonstrate to NMFS that groundfish will not be caught; this information must be presented in the sector's operations plan. If the groundfish caught are an element of another ACL or ACL sub-component, then it does not apply to the sector's ACE. For example, since an ACL sub-component for yellowtail flounder is determined for scallop vessels, yellowtail flounder caught by a sector vessel fishing in the General Category scallop fishery, or by a vessel with a combination groundfish permit that is fishing in the scallop dredge fishery, applies to the ACL sub-component and not the sector's ACE. If a vessel is participating in a fishery that is included in the "other non-groundfish" sub-component (for example, whiting, fluke, shrimp, etc.), then that catch does not apply to the sector's ACE.

Sector vessels are prohibited from landing ocean pout, windowpane flounder, and SNE/MA winter flounder. This will discourage sectors from targeting these stocks.

4.2.3.5 Monitoring and Enforcement

Amendment 13 adopted the concept that sectors are responsible for monitoring sector catch and enforcing sector provisions but provided few details for that requirement. This section addresses those requirements and organizes requirements from several sections of Amendment 13 into one location.

4.2.3.5.1 Revised Monitoring and Enforcement Provisions - General

It will be the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Ultimately, a sector may desire to expel a member due to repeated violations of sector provisions. Once a vessel enters into a sector, it cannot fish during that fishing year under the regulations that apply to the common pool. In other words, if a vessel is expelled from a sector, it cannot participate in the groundfish fishery during the remainder of that fishing year.

For the purposes of enforcement, a sector is a legal entity that can be subject to NMFS enforcement action for violations of the regulations pertaining to sectors. Vessels operating within a sector are responsible for judgments against the sector.

Sector operations plans will specify how a sector will monitor its catch to assure that sector catch does not exceed the sector allocation. At the end of the fishing year, NMFS will evaluate catch using IVR, VMS, and any other available information to determine whether a sector has exceeded any of its allocations based on the list of participating vessels submitted in the operations plan.

As previously noted, the determination that a sector has exceeded the ACE for a stock and is subject to an overage penalty is made after considering all transfers. The ability to balance catches and ACE through transfers does not excuse a sector from the requirements to adequately monitor catch and stop fishing when it is projected that an ACE will be harvested. Repeated instances of exceeding ACE may be evidence of inadequate monitoring systems, poor compliance with an operations plan, or a failure to adhere to other regulatory requirements. A sector may be subject to administrative or enforcement action for these shortfalls, even if the sector is able to complete ACE transfers so that an ACE overage does not exist.

As required by section 4.2.3.2, sectors must notify NMFS if a member is ejected from the sector.

The next two sections describe the requirements necessary for monitoring both landings and discards. These sections add additional requirements to those currently in place (such as weighmasters/dockside monitors for all landings, improved discard monitoring systems, etc.). The range of alternative considered by the Council includes the current system (No Action, see above) as well as the system proposed below.

4.2.3.5.2 Enforcement

It will be the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Ultimately, a sector may desire to expel a member due to repeated violations of sector provisions. Once a vessel enters into a sector, it cannot fish during that fishing year under the regulations that apply to the common pool. In other words, if a vessel is expelled from a sector, it cannot participate in the groundfish fishery during the remainder of that fishing year.

For the purposes of enforcement, a sector is a legal entity that can be subject to NMFS enforcement action for violations of the regulations pertaining to sectors. Vessels operating within a sector are responsible for judgments against the sector. The following options are adopted to further explain this concept. These provisions are in addition to other sector requirements currently in place or adopted through this action.

<u>Option 2:</u> Sectors may be held jointly liable for violations of the following sector operations plan requirements:

- ACE overages
- Discarding of legal-sized fish
- Misreporting of catch (landings or discards)

<u>Rationale:</u> This change limits the elements of the operations plan for which sectors are subject to joint and several liability.

<u>Option 3:</u> Should a hard TAC allocated to a sector be exceeded in a given fishing year, the sector’s allocation will be reduced by the overage in the following fishing year, and the sector, each vessel, and vessel operator and/or vessel owner participating in the sector may be charged, as a result of said overages, jointly and severally for civil penalties and permit sanctions pursuant to 15 CFR Part 904. If the sector exceeds its TAC in more than one (1) fishing year, the sector’s share may be permanently reduced or the sector’s authorization to operate may be withdrawn.

Rationale: This option clarifies regulatory text to indicate that sectors are jointly liable for overages of the TAC, and clarifies the repercussions of such overages.

4.2.3.5.3 Sector Monitoring Requirements

Sector operations plans will specify how a sector will monitor its catch to assure that sector catch does not exceed the sector allocation. At the end of the fishing year, NMFS will evaluate catch using IVR, VMS, and any other available information to determine whether a sector has exceeded any of its allocations based on the list of participating vessels submitted in the operations plan.

The next paragraphs describe the requirements necessary for monitoring both landings and discards. These sections add additional requirements to those currently in place (such as weighmasters/dockside monitors for all landings, improved discard monitoring systems, etc.). These provisions are in addition to other sector requirements currently in place or adopted through this action.

Monitoring of Landings and Discards

Sectors are responsible for developing mechanisms in their operations plans that satisfy monitoring requirements for catch and landings. Certain requirements will begin in FY 2010, and others will be phased in over the ensuing three-year period.

Sector operations plans must provide detailed information about how landings in the fishery will be monitored, reported, and enforced within the sector.

- Sectors are required to land *all* legal-sized fish from stocks managed by the FMP that are specifically allocated to the sector.
- Sectors must comply with other rules regarding broad reporting areas as specified in this Amendment, including demonstrating the ability to accurately attribute landings to a specific statistical area.
- Sectors are required to report all landings and discards by sector vessels to NMFS on a weekly basis.
- Sectors are required to develop and implement an independent third-party weighmaster/dockside monitoring system that is satisfactory to NMFS for monitoring landings and utilization of ACE. The details of the weighmaster/dockside monitoring system must be provided in the sector's operations plan.
- The sector operations plan also must include a list of specific ports where members will land fish; specific exceptions should be noted (e.g., safety, weather) and allowed, provided there is reasonable notification of a deviation from the listed ports.

The industry will be responsible for the development of and costs associated with a program, including an observer program that will satisfy the monitoring rules. Such a program should include the use of an independent private contractor(s) to coordinate roving and dockside monitor deployment, summarize trips validated by dealer reports, oversee the use of electronic monitoring equipment, and review data associated with the program. Either the contractor or sector manager should maintain a database of VTR, dealer, observer, and electronic monitoring reports. In addition, that entity should determine all species landings by stock and statistical areas, apply discard estimates to landings, deduct catch from sector TACs, and submit weekly reports detailing status, catch, and discards, including compliance concerns to the sector and NMFS. Any sector monitoring program will not replace the current VTR and dealer reporting requirements of the existing law nor any additional reporting requirements proposed in this Amendment.

In FY 2010 and FY 2011, sectors will be responsible for meeting all existing reporting requirements, including any requirements associated with NMFS Observer Program coverage. A dockside monitoring program will also be implemented in order to verify landings of a vessel at the time it is weighed by a dealer, to certify the landing weights are accurate as reported on the dealer report. Pre-sailing and pre-landing hails will be required in order to coordinate the deployment of dockside or roving monitors, and reports of those hails will be made to the sector manager/monitoring contractor (and other entities if directed by NMFS). A dockside monitor will meet vessels upon landing and validate the dealer report. For offloads to trucks, a roving monitor may meet the vessel and confirm the landings.

In FY 2012 and beyond, all of the requirements previously in place will remain. In addition, an industry-funded observer or at-sea monitor program will be implemented along with the use of electronic at-sea monitoring. The primary goal of observers or at-sea monitors for sector monitoring is to verify area fished, catch, and discards by species, by gear type. This data will be reported to the sector managers and to the NMFS. Electronic monitoring may be used in place of actual observers or at-sea monitors if the technology is deemed sufficient for a specific trip based on gear type and area fished. When a vessel issues a pre-sailing hail, the monitoring contractor will decide whether that vessel is required to carry an observer or will be subject to electronic monitoring. If either is assigned, a vessel will not be allowed to leave port without the appropriate equipment. The industry-funded observer or at-sea monitor program will not replace the NMFS Observer Program. In the event a NMFS observer and a third party observer or at-sea monitor are assigned to the same trip, the NMFS observer will take precedence and the third party observer or at-sea monitor will stand down. Observers or at-sea monitors will be required to submit reports on catch, discard, and other data elements to NMFS and/or the sector manager and/or the monitoring contractor.

For dockside monitoring, the required coverage will be as follows:

FY 2010: Random dockside monitoring of 50% of trips in each sector.
Subsequent years: Random dockside monitoring of 20% of trips in each sector.

For observer or at-sea monitor coverage, minimum coverage levels must meet the coefficient of variation in the Standardized Bycatch Reporting Methodology. The required levels of coverage will be set by NMFS based on information provided by the Northeast Fisheries Science Center (NEFSC) and may consider factors other than the SBRM CV standard when determining appropriate levels. Any electronic monitoring equipment or systems used to provide at-sea monitoring will be subject to the approval of NMFS through review and approval of the sector operations plan. Less than 100% electronic monitoring and at-sea observation will be required.

Assumed discard rates will be applied to sectors unless an at-sea monitoring system (such as a sector's independent monitoring program, a federal monitoring program, or other program that NMFS determines is adequate) provides accurate information for use of actual discard rates. Sector operations plans must provide detailed information about how discards in the fishery will be monitored, reported, and enforced within the sector.

- Discards will not be counted when determining the sector's ACE/permit PSCs but will be counted against the ACE during the fishing year. When data is available from an adequate at-sea monitoring program (such as a federal observer program, a sector provided program, or other program that NMFS determines is adequate), in-season discard rates will be determined using a procedure specified by NMFS.

- A sector must develop an adequate monitoring system and demonstrate to NMFS that discards can be accurately monitored and counted as part of the ACE, at the sector's expense, by FY 2012. Details about such a monitoring system must be provided in the sector's operations plan. This system will enable the sector to deduct annual discards from the ACE instead of using assumed discard rates.
- Discard rates used if data from an adequate at-sea monitoring program is not available will be determined using a sector-specific discard rate. A sector-specific discard rate will be calculated for each stock and gear based on observer data from the previous year. If NMFS determines there are insufficient data to estimate discard rates at this fine of a scale, the fleet-wide stock and gear discard rate would be used for those sector-gear combinations. When calculating discard rates, regulatory discards of legal-sized fish caused by trip limits will be excluded.
- Assumed discards will be calculated for the gear/species combinations shown in Table 19. If other discards are observed they will be counted against sector ACE regardless of whether the specific gear/species combination is listed in this table. While it is possible that discards may be observed with other gear/species combinations shown in Table 19, the absence of data makes it impossible to develop an assumed discard rate and apply it to landings. This is an element of uncertainty that should be considered in setting sector ACLs.
- Discards will be counted at the previous assumed discard rate, calculated as often as is practicable, by gear. The calculated discard rate will be used to add a discard estimate to each landing by sector vessels so that total catch can be determined for each trip.
- If a trip is observed, the discards reported by the observer or at-sea monitor on that trip till be counted as the discards for that trip. Unobserved trips will use a discard estimate calculated from the observed trips.

Other requirements of sector monitoring plans may be implemented as directed by the Regional Administrator. The exact details of sector monitoring plans will be included in the sector's operations plan, and NMFS will approve the monitoring plan as part of the review of the operations plan.

<u>Rationale</u>: The only fishing mortality control for sectors is the hard TAC that, if caught, results in the sector vessels not being allowed to fish. Effective management of sectors requires that catch be accurately known. This is important not only for managers but also so that each sector is confident that all sectors are being held to the same standards. The provisions in this section are designed to ensure that landings are accurately monitored. The weighmaster/dockside monitoring system provides an independent verification of landed weights. A portion of catch could be comprised of discards. A two-step approach is being taken to monitor discards if at-sea monitoring is not available. First, initially an estimated discard rate will be developed that will be used to inflate sector landings to total catch. This approach is required because there is only limited experience with what discard rates will be for vessels operating in sectors. Sectors are next required to develop an adequate at-sea monitoring program so that each sector's discards can be determined. This implementation is phased in so that sectors have time to develop these systems, locate qualified vendors, and have their programs approved by NMFS.

4.2.3.5.4 Standards for Sector Monitoring and Reporting Service Providers

Amendment 13 did not establish any requirements for the service providers that help sectors monitor catches. This section proposes those requirements. These provisions are in addition to other sector requirements currently in place or adopted through this action.

The following standards would be used by NMFS to evaluate service providers employed by sectors to comply with the dockside and at-sea monitoring and reporting requirements outlined in this section. NMFS will certify/approve service providers and associated dockside, roving, and/or at-sea monitors as eligible to provide sector monitoring services based upon criteria specified below and can decertify/disapprove service providers and/or individual monitors if such criteria are no longer being met. A service provider is not required to offer both dockside and at-sea monitoring services to be approved/certified by NMFS to provide sector monitoring services. NMFS will publish a list of approved service providers consistent with the APA. In its yearly operations plan, each sector must demonstrate that its sector monitoring program adheres to the sector monitoring and reporting requirements outlined in this section, including the use of an approved service provider for sector reporting and dockside, roving, and/or at-sea monitoring services before the operations plan can be approved by NMFS. The following standards and criteria for approval can be further modified by a future Council action.

Sector monitoring program service providers, including those providing dockside, roving, and at-sea monitor services, must apply for certification/approval from NMFS. NMFS shall approve or disapprove a service provider based upon the completeness of the application and a determination of the applicant's ability to perform the duties and responsibilities of a sector monitoring service provider, as further defined below. As part of that application, potential service providers must include the following information:

- Identification of corporate structure, including the names and duties of controlling interests in the company such as owners, board members, authorized agents, and staff; and articles of incorporation, or a partnership agreement, as appropriate.
- Contact information for official correspondence and communication with any other office
- A statement, signed under penalty of perjury, from each owner, board member, and officer that they are free from a conflict of interest with fishing-related parties including, but not limited to, vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions and will not accept, directly or indirectly, any gratuity, gift, favor, entertainment, loan, or anything of monetary value from such parties.
- A statement, signed under penalty of perjury, from each owner, board member, and officer describing any criminal convictions, Federal contracts they have had, and the performance rating they received on the contract, and previous decertification action while working as an observer or observer service provider.
- A description of any prior experience the applicant may have in placing individuals in remote field and/or marine work environments. This includes, but is not limited to, recruiting, hiring, deployment, and personnel administration.
- A description of the applicant's ability to carry out the responsibilities and duties of a sector monitoring/reporting service provider and the arrangements to be used, including whether the service provider is able to offer dockside and/or at-sea monitoring services.
- Evidence of adequate insurance to cover injury, liability, and accidental death for dockside, roving, and at-sea monitors (including during training). Workers' Compensation and Maritime Employer's Liability insurance must be provided to cover the dockside, roving, and at-sea monitors; vessel owner; and service provider. Service

providers shall provide copies of the insurance policies to dockside, roving, and at-sea monitors to display to the vessel owner, operator, or vessel manager, when requested.

- Service providers shall provide benefits and personnel services in accordance with the terms of each monitor's contract or employment status.
- Proof that the service provider's dockside, roving, and at-sea monitors have passed an adequate training course that is consistent with the curriculum used in the current NEFOP training course, unless otherwise specified by NMFS.
- An Emergency Action Plan (EAP) describing the provider's response to an emergency with a dockside, roving, and at-sea monitors, including, but not limited to, personal injury, death, harassment, or intimidation.
- Evidence that the company is in good financial standing.

Monitoring service providers must be able to document compliance with the following criteria and requirements:

- A comprehensive plan to deploy NMFS-certified dockside, roving, and/or at-sea monitors, or other at-sea monitoring mechanism, such as electronic monitoring equipment that is approved by NMFS, according to a prescribed coverage level (or level of precision for catch estimation), as specified by NMFS, including all of the necessary vessel reporting/notice requirements to facilitate such deployment, including the following requirements:
    - A service provider must be available to industry 24 hours per day, 7 days per week, with the telephone system monitored a minimum of four times daily to ensure rapid response to industry requests.
    - A service provider must be able to deploy dockside, roving, and/or at-sea monitors, or other approved at-sea monitoring mechanism to all ports in which service is required by this section, or a subset of ports as part of a contract with a particular sector.
    - A service provider must report dockside, roving, and at-sea monitors and other approved at-sea monitoring mechanism deployments to NMFS and the sector manager in a timely manner to determine whether the predetermined coverage levels are being achieved for the appropriate sector.
    - A service provider must assign dockside, roving, and at-sea monitors and other approved at-sea monitoring mechanisms in a fair and equitable manner without regard to any preference by the sector manager or representatives of vessels other than when the service is needed and the availability of approved/certified monitors and other at-sea monitoring mechanisms.
    - A service provider's dockside, roving, and at-sea monitor assignment must be representative of fishing activities within each sector and must be able to monitor fishing activity throughout the fishing year.
    - For service providers offering catch estimation or at-sea monitoring services, a service provider must be able to determine an estimate of discards for each trip, and provide such information to the sector manager and NMFS, as appropriate and required by this section.
- The service provider must ensure that dockside, roving, and at-sea monitors remain available to NMFS, including NMFS Office for Law Enforcement, for debriefing for at least 2 weeks following any monitored trip/offload.
- The service provider must report possible dockside, roving, and at-sea monitor harassment; discrimination; concerns about vessel safety or marine casualty; injury; and any information, allegations, or reports regarding dockside, roving, or at-sea monitor

conflict of interest or breach of the standards of behavior to NMFS and/or the sector manager, as specified by NMFS.

- Service providers must submit to NMFS, if requested, a copy of each signed and valid contract (including all attachments, appendices, addendums, and exhibits incorporated into the contract) between the service provider and those entities requiring services (i.e., sectors and participating vessels) and between the service provider and specific dockside, roving, or at-sea monitors.
- Service providers must submit to NMFS, if requested, copies of any information developed and used by the service providers distributed to vessels, such as informational pamphlets, payment notification, description of duties, etc.
- A service provider may refuse to deploy a dockside, roving, or at-sea monitor or other approved at-sea monitoring mechanism on a requesting fishing vessel for any reason including, but not limited to, the following:
    - If the service provider does not have an available dockside/roving monitor prior to a vessel's intended date/time of landing, or if the service provider does not have an available at-sea monitor or other at-sea monitoring mechanism approved by NMFS within the advanced notice requirements established by the service provider.
    - If the service provider is not given adequate notice of vessel departure or landing from the sector manager or participating vessels, as specified by the service provider.
    - If the service provider has determined that the requesting vessel is inadequate or unsafe pursuant to the reasons described at § 600.746.
    - For any other reason, including failure to pay for previous deployments of dockside, roving, or at-sea monitors other approved at-sea monitoring mechanism.
- A service provider must not have a direct or indirect interest in a fishery managed under Federal regulations, including, but not limited to, fishing vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions and may not solicit or accept, directly or indirectly, any gratuity, gift, favor, entertainment, loan, or anything of monetary value from anyone who conducts fishing or fishing-related activities that are regulated by NMFS, or who has interests that may be substantially affected by the performance or nonperformance of the official duties of service providers. This does not apply to corporations providing reporting, dockside, and/or at-sea monitoring services to participants of another fishery managed under Federal regulations.
- A system to record, retain, and distribute the following information to NMFS, as requested, for a period specified by NMFS:
    - Dockside, roving, and/or at-sea monitor and other approved monitoring equipment deployment levels, including the number of refusals and reasons for such refusals
    - Incident/non-compliance reports (e.g., failure to offload catch)
    - Hail reports, landings records, and other associated communications with vessels
- A means to protect the confidentiality and privacy of data submitted by vessels, as required by the Magnuson-Stevens Act.
- A service provider must be able to supply dockside and at-sea monitors with sufficient safety and data-gathering equipment, as specified by NMFS.

Standards for Approval/Certification of Individual Dockside/Roving Monitors

For an individual to be certified as a dockside or roving monitor, the service provider must demonstrate that each potential monitor meets the following criteria:

- A high school diploma or legal equivalent.
- Successful completion of all NMFS-required training and briefings before deployment.
- Physical capacity for carrying out the responsibilities of a dockside/roving monitor pursuant to standards established by NMFS such as being certified by a physician to be physically fit to work as a dockside/roving monitor. The physician must understand the monitor's job and working conditions, including the possibility that a monitor may be required to climb a ladder to inspect fish holds and/or trucks.
- Absence of fisheries-related convictions based upon a thorough background check
- Independence from fishing-related parties including, but not limited to, vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions to prevent conflicts of interest

Standards for Approval/Certification of Individual At-Sea Monitors

For an individual to be certified as an at-sea monitor, the service provider must demonstrate that each potential monitor meets the following criteria:

- A high school diploma or legal equivalent.
- Successful completion of all NMFS-required training and briefings before deployment
- Physical and mental capacity for carrying out the responsibilities of an at-sea monitor on board fishing vessels, pursuant to standards established by NMFS such as being certified by a physician to be physically fit to work as an at-sea monitor. The physician must understand the monitor's job and working conditions. Physical considerations include, but are not limited to the following:
    - Susceptibility to chronic motion sickness;
    - Ability to live in confined quarters;
    - Ability to tolerate stress;
    - Ability to lift and carry heavy objects up to 50 pounds;
    - Ability to drag heavy objects up to 200 pounds; and
    - Ability to climb a ladder.
- A current Red Cross (or equivalent) CPR/first aid certification.
- Absence of fisheries-related convictions based upon a thorough background check
- Independence from fishing-related parties including, but not limited to, vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions to prevent conflicts of interest

4.2.3.6 Sector Annual Report Requirements

Current regulations require an annual report but Amendment 13 was unclear on the requirements for that report. This section expands on those requirements.

The annual report is intended to provide information necessary to evaluate the biological, economic, and social impacts of sectors and their fishing operations. As such, information must be provided that described the catch and characteristics of the sector.

Approved sectors must submit an annual year-end report to NMFS and the Council, within 60 days of the end of the fishing year that summarizes the fishing activities of its members, including harvest levels of all species by sector vessels (landings *and* discards by gear type), enforcement actions, and other relevant information required to evaluate the performance of the sector. The annual report must report the number of sector vessels that fished for regulated groundfish and the permit numbers of those vessels (except when this would violate protection of confidentiality), the number of vessels that fished for other species, the method used to estimate discards, the landing ports used by sector vessels while landing regulated groundfish, and any other information requested by the Regional Administrator.

Rationale: This measure clarifies the information that should be reported in annual reports so that sectors can be evaluated.

4.2.3.7 Transfer of Annual Catch Entitlements (ACE)

Amendment 13 did not authorize transfer of ACE between sectors, nor did it allow carry-over from one fishing year to the next. This section adopts provisions for such transfers.

A sector can carry up to 10 percent of unused ACE forward into the next fishing year.

There are no restrictions on the nature of the transfer of ACE between sectors. The exchange of ACE between two sectors is viewed as a private business arrangement. Sectors can seek compensation (monetary or otherwise) when transferring ACE to another sector. Sectors are not obligated to transfer unused ACE to a sector that needs additional ACE.

In addition, all or a portion of a sector's ACE of any stock can be transferred to another sector. This exchange can occur at any time during the fishing year and up to two weeks into the following fishing year. The transfer does not become effective until it is approved by NMFS.

During the fishing year, a sector should project when its ACE will be exceeded and should cease fishing operations prior to exceeding it. If the sector's ACE is exceeded, the sector must cease operations in that stock area until it can acquire additional ACE through a transfer to balance the catch, and the sector also must comply with other overage penalties that may be applicable. A sector can resume fishing in the stock area if it acquires more ACE.

These provisions do not provide for the permanent transfer of sector shares. The only method for transferring sector shares is by moving permits between sectors, and this can only be accomplished prior to the beginning of the fishing year.

Proposed ACE transfers will be referred to NMFS. The transfer is not considered authorized until NMFS notifies both sectors. The NMFS review of a transfer request will be based on general issues such as whether both sectors are complying with reporting or other administrative requirements. The responsibility for ensuring that sufficient ACE is available to cover the transfer is the responsibility of the sector manager. NMFS approval of a transfer does not absolve the sector from managing its ACE.

Transfers of previous year's ACE after the end of the fishing year will allow sectors to balance accidental overages if other sectors hold unused ACE at the end of the year and are willing to transfer that ACE to the sector with an overage. Should a sector be unable to acquire ACE from another sector to balance an overage, the overage will be deducted from the next year's ACE allocation, and the sector may be subject to other penalties. Since ACE transfers may take place after fishing has commenced and it will not be clear whether sectors are able to balance overages by acquiring ACE until all transfers have been processed, 20% of each sector's ACE allocation for each stock will be held in reserve by NMFS until 61 days after the beginning of the fishing year to ensure that sectors will have sufficient ACE to balance overages from the previous year.

Rationale: Allowing transfer of ACE provides flexibility for sectors to adjust their allocations to account for unusual circumstances or to take advantage of other opportunities. For example, there may be instances were a sector does not have an allocation for a stock that has an unusual distribution due to oceanographic conditions – without allowing ACE transfer, the sector may be forced to discard this stock and may have to cease fishing because of the discards. Allowing the exchanges to continue for a period after the end of the fishing year provides a limited opportunity for a sector to quota balance in the instances that the ACE was inadvertently exceeded. This provision is not intended to allow sectors to exceed their ACE.

4.2.3.8 Sector Participation in Special Management Programs

Amendment 13 did not establish guidelines for participation in Special Management Programs by vessels that are in sectors. Sector participation in existing special management programs is described below. If additional program are adopted, specific provisions for sector participation will be defined. In all cases, sector vessels cannot participate in a special management program unless the sector has ACE (allocated or acquired) for the stocks caught in this SAP in order to participate. The ACE must be sufficient to account for the expected catch in the SAP.

4.2.3.8.1 Special Management Program Reporting Requirements

The Regional Administrator is authorized to remove specific reporting requirements for sector vessels participating in special management programs if it is determined the requirements are unnecessary.

<u>Rationale</u>: Since sectors are subject to additional reporting requirements in order to monitor the catch of ACE, it may not be necessary for sector vessels to also comply with reporting requirements for special management programs.

4.2.3.8.2 Eastern U.S. Canada Haddock SAP

For a sector exempt from DAS, the only benefit to this SAP is that it allows fishing in the far northern tip of CAII. The following provisions apply for sector participation:

(1) Sector vessel participating in the SAP must follow reporting requirements.
(2) All catch applies against the sector's allocated TACs for each stock, including those specific to the Eastern U.S./Canada area, but not against any incidental catch TACs.
(3) Sectors can fish in the corner of CAII (within SAP boundaries) during the season of the SAP.
(4) There are no specific gear requirements for sectors. Since the sectors will have hard TACs on most species, gear requirements designed to maximize catch of the target species may not be necessary. Presumably sectors will adjust their operation to maximize their benefits from their available TACs.

<u>Rationale</u>: Because this SAP allows access to only a small part of CAII, and sectors are expected to have a hard TAC on their catches of cod and haddock in the Eastern U.S./Canada area, there is little need to restrict sector participation in this SAP to specific gears.

4.2.3.8.3 Closed Area II Yellowtail Flounder SAP

This SAP has a limit on the catch per trip of target species, limit on the total number of trips, limits on the number of trips that can be taken each month, gear requirements, and a cod catch limit.

(1) Sectors are subject to reporting requirements (unless waived by the Regional Administrator as described in section 4.2.3.8.1).
(2) Sectors are not subject to the cod, haddock, or yellowtail flounder trip limits, or limits on the number or frequency of trips.
(3) Sectors are subject to the gear requirement. This SAP is designed to target flounder and it would not be appropriate to allow sectors to use gear designed to target other species in this SAP. The PDT recognizes this may seem inconsistent with the advice for the Eastern U.S./Canada SAP, but note that unlike in that SAP, the access area is much larger and the sector's catch of the target species (GB YTF) is not limited by a specific sector Eastern U.S./Canada area TAC.

Rationale: Unlike the Eastern U.S./Canada Haddock SAP, the CAII yellowtail flounder SAP provides access to a large area in CAII. Non-sector vessels are limited in the number of trips they can take each month, in the gear that can be used, and the amount of the target species that can be landed each trip. If sector vessels are not subject to the same provisions, they would have an unfair advantage in this SAP.

4.2.3.8.4 Closed Area I Hook Gear Haddock SAP

This SAP provides an opportunity to target GB haddock within CAI. The SAP already has provisions that describe requirements for sectors and additional provisions are not proposed (but see section 4.2.7.2 for SAP changes).

4.2.3.9 Interaction of Sector with Common Pool Vessels

This section modifies the provisions that relate to the interaction between sector and non-sector (common pool) vessels.

As noted above, sectors will be assigned an ACE (share of total TAC) based on landings history or a combination of landings history and vessel capacity. While it is appropriate for changes in stock condition to affect the amount of fish that the share represents, sectors should not suffer if other sectors, or common pool vessels, exceed TACs and create a need for mortality reductions.

If a hard TAC allocated to a sector is not exceeded in a given fishing year, the sector's allocation of a TAC will not be reduced for the following fishing year as a result of an overage of a TAC by non-compliant sectors or by non-sector groundfish fishing vessels.

If a sector exceeds its ACE, the sector's ACE will be reduced in the following year and the sector may be subject to enforcement action. If the sector exceeds its ACE repeatedly, other enforcement sanctions may be applied by NMFS. These could include a permanent reduction in the sector's share or a withdrawal of the sector's authorization to operate. A permanent reduction in a sector's share will follow any vessels that leave the sector.

If declining stock conditions result in a need to reduce fishing mortality, and all sectors and common pool vessels have operated within TAC limits, a sector's share will not be changed, but the amount this share represents may be due to reduced overall TACs. If stock conditions improve, and a sector stays within its quota while other sectors do not, the sector will receive a temporary increase in share equal to the amount that other sectors exceeded their quota.

Some multispecies management measures that apply to common pool vessels will also apply to any vessel in a sector, and these measures are listed below. Other groundfish measures that are not included in the list below may be altered through a sector's operations plan. In its operations plan, a sector should specify any additional multispecies management measures that should not apply to the sector. Exemptions and/or modifications to other management measures must be approved by NMFS. The following list may be modified through a framework adjustment. Sectors ***cannot*** request exemption from the management measures included in this list. Current measures that will apply to both sector and common pool vessels include:

- Year round closed areas
- Permitting restrictions (vessel upgrades, etc.)
- Gear restrictions designed to minimize habitat impacts (roller gear restrictions, etc.)
- Reporting requirements (not including DAS reporting requirements)

Similarly, all sectors will be universally exempt from some multispecies management measures. A sector must request changes or exemptions to other multispecies management measures in its operations plan, as appropriate. The following list of sector exemptions may be modified in the future through a framework adjustment. **With the implementation of this amendment, all sectors will be exempt from:**

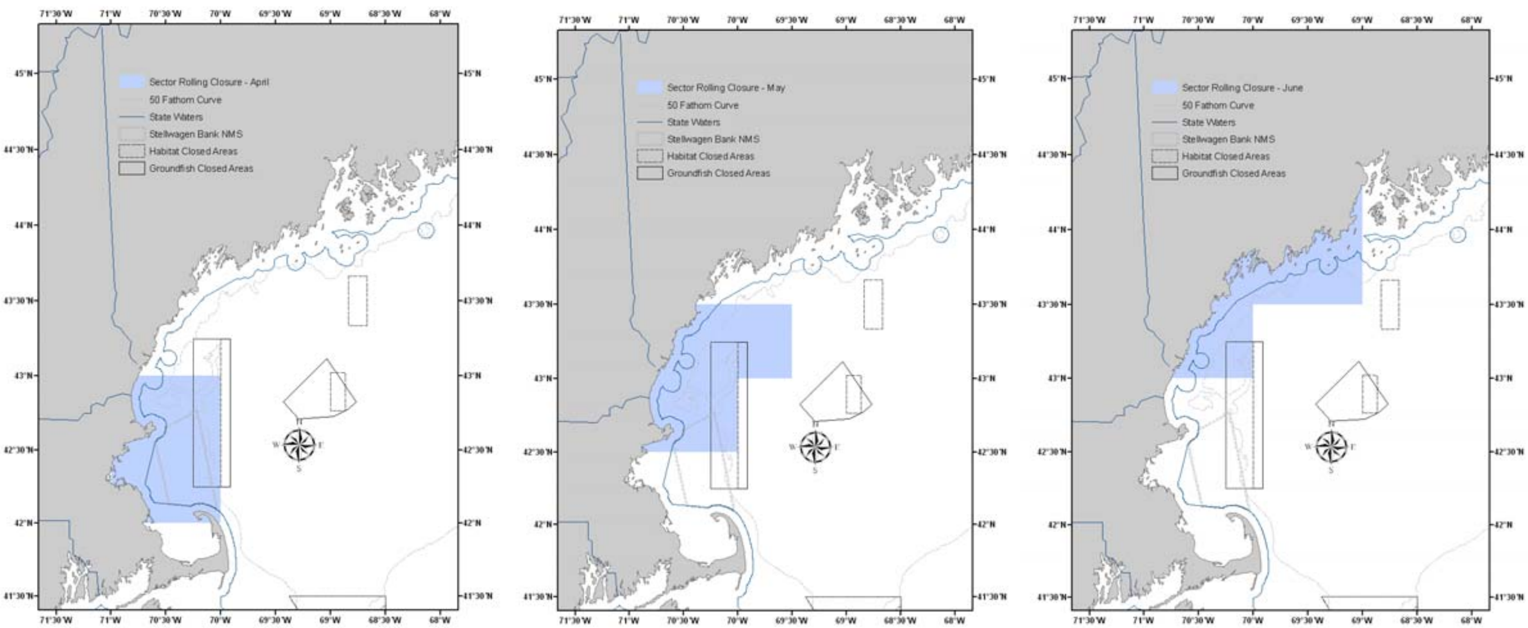
- Trip limits on stocks for which a sector receives an allocation (all stocks except halibut, ocean pout, SNE/MA winter flounder(unless allocated in a future action), Atlantic wolffish, and windowpane flounder);
- Seasonal closed areas (note that this does not include the Gulf of Maine "rolling" closures; at present the only seasonal closure is in May, on Georges Bank; specific rolling closure exemptions are listed below); and
- Groundfish DAS restrictions;
- While using a haddock separator trawl, Ruhle trawl, or other authorized trawl gear on Georges Bank sectors are exempt from using a six and a half inch cod-end; when using this exemption they must use a six inch mesh codend. This measure was not included in the draft amendment; it was adopted in response to comments.
- Sector vessels are exempt from all GOM rolling closures with the exception of those listed below (see also Figure 1). The Groundfish PDT will review and analyze the existing rolling closures and determine which areas should remain closed to protect cod spawning aggregations. As a result of this analysis, any adjustments necessary to adequately protect concentrations of spawning cod would be adjusted in either a management action or the biennial specification process. This measure was not included in the draft amendment; it was adopted by the Council in response to public comments.
    - April: Blocks 124, 125, 132, 133
    - May: Blocks 132, 133, 138
    - June: 139, 140, 145, 146, 147, 152

These universal exemptions only apply to groundfish fishing regulations. They do not apply to requirements implemented by other management plans. For example, certain categories of monkfish permits must use a groundfish DAS when using a monkfish DAS. That requirement continues until or unless the monkfish FMP changes it. If vessel with a monkfish Category C or D permit is in a groundfish sector and wants to use a monkfish DAS and land the monkfish trip limit associated with using a monkfish DAS, then it must use a groundfish DAS while that is required by the monkfish FMP. The same vessel can instead not use either a groundfish or monkfish DAS and be limited to the monkfish trip limit for vessels not fishing on a monkfish DAS.

Sectors will not be required to adhere to additional mortality controls adopted by this action, such as additional seasonal and year round closed areas, gear requirements and/or restricted gear areas, DAS reductions, and differential DAS counting, since mortality by sector vessels is controlled by a hard TAC. Note that this applies only to *additional* requirements, and does not automatically exempt the sectors from mortality controls adopted in previous actions that are not listed in 4.3.2. For example, sectors will be required to adhere to those GOM rolling closures that are not included in the list of universal exemptions (unless a specific exemption from the remaining closures is granted when the sector's operations plan is approved)

Rationale: This section clarifies the exemptions that apply to all sectors, minimizing the administrative burden for sectors since they do not have to request these exemptions, and for NMFS since the agency will not have to evaluate the universal exemptions.

Figure 1 – GOM rolling closures for which sectors do not receive an automatic exemption



4.2.3.10 Movement between Sectors

No changes are proposed to this element of the sector allocation process. Each sector will set its own rules on movement into and out of the sector. This section is included here solely to identify all sector provisions in one location and this No Action option is the only one being considered.

Rationale: By not mandating the commitment time to a sector and allowing the sectors to set their own rules, the sector might be more successful in the long-term. This success will be realized, while working within their allocation (hard TAC), the group will be largely self-regulating. A code of conduct for all sectors should be developed by the Council or by industry with Council approval.

4.2.4 Reporting Requirements

This measure proposed to add additional requirements for limited access groundfish vessels to facilitate the monitoring of Annual Catch Limits (ACLs) and sectors.

4.2.4.1 Area-specific Reporting Requirements

This action adopts Option 2 from the draft amendment, but was modified to be consistent with other measures adopted. The measures in this section apply to all limited access groundfish vessels, whether fishing in the common pool or as a member of a sector. They are in addition to any specific requirements applicable to either common pool or sector vessels that are adopted in other sections.

Four broad reporting areas will be established (see Figure 2). These areas were determined so that all groundfish catch in the area can be allocated to the appropriate stock. All limited access groundfish vessels required to use VMS will be required to make a declaration via VMS at the beginning of a trip on whether they intend to fish in one broad reporting area or multiple reporting areas. This declaration must be made prior to departing on every groundfish fishing trip. If a vessel operator reports that he is only going to fish in one area, the vessel cannot fish in multiple reporting areas on that trip, but can fish in multiple areas on subsequent trips. Vessels that notify NMFS they intend to fish in multiple areas will be required to submit a daily report to NMFS that reports kept groundfish catch by broad reporting area (other reporting periods may be authorized by NMFS). There is no restriction on the number of areas that can be fished on such trips, or on the number of times a vessel can enter or exit any area, as long as accurate daily catch reports are submitted by VMS. NMFS will specify the content of these reports, including the elements of catch that must be reported (kept and/or discarded catch).

In order to link this information on area fished and catch to dealer data, each limited access groundfish vessel operator (whether fishing in one or multiple broad reporting areas) will be required to report a VTR serial number, or other appropriate identifier, for the trip via VMS at a time specified by NMFS. The vessel operator must also provide this VTR serial number to the dealer or dealers purchasing the fish from that trip, as well as to the observer if the trip is observed. The dealer will include this serial number when reporting purchases to NMFS. NMFS will provide directions for reporting this serial number for those vessels that fish in multiple statistical areas or use multiple gears on the same trip (vessels are required to submit a new VTR page for each statistical area fished or gear used).

To the extent possible, NMFS will develop procedures for these new requirements that reduce unnecessary duplication.

Rationale: The implementation of ACLs and the possible implementation of additional sectors places increased importance on timely reporting of catch (kept and discarded) information. The current reporting system relies on submission of paper VTRs to identify area fished. There are delays in receiving and processing these VTRs that make them unusable for timely monitoring of either sector catch or ACLs, which are stock specific. In order to improve the timeliness of reporting, additional requirements will be adopted. Note that these requirements do not replace the existing requirements for dealer and vessel reporting. Amendment 13 included language that authorized the future use of electronic reporting systems as a replacement for the VTR. This option does not preclude that possibility in the future, but does not replace VTRs with this proposal. This option also does not replace reporting requirements for special management programs or fishing in the U.S./Canada area.

GOM Area/Reporting Area 1

Point	Latitude	Longitude
G1	([1])	([1])
G2	43° 58’ N.	67° 22’ W.
G3	42° 53.1’ N.	67° 44.4’ W.
G4	42° 31’ N.	67° 28.1’ W.
CII3	42° 22’ N.	67° 20’ W.
G6	42° 20’ N.	67° 20’ W.
G10	42° 20’ N.	70° 00’ W.
G9	42° 00’ N.	([2])

[1]The intersection of the shoreline and the U.S.-Canada Maritime Boundary.
[2]The intersection of the Cape Cod, MA, coastline and 42°00' N. lat.

Inshore GB Area/Reporting Area 2

Point	Latitude	Longitude
G9	42° 00’ N.	([1])
G10	42° 20’ N.	70° 00’ W.
IGB1	42° 20’ N.	68° 50’ W.
IGB2	41° 00’ N.	68° 50’ W.
IGB3	41° 00’ N.	69° 30’ W.
IGB4	41° 10’ N.	69° 30’ W.
IGB5	41° 10’ N.	69° 50’ W.
IGB6	41° 20’ N.	69° 50’ W.
IGB7	41° 20’ N.	70° 00’ W.
G12	([2])	70° 00’ W.

[1]The intersection of the Cape Cod, MA, coastline and 42°00' N. lat.
[2]South facing shoreline of Cape Cod.

Offshore GB Area/Reporting Area 3

Point	Latitude	Longitude
IGB1	42° 20' N.	68° 50' W.
CII3	42° 22' N.	67° 20' W.
SNE1	40° 24' N.	65° 43' W.
SNE2	([1])	69° 00' W.
SNE3	39° 50' N.	69° 00' W.
SNE4	39° 50' N.	68° 50' W.
IGB2	41° 00' N.	68° 50' W.
IGB1	42° 20' N.	68° 50' W.

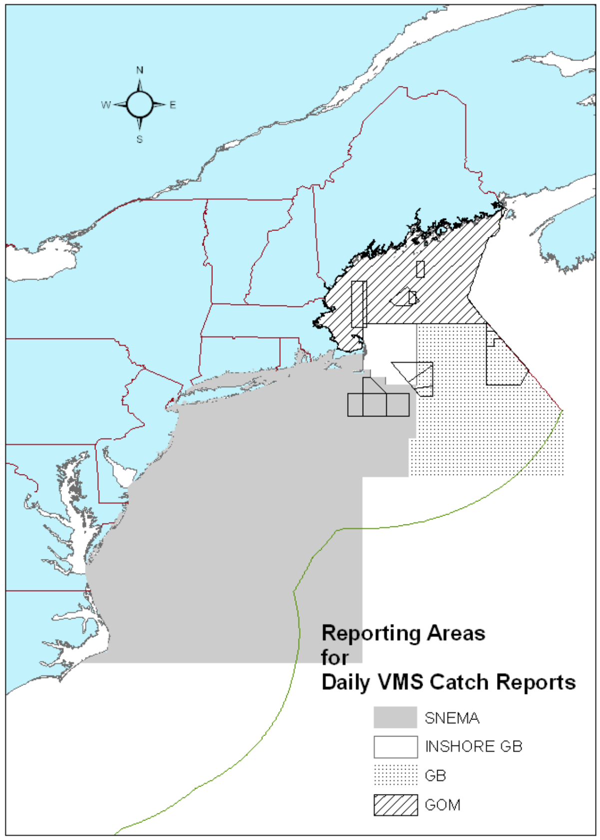
[1]The U.S.-Canada Maritime Boundary as it intersects with the EEZ.

SNE/MA Area/Reporting Area 4

Point	Latitude	Longitude
G12	([1])	70° 00' W.
IGB7	41° 20' N.	70° 00' W.
IGB6	41° 20' N.	69° 50' W.
IGB5	41° 10' N.	69° 50' W.
IGB4	41° 10' N.	69° 30' W.
IGB3	41° 00' N.	69° 30' W.
IGB2	41° 00' N.	68° 50' W.
SNE4	39° 50' N.	68° 50' W.
SNE3	39° 50' N.	69° 00' W.
SNE2	([2])	69° 00' W.

[1]South facing shoreline of Cape Cod.
[2]The U.S.-Canada Maritime Boundary as it intersects with the EEZ.

Figure 2 – Proposed reporting areas



4.2.4.2 Accounting for Discards for Non-Sector Vessels

This action adopts Option 3 from the draft amendment. The requirement to monitor ACLs means that catch (landings and discards) must be estimated. Measures to monitor discards by sector vessels are described in section 4.2.3.5. For non-sector vessels in the commercial fishery, a discard rate, by gear, will be determined and applied to the landings for each trip. NMFS may apply this discard estimate in one of two ways: either based on the total landings of a stock, by gear, or on a trip-by-trip basis. The former approach is easier to administer but does not attribute discards for each vessel on an individual basis. This is not as important as for sector vessels, but if this is not tracked it may complicate any future allocation scheme that is based on total catch.

Discards will be typically applied only for those combinations of species and gear where discards are expected.

Table 19 – Discard estimates will be applied to the species/gear combinations show

Gear	Species
Trawl	All
Gillnet	Cod, haddock, pollock, white hake, yellowtail flounder, winter flounder, witch flounder, American plaice, redfish, Atlantic wolffish
Longline	Cod, haddock, pollock, white hake, redfish, Atlantic wolffish

A discard rate will be calculated for each stock and gear based on observer data from the previous year by vessels that are not in sectors. If NMFS determines that there are insufficient data to estimate discard rates at this fine a scale, the fleet-wide stock and gear discard rate will be used for those stock-gear combinations. If NMFS determines there is sufficient data to determine in-season discard rates, such data will be used in place of an assumed rate that is based on the previous year's data.

Rationale: ACLs are based on total catch (landings and discards) for most stocks. Discards need to be accounted for in order to determine whether ACLs have been caught and AMs need to be implemented. This option uses a discard rate to inflate landings to provide an estimate of total catch that can be updated on a weekly basis (the frequency of submission for dealer reports). This provides a timely estimate of in-season catches that can be used to monitor ACLs. In-season monitoring estimates will be compared to catch estimates determined by the assessments to verify that this practice is not mis-estimating discards.

4.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

This action adopts Option 2 of the draft amendment. An allocation will be made of certain regulated groundfish stocks to the commercial and recreational components of the fishery. For this action, an allocation will be determined after accounting for state waters catches taken outside of the FMP. An allocation will not be made in the case of stocks that are not fully harvesting the ACL. An allocation will also not be made if the recreational harvest, after accounting for state waters catches outside the management plan, is less than five percent of the removals.

In those cases that meet the requirements to establish an allocation, a defined time period will be used to calculate the allocation. The time periods that are being used for GOM cod and GOM haddock are shown in Table 20. The proportion allocated to these fisheries will be determined using the time periods shown in the table based on the data that is used in GARM III assessments. When possible, the shares will be determined by using the numbers of fish in the years caught (as used by the assessment: harvested, landed, or discarded) by each component. The shares determined in this manner will be applied to the ACL to determine the weight of catch available for each component. If the number of fish caught by each component is not available, the shares will be calculated based on weight. The proportion for each year will be calculated, and then the average proportion over the time period will be the share for each component of the fishery. The proportions will be reviewed consistent with the periodic assessment cycle, and if determined necessary, changes can be implemented through a framework action. Any changes that are adopted will not affect the implementation of accountability measures based on proportions that were in effect at the time of the catches. This table also lists an estimate of the allocations that will result – this estimate has not yet been adjusted for state waters catches. Allocations are not being considered at present for SNE/MA winter flounder, GOM winter flounder, pollock, or GB cod, because current catches do not meet the standard for an allocation. Allocations may be defined for these stocks in the future.

Table 20 – Proposed time periods for calculating the recreational and commercial share of the groundfish ACL and preliminary estimate of recreational allocation that results.

Stock	Years	Preliminary Estimate
GOM Cod	2001 - 2006	33.7%
GOM Haddock	2001 - 2006	27.5%

Rationale: By allocating certain groundfish stocks to the commercial and recreational components of the fishery, the design of management measures can be tailored to the components that are responsible should mortality targets be exceeded. GOM winter flounder, SNE/MA winter flounder, pollock, and GB cod are not allocated because at present the federal waters catch of these stocks is less than 5 percent of removals. Catches will be monitored and an allocation may be considered in the future if it exceeds 5 percent.

4.2.6 Changes to the DAS Transfer and DAS Leasing Programs

4.2.6.1 DAS Transfer Program Conservation Tax

This action adopts Option 2 from the draft amendment. The Council will eliminating the conservation tax on DAS transfers, currently set at 20 percent. No adjustment will be made for permits previously charged the conservation tax.

Rationale: There has been limited use of the DAS transfer program. Modifying or eliminating the conservation tax may encourage use.

4.2.6.2 Eligibility of Permits in the Confirmation of Permit History (CPH) Category to Participate in the DAS Leasing and Transfer Programs

Confirmation of permit history (CPH) permits do not need to be activated in order participate in the DAS leasing program (this is consistent with a change proposed to the eligibility of these permits to join sectors that is proposed in section 5.2.3.3.1). In addition, these permits do not need to be activated prior to participation in the DAS transfer Program. This was Option 5 in the draft amendment.

Rationale: Under regulations implementing Amendment 13, permits in the CPH category cannot lease DAS. The rationale for this provision is unclear, but appears to relate to the idea that CPH permits did not contribute to fishing mortality during the period prior to Amendment 13 and thus should not contribute via DAS leases after the amendment's adoption. CPH is not a permanent category, however, and permits can be activated at any time. Vessel replacement regulations allow the permits to be placed on any vessel, including skiffs, at any time. This prohibition thus means only that there are administrative barriers to having a CPH permit lease DAS. This option acknowledges the reality of this situation and removes the administrative barriers to having a

CPH permit lease DAS. It also clarifies that a permit need not be activated prior to participating in a DAS transfer.

4.2.6.3 Removal of the DAS Leasing Cap

This action removes the cap on leased DAS that was adopted in Amendment 13. There is no limit on the number of DAS that a permit can lease from other permits. In that action, vessels were limited to leasing the number of DAS equal to the vessel's allocation for FY 2001.

This measure was not included in the draft amendment and was added in response to public comments.

Rationale: The DAS leasing program was adopted in Amendment 13 in part as a mitigation measure. By allowing the temporary exchange of DAS between permits, DAS leasing provided an opportunity for vessels to acquire enough DAS to operate profitably. In addition, permits with too few DAS to fish for groundfish could receive some benefits by leasing DAS to other vessels. With continued reductions in DAS – including the proposed 50 percent reduction in this action - the leasing cap adopted in Amendment 13 imposes a barrier that prevents vessels from acquiring enough DAS to be profitable. Removing the cap will facilitate effective use of the leasing program and will provide the ability for some vessels to acquire enough DAS to be profitable.

4.2.7 Special Management Programs

4.2.7.1 Incidental Catch TACs

Incidental catch TACs were first adopted in FW 40A in order to limit the catch of non-target stocks while vessels were using Category B DAS. As a result of groundfish assessments completed in August 2005 the incidental catch TACs were revised. TACs were added for GB yellowtail flounder and GB winter flounder. The TACs for GOM cod, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and SNE/MA winter flounder were reduced from two percent of the total target TAC to one percent of the total target TAC.

Option 1 – Revised Incidental Catch TACs

Because of changes in stock status, as well as the possible addition of additional SAP provisions, the specific stocks subject to incidental catch TACs and the allocations to SAPs are revised as provided below (Table 21). Incidental catch TACs will be based on the ACL for a stock.

GB yellowtail flounder and GB cod are transboundary stocks, and management is coordinated with Canada. The U.S. and Canadian shares of the TAC for these stocks are determined annually and cannot be predicted in advance. Values will be calculated in the future and announced through procedures consistent with the Administrative Procedure Act. Since the U.S. /CA TAC only applies to part of the GB cod stock, the incidental catch TAC for this stock is calculated as:

$$0.02 \text{ X } (\text{Total GB cod target TAC} - \text{CA GB cod TAC})$$

The incidental catch TACs in this program are calculated based on the non-sector commercial fishery ACL (see section 4.2.1) for the stock, and not based on the total TAC as in the past. This is to make the program consistent with the ACLs. Specific incidental catch TACs are not identified in this table for sector participation in SAPs, but are implied by the allocation process described in 4.2.3.3.3.

Table 21 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year. TACs shown are metric tons, live weight. Note: GB cod and GB yellowtail flounder TAC is determined annually and cannot be estimated in advance. Values are dependent on ACLs, which have not yet been determined.

		Incidental Catch TAC			
	Percentage of Total TAC	2009	2010	2011	2012
GB cod	Two				
GOM cod	One				
GB Yellowtail	Two				
CC/GOM yellowtail	One				
SNE/MA Yellowtail	One				
Plaice	Five				
Witch Flounder	Five				
SNE/MA Winter Flounder	One				
GB Winter Flounder	Two				
White Hake	Two				
Pollock	Two				

Table 22 - Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	Category B (regular) DAS Program	CAI Hook Gear SAP	Eastern US/CA Haddock SAP	Southern CAII Haddock SAP
GOM cod	100%	NA	NA	
GB cod	50%	16%	34%	
CC/GOM yellowtail	100%	NA	NA	
Plaice	100%	NA	NA	
White Hake	100%	NA	NA	
SNE/MA Yellowtail	100%	NA	NA	
SNE/MA Winter Flounder	100%	NA	NA	
Witch Flounder	100%	NA	NA	
GB Yellowtail	50%	NA	50%	
GB Winter Flounder	50%	NA	50%	
Pollock	50%	16%	34%	

4.2.7.2 Closed Area I Hook Gear Haddock SAP Revisions

The CAI Hook Gear Haddock SAP provides an opportunity to target GB haddock within the boundaries of CAI. Changes are being considered to the area and the season, and to the provisions adopted to mitigate competition between sector and common pool participants. This action adopts Option 2 from the draft amendment. This action revises the season, area, and other provisions of the CAI Hook Gear Haddock SAP.

Season: The SAP would be extended to nine months, May 1 through January 31. Fishing would be allowed in the SAP during the May seasonal closure on GB. Sector and non-sector vessels can fish at any time during the SAP season – the current division of the season into sector and non-sector participation periods would be eliminated.

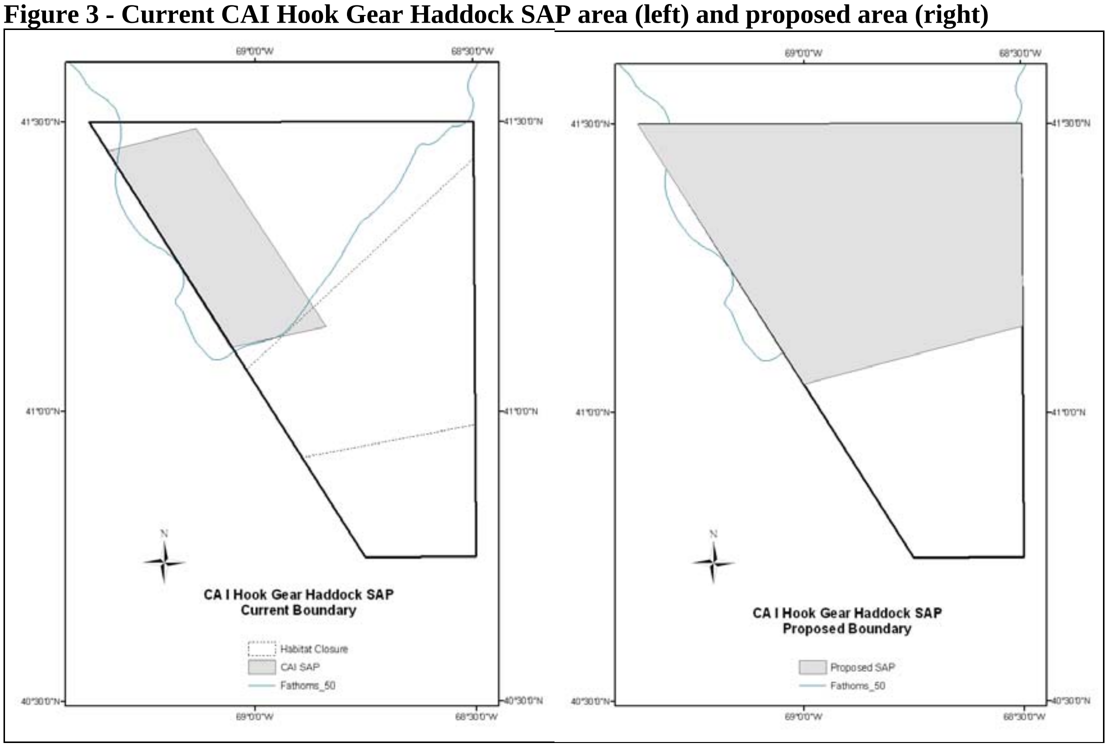
Area: The area of the SAP would be expanded to include the northern portion of CAI, as shown in Figure 3. The coordinates for the revised SAP area would be:

41-09 N	68-30 W	
41-30 N	68-30 W	
41-30 N	69-23 W	(Western Boundary of CAI)
41-04 N	41-04N 69-01.1W (Western Boundary of CAI)	

TAC: The SAP TAC for GB haddock would not longer be split between sector and non-sector vessels.

Rationale: SAP participants have not harvested the available catch. The extension of the season and area is intended to provide more opportunities to harvest haddock in this SAP. The extended season and area make it unlikely that the conflicts between sector and non-sector participants will be an issue. The Proposed Action adopts a NMFS suggested correction to the coordinates for the SAP.

Figure 3 - Current CAI Hook Gear Haddock SAP area (left) and proposed area (right)



4.2.7.3 Reauthorization of the Eastern U.S./Canada Haddock SAP

This SAP provides an opportunity to target GB haddock in the Eastern U.S./Canada area, including a small portion of CAII. This action reauthorizes the SAP and continues it indefinitely unless changed by a future Council action, or unless closed for the season by the Regional Administrator consistent with the Administrative Procedures Act and SAP regulations (Option 2 of the draft amendment). All provisions of the SAP remain with one change:

> Gear: Trawl vessels fishing in the SAP can use codends with a minimum mesh size of six inch square or diamond mesh. They are still required to use net configurations required for the SAP.

4.2.7.4 Closed Area II Yellowtail Flounder SAP

This action modifies the existing CAII yellowtail flounder SAP to provide an opportunity to target GB haddock in the SAP area even when the SAP is not opened to allow targeting of GB yellowtail flounder (Option 2 of the draft amendment). The SAP provisions are modified as follows:

- When the SAP is opened to allow targeting of GB yellowtail flounder, the current SAP provisions apply. These include gear requirements, limits on the number of trips, limits on the number of trips a vessel can make each month, season, limits on the yellowtail flounder catch per trip, and possession limits for cod. With this action, the eliminator trawl is authorized for this SAP when it is open to target yellowtail flounder.
- When the SAP is not open to allow targeting of GB yellowtail flounder (either because there is insufficient GB yellowtail flounder TAC to open the SAP at all, or the SAP was opened but the number of trips allowed has been reached), the SAP is opened to target GB haddock subject to the provisions in this section.

Haddock Season: The haddock season is August 1 through January 31 if the SAP is not opened to target GB yellowtail flounder.

Opening Criteria: This SAP can be opened for targeting haddock only if the Eastern GB haddock TAC has not been caught. All catches in this SAP will be applied against the Eastern GB haddock TAC for either common-pool vessels or individual sectors. If sectors receive an allocation of Eastern GB haddock, only catches of haddock by non-sector vessels will be applied to this TAC. If sectors receive ACE for Eastern GB haddock (see section 5.2.3.3.3), they can fish in this SAP during the haddock season as long as they have ACE remaining for the stocks caught in this SAP, even if the SAP is closed to non-sector vessels.

Trip Limits: There are no haddock trip limits unless trip limits are implemented for the entire GB haddock resource. Trip limits for other species are the same as those in effect when using gear subject to the gear performance standards.

No discard provision and DAS flips: A vessel fishing in this SAP cannot discard legal-sized regulated NE multispecies with the exception of species whose possession is prohibited. Vessels may discard Atlantic halibut exceeding the one fish per trip possession limit. If a vessel exceeds an applicable trip limit, it must flip to a Category A DAS and must exit the SAP.

Gear requirements: At times when the SAP is open to target GB yellowtail flounder, vessels must use the gear authorized for that SAP (flounder net, haddock separator trawl, and eliminator trawl). When open only to target haddock, the flounder net is not authorized and trawl vessels must use a haddock separator trawl, eliminator trawl, or hook gear. Additional gear can be approved by the Regional Administrator using the process established to approve additional gear for the Eastern U.S./Canada Haddock SAP and the Category B (regular) DAS Program.

Rationale: Catches of GB haddock have been well below target catches in recent years, and the U.S. Eastern GB haddock TAC has never been harvested. During the CAII Yellowtail Flounder SAP opening in 2004 about one million pounds of haddock were landed on 319 trips into the SAP area while targeting flounder. This proposed change uses gear requirements to avoid catching yellowtail flounder when the SAP is not open to that gear.

4.2.7.5 SNE/MA Winter Flounder SAP

Option 1- Suspension of SNE/MA Winter Flounder SAP
The SNE/MA winter flounder SAP described in 50 CFR 648.85(b)(4) is suspended until stock conditions warrant its re-implementation.

Rationale: The existing SAP allows landings of small amounts of winter flounder without using a groundfish DAS. It was primarily designed to reduce discards of winter flounder in the fluke fishery. With the adoption of a rebuilding program for winter flounder, and pending prohibitions on landing SNE/MA winter flounder, it is no longer appropriate to allow any increased effort on this stock outside of the groundfish plan.

4.2.7.5.1 Program Revisions Due to Updated Stock Status

This was Option 2 in the draft amendment. Because of the results of GARM III, this program is revised to focus Category B DAS effort on three stocks: GB haddock, GOM haddock, and redfish. In addition, because pollock is overfished, catches of pollock in this program are limited to the incidental catch limit of 100 lbs./DAS with a maximum of 1,000 lbs./trip.

> Trawl gear requirements: Vessels fishing in the Category B (regular) DAS program in the GB cod stock area, and required to use approved trawl gear such as the haddock separator trawl, the Ruhle trawl, or other approved trawl gear, may use a codend with a minimum mesh size of six-inch diamond or square mesh.

Rationale: Allowing the use of six-inch mesh in trawl gear designed to target haddock will increase haddock catches while not having an impact on other stocks.

4.2.7.6 Approval of Additional Gear

Several programs in the multispecies fishery impose specific gear requirements. For example, trawl vessels fishing in the U.S./Canada area are required to use specific trawl gear configurations; trawl vessels fishing in the Category B (regular) DAS program are required to use a separator trawl or Ruhle trawl, and similar requirements apply to the Eastern U.S./Canada Haddock SAP. Some of these programs allow the Regional Administrator to authorize additional gear after determining that it meets specific requirements, but this authority is at times limited to in-season authorization that must be renewed annually.

This measure adopts Option 2 from the draft amendment. It authorizes the Regional Administrator to permanently approve additional selective gear for use in any program that requires the use of selective gear. This includes both existing programs and future programs.

Rationale: This measure simplifies administration by removing the necessity for NMFS to re-authorize the use of selective gear on an annual basis. If future programs are adopted that require the use of selective gear t he assumption will be that the Regional Administrator can authorize additional gear unless this authority is rescinded.

4.2.8 Periodic Adjustment Process

The periodic adjustment process is modified as proposed by Option 2in the draft amendment:

Measures implemented in this action can be adjusted via framework actions consistent with the periodic adjustment process. These additional measures include, but are not limited to:

- Changes to the ACL and AM process or implementation
- Modifications to sector administration policies
- Reporting requirements

The draft amendment proposed to modify Groundfish Plan Development Team membership. This language was removed from the amendment; PDT membership will be consistent with Council policies.

4.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

This action adopts Option 2 from the draft amendment. A vessel may possess a limited access multispecies permit and a limited access scallop permit at the same time, even if the scallop dredge vessel did not qualify for a limited access multispecies vessel combination permit. This change allows a limited access scallop vessel to acquire a limited access multispecies permit, and also allows vessels that possess a limited access scallop trawl permit and a limited access multispecies permit to change the scallop trawl permit to a scallop dredge permit (if consistent with all provisions of the Atlantic Sea Scallop FMP) without surrendering the limited access multispecies permit.

Most limited access scallop permit holders that do not hold a limited access multispecies combination permit also hold an open access scallop Northeast multispecies possession limit permit. This open access permit allows the vessel to land a limited amount of Northeast multispecies caught while fishing for scallops. Should such a scallop vessel acquire a limited access multispecies permit, the multispecies landings history from the open access permit does not transfer to the acquired limited access permit. As long as only limited access multispecies permits are eligible for membership in sectors, and potential sector contributions in the multispecies fishery are based wholly or in part on landings history, when a vessel obtains both a scallop and limited access multispecies permit only multispecies landings history acquired from the limited access multispecies permit is considered when calculating potential sector share contributions.

Rationale: Fishing vessels represent a substantial capital investment. In both the scallop and multispecies fisheries, conservation controls limit the efficient use of these resources. If the current restriction that prevents a vessel owner from having a limited access groundfish permit and a limited access scallop permit on the same vessel is lifted, vessel owner's will be able to increase the return on their investments by participating in both fisheries. This will also provide vessel owner increased flexibility to conduct fishing operations in a profitable way, moving between the two fisheries as opportunities develop.

The reason that only the multispecies landing history can be used to calculate the combined permit's potential sector contribution is that only these landings are used in the initial, one-time calculation of PSC for the fishery. If open access landings by the scallop permit were added, then each time permits from the two fisheries were combined the potential sector contribution for all permits would need to be recalculated. Note that a permit known as a combination multispecies permit, issued to a small number of scallop dredge vessels, is considered a limited access multispecies permit and could contribute landings history to a vessel's potential sector contribution.

4.2.10 Catch History

With the adoption of this action, no vessel, permit, sector, or component (commercial, private recreational, party/charter, etc.) of the fishery will accrue groundfish catch history as a result of fishing activity that takes place after implementation of the amendment. While the Council recognizes that in the future the Council may overturn this measure, this will require an explicit action.

Rationale: With the adoption of the PSC alternatives for commercial groundfish sectors, accountability measures, and recreational/commercial allocations, there is a desire to "freeze"catch history. This is considered important to facilitate the transfer of ACE within and between sectors. In addition, it is viewed as a desirable step should the impacts of the adopted AMs prove unequal for different components of the fishery. Adopting this measure is problematic because it is always possible a future Council may overturn it. Nevertheless, the Council believes it important to explicitly make this statement and force any future Council to carefully consider any decision to modify this policy. It is the Council's intent that catch history for all groundfish fishing vessels (including both the recreational and commercial components of the fishery) is essentially frozen at implementation of Amendment 16. This measure was not considered in the draft document but was adopted in response to comments received. This measure only applies to catch history and does not change the treatment of DAS history for leased DAS that was adopted in Amendment 13.

4.3 Measures to Meet Mortality Objectives

4.3.1 Introduction

4.3.2 Commercial Fishery Measures

In this Proposed Action, measures in existence in FY 2008 continue unless changed by this action.

4.3.2.1 Non-sector Vessels Option 3A – 24 hour clock, Restricted Gear Areas

This action eliminates differential DAS counting areas, reduces Category A DAS by 50 percent from the FW 42 allocations, and counts all DAS in 24-hour increments (i.e. 6 hours is counted as one DAS, 25 hours is counted as two DAS, etc.). The category A/Category B DAS split that results is 27.5%/72.5% from each permit's Amendment 13 baseline. Most other current measures remain, including seasonal and rolling closures and gear requirements.

Impact on Monkfish Category C and D vessels: Vessels with monkfish Category C and D permits are generally required to use a groundfish DAS when using a monkfish DAS. The groundfish DAS will be counted at full 24-hour DAS rate as described in this section. As a result, the vessel's groundfish DAS may be used before the vessel uses all of its monkfish DAS. Once the groundfish allocation is used the vessel cannot use its monkfish DAS. If a vessel's groundfish DAS allocation is less than its monkfish DAS allocation the vessel is given monkfish only DAS in the amount equivalent to that vessel's annual monkfish allocation minus its annual allocation of NE multispecies. This provision does not apply to different DAS counting rates – using the groundfish DAS at a higher rate than the monkfish DAS does not entitle the vessel to additional monkfish only DAS. Using groundfish DAS in 24-hour increments does not, at present, entitle a vessel to use monkfish-only DAS.

The following trip limits would be implemented for fishing on a Category A DAS. All other trip limits while fishing on a Category A DAS would be eliminated. This measure does not change the authority of the Regional Administrator to impose trip limits as necessary under the provisions implementing the U.S./Canada Resource Sharing Understanding. Under those regulations, the Regional Administrator specifies the trip limit for GB yellowtail flounder. In all cases, only one landing limit can be landed in any twenty-four hour period. If a vessel fishes in more than one area, the most restrictive trip limit for a species applies for the entire trip.

Cod: 2,000 lbs./DAS; maximum 12,000 lbs/trip in GOM, 20,000 lbs/trip GB; with the exception of the Eastern U.S./Canada area, where the Regional Administrator will specify the appropriate trip limit at the beginning of the fishing year (the default trip limit for this area remains 500 lbs./DAS, up to a maximum of 5,000 lbs./trip).

Handgear A Permits (HA Permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for cod is increased to 750 lbs./trip. The automatic adjustment mechanism is retained.

Handgear B Permits (HB permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for GOM cod is increased to 200 lbs./trip. The automatic adjustment mechanism is retained.

CC/GOM Yellowtail flounder: 250 lbs./ DAS up to a maximum of 1,500 lbs./trip

SNE/MA Yellowtail flounder: 250 lbs./ DAS up to a maximum of 1,500 lbs./trip

SNE/MA Winter Flounder: Landing of this stock is prohibited in any fishery.

Windowpane Flounder: Landing of this species is prohibited in any fishery.

Ocean Pout: Landing of this species is prohibited in any fishery.

Atlantic halibut: One fish per trip

Atlantic wolffish: Landing of this species is prohibited in all fisheries (see section 4.3.5).

Restricted Gear Areas: Two restricted gear areas are established. Vessels fishing under a groundfish DAS are required to comply with the gear requirements for these areas.

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:

Trawl Gear: Trawl vessels 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.

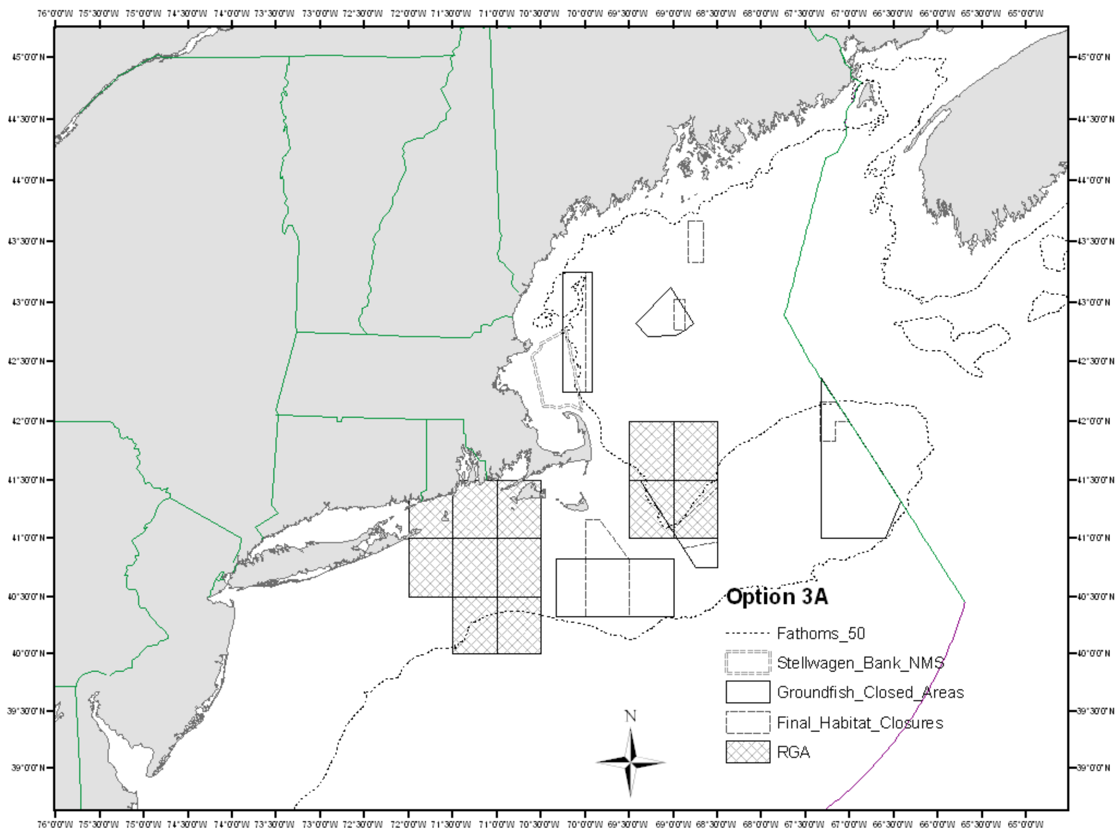
Rope trawl: The design includes a four-panel structure to increase headline height and large mesh in the front part of the trawl. The separator panel is made from a series of parallel ropes of different lengths. The panel is one-third from the fishing line in the vertical plane. There is a large escape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

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

Longline/tub trawls

Handgear

Figure 4 – Option 3A, 24-hour clock, restricted gear areas



4.3.2.2 GOM Haddock Sink Gillnet Pilot Program

To facilitate the targeting of haddock in the GOM by sink gillnet vessels, a pilot program is authorized with the following requirements and restrictions. This was Option 2 in the draft amendment.

<u>Location</u>: Gulf of Maine regulated mesh area

<u>Gear</u>: Six inch gillnets. A day gillnet vessel participating in this program cannot fish with, possess, haul, or deploy more than thirty nets. There are no limits on the number of nets for trip gillnet vessels. All nets must be stand-up nets - tie-down nets cannot be used during this period if a vessel has notified NMFS of its intent to participate.

<u>Season</u>: January 1 – April 30 (subject to any rolling or seasonal closures in effect).

<u>Effort controls</u>: All vessels notifying NMFS of their intent to participate must use Category A DAS for any fishing trip during the period January 1 through April 30, regardless of whether catch is landed or not.

Notification requirements:

(1) Participating vessels must annually notify the NMFS by October 1 of the intent to participate in this program.

(2) Vessels notifying NMFS will receive a letter of authorization and must have that letter on board during the period.

(3) Vessels advising NMFS of their intent to participate in the program must notify the observer program at least 72 hours before any sink gillnet trip during the period January 1 – April 30.

Duration: This program will be in place for FY 2010 through FY 2012. The Regional Administrator can suspend participation in the program by individual vessels, or by all vessels, if the program is determined to be inconsistent with the goals and objectives of the management plan.

Rationale: Recent gillnet selectivity studies suggest that six and a half inch sink gillnets retain few haddock. This program is a limited, strictly controlled program to determine if a smaller minimum mesh size for sink gillnets will enable these vessels to target haddock, allowing them to become more diverse in their catches while not having a negative impact on other stocks.

There have been suggestions that this program is analogous to a SAP and an experiment should be conducted prior to its authorization. These arguments raise the concern that there isn't evidence that haddock can be selectively targeted and this program will increase catches of cod and/or pollock. The arguments further suggest that the program should be supported by appropriate research. First, the Council notes that vessels in this pilot program must use Category A DAS; it is thus not akin to SAPs that result in an increase of effort because they authorize the use of Category B DAS. In addition, vessels must use a smaller number of nets than are authorized outside the program and are subject to the GOM cod trip limits, making it less likely that the program will increase cod and pollock catches. Analyses in this document show that there isn't evidence that cod or pollock catch rates will increase significantly as a result of this program. Second, there are no regulatory provisions that require the conduct of an experiment prior to a management change implemented by the Council through a management action. In addition, there are no Council policies that require research prior to the adoption of gear through a management action. The Council does have a policy for approval of additional gear in the Category B regular DAS program and SAPs through an administrative change, and does have a policy for approval of cooperative research, but neither policy constrains the Council from implementing management changes through a management action.

4.3.2.3 Haddock Minimum Size

The minimum size for haddock (both GOM and GB) is changed to 18 inches. This measure applies to commercial groundfish vessels. This was Option 2 in the draft amendment.

Rationale: This measure is intended to reduce discards and increase landings of the rebuilt haddock stocks. As proposed it does not apply to recreational vessels but this may change if recreational vessels can increase their mortality on all haddock stocks.

4.3.3 Recreational Fishery Measures

4.3.3.1 Provisions for Landing Fillets

Option 2 from the draft amendment is adopted as modified. Recreational (including party/charter) fishermen will be allowed to land fillets. All landed species must have at least two square inches of skin are on the fillet. The skin must be contiguous and must allow ready identification of the fish species. Fillets must be from legal sized fish. For enforcing bag limit restrictions, the number of fillets will be converted to whole fish at the place of landing by dividing the fillet number by two. If fish are filleted into single (butterfly) fillets, each fillet is deemed to be from one whole fish.

In the draft amendment, this requirement only applied to stocks with a recreational and commercial allocation, and the fillets had to be of legal size. These elements were changed for this action in response to comments.

Rationale: Many recreational fishermen prefer to land fish in fillets, particularly on party/charter vessels where skinning of fish is provided as a service to the customer. The second option addresses the concerns of enforcement agents that they will not be able to enforce size limits if skin is removed because the species will not be identifiable.

4.3.3.2 Removal of the Limit on Hooks

Option 2 from the draft amendment is adopted. Recreational (including party/charter) fishermen are not limited to two hooks per line. Fishermen continue to be limited to one line per angler.

Rationale: Amendment 7 restricted recreational groundfish fishermen to two hooks per line and one line per angler as an effort reduction measure. This restriction does not exist in other recreational fisheries. As cod rebuild, some of these fisheries are catching small amounts of cod when using multiple hooks. These fish must either be discarded or retained illegally. This revision recognizes the reality that these incidents are likely to increase as cod rebuild and it serves little purpose to require discarding of cod.

4.3.3.3 Measures to Reduce Mortality

The primary groundfish species caught by recreational fishermen are winter flounder, cod, haddock, and pollock. Most winter flounder is caught within state waters and the Council cannot specify management measures for these catches as they are outside Council jurisdiction. The stocks where recreational catches are a substantial part of the harvest are GOM cod and GOM haddock. Whether a reduction in fishing mortality from recreational fishing is a function of two factors: the overall fishing mortality (and if it needs to be reduced to achieve mortality targets) and the division of the stocks into a commercial and recreational allocation.

If both the commercial and recreational components are catching their share of the allocation, then each component of the fishery would have to contribute an equivalent mortality reduction if one is required. If one component is exceeding its share it would need to contribute a larger reduction.

For the allocation option selected by the Council in section 4.2.5 and the mortality changes needed for GOM cod and GOM haddock, the necessary mortality reductions for the recreational fishery are shown in Table 23. The numbers in this table differ from those in the draft amendment because by adopting the revised ABC control rules (see section 4.1.2) the Council changed the needed mortality reduction for GOM cod.

Table 23 – Impacts of recreational/commercial allocation options on mortality reductions needed for the recreational components of the groundfish fishery.

Stock	Overall Needed Reduction	Allocation Years 2001-2006 Rec.
GOM cod	-40%	-25%
GOM haddock	NA	Increase

4.3.3.3.1 GOM Cod

Option 3: Landing of GOM cod is prohibited from November 1 through April 15. There is no change to the minimum size or bag limit.

Rationale: This measure modifies the recreational measures to meet mortality objectives.

4.3.3.3.2 Haddock

The minimum size for both GOM and GB haddock is reduced to 18 inches.

Rationale: This measure modifies the minimum size for haddock so that it is consistent with the change for the commercial fishery. It also provides increased recreational access to the rebuilt haddock resource. In the draft amendment this measure was incorrectly proposed only for GOM haddock, but the Council corrected this error when making its final decision.

4.3.4 Atlantic Halibut Minimum Size

The minimum size for Atlantic halibut is increased to 41 inches (104.1 cm.), total length. This measure applies to all groundfish vessels (commercial, recreational (private, party, and charter). This adopts Option 2 from the draft amendment.

Rationale: This increase in the minimum size matches the median length at maturity for female halibut in the Gulf of Maine. This change should slightly increase opportunities for additional halibut to spawn prior to capture.

4.3.5 Prohibition on Retention of Atlantic Wolffish

This action adopts Option 2 from the draft amendment. Atlantic wolffish cannot be retained, landed, or sold by any vessel, including all commercial vessels and all recreational (private, party, and charter) vessels. All Atlantic wolffish caught by any gear must be returned to the sea unharmed as quickly as possible.

Rationale: Canadian studies suggest that Atlantic wolffish have relatively high survival rates if returned to the sea after capture in trawl gear. This measure uses this fact to reduce fishing mortality on this species.

4.3.6 Implementation of Additional Sectors/Modifications to Existing Sectors

The following list summarizes the new sector applications, and request for modifications to existing sectors, that were received for inclusion in Amendment 16. The Council has determined that if approved new sectors will begin operating in FY 2010. This is to allow more time for sector organizers and NMFS to prepare for their implementation. Subsequently, the implementation of each sector is analyzed in separate Environmental Assessments that tier from this FEIS.

When submitted, most applications were based on the existing sector regulations that were adopted by Amendment 13. Since several Council policies may revise those regulations, some of the applications may be modified. This list does not include all exemptions requested by the sectors, but just those that are not consistent with existing or proposed sector policies that await approval by NMFS. As an example, some sectors have asked to be allowed to trade ACE. Since this is being considered as a policy for all groundfish sectors, that request is not listed in this section. Almost all sectors asked for allocations of specific groundfish stocks, but the revised Council sector policy will require these sectors to receive an allocation of all stocks caught. Most sectors submitted documents to the Council incorporating the proposed sector policies.

Should the Council not adopt the proposed policies (such as trading of ACE, universal exemptions, etc.), the final amendment may need to be modified to reflect individual sector requests. Presumably a sector could still request an exemption from NMFS without Council action unless it is specifically prohibited.

Several sectors have asked for allocations of stocks not managed by this FMP. Since these requests cannot be granted until other FMPs adopt sectors, they are not addressed here and are not listed.

Several sectors asked that their sector names and description be modified from the draft amendment text. These changes were approved by the Council and have been incorporated below.

4.3.6.1 Modifications to the Georges Bank Cod Hook Sector

The existing sector is proposed to be modified as follows:

- The sector would receive an allocation of all regulated groundfish stocks that are allocated to sectors (i.e. not just GB cod).
- Fishing would be allowed in all stock areas.
- Requested exemptions will be consistent with existing or proposed sector policies.

4.3.6.2 Modifications to the Fixed Gear Sector

The existing sector is proposed to be modified as follows:

- The sector would receive an allocation of all regulated groundfish stocks that are allocated to sectors (i.e. not just GB cod).
- Fishing would be allowed in all stock areas.
- Requested exemptions will be consistent with existing or proposed sector policies.

4.3.6.3 Sustainable Harvest Sector

This sector will be comprised of more than 70 permit holders that will fish in all three stock areas Gulf of Maine, Georges Bank and Southern New England, using trawl, gillnet and longline fishing gear.

Primary Hailing Ports: Cundy's Harbor ME, Portland, ME, Portsmouth, NH, Boston, MA, Gloucester, MA, New Bedford, MA, Newport, RI
Primary unloading ports: Cundy's Harbor ME, Portland, ME, Portsmouth, NH, Boston, MA, Gloucester, MA, New Bedford, MA, Newport, RI
(Other unloading ports may be named in the operations plan.)
Primary Gear: otter trawl, gillnets, longlines
Primary fishing areas: Gulf of Maine, Georges Bank, Southern New England
Estimated sector ACE share: may exceed 20% on several stocks depending on allocation method chosen
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16

4.3.6.4 Port Clyde Community Groundfish Sector

The Port Clyde Draggermen's Co-Op and the Midcoast Fishermen's Association propose a community-based sector, with membership of more than ten vessels expected. The sector initially requested allocations for GOM stocks, suggesting that the intended operating area is statistical areas 511, 512, 513, 514 and 515, but the sector may operate in any area. Members will primarily use trawl gear but will be allowed to use other legal gear (gillnets and longlines). All exemptions requested are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Port Clyde, ME, Cape Porpoise/Saco, ME, Cundy's Harbor, ME, Portland, ME, Monhegan, ME, Boothbay Harbor, ME, and Phippsburg, ME
P**rimary unloading ports anticipated**: Port Clyde, ME, Cape Porpoise/Saco, ME, Cundy's Harbor, ME, Portland, ME, Monhegan, ME, Boothbay Harbor, ME, and Phippsburg, ME
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: Any gear allowed by regulations
Potential secondary gear: Any gear allowed by regulations
Primary fishing areas: Gulf of Maine
Potential other fishing areas: Georges Bank, Southern New England
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16

4.3.6.5 Northeast Fishery Sector I

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.6 Northeast Fishery Sector II

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.7 Northeast Fishery Sector III

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)

Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.8 Northeast Fishery Sector IV

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.9 Northeast Fishery Sector V

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.10 Northeast Fishery Sector VI

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.11 Northeast Fishery Sector VII

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.12 Northeast Fishery Sector VIII

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Primary unloading ports anticipated: To be designated in the operations plan.

Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.13 Northeast Fishery Sector IX

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.14 Northeast Fishery Sector X

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.15 Northeast Fishery Sector XI

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.16 Northeast Fishery Sector XII

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
Pr**imary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.17 Tri-State Sector

Working with the Cape Cod Commercial Hook Sector, this sector will be formed to operate in all management areas using all legal gear (trawl, gillnet, hook). In addition to exemptions that are consistent with current or proposed policies, the sector asks for exemptions from the following regulations.

4.3.6.18 Northeast Fishery Sector XIII

Working with the Northeast Seafood Coalition, this sector will consist of multiple permits qualified to enroll in a sector. There would be no limit to the number of permits that could be enrolled in the sector (unless the Council implements a cap on ACE). There are no internal limits on membership, but it is expected the sector will consist of 12 to 35 active vessels fishing on the ACE in any given fishing year. The sector will list all permits and identify active vessels in the annual operations plan. This sector will operate within a network of thirteen sectors for the purpose of achieving economy of scale for management, monitoring, database, trading and other services to improve compatibility between the individual sector operations.

Primary hailing ports anticipated: To be designated in the operations plan.
P**rimary unloading ports anticipated**: To be designated in the operations plan.
Gear: Primary and secondary gear will be described in the operations plan.
Primary fishing areas: Intended fishing areas will be described in the operations plan.
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All allocated regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16.

4.3.6.19 Northeast Coastal Communities Sector

A sector is proposed based in Martha's Vineyard and other coastal communities. This sector will take into account the unique situation of the Vineyard and smaller coastal communities geographically and philosophically. This sector hopes to cooperate with other sectors, and the NEFMC and NMFS, to maintain a fishery on Martha's Vineyard and other communities.

Primary hailing ports anticipated: Menemsha, MA, Vineyard Haven, MA, Edgartown, MA, and Oak Bluffs, MA.
P**rimary unloading ports anticipated**: Menemsha, MA, Vineyard Haven, MA, Edgartown, MA, and Oak Bluffs, MA.
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: hand gear otter trawl
Potential secondary gear as needed based on future management changes and SAPS, and final sector roster: otter trawl, and any other gear allowed by regulations
Primary fishing areas: Georges Bank, Southern New England
Potential other fishing areas: Gulf of Maine
Estimated sector ACE share: 0-20% (but may exceed 20% subject to elimination of the 20% cap)
Stocks: All regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder, SNE/MA winter flounder, and Atlantic wolffish) as proposed by Amendment 16. Development quota depending on allocation chosen by the NEFMC (no such scheme is included in this action and adoption will take a future action). Martha's Vineyard reserves the right to apply for a Community Development Quota. Aquinnah/Wampanoag Tribe issues to be resolved later.

Requested exemptions are consistent with existing or proposed sector policies. ACE trading between sectors will be as set forth in A16.

4.3.7 Accountability Measures

The SFA revisions to the Magnuson-Steven Act imposed the following required element for FMPs:

> [FMPs must] "establish a mechanism for specifying annual catch limits in the plan (including a multi-year plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability." (16 USC 1853(a)(15))

Provisions for implementing annual catch limits (ACLs) are proposed in section 4.2.1. This section implements accountability measures (AMs).

The National Standard Guidelines were revised to provide advisory guidance (that does not have the effect or force of law) for the implementation of these requirements (50CFR 600.310(g)). Some of the provisions of this guidance include:

- AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur.
- AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overages in as short a time as possible.
- AMs can be either in season AMs or AMs for when the ACL is exceeded.

NMFS acknowledged in the publication of the guidelines that there is no requirement that AMs and ACLs be implemented as hard TACs or quotas, but conservation and management measures must be implemented so that the ACL is not exceeded and AMs must apply if the ACL is exceeded (74 FR 3184). While many measures in the management program are intended to control fishing mortality and might be interpreted to be AMs since they are "management controls to prevent the ACL from being exceeded," the term AM is usually applied to specific, automatic measures that are implemented either as an ACL is approached or after an ACL is exceeded.

With respect to in-season AMs, the guidelines suggest that whenever possible these should be included in FMPs. This action adopts several types of in-season AMs. Beginning in FY 2012, common pool vessels will be subject to a hard TAC AM. This measure (section 4.3.7.1.2) for common pool commercial vessels overlays a hard TAC system that includes closures of areas as in-season TACs are approached and deductions of overages from the following period. The sector program includes in-season AMs in that sectors must stop fishing in a stock area if they have harvested the entire ACE for that stock (section 4.2.3.4). Sector provisions also include an overage deduction in the following fishing year. While not identified in this section, existing provisions implementing the U.S./Canada Resource Sharing Understanding could be considered in-season AMs for GB yellowtail flounder and portions of GB cod and haddock: adjustments are made to management measures (such as trip limits or gear requirements) as the TAC is approached, areas are closed when a TAC is caught, and any overages are deducted from the TAC in the subsequent fishing year.

The AM proposed for common-pool vessels in FY 2010 and FY 2011 is an AM for when the ACL is exceeded (4.3.7.1.1). This alternative is designed to estimate the catch before the end of the fishing year so that adjustments can be made at the start of the subsequent fishing year. The goal of these adjustments is to end overfishing, as required by the M-S Act. Similarly, the AM options being considered for recreational vessels are implemented after an ACL is exceeded (4.3.7.2).

When AMs are established for other fisheries (e.g. the scallop fishery) in order to end overfishing on a groundfish ACL, the AMs may be adopted or revised in either a groundfish management action or a management action for that fishery. While this action will specify the process for accountability measures, they will be implemented as required by the M-S Act: that is, FY 2010 for fisheries determined to be subject to overfishing and FY 2011 for all other fisheries.

4.3.7.1 Commercial Groundfish Fishing Vessel Accountability Measures

4.3.7.1.1 Common Pool Vessels Accountability Measure – Differential DAS/DAS Adjustment

This accountability measure will apply to commercial groundfish vessels that do not fish in sectors in FY 2010 and FY 2011. Since the proposed AM modifies DAS in the year following a given fishing year, if ACLs are projected to be exceeded in FY 2010 or FY 2011 then DAS will be adjusted at the beginning of FY 2011 and FY 2012. No further DAS adjustments as a result of this AM are expected after FY 2012, since the hard TAC AM (see section 4.3.7.1.2) takes effect in that year.

In February, with available catch data, NMFS will estimate whether the ACLs will be exceeded for the year. If so, NMFS will adjust DAS counting for the following fishing year based on whether the ACLs will be exceeded or not. If an ACL for any stock is exceeded, NMFS will calculate the differential DAS rate change needed to prevent the ACL for that stock from being exceeded the following year. Since every ACL is evaluated, unless the mixed-stock exception is invoked as discussed below, this approach means that in a given area the differential DAS rate applied will be the most onerous rate determined. If this calculation results in similar changes needed in all areas, NMFS will revise the Category A/Category B DAS split to account for the change.

If in a given area catches of all stocks are at least ten percent less than the groundfish ACL, NMFS will apply differential DAS to reduce the rate DAS are counted in order to allow harvests in a subsequent year to attain the ACL. If similar changes are needed in all areas, NMFS will revise the Category A/Category B DAS split rather than apply area specific differential DAS changes. The first such change will be effective in FY 2011, based on the implementation of ACLs in FY 2010.

Differential DAS changes will apply to the areas where specific stocks are caught. In the draft amendment document, the areas were based on 30-minute squares as shown in Table 24. The draft amendment noted that the differential DAS areas could be modified in order to avoid a patchwork of DAS counting areas. Subsequent to the selection of final management measures, it became clear that the differential DAS AM regulations could be simplified and effectiveness of the AM could be improved by using areas similar to the broad reporting areas adopted in section 4.2.4.1. Since NMFS could make this change under the authority granted by the amendment, the revised differential DAS areas are included here. Figure 5 illustrates the revised areas and

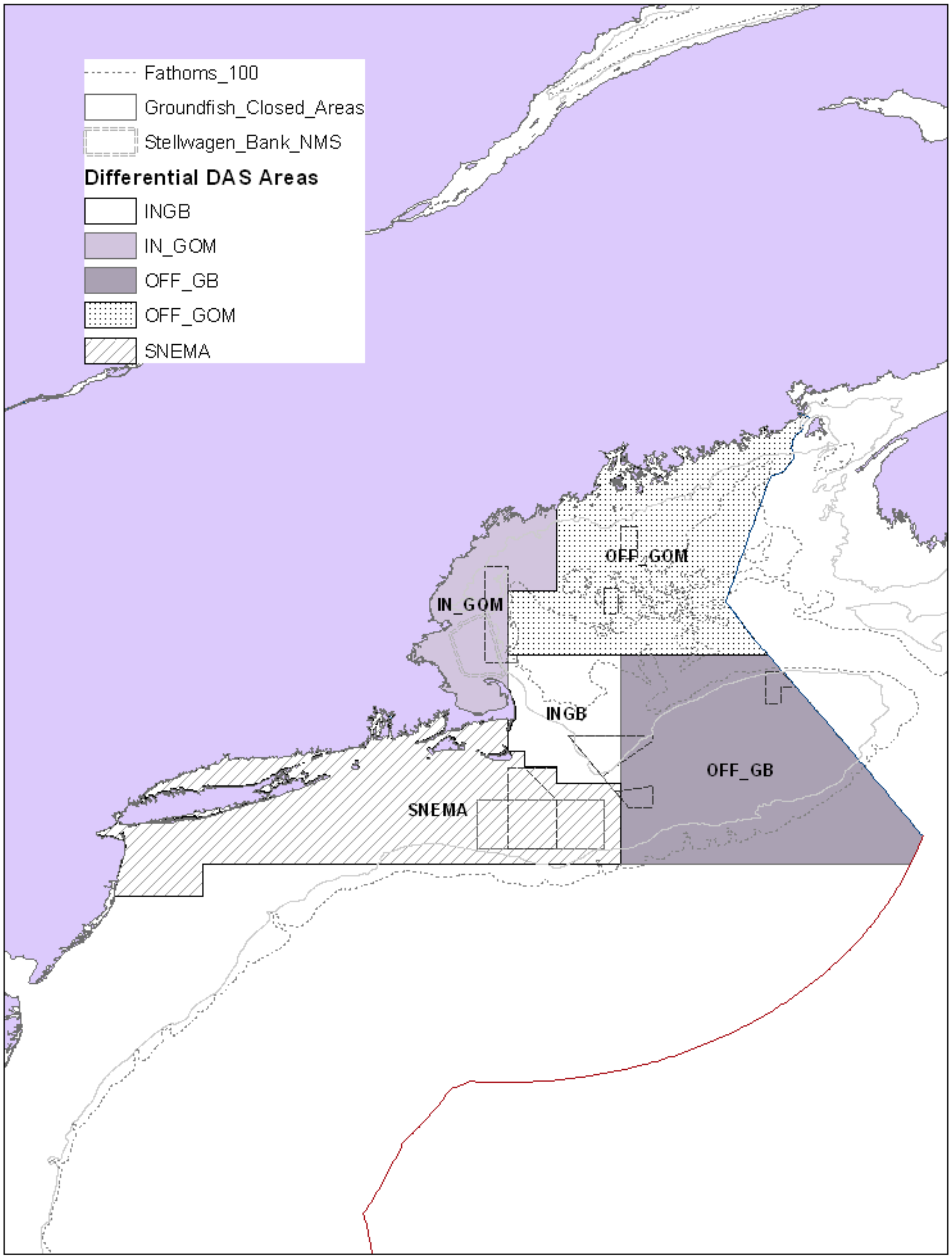
Table 25 describes how differential rates for a specific stock will be applied to an area. The coordinates for the GOM areas (inshore and offshore combined), offshore GOM area, and inshore GB area are the same as for the reporting areas in section 4.2.4.1. The coordinates for the differential DAS areas are listed below Figure 5. The two GOM areas differ from the single GOM reporting area, but were adopted to more effectively implement this AM.

The adjustments to DAS counting will be based on Table 26. This table shows the differential DAS adjustment necessary for different levels of catch in order to prevent overfishing. Once NMFS evaluates the catch for every stock, the DAS adjustment required will be based on these tables. Because the adjustment is formulaic, it will be implemented as a final rule. The necessary adjustments will be based on the proportion of ACL caught rounded up to the nearest even tenth: for example, if catch is 1.55 times the ACL, then the differential DAS adjustment is 1.6. When determining any change in differential DAS counting, an analysis will be done to determine if the mixed stock exception is applicable and if so the mixed stock exception will be applied.

Table 24 – Draft amendment document stocks and areas for differential DAS AM adjustment

Area	Stocks	Areas Included (depends on final measures)
Inshore GOM	GOM Cod GOM Haddock CC/GOM yellowtail GOM winter flounder GOM/GB windowpane flounder	114-116,123-125,132,133,138-140
Offshore GOM	White Hake Pollock Redfish Witch Plaice Halibut	98,99,112,113,118-122, 126-131,134-137,141-143,148-150,154,155
Offshore GB	GB cod GB haddock GB yellowtail (see note) GB winter flounder	75-79, 92-97,108-111
SNE/MA	SNE/MA winter flounder SNE/MA yellowtail flounder SNE/MAB windowpane flounder	64-73, 80-90,100-106

Figure 5 – Proposed areas for differential DAS AM



Inshore GOM Differential DAS Area

Point	N. Latitude	W. Longitude
INGOM1	([1])	69° 30'
INGOM2	43° 00'	69° 30'
INGOM3	43° 00'	70° 00'
INGOM4	([2])	70° 00'

([1]) Intersection with ME shoreline
(2) North-facing shoreline of Cape Cod, MA

Offshore GOM Differential DAS Area

Point	N. Latitude	W. Longitude
CII3	42° 22'	67° 20'
OFFGOM1	42° 20'	67° 20'
OFFGOM2	42° 20'	70° 00'
OFFGOM5	43° 00'	70° 00'
INGOM2	43° 00'	69° 30'
INGOM1	([1])	69° 30'

([1]) Intersection with ME shoreline

Inshore GB Differential DAS Area

Point	Latitude	Longitude
G9	42° 00' N.	([1])
G10	42° 20' N.	70° 00' W.
IGB1	42° 20' N.	68° 50' W.
IGB2	41° 00' N.	68° 50' W.
IGB3	41° 00' N.	69° 30' W.
IGB4	41° 10' N.	69° 30' W.
IGB5	41° 10' N.	69° 50' W.
IGB6	41° 20' N.	69° 50' W.
IGB7	41° 20' N.	70° 00' W.
G12	([2])	70° 00' W.

[1]The intersection of the Cape Cod, MA, coastline and 70° 00' W. longitude.

[2]South-facing shoreline of Cape Cod, MA.

Offshore GB Differential DAS Area

Point	N. Latitude	W. Longitude
IGB1	42° 20’	68° 50’
OGB1	42° 20’	67° 20’
CII3	42° 22’	67° 20’
SNE1	40° 27’	65° 43’
OGB2	40° 10’	([1])
OGB3	40° 10’	68° 50’
IGB1	42° 20’	68° 50’

[1]The U.S./Canada Maritime Boundary as it intersects with the EEZ.

SNE/MA Differential DAS Area

Point	N. Latitude	W. Longitude
G12	([1])	70° 00’
IGB7	41° 20’	70° 00’
IGB6	41° 20’	69° 50’
IGB5	41° 10’	69° 50’
IGB4	41° 10’	69° 30’
IGB3	41° 00’	69° 30’
IGB2	41° 00’	68° 50’
SNEDA1	40° 10’	68° 50’
SNEDA2	40° 10’	73° 10’
SNEDA3	39° 50’	73° 10’
SNEDA4	39° 50’	([2])

[1]South-facing shoreline of Cape Cod, MA.

[2]East-facing shoreline of New Jersey.

Table 25 – Proposed stock/area combinations for application of differential DAS AM

Stock	Areas
Witch Flounder	OFFGOM, INGB, OFFGB
Plaice	OFFGOM. INGB, OFFGB
White Hake	INGOM, INGB, OFFGOM
Halibut	INGB, OFFGB, OFFGOM
Redfish	INGB, OFFGOM
Pout	SNE
Pollock	INGOM, INGB, OFFGOM
Atlantic wolffish	INGOM, INGB
GOM Cod	INGOM
GOM Haddock	INGOM, OFFGOM
GOM WFL	INGOM
CC/GOM Yellowtail Flounder	INGOM, INGB
GOM/GB Windowpane	OFFGB
GB Cod	INGB, OFFGB
GB Haddock	INGB, OFFGB
GB Yellowtail Flounder	OFFGB
GB Winter Flounder	OFGGB
SNE/MA Winter Flounder	INGB, SNE
SNE/MA Yellowtail Flounder	SNE
SNE Windowpane	SNE

Table 26 – Differential DAS AM factor

Proportion of ACL Caught	Differential DAS Factor
0.5	0.5
0.6	0.6
0.7	0.7
0.8	0.8
0.9	No Change
1.0	No Change
1.1	1.1
1.2	1.2
1.3	1.3
1.4	1.4
1.5	1.5
1.6	1.6
1.7	1.7
1.8	1.8
1.9	1.9
2.0	2.0

Rationale: The use of a differential DAS adjustment as an AM shown is based on the concept that if stock size is known a change in catch results in a proportional change in exploitation. For the strengths and weaknesses of this assumption, see the analysis of the impacts of this measure (section 7.2.1.3.6). The areas proposed are the same as the areas for the broad reporting areas, simplifying administration and matching the differential DAS areas with stock boundaries. The stock/area combinations are designed to apply the AM (if needed) to the area where most of a stock's catch is harvested.

4.3.7.1.2 Common Pool Vessels Accountability Measures – "Hard" Total Allowable Catch (TAC)

This accountability measure will apply to commercial groundfish vessels that do not fish in sectors in FY 2012 and beyond.

This action adopts a "hard" TAC backstop for common pool vessels in the commercial groundfish fishery as the AM to ensure that overfishing does not occur. AMs are typically thought of as a specific measure that controls fishing effort or catches as a result of exceeding, or to prevent exceeding, an ACL. For example, one AM could be closing the fishery if catches reach a certain level. In this case most consider the closure the AM and the specification of the ACL and other measures used to control catches before the ACL is reached as separate measures. As described in this action, the overlay of a hard TAC backstop is an AM **system** rather than one specific measure. While this same approach could be used as a stand-alone management alternative, it is proposed here as an overlay to the effort control measures described in section 4.3.2.1. Under this measure, most commercial groundfish fishing by common pool vessels ceases in a stock area when it is projected that the TAC of a stock will be caught. This accountability measure does not apply to recreational groundfish fishing, commercial groundfish fishing within sectors, or incidental catches of groundfish in other fisheries (e.g. yellowtail flounder in the scallop dredge fishery).

Affected Stocks

TACs/ACLs will be determined for all stocks in the multispecies FMP. TACs/ACLs will be specified and monitored for the commercial fishery. If enough information is available, TACs/ACLS for a species will be based on total commercial removals: commercial landings and discards. This requires sufficient information to adequately estimate and monitor discards. While for some stocks such information is already available and is included in stock assessments, for other stocks it is not. When discards cannot be accurately estimated, then the TAC/ACL is specified for and based on landings. Some measures (see sections 4.3.2.1 and 4.3.5) in this action identify stocks that cannot be landed. If possession of a species or stock is prohibited then the TAC/ACL for that stock or species will not be monitored on a real-time basis for the purposes of closing the fishery. The following discussion however includes information on all species and stocks since future management actions may allow landing these species.

There will be a separate TAC/ACL for each of the stocks managed under the multispecies plan. Each TAC/ACL will be determined based on stock status and will be calculated according to the periodic adjustment schedule adopted in Amendment 13 (i.e. every two years).

Target (Trimester) TACs

For each stock, the total annual TAC will be apportioned to trimesters. Each trimester will be four months in duration. The trimesters will be divided as follows:

1st trimester: May 1-August 31
2nd trimester: September 1-December 31
3rd trimester: January 1-April 30

The target TACs, or percentages of total TAC allocated to each trimester, are shown in Table 27. The initial distribution was developed by the Council after taking into account the influence of regulatory changes on recent landings patterns. Subsequent calculations will use the most recent five year periods available when the calculations are performed. For other stocks, the distribution of landings has been heavily influenced by management measures and the distribution shown in the table represents a preferred distribution of landings.

The trimester TAC distribution for Atlantic wolffish was not included in the draft amendment and is added here since this stock was added to the management unit.

Table 27 – Initial apportionment of common pool TAC to trimesters

Stock	Trimester 1	Trimester 2	Trimester3
GOM Cod	27%	36%	37%
GB Cod	25%	37%	38%
GOM Haddock	27%	26%	47%
GB Haddock	27%	33%	40%
CC/GOM Yellowtail	35%	35%	30%
GB Yellowtail	19%	30%	52%
SNE/MA Yellowtail	21%	37%	42%
GOM Winter	37%	38%	25%
GB Winter	8%	24%	69%
SNE/MA Winter	36%	50%	14%
Witch Flounder	27%	31%	42%
Plaice	24%	36%	40%
Pollock	28%	35%	37%
Redfish	25%	31%	44%
White Hake	38%	31%	31%
N. Windowpane			
S. Windowpane			
Ocean Pout			
Halibut			
Atlantic wolffish	75%	13%	12%

Setting the TAC/ACL and TAC/ACL Adjustment

The TACs/ACLs will be reviewed on a biennial basis as part of the periodic adjustment process adopted by Amendment 13. TACs will be determined and set for each of the next two years. The TAC/ACL set each year will either be altered from the previous year's TAC/ACL based on a review process or renewed unchanged. If the Council does not recommend a change to a TAC/ACL, there is no requirement for submission of a Council document or a new NEPA document.

For the purposes of determining this TAC/ACL, the basic process is outlined as:

- The Annual Catch Limit (ACL) for the stock is determined.

- The catch available to the groundfish fishery is determined by subtracting the catch for other fisheries from the ACL and the amount reserved for a research set-aside (should one be adopted in a future action).
- The catch available to the commercial and recreational groundfish fishery is determined based on the percentage of each stock allocated to each.
- The catch available to common pool vessels is determined by subtracting the catch available to the commercial groundfish sectors.

Measures to ensure the TACs/ACLs are not exceeded

Stock Area Closures
In any trimester, when it is projected that ninety percent of the TAC/ACL for a stock will be caught, NMFS will close the area where the stock is caught to all groundfish fishing using gear capable of catching that species (see below for an exception to this requirement). Gear used to catch other species will still be allowed to fish in the area. As an example, if an area is closed to stop the catch of yellowtail flounder, groundfish fishing by common pool vessels using hook gear may still be allowed in the area since they catch little yellowtail flounder. The area closed will be based on the area that accounted for ninety percent of the reported (VTR) landings in prior years. Areas that will be closed for each stock are shown in Table 29. These areas are based on statistical areas where ninety percent of the catch was taken in recent years. The Regional Administrator is authorized to expand or narrow the areas closed based on additional information. For example, some stocks are found in a narrow depth range and it may be possible to use this information to limit the area that must be closed. Other stocks may expand their range as they rebuild, and larger areas may be needed to prevent exceeding the TAC. Because this action incorporates Atlantic wolffish into the management unit, Table 29 has been modified from the table shown in the draft amendment to include the statistical areas that contribute 90 percent of the Atlantic wolffish landings.

Table 28 was originally developed for Amendment 13. The distribution of catches can change over time, which is why this amendment authorizes the Regional Administrator to modify the areas that close when 90 percent of a TAC/ACL is caught. As an example of the differences that can develop over time, Table 29 summarizes the areas that contributed 90 percent of landings for calendar years 2006-2008 and compares those areas to the ones shown in Table 28.

If a trimester TAC/ACL is not caught in the first or second trimester, the uncaught portion will be carried forward into the next trimester. Uncaught portions in the third trimester will not be carried over into the following fishing year.

If the TAC for the first two trimesters is exceeded, the overage will be deducted from the TAC/ACL for the third trimester. If the TAC/ACL for the year is exceeded, an amount equal to the overage will be deducted from the TAC/ACL for common pool vessels in the following year.

<u>Rationale</u>: Most regulated groundfish are caught by commercial vessels targeting groundfish. This measure is designed to ensure that TACs/ACLs are not exceeded. By closing stock areas to groundfish fishing before the groundfish TA/ACL is achieved, it reduces the likelihood the groundfish TAC will be exceeded. Note that an adjustment is made when setting the TAC/ACL to account for catches in other fisheries.

Some stock areas cover broad areas, even though the species may not be caught throughout the area. By limiting closures to areas where most of the stock is caught, the stock is protected while allowing opportunities to fish for other stocks. For example, the GB cod stock area stretches from

Georges Bank to New Jersey, but very little cod is caught west of 70W. Other species are caught in narrow depth bands within a stock area. Similarly, there is no reason to restrict gear that does not catch a particular species from an area when the TAC/ACL is caught. This may also encourage development of more selective fishing techniques so that fishing can continue when the TAC/ACL for one species is caught. The draft amendment listed SA 521 as an area that will be closed for GB winter flounder. This statistical area is not part of the stock area and so it has been removed from the above table.

Table 28 – Gears prohibited in specific areas when a TAC/ACL is caught.

SPECIES	STOCK	Area/Gear Prohibited When TAC/ACL is Caught	
		Statistical Areas	Gear
Cod	GB	521,522,525,526,561	Trawl, gillnet, longline/hook
	GOM	513,514,515	Trawl, gillnet, longline/hook
Haddock	GB	521,522,561	Trawl, gillnet, longline/hook
	GOM	512,513,514,515	Trawl, gillnet, longline/hook
Yellowtail Flounder	GB	522,525,561,562	Trawl, gillnet
	SNE/MA	537,539,612,613	Trawl, gillnet
	CC/GOM	514,521	Trawl, gillnet
American Plaice		512,513,514,515,521,522	Trawl
Witch Flounder		512,513,514,515,521,522	Trawl
Winter Flounder	GB	522,562	Trawl
	GOM	514	Trawl, gillnet
	SNE/MA	521,526,537,539,612,613	Trawl
Redfish		513,514,515,521,522,561	Trawl
White Hake		511,512,513,514,515,521,522, 525,561,613,616	Trawl, gillnet, longline/hook
Pollock		513,514,515,521,522,561	Gillnet, trawl, longline/hook
Atlantic Wolffish		513,514,521,522	Gillnet, trawl, longline

Table 29 – Comparison of statistical areas contributing 90 percent of landings using data from draft Amendment 16 and CY 2006-2008 landings. Differences are underlined.

SPECIES	STOCK	Statistical Areas Contributing 90 percent of Landings	
		Draft A16 Statistical Areas	CY 2006-2008
Cod	GB	521,522,525,526,561	521,522,525,561
	GOM	513,514,515	513,514
Haddock	GB	521,522,561	521,522,525,561,562
	GOM	512,513,514,515	513,514,515
Yellowtail Flounder	GB	522,525,561,562	522,525,561,562
	SNE/MA	537,539,612,613	537,539,538,613
	CC/GOM	514,521	514,521
American Plaice		512,513,514,515,521,522	512,513,514,515,521,522, 525
Witch Flounder		512,513,514,515,521,522	512,513,514,515,521,522, 525
Winter Flounder	GB	521,522,562	522,525,561,562
	GOM	514	514
	SNE/MA	521,526,537,539,612,613	512,537,539,611,612,613
Redfish		513,514,515,521,522,561	513,514,515,521,522
White Hake		511,512,513,514,515,521,522, 525,561,613,616	513,514,515,521,522
Pollock		513,514,515,521,522,561	513,514,515,521,522

GB Cod Trimester TAC Area

Point	N. Latitude	W. Longitude
GB1	42° 20'	70° 00'
GB2	42° 20'	(1)
GB3	40° 30'	65° 40'
GB4	40° 30'	66° 40'
GB5	39° 50'	66° 40'
GB6	39° 50'	66° 40'
GB7	41° 00'	68° 50'
GB8	41° 00'	69° 30'
GB9	41° 10'	69° 30'
GB10	41° 10'	69° 50'
GB11	41° 20'	69° 50'
GB12	(2)	70° 00'
GB13	(3)	70° 00'
GB14	(4)	70° 00'
GB15	(5)	70° 00'
GB1	42° 20'	70° 00'

(1) U.S. Canada maritime boundary
(2) East-facing shoreline of Nantucket

(3) North-facing shoreline of Nantucket
(4) South-facing shoreline of Cape Cod
(5) North-facing shoreline of Cape Cod, MA

GOM Cod Trimester TAC Area

Point	N. Latitude	W. Longitude
GOM1	(1)	69° 20’
GOM2	43° 40’	69° 20’
GOM3	43° 40’	69° 00’
GOM4	43° 20’	69° 00’
GOM5	43° 20’	69° 10’
GOM6	43° 00’	69° 10’
GOM7	43° 00’	69° 20’
GOM8	42° 50’	69° 20’
GOM9	42° 50’	69° 40’
GOM10	42° 20’	69° 40’
GOM11	42° 20’	70° 00’
GOM12	(3)	70° 00’

(1) Intersection with ME shoreline
(2) North-facing shoreline of Cape Cod, MA

GB Haddock Trimester TAC Area

Point	N. Latitude	W. Longitude
GB1	42° 20’	70° 00’
GB2	42° 20’	(1)
GB3	40° 30’	65° 40’
GB4	40° 30’	66° 40’
GB5	39° 50’	66° 40’
GB6	39° 50’	66° 40’
GB7	41° 00’	68° 50’
GB8	41° 00’	69° 30’
GB9	41° 10’	69° 30’
GB10	41° 10’	69° 50’
GB11	41° 20’	69° 50’
GB12	(2)	70° 00’
GB13	(3)	70° 00’
GB14	(4)	70° 00’
GB15	(5)	70° 00’
GB1	42° 20’	70° 00’

(1) U.S. Canada maritime boundary
(2) East-facing shoreline of Nantucket
(3) North-facing shoreline of Nantucket
(4) South-facing shoreline of Cape Cod
(5) North-facing shoreline of Cape Cod, MA

GOM Haddock Trimester TAC Area

Point	N. Latitude	W. Longitude
GOM1	(1)	69° 20’
GOM2	43° 40’	69° 20’
GOM3	43° 40’	69° 00’
GOM4	43° 20’	69° 00’
GOM5	43° 20’	67° 40’
GOM6	(2)	67° 40’
GOM7	42° 53.1’	67° 44.4’
GOM8	(2)	67° 40’
GOM9	42° 20’	67° 40’
GOM10	42° 20’	70° 00’
GOM10	(3)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary
(3) North-facing shoreline of Cape Cod, MA

GB Yellowtail Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
GB1	42° 20’	68° 50’
GB2	42° 20’	(1)
GB3	40° 30’	65° 40’
GB4	40° 30’	66° 40’
GB5	39° 50’	66° 40’
GB6	39° 50’	68° 50’
GB1	42° 20’	68° 50’

(1) U.S. Canada maritime boundary

SNE/MA Yellowtail Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
SNEMA1	(1)	70° 00’
SNEMA2	(2)	70° 00’
SNEMA3	(3)	70° 00’
SNEMA4	39° 50’	70° 00’
SNEMA5	39° 50’	71° 40’
SNEMA6	40° 00’	71° 40’
SNEMA7	40° 00’	73° 00’
SNEMA8	(4)	73° 00’
SNEMA9	41° 00’	(5)
SNEMA10	41° 00’	71° 40’
SNEMA11	(6)	71° 40’

(1) South-facing shoreline of Cape Cod, MA
(2) North-facing shoreline of Nantucket, MA
(3) South-facing shoreline of Nantucket, MA
(4) South-facing shoreline of Long Island, NY
(5) East-facing shoreline of Long Island, NY
(6) Intersection with Rhode Island shoreline

CC/GOM Yellowtail Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
CCGOM1	42° 50’	(1)
CCGOM2	42° 50’	69° 40’
CCGOM3	42° 20’	69° 40’
CCGOM4	42° 20’	68° 50’
CCGOM5	41° 00’	68° 50’
CCGOM6	41° 00’	69° 30’
CCGOM7	41° 10’	69° 30’
CCGOM8	41° 10’	69° 50’
CCGOM9	41° 20’	69° 50’
CCGOM10	41° 20’	(2)
CCGOM11	(3)	70° 00’
CCGOM12	(4)	70° 00’

(1) Intersection with MA shoreline
(2) East-facing shoreline of Nantucket, MA
(4) North-facing shoreline of Nantucket, MA
(3) South-facing shoreline of MA

American Plaice Trimester TAC Area

Point	N. Latitude	W. Longitude
AP1	(1)	68° 00’
AP2	44° 10’	67° 50’
AP3	44° 00’	67° 50’
AP4	44° 00’	67° 40’
AP5	(2)	67° 40’
AP6	42° 53.1'	67° 44.4'
AP7	(2)	67° 40’
AP8	41° 20’	67° 40’
AP9	41° 10’	67° 40’
AP10	41° 10’	67° 10’
AP11	41° 00’	67° 10’
AP12	41° 00’	67° 00’
AP13	40° 50’	67° 00’
AP14	40° 50’	66° 50’
AP15	40° 40’	66° 50’
AP16	40° 40’	66° 40’
AP17	39° 50’	66° 40’
AP18	39° 50’	68° 50’
AP19	41° 00’	68° 50’
AP20	41° 00’	69° 30’
AP21	41° 10’	69° 30’
AP22	41° 10’	69° 50’
AP23	41° 20’	69° 50’
AP24	41° 20’	(3)
AP25	(4)	70° 00’
AP26	(5)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary
(3) East-facing shoreline of Nantucket, MA

(4) North-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Cape Cod, MA

Witch Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
AP1	(1)	68° 00’
AP2	44° 10’	67° 50’
AP3	44° 00’	67° 50’
AP4	44° 00’	67° 40’
AP5	(2)	67° 40’
AP6	42° 53.1'	67° 44.4'
AP7	(2)	67° 40’
AP8	41° 20’	67° 40’
AP9	41° 10’	67° 40’
AP10	41° 10’	67° 10’
AP11	41° 00’	67° 10’
AP12	41° 00’	67° 00’
AP13	40° 50’	67° 00’
AP14	40° 50’	66° 50’
AP15	40° 40’	66° 50’
AP16	40° 40’	66° 40’
AP17	39° 50’	66° 40’
AP18	39° 50’	68° 50’
AP19	41° 00’	68° 50’
AP20	41° 00’	69° 30’
AP21	41° 10’	69° 30’
AP22	41° 10’	69° 50’
AP23	41° 20’	69° 50’
AP24	41° 20’	(3)
AP25	(4)	70° 00’
AP26	(5)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary
(3) East-facing shoreline of Nantucket, MA
(4) North-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Cape Cod, MA

GB Winter Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
GB1	42° 20'	68° 50'
GB2	42° 20'	67° 40'
GB3	41° 50'	67° 40'
GB4	41° 50'	(1)
GB5	40° 30'	65° 40'
GB6	40° 30'	66° 40'
GB7	40° 40'	66° 40'
GB8	40° 40'	66° 50'
GB9	40° 50'	66° 50'
GB10	40° 50'	67° 00'
GB11	41° 00'	67° 00'
GB12	41° 00'	67° 10'
GB13	41° 10'	67° 10'
GB14	41° 10'	67° 00'
GB15	41° 20'	67° 40'
GB16	41° 20'	68° 10'
GB17	41° 10'	68° 10'
GB18	41° 10'	68° 20'
GB19	41° 00'	68° 20'
GB20	41° 00'	68° 50'
GB1	42° 20'	68° 50'

(1) U.S. Canada maritime boundary

GOM Winter Flounder Trimester TAC Area

Point	N. Latitude	W. Longitude
GOM1	42° 50'	(1)
GOM2	42° 50'	69° 40'
GOM3	42° 20'	69° 40'
GOM4	42° 20'	70° 00'
GOM5	(2)	70° 00'

(1) Intersection with MA shoreline
(2) North-facing shoreline of Cape Cod, MA

SNE/MA Winter Flounder Trimester TAC Area I

Point	N. Latitude	W. Longitude
SNE/MA1	42° 20'	70° 00'
SNE/MA2	42° 20'	68° 50'
SNE/MA3	41° 00'	68° 50'
SNE/MA4	41° 00'	69° 30'
SNE/MA5	41° 10'	69° 30'
SNE/MA6	41° 10'	69° 50'
SNE/MA7	41° 20'	69° 50'
SNE/MA8	(1)	70° 00'
SNE/MA9	(2)	70° 00'
SNE/MA10	(3)	70° 00'
SNE/MA11	(4)	70° 00'
SNE/MA1	42° 20'	70° 00'

(1) East-facing shoreline of Nantucket, MA
(2) North-facing shoreline of Nantucket, MA

(3) South-facing shoreline of Cape Cod, MA
(4) North-facing shoreline of Cape Cod, MA

SNE/MA Winter Flounder Trimester TAC Area II

Point	N. Latitude	W. Longitude
SNE/MA12	(1)	71° 10’
SNE/MA13	41° 20’	71° 10’
SNE/MA14	41° 20’	(2)
SNE/MA15	41° 20’	(3)
SNE/MA16	41° 20’	(4)
SNE/MA17	(5)	70° 00’
SNE/MA18	39° 50’	70° 00’
SNE/MA19	39° 50’	71° 40’
SNE/MA20	40° 00’	71° 40’
SNE/MA21	40° 00’	(6)

(1) Intersection with RI shoreline
(2) West-facing shoreline of Martha’s Vineyard, MA
(3) East-facing shoreline of Martha’s Vineyard, MA
(4) West-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Nantucket, MA
(6) Intersection with NJ shoreline

Redfish Trimester TAC Area

Point	N. Latitude	W. Longitude
RF1	(1)	69° 20’
RF2	43° 40’	69° 20’
RF3	43° 40’	69° 00’
RF4	43° 20’	69° 00’
RF5	43° 20’	67° 40’
RF6	(2)	67° 40’
RF7	42° 53.1'	67° 44.4'
RF8	(2)	67° 40’
RF9	41° 20’	67° 40’
RF10	41° 20’	68° 10’
RF11	41° 10’	68° 10’
RF12	41° 10’	68° 20’
RF13	41° 00’	68° 20’
RF14	41° 00’	69° 30’
RF15	41° 10’	69° 30’
RF16	41° 10’	69° 50’
RF17	41° 20’	69° 50’
RF18	(3)	70° 00’
RF19	(4)	70° 00’
RF20	(5)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary
(3) East-facing shoreline of Nantucket, MA
(4) North-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Cape Cod, MA

White Hake Trimester TAC Area

Point	N. Latitude	W. Longitude
RF1	(1)	69° 20’
RF2	43° 40’	69° 20’
RF3	43° 40’	69° 00’
RF4	43° 20’	69° 00’
RF5	43° 20’	67° 40’
RF6	(2)	67° 40’
RF7	42° 53.1'	67° 44.4'
RF8	(2)	67° 40’
RF9	41° 20’	67° 40’
RF10	41° 20’	68° 10’
RF11	41° 10’	68° 10’
RF12	41° 10’	68° 20’
RF13	41° 00’	68° 20’
RF14	41° 00’	69° 30’
RF15	41° 10’	69° 30’
RF16	41° 10’	69° 50’
RF17	41° 20’	69° 50’
RF18	(3)	70° 00’
RF19	(4)	70° 00’
RF20	(5)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary
(3) East-facing shoreline of Nantucket, MA
(4) North-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Cape Cod, MA

Pollock Trimester TAC Area

Point	N. Latitude	W. Longitude
RF1	(1)	69° 20’
RF2	43° 40’	69° 20’
RF3	43° 40’	69° 00’
RF4	43° 20’	69° 00’
RF5	43° 20’	67° 40’
RF6	(2)	67° 40’
RF7	42° 53.1'	67° 44.4'
RF8	(2)	67° 40’
RF9	41° 20’	67° 40’
RF10	41° 20’	68° 10’
RF11	41° 10’	68° 10’
RF12	41° 10’	68° 20’
RF13	41° 00’	68° 20’
RF14	41° 00’	69° 30’
RF15	41° 10’	69° 30’
RF16	41° 10’	69° 50’
RF17	41° 20’	69° 50’
RF18	(3)	70° 00’
RF19	(4)	70° 00’
RF20	(5)	70° 00’

(1) Intersection with ME shoreline
(2) U.S. Canada maritime boundary

(3) East-facing shoreline of Nantucket, MA
(4) North-facing shoreline of Nantucket, MA
(5) South-facing shoreline of Cape Cod, MA

Atlantic Wolfish Trimester TAC Area

Point	N. Latitude	W. Longitude
ATWLF1	(1)	69° 20’
ATWLF2	43° 40’	69° 20’
ATWLF3	43° 40’	69° 00’
ATWLF4	43° 20’	69° 00’
ATWLF5	43° 20’	69° 10’
ATWLF6	43° 00’	69° 10’
ATWLF7	43° 00’	69° 20’
ATWLF8	42° 50’	69° 20’
ATWLF9	42° 50’	69° 40’
ATWLF10	42° 20’	69° 40’
ATWLF11	42° 20’	67° 40’
ATWLF12	41° 20’	67° 40’
ATWLF13	41° 20’	68° 10’
ATWLF14	41° 10’	68° 10’
ATWLF15	41° 10’	68° 20’
ATWLF16	41° 00’	68° 20’
ATWLF17	41° 00’	69° 30’
ATWLF18	41° 10’	69° 30’
ATWLF19	41° 10’	69° 50’
ATWLF20	41° 20’	69° 50’
ATWLF21	(2)	70° 00’
ATWLF22	(3)	70° 00’
ATWLF23	(4)	70° 00’

(1) Intersection with ME shoreline
(2) East-facing shoreline of Nantucket, MA
(3) North-facing shoreline of Nantucket, MA
(4) South-facing shoreline of Cape Cod, MA

Stocks Exempt from Stock Area Closures

Catching ninety percent of a TAC/ACL of northern windowpane flounder, southern windowpane flounder, ocean pout, or Atlantic halibut will not result in closing a stock area to groundfish fishing. When sixty percent of the TAC/ACL for these stocks is projected to be caught, the Regional Administrator will have the authority to specify a trip limit that is calculated to prevent the TAC/ACL from being exceeded prior to the end of the fishing year.

Rationale: Windowpane flounders, ocean pout, and Atlantic halibut are typically incidental catches in the groundfish fishery – they are rarely targeted. In order to avoid closing the groundfish fishery because catches of these minor stocks approach a TAC/ACL, the Regional Administrator is given the ability to establish trip limits to further discourage any possible targeting of these stocks if necessary to reduce the likelihood the TAC/ACL will be exceeded. Upon implementation of the amendment, possession of these stocks is prohibited, but this could be change in a future action and so the authority to implement trip limits is included for these stocks.

White Hake Possession Limit
In FY 2012, the white hake possession limit will be reduced to 500 lbs./DAS with a maximum of 2,000 lbs./trip.

Rationale: White hake is widely distributed (see Table 28). Because the TAC/ACL is expected to be small while white hake is rebuilt, there is a concern that approaching this TAC/ACL could result in a closure of the entire fishery. The reduced possession limit is intended to discourage targeting white hake in order to reduce the likelihood of an area-wide shutdown.

Catch Monitoring

- In FY 2012, twenty percent of all trips (selected on a random basis) must be verified by an independent, third-party weighmaster that meets standards established by the NMFS. Funding of this program is the responsibility of the industry. Non-sector vessels can use any vendor approved pursuant to the sector monitoring requirements of section 4.2.3.5.3.

- When monitoring progress towards the TAC during the fishing year, NMFS will consider both landings and discards. If near real-time observer information is available, it will be used to provide an in-season estimate of discards. If this information is not available, a discard estimate will be developed using the proportion of catch discarded according to the most recent assessment or PDT calculation.

4.3.7.2 Recreational Fishery Accountability Measures

ACLs for the recreational fishery will be established as described in section 4.2.1, consistent with the commercial/recreational allocation of groundfish stocks described in section 4.2.5. As noted in these sections, ACLs are set for the fishing year. The recreational ACL is set only for specific stocks; it is anticipated that at least GOM haddock and GOM cod will have recreational ACLs with the adoption of this amendment, but other stocks may be added in the future.

Recreational fishery catches in a fishing year will be monitored using the MRIP data. As soon as data are available for the entire fishing year (expected to be by June or July of the fishing year immediately following), recreational catches will be totaled for the fishing year and compared to the ACL (see below for additional details on this comparison). If catches exceed the ACL, NMFS will determine the measures necessary to prevent exceeding the ACL in future years following consultation with the Council and publish the accountability measure that would be put into effect using procedures consistent with the APA. Final measures will be published no later than January. When evaluating recreational "catch", the components of recreational catch that are used will be the same as used in the most recent assessment for the stock in question. For example, if the assessment uses recreational harvest (A+B1), then the ACL will be evaluated based on the same components.

The recreational AM will be either/or adjustments to season, adjustments to minimum size, or adjustments to bag limits. Separate AMs can be determined for the private boat and party/charter components of the recreational fishery – that is, the AMs may be different for these two components. With respect to the timing of AMs, it is anticipated that the AMs for an overage in fishing year one will be implemented at the end of fishing year two. Depending on the specific measures used, the AM may be in effect for an extended period. The applicable period will be specified when the AM is announced.

When evaluating whether a recreational ACL has been exceeded to determine if the AM needs to be implemented, the three-year average of recreational catch (calculated consistent with the catch used on the assessment) will be compared to the three-year average of the ACL. This practice will be phased in after implementation of this amendment as follows:

- For FY 2010, FY 2010 harvest will be compared to the FY 2010 ACL and if necessary AMs will be implemented in FY 2011.
- For FY 2011, the average of FY 2010 and FY 2011 harvest will be compared to the average of the FY 2010 and FY 2011 ACL and if necessary AMs will be implemented in FY 2012.
- In subsequent years, the three-year average of recreational harvest will be compared to the three-year average of the recreational ACL and if necessary AMs will be implemented in the year immediately following.

Rationale: Because of uncertainty about the number of participants and catches, it is difficult to design recreational AMs in advance given the tools typically used to manage this fishery. The impacts of size changes, bag limits, and seasons depend on the current distribution of fishing effort, sizes in the population, and stock abundance. For this reason, AMs will be adopted only after evaluating recent catches. Because of the need to coordinate recreational measures with the states, the Council determines the specific AMs that will be adopted and will forward that decision to NMFS.

Different AMs may be adopted for the private angler component and the party/charter components of the fishery. The party/charter component prefers changes in minimum fish size and bag limits; these measures, if adopted, will likely need to remain in effect for a longer period than a seasonal closure. There use will also likely increase the uncertainty of achieving recreational AMs and will need to be considered when setting ACLs.

The phase-in of the use of a three-year average for evaluating recreational ACLs is designed to implement the ACL/AM program consistent with the M-S Act requirements.

4.3.7.3 Multispecies Sector Accountability Measures

The sector administration provisions defined in section 4.2.3 incorporate accountability measures designed to ensure that each sector – and as a result, sectors as a whole - do not contribute to overfishing. To summarize those elements:

- The catch allocated to each sector is based on the Annual Catch Limit established by the Council (section 4.2.3). The ACL takes into account biological and management uncertainty to reduce the risk of overfishing.
- Sectors are required to stop groundfish fishing when they are projected to have caught their allocation for any groundfish stock.
- Reporting requirements are implemented to ensure monitoring of sector catches is timely and accurate. These requirements include:
    - Weekly catch reporting to NMFS.
    - Identification of specific landing ports.
    - Notice to NMFS when catches approach a defined threshold.
    - At-sea and shoreside monitoring requirements
- Sectors are provided opportunities to “balance” catches with their allocation through the trading of annual catch entitlements between sectors.

- If a sector exceeds its allocation in a given year, and cannot balance its catch and allocation through the trading of annual catch entitlements, then its allocation in the following year is reduced by the overage (see section 4.2.3).

5.0 Alternatives to the Proposed Action

5.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

5.1.1 Revised Status Determination Criteria

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 13 adopted status determination criteria for regulated groundfish stocks. It also provided that these criteria would be reviewed in 2008. This amendment will adopt new status determination criteria.

5.1.1.1 Option 1 – No Action

Under this option, the status determination criteria adopted by Amendment 13 would not be changed. Amendment 13 established that there are two elements to these criteria. First, the criteria are specified as a parameter that describes a quantity. Second, the current numerical estimate of that parameter is determined. Changes in the parameter – such as using an index – based proxy rather than an estimate of SSB_{MSY} for the minimum biomass threshold – requires a management action by the Council. Changes in the numerical estimate do not normally require a management action with the exception of change that may result from the 2008 review of stock status.

The parameters that were adopted by Amendment 13 are listed in Table 30. The numerical estimates of these parameters that were adopted by Amendment 13 are listed in Table 31.

Table 30 – Amendment 13 status determination criteria

Stock	Biomass Target	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold	Fishing Mortality Target
GOM Cod	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
GB Cod	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
GB Haddock	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
GOM Haddock	B_{MSY} Proxy/Fall Trawl Survey Index	½ Btarget	F_{MSY} Proxy/Relative Exploitation Index	75% of F_{MSY}
GB Yellowtail Flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
Cape Cod/GOM Yellowtail Flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
SNE/MA yellowtail flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
American Plaice	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
Witch Flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
Gulf of Maine Winter Flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
GB Winter Flounder	B_{MSY}	½ Btarget	F_{MSY} (1)	75% of F_{MSY}
SNE/MA Winter Flounder	SSB_{MSY}	½ Btarget	F_{MSY}	75% of F_{MSY}
Acadian Redfish	SSB_{MSY}	½ Btarget	$F_{50\%}$ proxy for F_{MSY}	75% of F_{MSY}
White Hake	B_{MSY} Proxy/Fall Survey Index (> 60 cm fish)	½ Btarget	F_{MSY} Proxy/Relative Exploitation Index (> 60 cm fish)	75% of F_{MSY}
Pollock	B_{MSY} Proxy/ Fall Survey Index	½ Btarget	F_{MSY} Proxy/ Relative Exploitation Index	75% of F_{MSY}
Windowpane Flounder (North)	B_{MSY} Proxy/Fall Survey Index	½ Btarget	F_{MSY} Proxy/Relative Exploitation Index	75% of F_{MSY}
Windowpane Flounder (South)	B_{MSY} Proxy/Fall Survey Index	½ Btarget	F_{MSY} Proxy/Relative Exploitation Index	75% of F_{MSY}
Ocean Pout	B_{MSY} Proxy/Fall Survey Index	½ Btarget	F_{MSY} Proxy/Relative Exploitation Index	75% of F_{MSY}
Atlantic Halibut	B_{MSY}	½ Btarget	F_{MSY} (1)	75% of F_{MSY}

Table 31 – Amendment 13 numerical estimates of status determination criteria.

1. Total biomass, metric tons
2. Unit is total stock biomass for fish >= 60 cm., mt
3. Unit is biomass weighted F
4. Survey based equivalents developed by GARM 2002

SPECIES	STOCK	NUMERICAL ESTIMATE OF STATUS DETERMINATION CRITERIA				
		B_{TARGET} (metric tons)	$B_{THRESHOLD}$ (metric tons)	F_{MSY} **(Maximum fishing mortality)**	**Ftarget (at biomass target)**	**MSY** (metric tons)
COD	GB	216,800	108,400	0.18	0.14	35,200
	GOM	82,800	41,400	0.23	0.17	16,600
HADDOCK	GB	250,300	125,150	0.26	.20	52,900
	GOM	22.17 kg/tow	11.09 kg/tow	0.23C/I	0.17 C/I	5,100
YELLOWTAIL FLOUNDER	GB	58,800	29,400	0.25	0.19	12,900
	SNE/MA	69,500	34,750	0.26	0.20	14,200
	CC/GOM	12,600	6,300	0.17	0.13	2,300
AMERICAN PLAICE		28,600	14,300	0.17	0.13	4,900
WITCH FLOUNDER		25,240	12,620	0.23	0.17	4,375
WINTER FLOUNDER	GB	9,400(1)	4,700	0.32	0.24	3,000
	GOM	4,100	2,050	0.43	0.32	1,500
	SNE/MA	30,100	15,050	0.32	0.24	10,600
REDFISH		236,700	118,350	0.04	0.03	8,200
WHITE HAKE[2]		14,700(2) 7.70 kg/tow	7,350 3.35 kg/tow	0.29 0.55 C/I	0.22 0.41 C/I	4,200
POLLOCK		3.0 kg/tow	1.5 kg/tow	5.88 C/I	4.41 C/I	17,600
WINDOWPANE FLOUNDER	North	0.94 kg/tow	0.47 kg/tow	1.11 C/I	0.83	1,000
	South	0.92 kg/tow	0.46 kg/tow	0.98 C/I	0.735 C/I	900
OCEAN POUT		4.9 kg/tow	2.95 kg/tow	0.31 C/I	0.23 C/I	1,500
ATLANTIC HALIBUT		5,400(1)	2,700	0.06	0.4	300

5.1.2 ABC Control Rules

The No Action alternative would keep in place the MSY control rules adopted by Amendment 13 (Table 32).

Table 32 – Amendment 13 MSY control rules. Target fishing mortality rates are 75 percent of the control rule mortality.
For all stocks, when stock size is less than the threshold biomass the F will be as established by the formal rebuilding program.

SPECIES	STOCK	MSY CONTROL RULE
COD	GB	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
	GOM	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
HADDOCK	GB	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
	GOM	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
YELLOWTAIL FLOUNDER	GB	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{msy}
	SNE	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{msy}
	MID-Atl.	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
	Cape Cod	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
AMERICAN PLAICE		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
WITCH FLOUNDER		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
WINTER FLOUNDER	GB	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
	GOM	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{msy}
	SNE/MA	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{msy}
REDFISH		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
WHITE HAKE		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{msy}
POLLOCK		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
WINDOWPANE FLOUNDER	North	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
	South	F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
OCEAN POUT		F calculated to rebuild to B_{msy} in 10 years when ½ B_{msy}< B < B_{target}
ATLANTIC HALIBUT		F=0 until stock is rebuilt (provisional control law)

5.1.3 Revised mortality targets for formal rebuilding programs

5.1.3.1 Option 1 – No Action

Under this option, the rebuilding fishing mortality rates adopted by Amendment 13 and Framework 42 (GB yellowtail flounder) would continue to guide management actions. These fishing mortality rates are considered as a package and not on a stock by stock basis – that is, all rebuilding fishing mortality targets must not change for this option to be selected.

There were three rebuilding strategies adopted by Amendment 13. First, for stocks that were not determined to be overfished, formal rebuild programs were not adopted and the goal was to prevent overfishing while achieving optimum yield. Second, the adaptive strategy strove to reduce fishing mortality to F_{MSY} through 2008, and then to the mortality necessary to rebuild the stock by the end of the rebuilding period. The adaptive strategy was adopted for GOM cod, GOM haddock, GB haddock, redfish, SNE/MA winter flounder, windowpane flounder (south), and ocean pout. Third, a phased reduction rebuilding strategy sought to reduce fishing mortality in a series of steps over time. This strategy was adopted for GB cod, American plaice, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and white hake. Subsequent to Amendment 13, FW 42 adopted an adaptive rebuilding strategy for GB yellowtail flounder. The rebuilding fishing mortality rates that resulted from these approaches are shown in Table 33.

Table 33 – Rebuilding fishing mortality rates as adopted by Amendment 13 and FW 42.
Boldfaced italics identify phased reduction strategies; other rebuilding programs use the adaptive strategy. FW 42 illustrated two trajectories for GB yellowtail flounder based on two candidate assessment formulations. The second row for this stock reflects the Major Change assessment model that has been used for management advice.

SPECIES	STOCK	Rebuilt Year / Probability of Success	Fishing mortality rates for adopted rebuilding programs									
			2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Cod	***GB***	2026/50%	***0.21***	***0.21***	***0.21***	***0.21***	***0.21***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***
	(add ten years)		***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***	***0.18***
	GOM	2014/50%	0.23	0.23	0.23	0.23	0.23	0.21	0.21	0.21	0.21	0.21
Haddock	GB	2014/50%	0.26	0.26	0.26	0.26	0.26	0.24	0.24	0.24	0.24	0.24
	GOM	2014/50%	0.23	0.23	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.22
Yellowtail Flounder	GB	2014/75%	NA	NA	0.25	0.25	0.25	0.16	0.16	0.16	0.16	0.16
			NA	NA	0.25	0.25	0.25	0.135	0.135	0.135	0.135	0.135
		2014/50%	***0.37***	***0.37***	***0.26***	***0.26***	***0.26***	***0.17***	***0.17***	***0.17***	***0.17***	***0.17***
	CC/GOM	2023/50%	***0.26***	***0.26***	***0.26***	***0.26***	***0.26***	***0.17***	***0.17***	***0.17***	***0.13***	***0.13***
	(add ten years)		***0.13***	***0.09***	***0.09***	***0.09***	***0.09***	***0.09***	***0.09***	***0.09***	***0.09***	***0.09***
American Plaice		2014/50%	***0.23***	***0.23***	***0.17***	***0.17***	***0.17***	***0.15***	***0.15***	***0.15***	***0.15***	***0.15***
Witch Flounder			No formal rebuilding program required (see overfishing discussion)									
Winter Flounder	GB		No formal rebuilding program required									
	GOM		No formal rebuilding program required									
SNE/MA		2014/50%	0.32	0.32	0.32	0.32	0.32	0.23	0.23	0.23	0.23	0.23
Redfish		2051/50%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
White Hake		2014/50%	***1.03***	***1.03***	***1.03***	***1.03***	***1.03***	***0.23***	***0.23***	***0.23***	***0.23***	***0.23***
Pollock			No formal rebuilding program required									
Windowpane Flounder	North		No formal rebuilding program required									
	South	2014/50%	0.98	0.98	0.98	0.98	0.98	0.49	0.49	0.49	0.49	0.49
SNE/MA **Ocean Pout**[1]		2014/50%	0.03	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.01
Atlantic Halibut		UNK	Insufficient information to calculate rebuilding mortality									

5.2 Fishery Program Administration

5.2.1 Annual Catch Limits

5.2.1.1 Option 1 – No Action

If this option is selected, a process for implementing Annual Catch Limits (ACLs) will not be adopted in this action. This option would not comply with current legal requirements and was not adopted.

5.2.2 Addition of Atlantic Wolffish to the Management Unit

5.2.2.1 Option 1 – No Action

Atlantic wolffish would not be added to the management unit.

5.2.2.2 Essential Fish Habitat for Atlantic Wolffish

5.2.2.2.1 Introduction

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, known as the Sustainable Fisheries Act (SFA), emphasized the importance of habitat protection to healthy fisheries and strengthened the ability of the National Marine Fisheries Service (NMFS) and the Councils to protect and conserve the habitat of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed "essential fish habitat" (EFH) and is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity".

The New England Fishery Management Council designated essential fish habitat for each species it manages in the 1998 Essential Fish Habitat Omnibus Amendment (Amendment 11 to the Multispecies FMP). Amendment 12 (2000) added Offshore Hake to the Multispecies FMP and designated EFH for the species. Among other measures, Amendment 16 to the Multispecies FMP adds Atlantic wolffish to the management unit and designates EFH for the species.

5.2.2.2.2 EFH Designation Options for Atlantic Wolffish

Two alternatives to the Proposed Action were considered for designating EFH for Atlantic wolffish.

Option 1—No EFH Designation
Considered the “no action” alternative, this approach would not designate EFH for Atlantic wolffish. According to the Magnuson-Stevens Act, however, the Regional Fishery Management Councils are mandated to designate EFH for each species managed under an FMP. Thus, this alternative would not be in compliance with the Magnuson-Stevens Act. There would be no EFH Text Description for this alternative.

Text descriptions

No text descriptions are required for this Option.

Maps
No EFH maps are required for this Option.

Option 3—NMFS Survey Data
This option would base the EFH designation on catch per unit effort data from the NMFS trawl survey. This option is broadly consistent with the EFH designations for other species under Multispecies Amendments 11 and 12, and also with Phase I of the Omnibus EFH Amendment 2 (in preparation).

Text descriptions
Eggs
Essential fish habitat for wolffish eggs is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank between 40 and 240 meters. In the Gulf of Maine, spawning is thought to occur during September and October, and there is a 3-9 month incubation period prior to hatching; thus wolffish eggs are assumed to be present throughout most of the year. Wolffish eggs are deposited in rocky substrates and brooded in nests, which are guarded by males for some period but perhaps all the way until hatching. The temperature range for wolffish eggs is assumed to be the temperature range in which adult wolffish were captured in the NMFS trawl survey, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Larvae
Essential fish habitat for wolffish larvae is described as the surface to the seafloor across the predominant depth and distribution range identified for the species, 40 to 240 meters within the Gulf of Maine south to Cape Cod, and on Georges Bank. Larvae remain close to the bottom and the hatching site, presumably using rocky substrates for shelter. Because wolffish appear to be largely sedentary and the larvae do not appear to have a long (if any) pelagic stage, the temperature range for larval wolffish is assumed to be the temperature range in which adult wolffish were captured in the NMFS trawl survey, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Juveniles
Wolffish in the Gulf of Maine reach maturity at age 5-6 years, so fish younger than this age would be considered juveniles. Essential fish habitat for wolffish juveniles is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank. Substrate preferences range from large stones and rocks, used for shelter and nesting, to softer substrates where feeding occurs. The depth range of Atlantic wolffish in this region ranges from 40 to 240 meters. The preferred temperature range for adult wolffish is assumed to be the temperature range within which they were caught in the NMFS trawl surveys, 0 to 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Adults

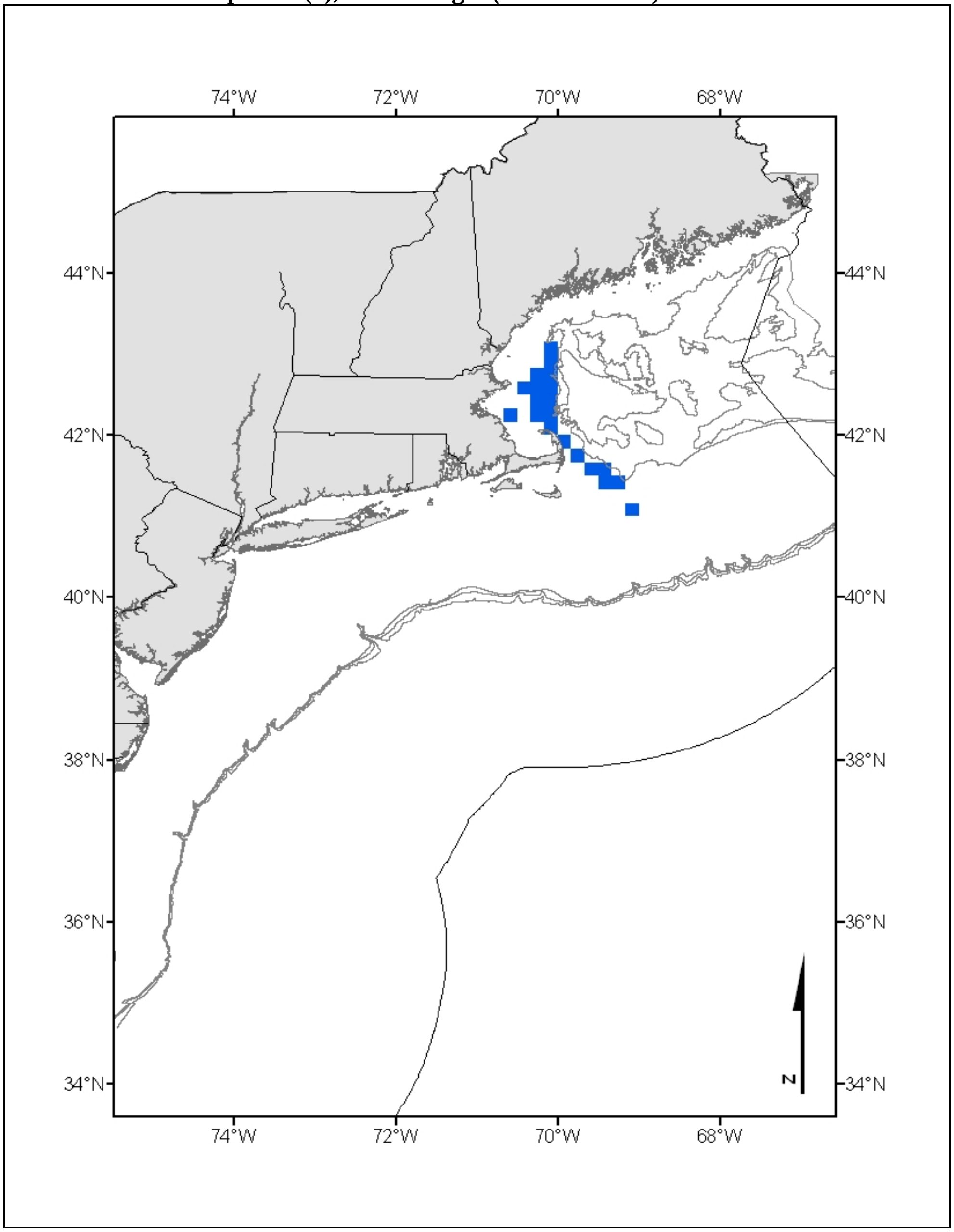
Essential fish habitat for wolffish adults is described as bottom habitats of the continental shelf and slope within the Gulf of Maine south to Cape Cod, and on Georges Bank. Substrate preferences range from large stones and rocks, used for shelter and nesting, to softer substrates where feeding occurs. The depth range of Atlantic wolffish in this region ranges from 40 to 240 meters. The preferred temperature range for adult wolffish is assumed to be the temperature range within which they were caught in the NMFS trawl surveys, between 0 and 14.3° C. Salinity or dissolved oxygen preferences were not reported, however, wolffish are not known to occur in brackish or estuarine waters, and it is assumed that the offshore waters they inhabit are well-mixed/oxygenated.

Text description methods

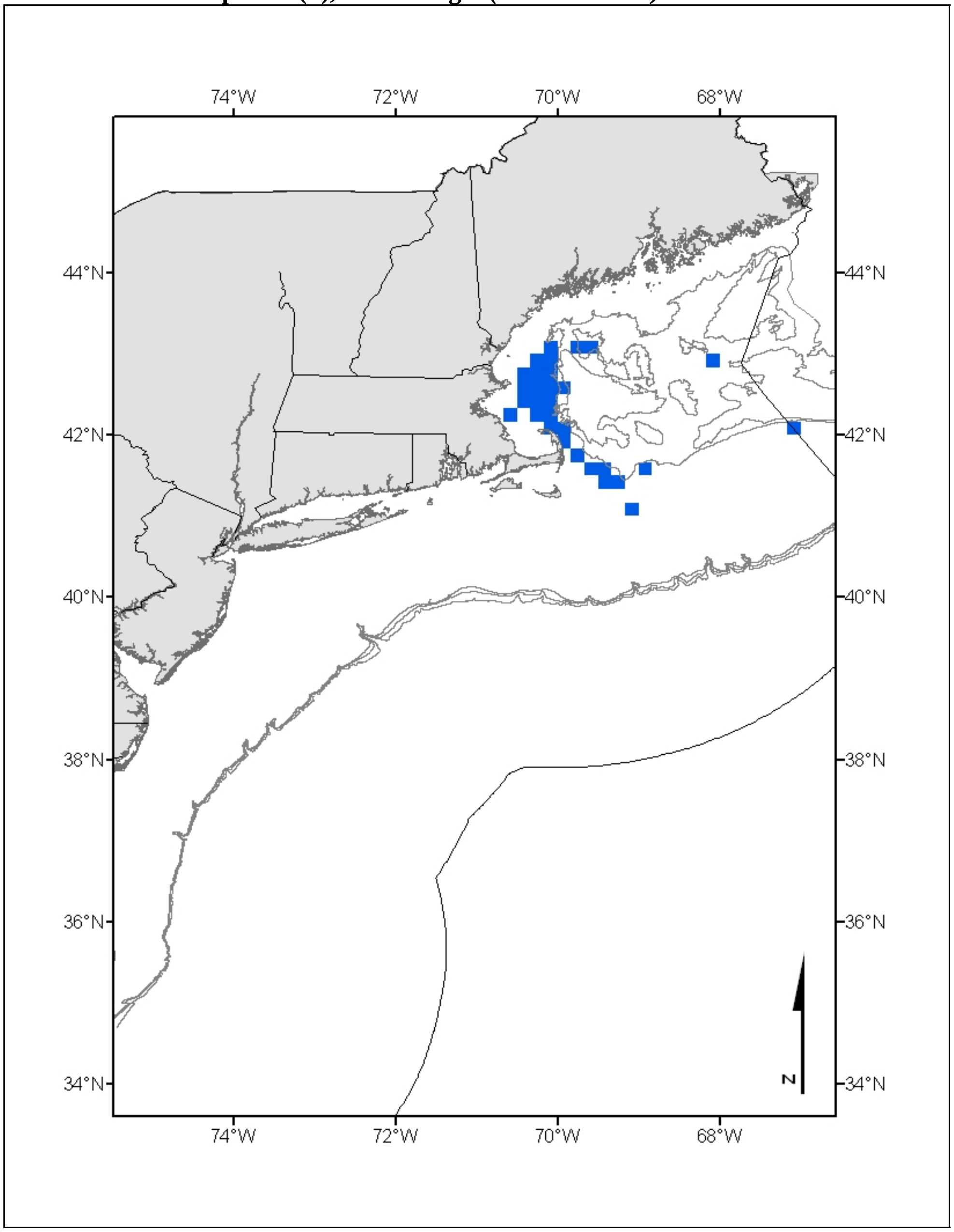
Text descriptions are based on the following information sources: Collette and Klein-MacPhee (2002), Keith (2006), and DPWG (2009).

Maps *(see next page)*

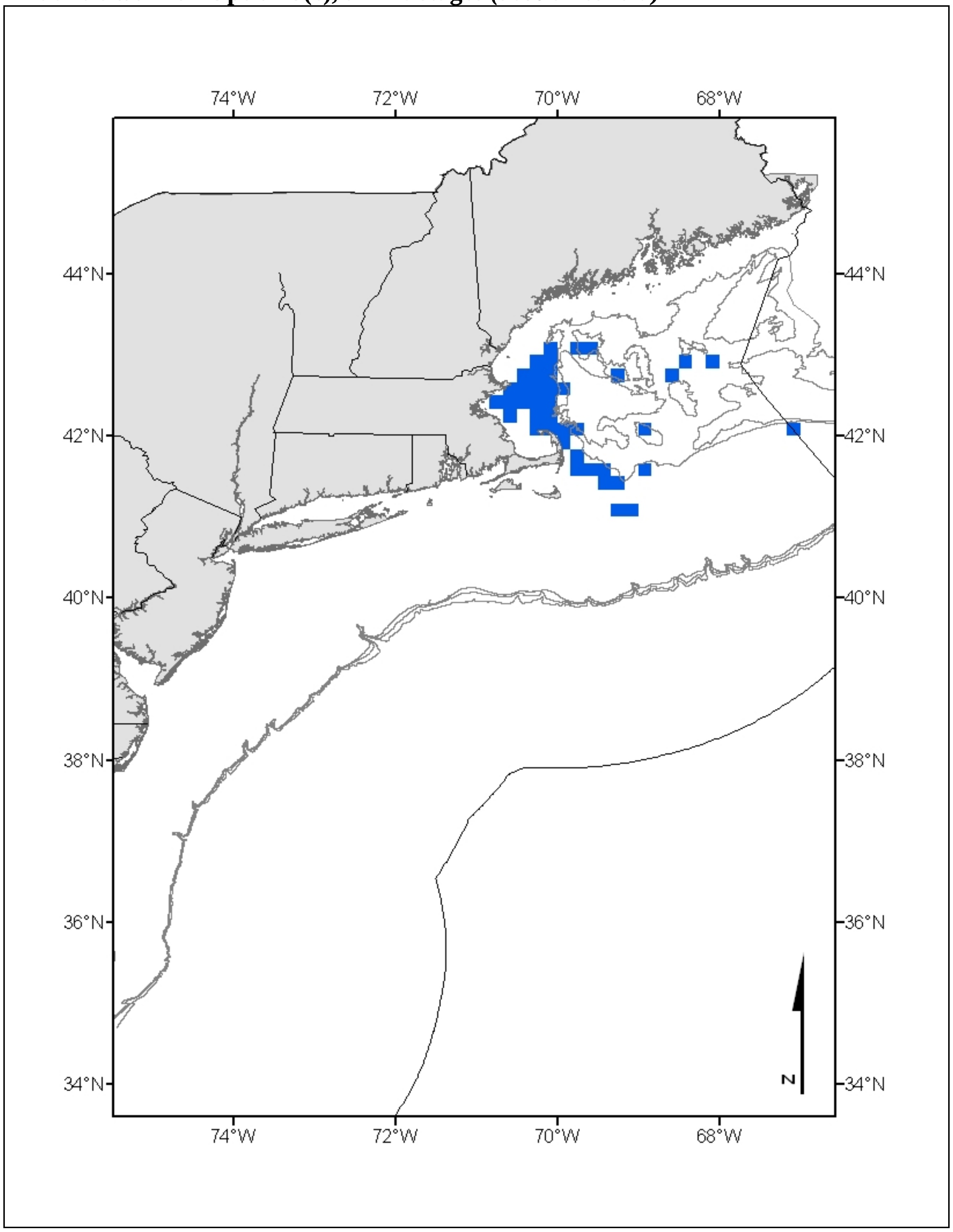
Map 2 – Atlantic wolffish Option 3(a), all life stages *(50% threshold)*



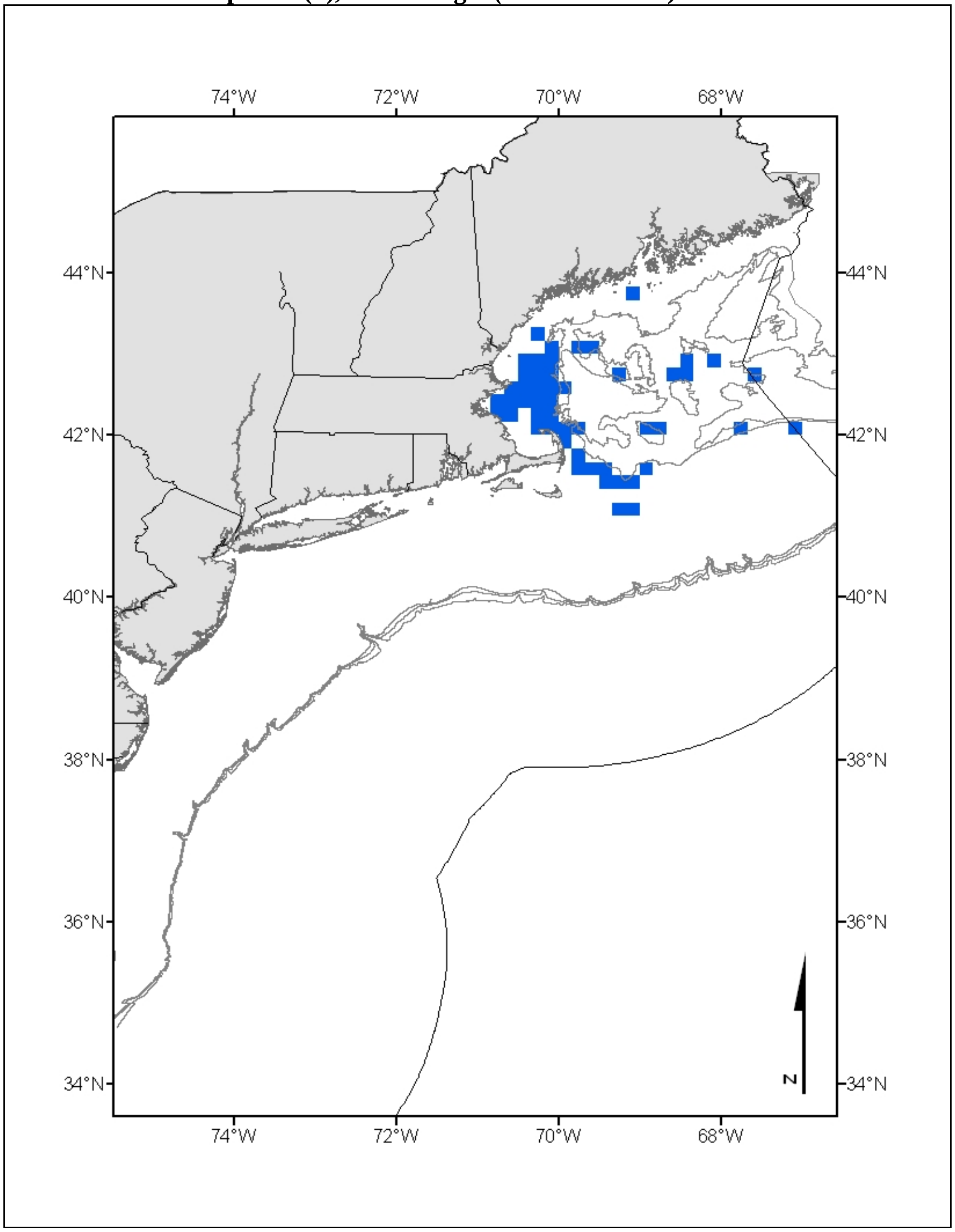
Map 3 - Atlantic wolffish Option 3(b), all life stages *(75% threshold)*



Map 4 – Atlantic wolffish Option 3(c), all life stages *(90% threshold)*



Map 5 – Atlantic wolffish Option 3(d), all life stages *(100% threshold)*



Mapping methods

Wolffish are considered a data poor stock, and the modern scientific literature on the species is limited. Because they are typically found in complex habitats with large stones and rocks that provide shelter and nesting sites (Pavlov and Novikov 1993), and are believed to be relatively sedentary with localized populations, relatively few Atlantic wolffish have been sampled by either the NMFS bottom trawl survey. However, the NMFS bottom trawl survey (1968 - 2007) provides the best available information on the distribution and relative abundance Atlantic wolffish.

Atlantic wolffish EFH maps were developed using methods broadly consistent with those used in Amendments 11 and 12 to the Multispecies FMP, but with several important differences. NMFS bottom trawl survey data from 1963-1998 was used for EFH designated in Amendments 11 and 12 to the multispecies FMP, but more recent data (through 2007) is now available. The earliest survey used was changed from 1963 to 1968 because from 1963-1967 only fall surveys were conducted. Detailed descriptions of the surveys and databases used by the Council in the EFH designation process, including the sampling protocols and methods, are provided in Appendix C of the 1998 EFH Omnibus Amendment. A discussion of the limitations associated with using these data and information sources as the basis for designating EFH is provided in Appendix D of the 1998 EFH Omnibus Amendment.

This approach was developed based on the available data and is consistent with the regulations and technical guidance developed by NMFS on how to designate EFH based on the level of information available. The EFH Final Rule describes four levels of information to be used, from basic presence/absence data (Level 1) to habitat-specific production data (Level 4). Relative abundance data from the NMFS surveys are considered Level 2 data. As such, the regulations and technical guidance indicated use of relative abundance data to differentiate areas with relatively greater abundance of a species as EFH in contrast to areas with relatively lower abundance. Ecologically, it follows that one can infer that areas of relatively high abundance or density are indicative of more suitable habitats. Research has demonstrated that as populations decline, their range contracts and they focus in on areas of best suited habitat.

As with the Council's previous EFH designations, the spatial extents of those designations, as reflected in the EFH maps are based upon an index of catch-per unit- effort (CPUE) data from the NMFS' Bottom Trawl surveys. Survey catches from all tows in U.S. waters (regardless of strata) for all years (1968-2007) were binned and summed (by number of fish) for each ten minute square of latitude and longitude. Only those squares that had greater than three samples and at least one positive catch were selected.

In order to minimize the effects of occasional large catches on the averages, catch data for each tow were transformed by taking the natural logarithm of the catch + 1 (ln(catch + 1)), and then back transformed. The mean of the back-transformed data was calculated for each ten minute square across all years. These back-transformed means were ranked from highest to lowest. Then, the cumulative percentage that each TMS made up of the total of the average catch rates for all TMS was determined.

For each life history stage, the alternatives considered included: (1) the area corresponding to the TMS that account for the top 50% of the cumulative abundance index, (2) the top 75% of the cumulative abundance index, (3) the top 90% of cumulative abundance index, and (4) 100% of the observed range of the species, i.e., the area covered by all TMS where at least one fish was caught in at least three tows.

The EFH regulations require that EFH be designated only in U.S. waters, so while there may be important Atlantic wolffish habitat on the Canadian side of the Hague Line, this area will not be considered for EFH designation. Survey catches from the Canadian side of the Hague Line were not used for the data ranking or for the mapping.

5.2.3 Sector administration provisions

The management measures proposed in this section relate to the process for establishing sector allocations in the multispecies fishery. This section considered updating Section 3.4.16.1 of the final Amendment 13 SEIS (Sector Allocation). Rather than only identify changes to sector administration policies in this section, the section is a complete rewrite of the entire program. Once final choices are made, this section will serve as a summary of all groundfish sector policies in effect. All of the sector policy changes proposed in this section will be implemented at the beginning of fishing year 2010 (May 1, 2010). Only those alternatives to sector policies that were considered, but not adopted, are described in the following sector administration sections. Where appropriate, the no action alternative is identified relative to each issue for which changes or additions are being considered.

5.2.3.1 Sector Definition/Formation of a Sector

This section clarifies the definition of a sector and sector formation and makes groundfish sectors consistent with the Council's sector policies.

No Action
Amendment 13 did not include a specific definition of what a sector is. The No Action option would continue to leave this definition unstated. Amendment 13 did define how sectors would be formed and indicated they would be self-selecting and voluntary and would submit a proposal and an operations plan agreed upon by all members of the sector and approved by NMFS.

Revisions to Sector Definitions/Formation of a Sector
Only vessels with a limited access multispecies permit are eligible to join a multispecies sector. The Council is considering two options for the treatment of permits that are in the Confirmation of Permit History Category:

> **Option 1**: (No Action) Confirmation of permit history (CPH) permits must be activated in order to be associated with/join a sector (this is consistent with the Groundfish DAS Leasing and Transfer Programs as adopted in Amendment 13.

Rationale: Under regulations implementing Amendment 13, permits in the CPH category cannot join a sector. The rationale for this provision is unclear, but appears to relate to the idea that CPH permits did not contribute to fishing mortality during the period prior to Amendment 13 and thus should not contribute to sectors (or lease DAS) after the amendment's adoption. CPH is not a permanent category, however, and permits can be removed at any time. Vessel replacement regulations allow the permits to be placed on any vessel, including skiffs, at any time. This prohibition thus means only that there are administrative barriers to having a CPH permit join a sector (or lease DAS). Option 2 acknowledges the reality of this situation and removes the administrative barriers to having a CPH permit join a sector.

5.2.3.2 Preparation of a Sector Formation Proposal and Operations Plan

This section considers two options for the document that must be submitted in order to form a sector.

5.2.3.2.1 Option 1 - No Action

If the No Action Alternative is selected, then requirements for the formation proposal and operations plan submitted by a self-selecting sector remain the same and must have, ***at a minimum***, the following components:

- A list of all participants and a contract signed by all participants indicating their agreement to abide by the operations plan accompanying the proposal.

- With the implementation of Amendment 13, a sector's operations plan must detail the following:
    - A list of all vessels that would be part of the sector including an indication for each vessel of whether it would continue to fish;
    - The original distribution of catch history or TACs;
    - A detailed plan for consolidation of TACs or DAS, if any is desired, including a detailing of the quantity and duration of any redistribution of TAC or DAS within the sector;
    - A plan and analysis to show how the sector will avoid exceeding their allocated TACs (or target TACs if the allocation is in terms of DAS). This plan should include provisions for monitoring and enforcement of the sector regulations, including documentation of both landings and discards;
    - Rules for entry and exit to the sector (see more on this in next section) including procedures for removing or disciplining members of the sector who do not abide by its rules. Rules for entry and exit must also define how catch or DAS history that is developed by vessels participating in a sector is assigned to each vessel;
    - Procedure for notifying NMFS if a member is expelled from the sector for violation of sector regulations.

Rationale: Option 1 merely restates the sector submission requirements that were included in Amendment 13 as written in the regulations. Option 2 expands on the submission requirements to require that sectors provide the Council additional details on reporting and monitoring and participation in other fisheries so that the Council can better evaluate the impacts of the sector.

5.2.3.3 Allocation of Resources

This section describes how resources will be allocated to sectors. It is nearly a complete revision to the approach adopted in Amendment 13. The terminology of sector allocations is revised, different ways to determine each permit's share are considered, and sectors can no longer be allocated DAS.

5.2.3.3.1 General

No Action
Amendment 13 provided only a brief discussion on the allocation of resources to sectors. While some parts of Amendment 13 said that sectors could request either a hard TAC or DAS allocations, this section did not address how DAS allocations would be determined. The calculation of landings history adopted a rolling five-year period except for GB cod, where the period FY 1996 through FY 2001 was chosen for any sector formed during the period FY 2004 through FY 2007. Amendment 13 adopted the concept that the allocation of resources is to the sector and not the individual permit holder. Amendment 13 also raised the concept that the allocation of TACs to sectors should be consistent with the design of measures for the common pool.

Rationale: This changes the sector provisions of Amendment 13 and clarifies how resources are allocated to a sector. Sectors can no longer request an allocation of groundfish DAS based on the DAS allocated to permits that join the sector. In addition, sectors fishing for groundfish must have an allocation of a*ll regulated groundfish stocks for which they qualify except halibut, ocean* *pout, and windowpane flounder*. This eliminates the situation where sectors could request allocations of selected regulated groundfish stocks and modify effort controls to facilitate targeting of other stocks.

TACs will not be allocated to sectors for Atlantic halibut, ocean pout, northern windowpane flounder, and southern windowpane flounder because these stocks have small TACs, and vessels have limited landings history. Allocating these stocks to sectors would complicate monitoring of sector operations and would require a different scheme for determining each permit's potential sector contribution. Rather than complicate sector administration, sectors will be limited to restrictions designed to discourage targeting of these stocks. For example, the catch of halibut is limited to one fish per trip (similar measures may be needed for the three other stocks).

5.2.3.3.2 Guidance on Sector Overages

Amendment 13 addressed sector overages in broad terms but did not address the situation if a sector disbands or members leave a sector the year following an overage. To be clear, in the subsequent discussion the term "sector overage" means exceeding a TAC in year one after any ACE transfers have occurred with the result that sector will receive a deduction of ACE in year two.

<u>No Action</u>
Under No Action, the only guidance for addressing sector overages would be that contained in Amendment 13. This guidance merely states that if a sector exceeds its allocation the overage is deducted in the following year.

<u>Rationale</u>: If a sector exceeds its ACE in any given year, its allocation in the subsequent year is reduced to account for the overage. This section specifies how exit of vessels from the sector affects the overage provision.

5.2.3.3.3 U.S./Canada Area

Amendment 13 was silent on how sectors interact with the management program in the U.S./Canada area. This section considers two options.

5.2.3.3.3.1 Option 1 - No Action

Under the No Action option, separate allocations will not be made for each portion of a stock that is caught both inside and outside the US/Canada Area. No additional provisions are adopted to address sector fishing in the U.S./Canada area.

<u>Rationale</u>: This measure ensures that common-pool and sector fishing vessels fishing in the Eastern US/CA area do not adversely impact each other. It prevents one group from catching the entire TAC in the area, closing it to the other group. This measure will initially apply only to Eastern GB cod and Eastern GB haddock, but is written so that it can be applied to other stocks in the future if necessary. As currently there is only on TAC for GB yellowtail flounder, this provision does not apply to that stock, which does not have a specific TAC for the Eastern US/CA area. Should the Eastern US/CA area be closed to limit catches of GB yellowtail flounder by common pool vessels, sectors could request an exemption from that closure as long as they have ACE remaining for the stocks in that area.

5.2.3.3.4 Sector Baseline Calculations/Potential Sector Contributions

This section is a new section that considered different options for determining the amount of resources allocated to sectors. Amendment 13 addressed this issue in a section labeled "Allocation of resources" and adopted a specific time period for determining the share of a TAC that each permit brings to a sector. This approach is included as the No Action option below. This section also introduced new terms that better define the different elements used to determine sector allocations and clarifies several issues with respect to the calculation of landings history (for example, that live weight is used).

5.2.3.3.4.1 No Action Alternative (Status Quo/Amendment 13)

Allocation of resources will be based on the accumulated catch histories ***over the previous five years*** for which data are available for each member of the self-selected sector, as described in Amendment 13. For example, for sectors beginning operations in FY 2009, the baseline period would be FY 2002 – FY 2006. Each permit's landings for the time period are divided by the total landings of the stock to determine each permit's share.

5.2.3.3.4.2 Option 2 - 50% Landings History and 50% Vessel Baseline Capacity for Landed Stocks FY 1996 – FY 2006

Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be calculated using the following formula:

$$(10L + HP) \times (\text{allocated “A” DAS}) = \text{baseline capacity}$$

The portion allocated based on capacity applies ***only*** to stocks landed by the permit. The length and horsepower characteristics of the capacity portion in the formula above will be fixed as of January 29, 2004, which is consistent with the baseline established by NMFS for the Groundfish DAS Leasing Program. The DAS used in this calculation are the baseline Category A DAS assigned to a permit under FW 42, without including carry-over DAS, bonus for using large-mesh, penalties, etc. For purposes of this calculation, the DAS allocated under FW 42 are considered to be the permit's Amendment 13 baseline Category A DAS as adjusted for FY 2006 by Framework 42.

The landings history share and the baseline capacity share for each permit will be averaged to obtain a value for each stock. Under this alternative, each permit will receive history only for groundfish stocks that it landed between FY 1996 and FY 2006.

<u>Rationale</u>: This option incorporates characteristics of the permit (vessel) that are believed to contribute to fishing power and thus the value of the permit. By incorporating factors other than landings history alone to determine the potential sector contribution for the permit, this option takes into account that some permits may not have targeted groundfish during the time period but may still have the ability to do so. This part of the formula only applies to stocks caught by the permit. Note that the inclusion of other factors only contributes to the calculation for those permits that have an allocation of Category A DAS. This formula effectively halves the landings history for any permit that does not have Category A DAS allocated.

5.2.3.3.4.3 Option 3 - 50% Landings History and 50% Vessel Baseline Capacity for All Stocks FY 1996 – FY 2006

Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be calculated using the following formula:

$$(10L + HP) \times (\text{allocated “A” DAS}) = \text{baseline capacity}$$

The portion allocated based on capacity applies to ***all*** stocks for which ACE will be allocated. The length and horsepower characteristics of the capacity portion in the formula above will be fixed as of January 29, 2004, which is consistent with the baseline established by NMFS for the Groundfish DAS Leasing Program. The DAS used in this calculation are the baseline Category A DAS assigned to a permit under FW 42, without including carry-over DAS, bonus for using large-mesh, penalties, etc. For purposes of this calculation, the DAS allocated under FW 42 are considered to be the permit's Amendment 13 baseline Category A DAS as adjusted for FY 2006 by Framework 42.

The landings history share and the baseline capacity share for each permit will be averaged to obtain a value for each stock. This alternative is different from Alternative 2 in that every permit will receive an allocation of every applicable groundfish stock.

Rationale: As with Option 2, this option incorporates permit characteristics into the potential sector contribution calculation. Unlike Option 2, this component applies to all stocks, not just those caught by the permit during the time period. This change means that every permit will be assigned a potential sector contribution for every stock. This recognizes that under the DAS system any permit has the potential to fish in any area and catch any stock.

5.2.3.3.4.4 Option 4 - 50% Landings History and 50% A DAS for All Stocks FY 1996 – FY 2006

Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be represented by allocated "A" DAS for ***all*** stocks for which ACE will be allocated. The DAS used in this calculation are the baseline Category A DAS assigned to a permit under FW 42, without including carry-over DAS, bonus for using large-mesh, penalties, etc. For purposes of this calculation, the DAS allocated under FW 42 are considered to be the permit's Amendment 13 baseline Category A DAS as adjusted by Framework 42. For purposes of this calculation, the DAS allocated under FW 42 are considered to be the permit's Amendment 13 baseline Category A DAS as adjusted for FY 2006 by Framework 42.

The landings history share and the A DAS share for each permit will be averaged to obtain a value for each stock.

Rationale: As with Option 2, this option incorporates permit characteristics into the potential sector contribution calculation. Unlike Option 2 or Option 3, only the Category A DAS allocated to the permit are considered. This option recognizes that length and horsepower may not have a strong impact on catches by vessels using fixed gear. Similar to Option 3, the capacity component in this option applies to all stocks, not just those caught by the permit during the time period. This change means that every permit will be assigned a potential sector contribution for every stock. This recognizes that under the DAS system any permit has the potential to fish in any area and catch any stock.

Rationale: This option recognizes that vessels that are members of the two existing sectors made investment decisions based on the qualification criteria adopted by Amendment 13. To change the allocation method might disadvantage those vessels. This provision only applies to members of the two sectors in FY 2007. A fixed pool of vessels has to be identified for this provision or else each time a vessel enters or exits one of these sectors, the potential sector contribution for all permits must be recalculated.

5.2.3.4 Mortality/Conservation Controls

This section is nearly a complete rewrite of a similar section that was in Amendment 13. It addresses several issues that are raised by the adoption of ACLs and clarifies which elements of groundfish catch are counted against a sector allocation.

No Action
If this section is not adopted, the language for mortality/conservation controls will be as in Amendment 13. That language was limited to the following brief sentences: "Hard annual TACs by species will be allocated to the sector as a whole. The sector would be required to submit an operating plan for approval by the regional administrator. The plan would detail the allocation of TAC within the group, how the catch of the sector would be monitored, and a plan for operation or cease of operations once the TACs of one or more species were taken. The plan would have to provide assurance that the sector would not exceed the target TACs allocated to it (either through landings or discards)."

5.2.3.5 Monitoring and Enforcement

Amendment 13 adopted the concept that sectors are responsible for monitoring sector catch and enforcing sector provisions but provided few details for that requirement. This section addresses those requirements and organizes requirements from several sections of Amendment 13 into one location.

5.2.3.5.1 No Action

The only provisions for monitoring and enforcement that were included in Amendment 13 were broad in nature. In various sections, Amendment 13 imposed the following requirements on sectors:

- Sector operations plans needed to include a plan and analysis to show how the sector will avoid exceeding their allocated TACs (or target TACs if the allocation is in terms of DAS). This plan should include provisions for monitoring and enforcement of the sector regulations, including documentation of both landings and discards. No specific standards were identified.
- Rules for entry and exit to the sector including procedures for removing or disciplining members of the sector who do not abide by its rules.
- It will be the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Ultimately, a sector may desire to expel a member due to repeated violations of sector

provisions. Once a vessel enters into a sector, it cannot fish during that fishing year under the regulations that apply to the common pool. In other words, if a vessel is expelled from a sector, it cannot participate in the groundfish fishery during the remainder of that fishing year.
- For the purposes of enforcement, a sector is a legal entity that can be subject to NMFS enforcement action for violations of the regulations pertaining to sectors. Vessels operating within a sector are responsible for judgments against the sector.

The No Action alternative would maintain these measures.

5.2.3.5.2 Enforcement

It will be the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Ultimately, a sector may desire to expel a member due to repeated violations of sector provisions. Once a vessel enters into a sector, it cannot fish during that fishing year under the regulations that apply to the common pool. In other words, if a vessel is expelled from a sector, it cannot participate in the groundfish fishery during the remainder of that fishing year.

For the purposes of enforcement, a sector is a legal entity that can be subject to NMFS enforcement action for violations of the regulations pertaining to sectors. Vessels operating within a sector are responsible for judgments against the sector. The following options are being considered to further explain this concept.

Option 1: Sector regulations at 50 CFR 648.87(b)(2)(x) including the following sentence:

> "Each Sector, vessel, and vessel operator and/or vessel owner participating in the Sector may be charged jointly and severally for violations of Sector Operations Plan requirements as well as any other applicable Federal regulations, resulting in an assessment of civil penalties and permit sanctions pursuant to 15 CFR part 904."

This sentence will be revised by removing the phrase "as well as any other applicable Federal regulations:"

> "Each Sector, vessel, and vessel operator and/or vessel owner participating in the Sector may be charged jointly and severally for violations of Sector Operations Plan requirements resulting in an assessment of civil penalties and permit sanctions pursuant to 15 CFR part 904."

Rationale: This modification to the regulation makes it clear that sectors are only jointly and severally liable for violations of operation plan requirements, and not all existing federal regulations. This is consistent with the language establishing sectors in Amendment 13.

Rationale: This option clarifies regulatory text to indicate that sectors are jointly liable for overages of the TAC, and clarifies the repercussions of such overages.

5.2.3.5.3 Sector Monitoring Requirements

Sector operations plans will specify how a sector will monitor its landings to assure that sector landings do not exceed the sector allocation. At the end of the fishing year, NMFS will evaluate landings using IVR, VMS, and any other available information to determine whether a sector has exceeded any of its allocations based on the list of participating vessels submitted in the operations plan.

The next paragraphs describe the requirements necessary for monitoring both landings and discards. These sections add additional requirements to those currently in place (such as weighmasters/dockside monitors for all landings, improved discard monitoring systems, etc.). The range of alternative considered by the Council includes the current system (No Action) as well as the system proposed below.

5.2.3.5.4 Standards for Sector Monitoring and Reporting Service Providers

Amendment 13 did not establish any requirements for the service providers that help sectors monitor catches. This section proposes those requirements.

5.2.3.6 Sector Annual Reports

Current regulations require an annual report but Amendment 13 was unclear on the requirements for that report. This section expands on those requirements.

5.2.3.6.1 No Action

Amendment 13 did not identify specific requirements for sector annual reports. The No Action option would continue to leave this requirement vague.

Rationale: This measure clarifies the information that should be reported in annual reports so that sectors can be evaluated.

5.2.3.7 Transfer of Annual Catch Entitlements (ACE)

Amendment 13 did not authorize transfer of ACE between sectors. This section considers alternatives for such transfers.

5.2.3.7.1 Option 1 - No Action

If this option is selected, transfer of ACE between sectors will not be authorized.

Rationale: Allowing transfer of ACE provides flexibility for sectors to adjust their allocations to account for unusual circumstances or to take advantage of other opportunities. For example, there may be instances were a sector does not have an allocation for a stock that has an unusual distribution due to oceanographic conditions – without allowing ACE transfer, the sector may be forced to discard this stock and may have to cease fishing because of the discards. Allowing the exchanges to continue for a period after the end of the fishing year provides a limited opportunity for a sector to quota balance in the instances that the ACE was inadvertently exceeded. This provision is not intended to allow sectors to exceed their ACE.

5.2.3.8 Sector Participation in Special Management Programs

Amendment 13 did not establish guidelines for participation in Special Management Programs by vessels that are in sectors. Sector participation in existing special management programs is described below. If additional program are adopted, specific provisions for sector participation will be defined. In all cases, sector vessels cannot participate in a special management program unless the sector has ACE (allocated or acquired) for the stocks caught in this SAP in order to participate. The ACE must be sufficient to account for the expected catch in the SAP.

5.2.3.8.1 No Action

This option would not adopt provisions to guide sector participation in special management programs. Presumably sector vessels would be subject to the same provisions as non-sector vessels, with the exception of the CA I Hook Gear Haddock SAP which adopted specific sector provisions.

5.2.3.8.2 Closed Area I Hook Gear Haddock SAP

This SAP provides an opportunity to target GB haddock within CAI. The SAP already has provisions that describe requirements for sectors and additional provisions are not proposed (but see section 5.2.7 for possible SAP changes).

5.2.3.9 Interaction of Sector with Common Pool Vessels

This section modifies the provisions that relate to the interaction between sector and non-sector (common pool) vessels.

<u>No Action</u>

Amendment 13 provided guidance on how sectors interact with common pool vessels. The underlying concept was to create a system where sectors would not be responsible for mortality overages by non-sector vessels, to the extent possible. While it is appropriate for changes in stock condition to affect the amount of fish that the share represents, sectors should not suffer if other sectors, or common pool vessels, exceed target or hard TACs and create a need for mortality reductions. If a sector does not exceed its assigned TAC in a given fishing year, but other sectors or common pool vessels do, the sector's quota [in absolute (not share) terms] in the following years will not be reduced. This does not permanently change the sector's percentage of the total TAC, however. In the extreme case, the total resources available may be less than a sector's absolute quota. In this instance, the sector's share will be temporarily increased by the percentage that other sectors exceeded their quota. As stock conditions improve, the sector will keep this temporary increase in share until its annual quota is the same as it was prior to the stock decline. The sector's permanent share will then revert to its original share.

If a sector exceeds its TAC, the sector's quota will be reduced in the following year and the sector may be subject to enforcement action. If the sector exceeds its TAC repeatedly, the sector's share can be permanently reduced as a penalty or the sector's authorization to operate withdrawn. If declining stock conditions result in a need to reduce fishing mortality, and all sectors and common pool vessels have operated within target or hard TAC limits, a sector's share will not be changed, but the amount this share represents may be due to reduced overall

TACs. If stock conditions improve, and a sector stays within its quota while other sectors do not, the sector will receive a temporary increase in share equal to the amount that other sectors exceeded their quota.

Some management provisions that apply to common pool vessels will also apply to any vessel in a sector. This list may be modified through a framework adjustment. Measures that are not included in this list maybe altered through a sector's operations plan, if approved by NMFS. These are:

If quotas are allocated to a sector:
- Year round closed areas
- Permitting restrictions (vessel upgrades, etc.)
- Gear restrictions designed to minimize habitat impacts (roller gear restrictions, etc.)
- Reporting requirements (not including DAS reporting requirements)

5.2.4 Reporting Requirements

This measure proposed to add additional requirements for limited access groundfish vessels to facilitate the monitoring of Annual Catch Limits (ACLs) and sectors.

5.2.4.1 Option 1 – No Action

Under the No Action option, no additional reporting requirements are adopted that are not specified in other sections.

5.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

5.2.5.1 Option 1 – No Action

At present, there is no allocation of groundfish made between the recreational groundfish fishery (private boat/party/charter) and the commercial groundfish fishery. If this No Action option is adopted, this situation will continue.

5.2.5.2 Option 2 – Commercial and recreational groundfish allocation for certain stocks

An allocation will be made of certain regulated groundfish stocks to the commercial and recreational components of the fishery. For this action, an allocation will be determined after accounting for state waters catches taken outside of the FMP. An allocation will not be made in the case of stocks that are not fully harvesting the ACL. An allocation will also not be made if the recreational harvest, after accounting for state waters catches outside the management plan, is less than five percent of the removals.

In those cases that meet the requirements to establish an allocation, a defined time period will be used to calculate the allocation. The time periods that are being considered for each stock are shown in Table 34; the Council will choose from these options for the Proposed Action. The proportion allocated to these fisheries will be determined using the time periods shown in the table based on the data that is used in GARM III assessments. When possible, the shares will be determined by using the numbers of fish in the years caught (as used by the assessment: harvested, landed, or discarded) by each component. The shares determined in this manner will be applied to the ACL to determine the weight of catch available for each component. If the number of fish caught be each component is not available, the shares will be calculated based on weight. The proportion for each year will be calculated, and then the average proportion over the time period will be the share for each component of the fishery. The proportions will be reviewed consistent with the periodic assessment cycle, and if determined necessary, changes can be implemented through a framework action. Any changes that are adopted will not affect the implementation of accountability measures based on proportions that were in effect at the time of the catches. This table also lists an estimate of the allocations that will result – this estimate has not yet been adjusted for state waters catches. Allocations are not being considered at present for SNE/MA winter flounder, GOM winter flounder, pollock, or GB cod, because current catches do not meet the standard for an allocation. Allocations may be defined for these tocks in the future.

Table 34 – Proposed time periods for calculating the recreational and commercial share of the groundfish ACL and preliminary estimate of recreational allocation that results. Note: not yet adjusted for state waters catches not subject to the management plan.

Stock	Years	Preliminary Estimate
GOM Cod (1)	1996 - 2006	25.1%
GOM Haddock (1)	1996 - 2006	17.6%

Rationale: By allocating certain groundfish stocks to the commercial and recreational components of the fishery, the design of management measures can be tailored to the components that are responsible should mortality targets be exceeded. GOM winter flounder, SNE/MA winter flounder, pollock, and GB cod are not allocated because at present the federal waters catch of these stocks is less than 5 percent of removals. Catches will be monitored and an allocation may be considered in the future if it exceeds 5 percent.

5.2.6 Changes to the DAS Transfer and DAS Leasing Programs

5.2.6.1 Option 1 – No Action

If this option is selected, there will not be any changes made to the conservation tax charged by the DAS leasing program or the DAS transfer program. DAS will be leased without any conservation tax, while a twenty percent conservation tax will be charged for using the DAS transfer program. A cap will remain on the number of DAS that can be leased by a permit: a permit cannot lease more DAS than its allocation prior to Amendment 13.

5.2.6.2 Option 2 - DAS Transfer Program Conservation Tax

The Council will eliminating the conservation tax on DAS transfers, currently set at 20 percent. If a change is made, transfers that have taken place before the change will be treated in one of two ways:

Option B: Permits that have been previously charged a conservation tax will have their tax refunded (consistent with the revised tax).

Rationale: There has been limited use of the DAS transfer program. Modifying or eliminating the conservation tax may encourage use.

5.2.6.3 Option 3 - DAS Leasing Program Conservation Tax

The Council will consider setting a tax on DAS leasing that is equivalent to the tax adopted for the DAS transfer program.

Rationale: Since the DAS can be acquired through the leasing program without a conservation tax, this program may inhibit consolidation in the fishery. In addition, the program may not be conservation neutral and may be increasing fishing mortality on some stocks. If the conservation tax on the leasing program and the DAS transfer program are the same, it may encourage vessel owners to consolidate permits, and if a tax is adopted it may reduce mortality impacts of the leasing program.

5.2.6.4 Option 4 - DAS Transfer Program Conservation Tax Exemption Window

An owner of multiple groundfish permits will be allowed to consolidate the DAS and catch history of those permits onto a single vessel while exempt from the DAS conservation tax. The period when such transfers will be exempt from the DAS transfer program conservation tax will be limited to a specific time period, after which any use of the DAS transfer program will be subject to the DAS transfer tax that is in effect. The time period considered for this exemption window is between three months and one fishing year.

Rationale: This measure will encourage owners of multiple limited access groundfish permits to consolidate their permits on one vessel. The limited period when such transfers are not subject to the conservation tax will encourage permit holders to make this decision. Permit holders will have reduced costs since they will no longer have to maintain vessels (skiffs) to hold additional permits, will not have to renew those permits annually, and will not have to file VTRs for those permits. To the extent that vessels take advantage of this opportunity, this will reduce the administrative burden on NMFS of processing DAS leases among vessels with the same owner. It will also reduce the risk that some of those permits may be reactivated in the future, either in the groundfish fishery or other fisheries.

5.2.7 Special Management Programs

5.2.7.1 Incidental Catch TACs

Incidental catch TACs were first adopted in FW 40A in order to limit the catch of non-target stocks while vessels were using Category B DAS. As a result of groundfish assessments completed in August 2005 the incidental catch TACs were revised. TACs were added for GB yellowtail flounder and GB winter flounder. The TACs for GOM cod, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and SNE/MA winter flounder were reduced from two percent of the total target TAC to one percent of the total target TAC.

No Action

Incidental catch TACs would not be set for pollock and the incidental catch TACs would not be based on the ACL amount.

5.2.7.2 Closed Area I Hook Gear Haddock SAP Revisions

The CAI Hook Gear Haddock SAP provides an opportunity to target GB haddock within the boundaries of CAI. Changes are being considered to the area and the season, and to the provisions adopted to mitigate competition between sector and common pool participants.

5.2.7.2.1 Option 1 – No Action

If this option is selected there will not be any changes to the SAP regulations. The area of the SAP will continue to be as shown in Figure 3. The season for the SAP will continue to be October 1 to December 31. The season will continue to be split in half, with one half of the season for sector vessels and the other half for common pool vessels. The TAC for GB haddock caught in the SAP will continue to be divided equally between sector and common pool vessels.

5.2.7.3 Eastern U.S./Canada Haddock SAP

This SAP provides an opportunity to target GB haddock in the Eastern U.S./Canada area, including a small portion of CAII.

5.2.7.3.1 Option 1 - No Action

The SAP is scheduled to terminate on December 31, 2008. If the No Action alternative is selected, the SAP will not be re-opened.

5.2.7.4 Closed Area II Yellowtail Flounder SAP

5.2.7.4.1 Option 1 – No Modifications

If this option is selected, the CAII yellowtail flounder SAP will not be modified to provide an opportunity to target GB haddock within the SAP area.

5.2.7.5 SNE/MA Winter Flounder SAP

<u>No Action</u>

The existing SAP provisions adopted in Amendment 13 allow a vessel fishing for fluke west of 72-30W, using mesh authorized by the fluke plan and not on a groundfish DAS, is allowed to retain and land up to 200 lbs. of winter flounder subject to the following restrictions:

- Vessel must possess a valid federal fluke permit
- Winter flounder cannot exceed the amount of fluke on board
- The vessel operator must sign into this program for a minimum of thirty days and must have a letter of authorization from the Regional Administrator on board
- While in the program, a vessel cannot fish on a groundfish DAS
- All fishing must take place west of 72-30W

- Possession and/or landing of other groundfish is prohibited

5.2.7.6 Category B DAS Program

5.2.7.6.1 Option 1 – No Action

There are no changes to the Category B DAS Program.

5.2.7.7 Approval of Additional Gear

Several programs in the multispecies fishery impose specific gear requirements. For example, trawl vessels fishing in the U.S./Canada area are required to use specific trawl gear configurations; trawl vessels fishing in the Category B (regular) DAS program are required to use a separator trawl or Ruhle trawl, and similar requirements apply to the Eastern U.S./Canada Haddock SAP. Some of these programs allow the Regional Administrator to authorize additional gear after determining that it meets specific requirements, but this authority is at times limited to in-season authorization that must be renewed annually.

5.2.7.7.1 Option 1 - No Action

Under this option, there are no changes to the provisions that allow the Regional Administrator to authorize additional gear in programs that adopt specific gear requirements. The Regional Administrator will be able to permanently authorize additional gear in the Category B (regular) DAS Program and the Eastern U.S. Canada Haddock SAP and can make in-season adjustments for gear used in the U.S./Canada area. If any additional programs are adopted, they will need to address whether the Regional Administrator can authorize additional gear.

5.2.8 Periodic Adjustment Process

5.2.8.1 Option 1 – No Action

If No Action is taken, there will be no changes to the periodic adjustment process. The membership of the Groundfish PDT will include the Chair of the Groundfish Advisory Panel and one other interested person. The measures adopted in this action will not be able to be adjusted by a framework action.

5.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

5.2.9.1 Option 1 - No Action

At present, only those limited access scallop permit holders that qualified for a combination vessel limited access multispecies permit are permitted to hold a limited access scallop permit and a limited access multispecies permit at the same time. Under the No Action option, this restriction will continue. Vessels with a limited access scallop permit will not be allowed to obtain a limited access multispecies permit, and vessels with a trawl limited access scallop permit that choose to modify their permit to a dredge limited access scallop permit must surrender any limited access multispecies permit that is held.

Rationale: This option continues the restriction adopted in Amendment 5 when the limited access permit system was created for the multispecies FMP.

5.2.10 Catch History

The Council considered not adopting any additional limits on catch history. This No Action alternative would have meant that catch history continued to accrue to the vessel that landed the catch.

5.3 Measures to Meet Mortality Objectives

5.3.1 Introduction

5.3.2 Commercial Fishery Measures

In all of these options, measures in existence in FY 2008 continue unless changed by this action. All of the options, including No Action, include a change in the Category A/Category B DAS split (effectively a reduction in Category A DAS).

5.3.2.1 No Action

If adopted, the effort controls adopted by Amendment 13 and subsequent frameworks would continue unchanged. These measures include a change in the Category A and Category B DAS split (45/55, or an 18 percent reduction in allocated Category A DAS) that is scheduled to occur in FY 2009 unless certain conditions are met: overfishing is not occurring on any stock and additional fishing mortality reductions are not needed to rebuild any stock. The measures used to meet mortality objectives are discussed in broad terms in section 3.5. More specific elements are described below.

Trip limits: The following trip limits apply when not participating in SAPs, the Category B (regular) DAS program, or when not altered by regulations for the U.S./Canada area.

GOM cod: 800 lbs./DAS up to 4,000 lbs./trip

GB cod: 1,000 lbs./DAS up to 10,000 lbs./trip
CC/GOM yellowtail flounder: 250 lbs./DAS up to 1,000 lbs./trip
SNE/MA yellowtail flounder: 250 lbs./DAS up to 1,000 lbs./trip
GB yellowtail flounder: 10,000 lbs./trip
GB winter flounder: 5,000 lbs./trip
White hake: 1,000 lbs./DAS up to 10,000 lbs./trip
Atlantic halibut: one fish per trip

Handgear A permit: 300 lbs./cod per trip
Handgear B Permit: 75 lbs./cod per trip

Gear requirements: See Table 35.

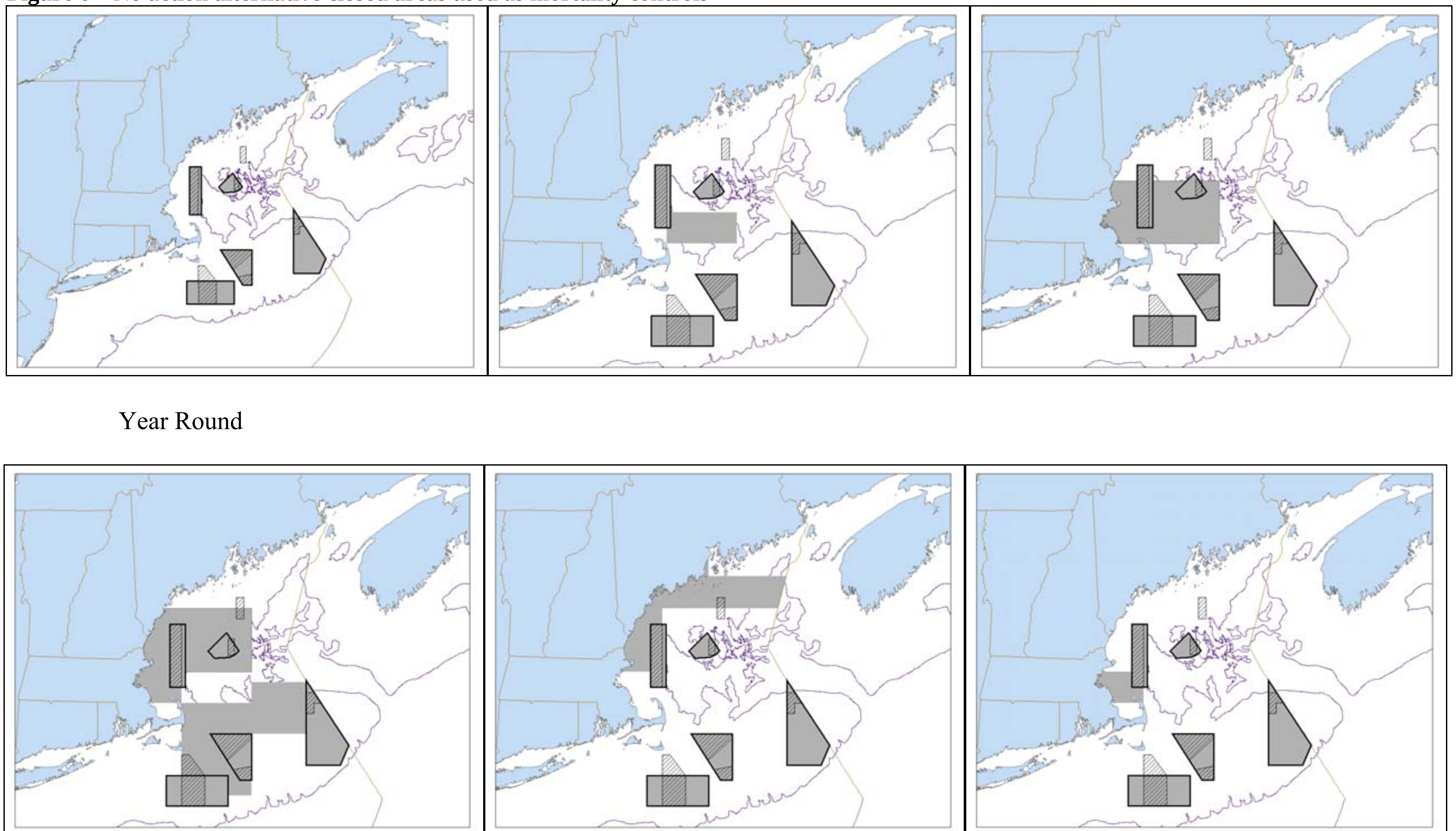
Closed areas: see Figure 6.

Differential DAS counting: DAS are counted at a 2:1 rate for vessels fishing in the areas shown in Figure 7.

Table 35 – No action alternative general gear requirements

	GOM	GB	SNE	Mid-Atl
MINIMUM MESH SIZE RESTRICTIONS FOR GILLNET GEAR				
NE Multispecies Day Gillnet Category*	Roundfish nets 6.5" (16.5 cm) mesh; 50-net allowance	All nets 6.5" (16.5 cm) mesh; 50-net allowance	All nets 6.5" (16.5 cm) mesh; 75-net allowance	Roundfish nets 6.5" (16.5 cm) mesh; 75-net allowance
	Flatfish nets 6.5" (16.5 cm) mesh; 100-net allowance			Flatfish nets 6.5" (16.5 cm) mesh; 75-net allowance
NE Multispecies Trip Gillnet Category*	All nets 6.5" (16.5 cm) mesh; 150-net allowance	All nets 6.5" (16.5 cm) mesh; 150-net allowance	All nets 6.5" (16.5 cm) mesh; 75-net allowance	All gillnet gear 6.5" (16.5 cm) mesh; 75-net allowance
Monkfish Vessels**	10" (25.4 cm) mesh/150-net allowance			
MINIMUM MESH SIZE RESTRICTIONS FOR TRAWL GEAR				
Codend only mesh size*	6.5" (16.5 cm) diamond or square		7.0" (17.8 cm) diamond or 6.5" (16.5 cm) square	6.5" (16.5 cm) diamond or square
Large Mesh Category - entire net	8.5" (21.59 cm) diamond or square			7.5" (19.0 cm) diamond or 8.0" (20.3 cm) square
MAXIUM NUMBER OF HOOKS AND SIZE RESTRICTIONS FOR HOOK-GEAR* **				
Limited access multispecies vessels	2,000 hooks	3,600 hooks	2,000 hooks	4,500 hooks (Hook-gear vessels only)
	No less than 6" (15.2 cm) spacing allowed between the fairlead rollers			
	12/0 circle hooks required for longline gear			N/A

Figure 6 – No action alternative closed areas used as mortality controls

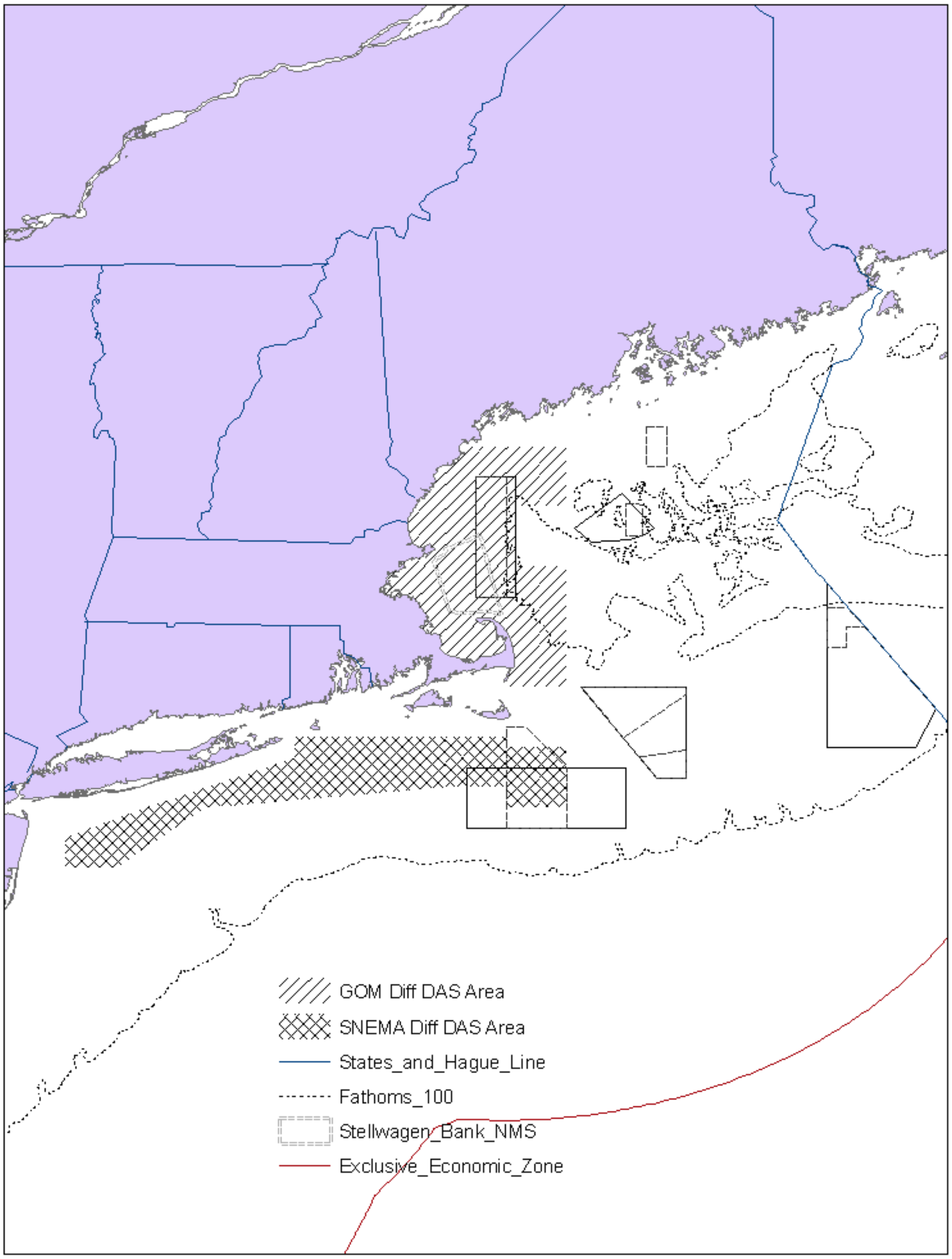


Year Round

April

May June October/November

Figure 7 – No action differential DAS area, year round closed areas, and habitat closed areas



Note: Option numbers are matched to PDT reports describing the options used during the development of the amendment to facilitate measure discussion.

5.3.2.2 Non-sector Vessels Option 2A – Differential DAS and Trip Limits

This option uses a combination of differential DAS and a trip limits on a few stocks to achieve mortality objectives. It does not modify the existing year round, rolling, seasonal, or habitat closed areas. Gear requirements while fishing on a Category A DAS that were implemented by Amendment 13, as modified by subsequent framework actions, remain in effect.

At the final meeting to review the draft measures, the Council was notified that pollock was overfished. The initial version of this option considered by the Council did not meet the mortality objectives needed to rebuild pollock. As a result, the Council considered two variations to Option 2A. These options modified the differential DAS counting areas, further reduced allocated Category A DAS, and modified trip limits. Table 36 below summarizes these changes for the two modifications to this option that the Council considered.

<u>Trip limits</u>: The following trip limits would be implemented for fishing on a Category A DAS. All other trip limits while fishing on a Category A DAS would be eliminated. This measure does not change the authority of the Regional Administrator to impose trip limits as necessary under the provisions implementing the U.S./Canada Resource Sharing Understanding. In all cases, only one landing limit can be landed in any twenty-four hour period. If a vessel fishes in more than one area, the most restrictive trip limit for a species applies for the entire trip.

<u>Cod (both GOM and GB stocks):</u>

Limited access vessels: 2,000 lbs. per DAS up to a maximum of 12,000 lbs./trip in the GOM and 20,000 lbs./trip for GB, with the exception of the Eastern U.S./Canada area where the Regional Administrator will specify the appropriate trip limit at the beginning of the fishing year (the default trip limit for this area remains 500 lbs./DAS, up to a maximum of 5,000 lbs./trip). The areas of applicability for the GOM and GB stocks will remain as currently defined.

Handgear A Permits (HA Permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for cod is increased to 750 lbs./trip. The automatic adjustment mechanism is retained.

Handgear B Permits (HB permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for GOM cod is increased to 200 lbs./trip. The automatic adjustment mechanism is retained.

<u>CC/GOM yellowtail flounder and SNE/MA yellowtail flounder:</u> 500 lbs./DAS up to a maximum of 3,000 lbs./trip.

<u>SNE/MA winter flounder:</u> Landing of this stock is prohibited in any fishery.

<u>Windowpane flounder:</u> Landing of windowpane flounder is prohibited in any fishery.

<u>Atlantic halibut:</u> The trip limit remains one fish per trip.

<u>Effort controls:</u>

DAS: The default change in the Category A/Category B DAS split that will be implemented May 1, 2009 is retained. The Category A/Category B split is 45/55.

Differential DAS counting: Differential DAS counting areas are adopted as described below using thirty-minute squares. Differential DAS will be counted based on the location of the vessel as determined by VMS. There is no requirement for declaring into an area (other than requirements for the U.S. /Canada Area. under regulations implementing the U.S./Canada Resources Sharing Understanding). DAS counting rates will be based on the first position in the differential DAS counting area and the first position out of the DAS counting area.

(a) Day gillnet vessel differential DAS counting: For day gillnet vessels that fish in more than one differential DAS counting area on the same trip, the differential DAS counting rate that applies is the highest rate for the areas fished. Because of the day gillnet 15 hour minimum rule, this applies for trips that are either three hours or less in length, or more than (15/differential DAS rate) in length. This is a change from the FW 42 practices in the SNE/MA differential DAS counting area. Examples of the application of this rule follow:

Fishes in one 2:1 area:
0-3 hours: charged at 2 times the time spent on the trip
Over 3-7.5 hours: charged 15 hours
Over 7.5 hours: charged at 2 times the time spent on the trip

Fishes in a 2:1 area and a 2.25:1 area:
0-3 hours: charged 2.25 times the time spent on the trip
Over 3 to 6.67 hours: charged at 15 hours
6.6 hours: charged at 2.25 times the time spent on the trip

(b) Impact on Monkfish Category C and D vessels: Vessels with monkfish Category C and D permits are generally required to use a groundfish DAS when using a monkfish DAS. The groundfish DAS will be counted at the appropriate differential DAS rate as described in this section. As a result, the vessel's groundfish DAS may be used before the vessel uses all of its monkfish DAS. Once the groundfish allocation is used the vessel cannot use its monkfish DAS. If a vessel's groundfish DAS allocation is less than its monkfish DAS allocation the vessel is given monkfish only DAS in the amount equivalent to that vessel's annual monkfish allocation minus its annual allocation of NE multispecies. This provision does not apply to differential DAS counting rates – using the groundfish DAS at a higher rate than the monkfish DAS does not entitle the vessel to additional monkfish only DAS. Burning up the groundfish DAS in a differential DAS area does not, at present, entitle a vessel to use monkfish-only DAS.

(c) Areas:

Gulf of Maine Inshore: 115-116 (north of Cape Cod), 123-125, 131-133, 138-140, 146-147
Rate: 2.25:1
Coordinates: Area bounded by the shore and:

Shoreline at 69-30W
41-30N 69-30W
41-30N 70-00W
North to Cape Cod at 70W

Gulf of Maine Offshore: 118-122, 126-130, 134-137, 141-145
Rate: 1.25:1
Coordinates: Area bounded by the shoreline at 44 N
44-00N and the US/CA boundary
42-00N and the US/CA boundary
42-00N 69-30W
Shoreline at 69-30W

Georges Bank: 92-96, 108-114
Rate: 2.25:1
Coordinates: 42N and the US/CA boundary
41-00N and the US/CA boundary
41-00N 68-30W
41-30N 68-30W
41-30N 70-00-W
42-00N and the Cape Cod Shoreline
42-00N and the US/CA Boundary

Southern New England/Mid-Atlantic: 80-91, 97-107, 115-116 (south of Cape Cod)
Rate: 3:1
Coordinates:
41-30N 68-30W
40-30N 68-30W
40-30N and the shoreline
Shoreline at 70-00W
41-30N 70-00W

Figure 8 – Option 2A proposed differential DAS areas

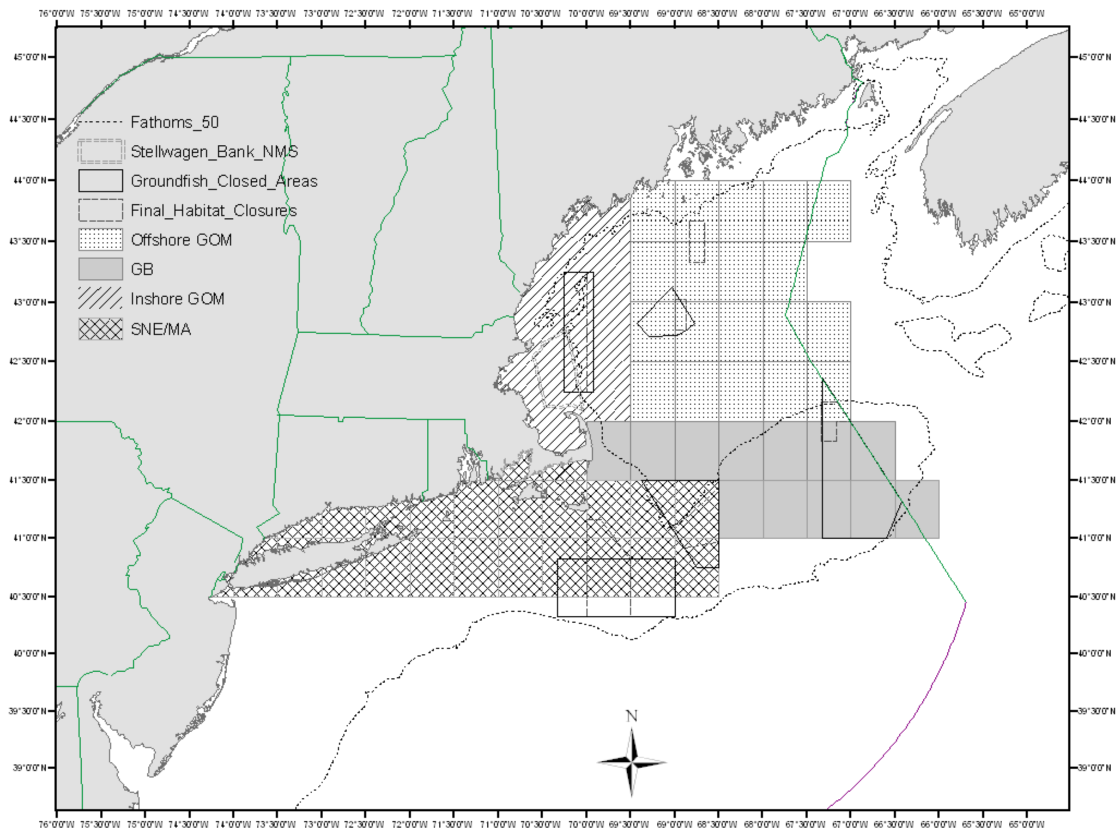


Table 36 – Modified measures for Alternative 2A

Measure	2A – Mod 1	2A – Mod 2
Cat A DAS Change	-30%	-35%
Differential DAS Counting	Inshore GOM 2.5:1 Offshore GOM 2:1 GB 1.5:1 SNE 2:1	
Trip Limits	GOM Cod -2,000 lbs./day/12,000 trip GB Cod - 2,000 lbs./day/20,000 trip EGB Cod - 500 lbs./day (E US/CA Area) CC/GOM GM YT - 500lbs./day/ 3,000 trip SNE/MA YT - 500 lbs./day/3,000 trip Pollock -1,000/day/10,000 trip	

5.3.2.3 Non-Sector Vessels Option 4 –DAS Reduction and Restricted Gear Areas

This option reduces Category A DAS by 40 percent from FW 42 allocations. This results in a Category A/Category B DAS split of 33/67. Most other current measures remain, including seasonal and rolling closures and gear requirements. This option does not quite achieve the rebuilding target for pollock and if selected as the Proposed Action measures may need to be modified to achieve that target.

The following trip limits would be implemented for fishing on a Category A DAS. All other trip limits while fishing on a Category A DAS would be eliminated. This measure does not change the authority of the Regional Administrator to impose trip limits as necessary under the provisions implementing the U.S./Canada Resource Sharing Understanding. In all cases, only one landing limit can be landed in any twenty-four hour period. If a vessel fishes in more than one area, the most restrictive trip limit for a species applies for the entire trip.

GOM cod: 2,000 lbs./DAS; maximum 12,000 lbs/trip

GB cod: 1,000 lbs./DAS, maximum 10,000 lbs./trip; with the exception of the Eastern U.S./Canada area, where the Regional Administrator will specify the appropriate trip limit at the beginning of the fishing year (the default trip limit for this area remains 500 lbs./DAS, up to a maximum of 5,000 lbs./trip).

Cod (all):

Handgear A Permits (HA Permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for cod is increased to 750 lbs./trip. The automatic adjustment mechanism is retained.

Handgear B Permits (HB permits): Consistent with the automatic adjustment in landing limits for this category adopted in A13, the landing limit for GOM cod is increased to 200 lbs./trip. The automatic adjustment mechanism is retained.

CC/GOM yellowtail flounder: 250 lbs./DAS up to a maximum of 1,500 lbs./trip

SNE/MA yellowtail flounder: 250 lbs./DAS up to a maximum of 1,500 lbs./trip

GB yellowtail flounder: 10,000 lbs./trip (unless adjusted consistent with US/CA area regulations)

SNE/MA winter flounder: Landing of this stock is prohibited in any fishery.

Windowpane Flounder: Landing of this stock is prohibited in any fishery.

Atlantic halibut: One fish per trip

A key feature of this option is the addition of an area in southern New England where only specific gear can be used while fishing on a groundfish DAS. In the gear areas, gear may be restricted to those gears that do not catch yellowtail flounder and winter flounder.

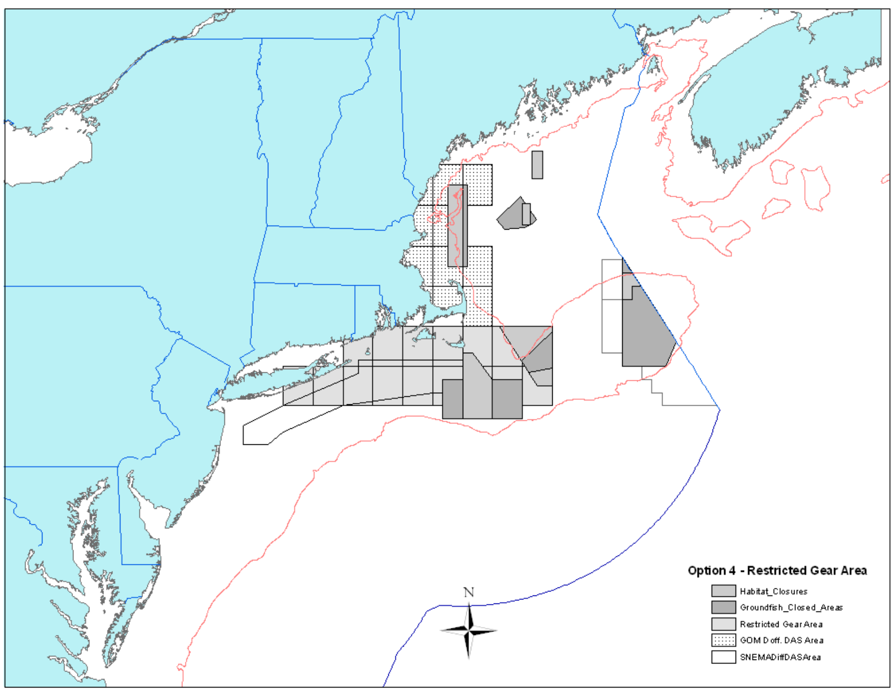
Coordinates of proposed area:

Massachusetts shoreline at 71-00W
41-30N 68-30W
40-30N 68-30W
40-30N 73-00W
New York shoreline at 73-00W
New York shoreline at 72-00W
North to Connecticut shoreline at 72-00W

Gears being considered include:

Trawl Gear: Haddock separator trawl, eliminator trawl, five point trawl, raised footrope trawl, rope trawl
Sink gillnets: No tiedown nets allowed unless using mesh over eight inches
Longline/tub trawls
Handgear

Figure 9– Option 4, restricted gear area



5.3.2.4 SNE/MA Small Mesh Fisheries Gear Requirement

In the area described by the following coordinates and illustrated in Figure 10, all vessels, in any fishery, fishing with bottom trawl gear that uses a cod end smaller than 6.5 inches, square or diamond, must use drop chains of at least 12 inches. The drop chains must be a minimum of 3/8 inch diameter bare chain. The spacing of the drop chains must be no less than 55 cm. from one chain to the next. The drop chain may attach directly to a traveler wire or directly to the footrope.

The area for this requirement is bounded as follows:

Cape Cod Shoreline at 70W

40-50N 70-00W

40-50N 69-40W

40-40N 69-40W

40-40N 70-30W

40-30N 72-30W

40-10N 73-00W

40-00N 73-15W

Shoreline at 40-00N

Exempted Nets
Nets that are constructed with a mesh of 24 inches or greater, throughout the face of the net, top and bottom, and that continues beyond the mouth of the net with the same mesh size (24 inches or greater) for at least five meshes, will not be required to utilize drop chains of any specific length, if any at all (example: Ruhle trawl or rope net). Figure 11 is an illustration of these net requirements.

Sweep Length
The sweep shall be no less than two feet longer that the footrope on all nets that are required to use 12 inch drop chains.

Construction
The sweep and foot rope shall be assembled at the wing end in such a way as to not facilitate simple adjustment. This connection should be free of chain. Ease of enforcement recognition.

Figure 10 – Proposed area for drop chain requirement

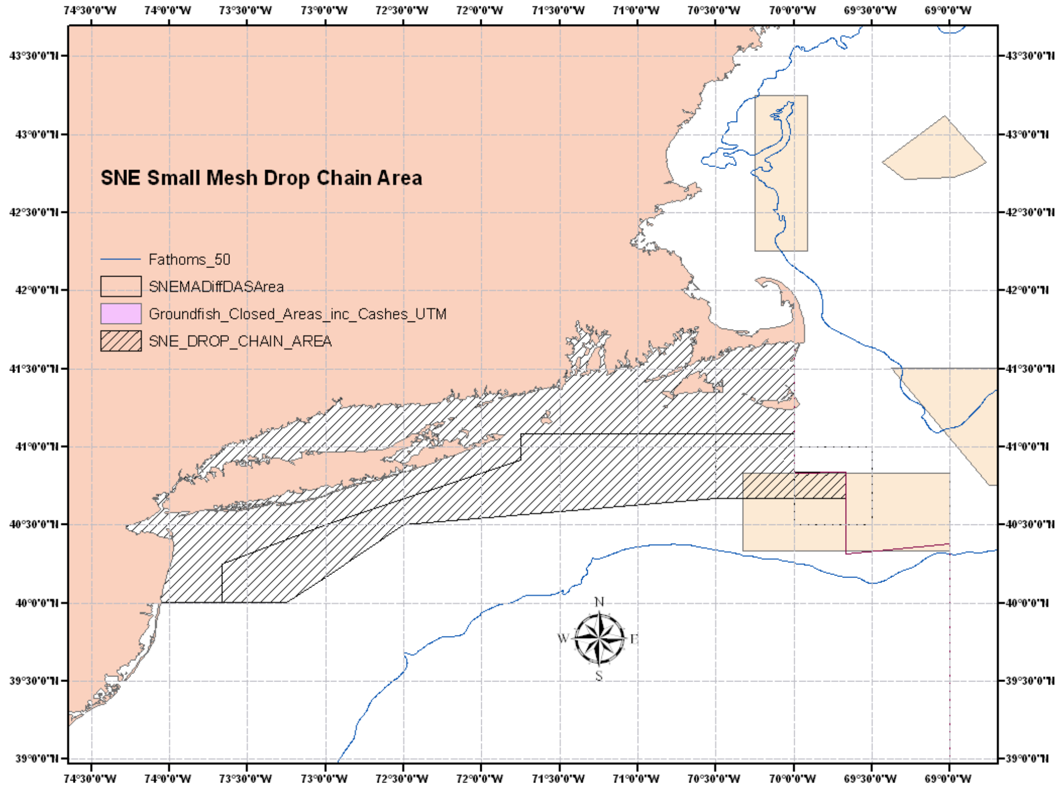
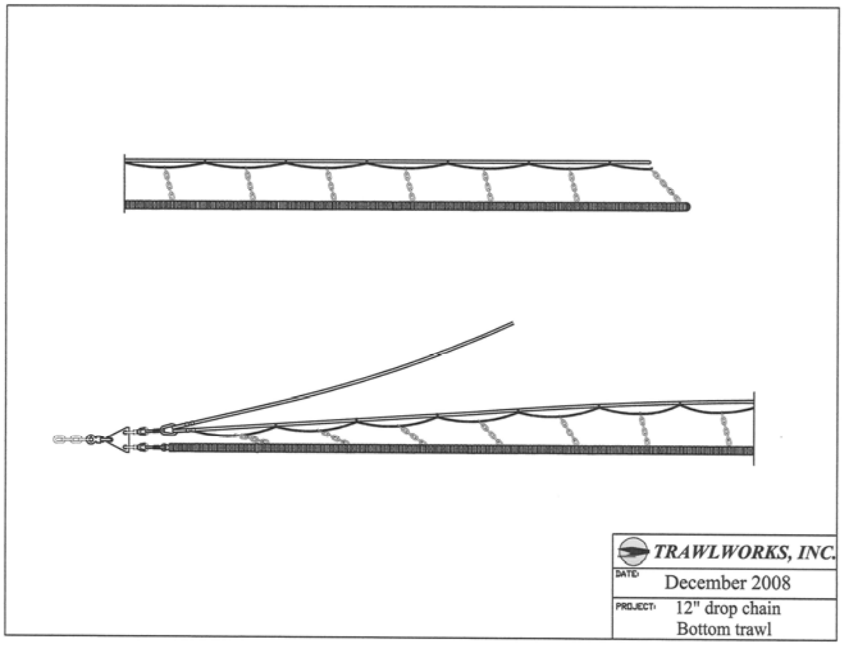
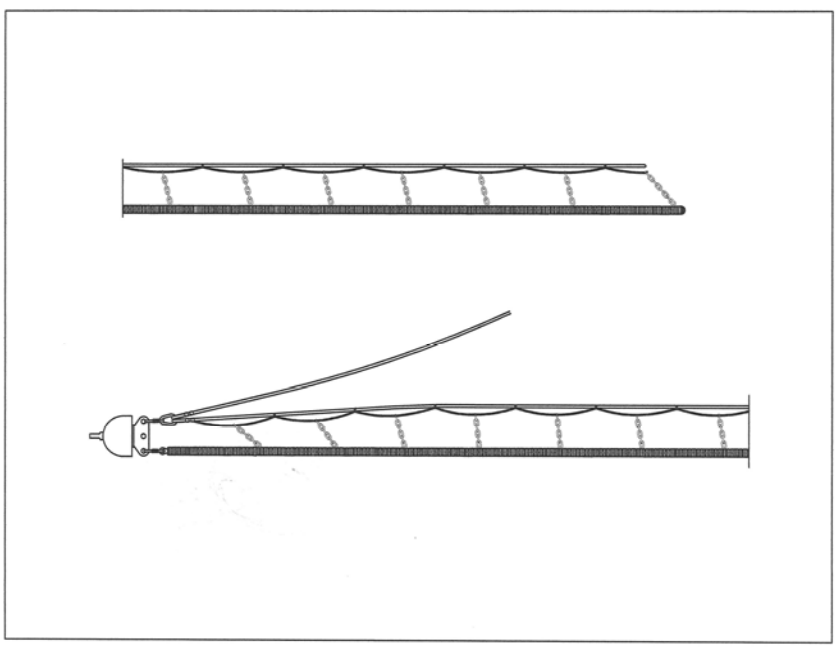


Figure 11 – Diagram of drop chain requirements for SNE





5.3.2.5 GOM Haddock Sink Gillnet Pilot Program

5.3.2.5.1 Option 1 – No Action

Under this option a program is not established to target GOM haddock using sink gillnets.

5.3.2.6 Haddock Minimum Size

5.3.2.6.1 Option 1 – No Action

This option, if adopted, leaves the haddock minimum size at 19 inches.

<u>Rationale</u>: This measure is intended to reduce discards and increase landings of the rebuilt haddock stocks. As proposed it does not apply to recreational vessels but this may change if recreational vessels can increase their mortality on all haddock stocks.

5.3.3 Recreational Management Measures

Recreational measures will be designed consistent with the allocations adopted in section 5.2.4 and any necessary adjustments in fishing mortality.

5.3.3.1 Provisions for Landing Fillets

<u>Option 1</u>: Recreational (including party/charter) fishermen will be allowed to land fillets with the skin off. For enforcing bag limit restrictions, the number of fillets will be converted to whole fish at the place of landing by dividing the fillet number by two. If fish are filleted into single (butterfly) fillets, each fillet is deemed to be from one whole fish.

<u>Option 2:</u> Recreational (including party/charter) fishermen will be allowed to land fillets. Species with a recreational allocation of an ACL must have at least two square inches of skin are on the fillet. The skin must be contiguous and must allow ready identification of the fish species. The minimum sizes apply to whole fish or to any part of a fish found in possession, e.g., fillets, except that party and charter vessels possessing valid state permits authorizing filleting at sea may possess fillets smaller than the size specified if all state requirements are met. For enforcing bag limit restrictions, the number of fillets will be converted to whole fish at the place of landing by dividing the fillet number by two. If fish are filleted into single (butterfly) fillets, each fillet is deemed to be from one whole fish.

<u>Option 3 – No Action</u>: Under the No Action option, recreational fishermen will continue to be required to land all groundfish fillets with the skin-on.

<u>Rationale</u>: Many recreational fishermen prefer to land fish in fillets, particularly on party/charter vessels where skinning of fish is provided as a service to the customer. The second option addresses the concerns of enforcement agents that they will not be able to enforce size limits if skin is removed because the species will not be identifiable.

5.3.3.2 Removal of the Limit on Hooks

Option 1 – No Action: Under this option, recreational fishermen will be limited to two hooks per line while fishing for northeast multispecies.

Rationale: Amendment 7 restricted recreational groundfish fishermen to two hooks per line and one line per angler as an effort reduction measure. This restriction does not exist in other recreational fisheries. As cod rebuild, some of these fisheries are catching small amounts of cod when using multiple hooks. These fish must either be discarded or retained illegally. This revision recognizes the reality that these incidents are likely to increase as cod rebuild and it serves little purpose to require discarding of cod.

5.3.3.3 Measures to Reduce Mortality

The primary groundfish species caught by recreational fishermen are winter flounder, cod, haddock, and pollock. Most winter flounder is caught within state waters and the Council cannot specify management measures for these catches as they are outside Council jurisdiction. The stocks where recreational catches are a substantial part of the harvest are GOM cod and GOM haddock. Whether a reduction in fishing mortality from recreational fishing is a function of two factors: the overall fishing mortality (and if it needs to be reduced to achieve mortality targets) and the division of the stocks into a commercial and recreational allocation.

If both the commercial and recreational components are catching their share of the allocation, then each component of the fishery would have to contribute an equivalent mortality reduction if one is required. If one component is exceeding its share it would need to contribute a larger reduction.

For the allocation options in section 5.2.5.2 and the mortality changes needed for GOM cod and GOM haddock, the necessary mortality reductions for the recreational fishery are shown in Table 37 for each of the allocation options being considered. If the selected allocation years are 2001-2006, additional measures will not be needed for the recreational fishery (technically a 2 percent reduction in GOM cod mortality is needed but this is considered an undetectable change). If the selected allocation years are 1996-2006, additional measures will be required. Table 37 also identifies the option measures being considered for each stock under each allocation option

Table 37 – Impacts of recreational/commercial allocation options on mortality reductions needed for the recreational and commercial components of the groundfish fishery.

Stock	Overall Needed Reduction	Allocation Years 1996-2006		Allocation Years 2001-2006	
		Rec.	Comm.	Rec.	Comm.
GOM cod	-21%	.-27%	-19%	-2%	-28%
Options Considered Section 4.4.3.3.1		*Options 1 through 3*		*No Action*	
GOM haddock	NA	-18%	Increase	Increase	Increase
Options Considered Section 4.4.3.3.2		*Options 1 through 3*		*Option 4*	

5.3.3.3.1 GOM Cod Options

Three options to No Action are being considered are to reduce mortality for GOM cod if the selected allocation years are 1996-2006.

Option 1: The minimum size for GOM cod is increased to 26 inches. There is no change to the bag limit or the season.

Option 2: The bag limit for GOM cod is six fish per angler per trip. There is no change to the minimum size or season.

Option 4 – No Action: Recreational fishing vessels will be subject to a minimum size for GOM cod of 24 inches (60.96 cm.). Fishermen on private recreational and party/charter vessels are limited to 10 cod/day per angler. There is a seasonal closure where possession of cod in the GOM cod regulated mesh area is prohibited from November 1 through March 31.

5.3.3.3.2 GOM Haddock Options

Three options to No Action are proposed to reduce mortality for GOM haddock if the selected allocation years are 1996-2006.

Option 1: The minimum size for GOM haddock is increased to 21 inches. There is no change to the bag limit or the season.

Option 2: A bag limit for GOM haddock is implemented as nine fish per angler per trip. There is no change to the minimum size or season.

Option 3: The minimum size for GOM haddock is reduced to 18 inches and a bag limit of 7 fish per angler per trip is adopted. There is no change to the season.

One option is proposed if the selected allocation years are 2001-2006 or if no allocation is made.

Option 5 – No Action: the minimum size for GOM haddock remains 19 inches and there is no bag limit.

Rationale: If the allocation years of 1996 -2006 are selected, recreational harvest of GOM haddock needs to be reduced to meet mortality objectives. The three options proposed have approximately the same impacts on mortality. If a different allocation period is selected then recreational harvest does not need to be reduced.

5.3.4 Atlantic Halibut Minimum Size

5.3.4.1 Option 1 – No Action

If the No Action option is selected the minimum size for Atlantic halibut will remain 36 inches (91.4 cm.).

Rationale: This increase in the minimum size matches the median length at maturity for female halibut in the Gulf of Maine. This change should slightly increase opportunities for additional halibut to spawn prior to capture.

5.3.5 Retention of Atlantic Wolffish

5.3.5.1 Option 1 – No Action

Under this option, there are no limits on the possession by commercial and recreational vessels of Atlantic wolffish.

5.3.6 Implementation of Additional Sectors/Modifications to Existing Sectors

The following list summarizes the new sector applications, and request for modifications to existing sectors, that were received for inclusion in Amendment 16. The Council has determined that if approved new sectors will begin operating in FY 2010, not FY 2009. This is to allow more time for sector organizers and NMFS to prepare for their implementation.

5.3.6.1 No Action

Under the No Action alternative, there will be no additional sectors adopted and no changes to the two existing sectors. All vessels that intend to fish in one of the seventeen additional sectors will have to fish subject to effort controls that may be modified or adopted by this action.

It is not clear how this alternative would affect existing sectors, since some of the changes in sector policy that may be adopted might affect these two existing sectors. For example, the Georges Bank Cod Hook Sector existing provisions allocate only GB cod to this sector, so the No Action alternative implies this would still be the case. But the sector policy changes may require that almost all groundfish stocks will be allocated anyway.

5.3.7 Accountability Measures

Requirements for Accountability Measures (AMs) are described in section 4.3.7.

5.3.7.1 Commercial Groundfish Fishing Vessel Accountability Measures

The Council adopted two of the alternatives that were considered, using one alternative in FY 2010 and FY 2011 and then modifying the AM to the second alternative in FY 2012. These were originally considered individually.

5.3.7.1.1 Common Pool Vessel Accountability Measure Alternative 3 – No Action

Under this alternative, AMs would not be adopted for common pool vessels. Any adjustments to management measures necessary to achieve mortality objectives would be implemented through either a framework adjustment action or an amendment. Such an approach would not comply with the interpretation of the M-S Act requirements for AMs. The exception would be measures that allow for in-season adjustments to measures in the U.S./Canada area.

5.3.7.2 Recreational Fishery Accountability Measures

5.3.7.2.1 Option 1

ACLs for the recreational fishery will be established as described in section 5.2.1, consistent with the commercial/recreational allocation of groundfish stocks described in section 5.2.4. As noted in these sections, ACLs are set for the fishing year. The recreational ACL is set only for specific stocks; it is anticipated that at least GOM haddock and GOM cod will have recreational ACLs with the adoption of this amendment, but other stocks may be added in the future.

Recreational fishery catches in a fishing year will be monitored using the MRIP data. As soon as data are available for the entire fishing year (expected to be by June or July of the fishing year immediately following), recreational catches will be totaled for the fishing year and compared to the ACL (see below for additional details on this comparison). If catches exceed the ACL, the Council will determine the measures necessary to prevent exceeding the ACL. Council decisions will be forwarded to NMFS which will initiate the process for implementation of the measures using procedures consistent with the APA. Final measures will be published no later than January. When evaluating recreational “catch”, the components of recreational catch that are used will be the same as used in the most recent assessment for the stock in question. For example, if the assessment uses recreational harvest (A+B1), then the ACL will be evaluated based on the same components.

The recreational AM will be either/or adjustments to season, adjustments to minimum size, or adjustments to bag limits. Separate AMs will be determined for the private boat and party/charter components of the recreational fishery – that is, the AMs may be different for these two components. With respect to the timing of AMs, it is anticipated that the AMs for an overage in fishing year one will be implemented at the end of fishing year two. Depending on the specific measures used, the AM may be in effect for an extended period. The applicable period will be specified when the AM is announced.

When evaluating whether a recreational ACL has been exceeded to determine if the AM needs to be implemented, the three-year average of recreational catch (calculated consistent with the catch used on the assessment) will be compared to the three-year average of the ACL. This practice will be phased in after implementation of this amendment as follows:

- For FY 2010, FY 2010 harvest will be compared to the FY 2010 ACL and if necessary AMs will be implemented in FY 2011.
- For FY 2011, the average of FY 2010 and FY 2011 harvest will be compared to the average of the FY 2010 and FY 2011 ACL and if necessary AMs will be implemented in FY 2012.
- In subsequent years, the three-year average of recreational harvest will be compared to the three-year average of the recreational ACL and if necessary AMs will be implemented in the year immediately following.

<u>Rationale</u>: Because of uncertainty about the number of participants and catches, it is difficult to design recreational AMs in advance given the tools typically used to manage this fishery. The impacts of size changes, bag limits, and seasons depend on the current distribution of fishing effort, sizes in the population, and stock abundance. For this reason, AMs will be adopted only after evaluating recent catches. Because of the need to coordinate recreational measures with the states, the Council determines the specific AMs that will be adopted and will forward that decision to NMFS.

Different AMs may be adopted for the private angler component and the party/charter components of the fishery. The party/charter component prefers changes in minimum fish size and bag limits; these measures, if adopted, will likely need to remain in effect for a longer period than a seasonal closure. There use will also likely increase the uncertainty of achieving recreational AMs and will need to be considered when setting ACLs.

The phase-in of the use of a three-year average for evaluating recreational ACLs is designed to implement the ACL/AM program consistent with the M-S Act requirements.

5.3.7.2.2 Option 2

ACLs for the recreational fishery will be established as described in section 5.2.1, consistent with the commercial/recreational allocation of groundfish stocks described in section 5.2.4. As noted in these sections, ACLs are set for the fishing year. The recreational ACL is set only for specific stocks; it is anticipated that at least GOM haddock and GOM cod will have recreational ACLs, but other stocks may be added in the future.

Recreational fishery catches in a fishing year will be monitored using the MRIP data. As soon as data are available for the entire fishing year (expected to be by June or July of the fishing year immediately following), recreational catches will be totaled for the fishing year and compared to the ACL (see below for additional details on this comparison). If catches exceed the ACL, the NMFS will determine the measures necessary to prevent exceeding the ACL and publish the accountability measures (AMs) that will be put into effect using procedures consistent with the APA. Final measures will be published no later than January. When evaluating recreational "catch", the components of recreational catch that are used will be the same as used in the most recent assessment for the stock in question. For example, if the assessment uses recreational harvest (A+B1), then the ACL will be evaluated based on the same components.

The recreational AM that is implemented will be selected from the following possible measures. This list is in priority order; that is, a change in season will be considered for the AM before either an adjustment to the minimum size or adjustments to bag limits.

- Changes in season
- Adjustments to minimum size
- Adjustments to bag limits

Separate AMs will be determined for the private boat and party/charter components of the recreational fishery – that is, the AMs may be different for these two components. With respect to the timing of AMs, it is anticipated that the AMs for an overage in fishing year one will be implemented at the end of fishing year two. Depending on the specific measures used, the AM may be in effect for an extended period. The applicable period will be specified when the AM is announced.

When evaluating whether a recreational ACL has been exceeded to determine if the AM needs to be implemented, the three-year average of recreational catch (calculated consistent with the catch used on the assessment) will be compared to the three-year average of the ACL. This practice will be phased in after implementation of this amendment as follows:

- For FY 2010, FY 2010 harvest will be compared to the FY 2010 ACL and if necessary AMs will be implemented in FY 2011.
- For FY 2011, the average of FY 2010 and FY 2011 harvest will be compared to the average of the FY 2010 and FY 2011 ACL and if necessary AMs will be implemented in FY 2012.

- In subsequent years, the three-year average of recreational harvest will be compared to the three-year average of the recreational ACL and if necessary AMs will be implemented in the year immediately following.

Rationale: Because of uncertainty about the number of participants and catches, it is difficult to design recreational AMs in advance given the tools typically used to manage this fishery. The impacts of size changes, bag limits, and seasons depend on the current distribution of fishing effort, sizes in the population, and stock abundance. For this reason, AMs will be adopted only after evaluating recent catches. This option differs from Option 1 in two respects. First, the AM is determined by NMFS and is not developed by the Council. Second, the AM will be selected from the possible measures that are listed in a priority order.

Different AMs may be adopted for the private angler component and the party/charter components of the fishery. The party/charter component prefers changes in minimum fish size and bag limits; these measures, if adopted, will likely need to remain in effect for a longer period than a seasonal closure. There use will also likely increase the uncertainty of achieving recreational AMs and will need to be considered when setting ACLs.

The phase-in of the use of a three-year average for evaluating recreational ACLs is designed to implement the ACL/AM program consistent with the M-S Act requirements.

Rationale: Because of uncertainty about the number of participants and catches, it is difficult to design recreational AMs in advance given the tools typically used to manage this fishery. The impacts of size changes, bag limits, and seasons depend on the current distribution of fishing effort, sizes in the population, and stock abundance. For this reason, AMs will be adopted only after evaluating recent catches. Because of the need to coordinate recreational measures with the states, the Council determines the specific AMs that will be adopted and will forward that decision to NMFS.

Different AMs may be adopted for the private angler component and the party/charter components of the fishery. The party/charter component prefers changes in minimum fish size and bag limits; these measures, if adopted, will likely need to remain in effect for a longer period than a seasonal closure. There use will also likely increase the uncertainty of achieving recreational AMs and will need to be considered when setting ACLs.

The phase-in of the use of a three-year average for evaluating recreational ACLs is designed to implement the ACL/AM program consistent with the M-S Act requirements.

5.3.7.2.3 Option 4 – No Action

Under this option, AMs would not be adopted for recreational groundfish fishing. Any adjustments to management measures necessary to meet plan objectives would be adopted through a framework adjustment or an amendment to the FMP. Such an approach would not be consistent with the interpretation of M-S Act requirements for AMs.

5.3.7.3 Multispecies Sector Accountability Measures

The sector administration provisions defined in section 5.2.1 incorporate accountability measures designed to ensure that each sector – and as a result, sectors as a whole - do not contribute to overfishing.

The No Action alternative to this approach would be to not adopt the sector policy changes.

5.4 Other Alternatives Considered

Other alternatives not included in this document were discussed and debated at various times during its preparation. While ultimately not pursued in this action, this does not prevent the Council from considering these options in a future action. Indeed, the Council has already stated its intention to revisit some of the suggestions at a later date (see below).

5.4.1 Research Set-Aside Program

A research set-aside program will be established for the groundfish fishery. The purpose of this program is to provide a portion of the available catch that can be used for research, including cooperative research, without requiring participating vessels to use days-at-sea or sector allocations to account for the mortality that results from the research. It is not intended that this set-aside will be sufficient to fund cooperative research programs. This program is not intended to preclude research that is conducted using days-at-sea or sector allocations to account for mortality.

For each regulated groundfish stock, one percent of the available catch will be set aside for conducting research. This set-aside will be available to any research associated with the groundfish fishery: it can be used for research projects related to the commercial and recreational groundfish fisheries, or other fisheries that have an incidental catch of groundfish. The process used to award the set-aside is as follows:

> (1) NMFS will publish a Request for Proposals (RFP) in the Federal Register, consistent with procedures and requirements established by the NOAA Grants Office, to solicit proposals for the upcoming fishing year, based on research priorities identified by the Council.
> (2) NMFS will convene a review panel including the Council's Research Steering Committee, as well as technical experts, to review proposals submitted in response to the RFP.
>> (i) Each panel member will recommend which research proposals should be authorized to utilize research quota, based on the selection criteria described in the RFP.
>> (ii) The NEFSC Director and the NOAA Grants Office will consider each panel member's recommendation, provide final approval of the projects and the Regional Administrator may, when appropriate, exempt selected vessel(s) from regulations specified in each of the respective FMPs through written notification to the project proponent.
>
> (3) The grant awards approved under the RFPs will be for the upcoming fishing year. Multi-year awards are possible. Proposals to conduct research that would end after the fishing year, will be eligible for consideration..
> (4) Research projects will be conducted in accordance with provisions approved and provided in an Exempted Fishing Permit (EFP) issued by the Regional Administrator.
> (5) If a proposal is disapproved by the NEFSC Director or the NOAA Grants Office, or if the Regional Administrator determines that the allocated research quota cannot be utilized by a project, the Regional Administrator shall reallocate the unallocated or unused amount of research quota to the respective commercial and recreational fisheries

by publication of a notice in the Federal Register in compliance with the Administrative Procedure Act, provided:

(i) The reallocation of the unallocated or unused amount of research quota is in accord with National Standard 1, and can be available for harvest before the end of the fishing year for which the research quota is specified; and

(ii) Any reallocation of unallocated or unused research quota shall be consistent with the proportional division of quota between the commercial and recreational fisheries in the relevant FMP and allocated to the remaining quota periods for the fishing year proportionally.

(6) Vessels participating in approved research projects may be exempted from certain management measures by the Regional Administrator, provided that one of the following analyses of the impacts associated with the exemptions is provided:

(i) The analysis of the impacts of the requested exemptions is included as part of the annual quota specification packages submitted by the Council; or

(ii) For proposals that require exemptions that extend beyond the scope of the analysis provided by the Council, applicants may be required to provide additional analysis of impacts of the exemptions before issuance of an EFP will be considered.

5.4.2 Effort Control Alternatives

During the course of developing alternatives for effort control measures designed to control fishing mortality from commercial vessels that do not join sectors, several alternatives were considered and rejected. One alternative eliminated all trip limits and relied on DAS reductions to reduce mortality. The Council was concerned that analysis of this alternative over-estimated the mortality reductions that would be achieved because the model was not correctly predicting changes in fishing behavior. A second alternative was rejected that would have implemented a large year-round offshore closure in the Gulf of Maine. This alternative was rejected because of concerns over inequitable economic impacts.

5.4.3 Alternative Management Systems

As described in section 3.3, the scoping notice for this action solicited suggestions for alternative management systems to replace the effort control system first adopted in Amendment 5 in 1994. A number of ideas were suggested. These included an output-based system that proposed using a points-based currency to control harvest, an area management system, and an individual fishing quota system. The Council decided not to pursue these alternatives in this action because of concerns the design of the measures could not be completed in time. The Council intends to revisit these suggestions after submitting this amendment and may decide to pursue them in a future action.

5.4.4 Miscellaneous Measures

Some of the measures that were considered but not included I this action include:

- remove 20-day spawning block requirement
- require use of diamond mesh codend in Closed Area II YTF SAP
- provide more flexibility in the length/horsepower restrictions in the das leasing and transfer programs
- remove the tonnage restriction on replacement vessels
- consider 6-inch mesh for gillnets
- running clock

- trip limit triggers on stocks with trip limits

6.0 Affected Environment

6.1 Physical and Biological Environment

The Northeast U.S. Shelf Ecosystem (Figure 12) 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 (Sherman *et al.* 1996). The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

Pertinent physical and biological characteristics of each of these sub-regions are described in this section, along with a short description of the physical features of coastal environments. Inshore, offshore, and continental slope lobster habitats are described in Section 3.2.6. Information on the affected physical and biological environments included in this amendment was extracted from Stevenson et al. (2004). The primary source references used by Stevenson et al. are not cited in this section. They are: Backus 1987; Schmitz *et al*. 1987; Tucholke 1987; Wiebe *et al*. 1987; Cook 1988; Reid and Steimle 1988; Stumpf and Biggs 1988; Abernathy 1989; Townsend 1992; Mountain 1994; Beardsley *et al*. 1996; Brooks 1996; Sherman *et al*. 1996; Dorsey 1998; Kelley 1998; NEFMC 1998; Steimle *et al*. 1999. References used to describe the biological features of the affected environment and to describe lobster habitats are cited in the text.

6.1.1 Gulf of Maine

6.1.1.1 Physical Environment

Although not obvious in appearance, the Gulf of Maine (GOM) is actually 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 13). The GOM was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes that result in a rich biological community.

Figure 12 - Northeast U.S Shelf Ecosystem

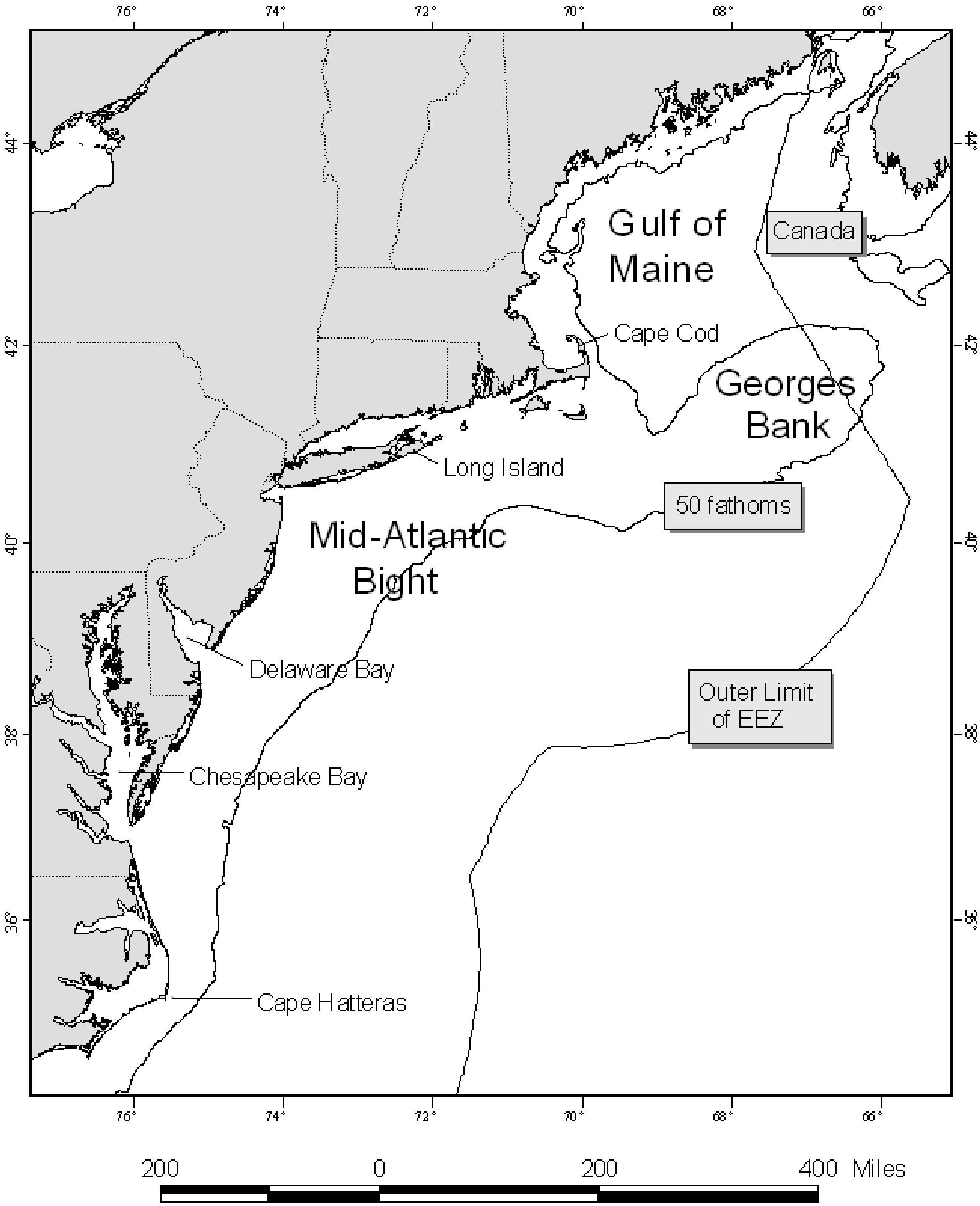
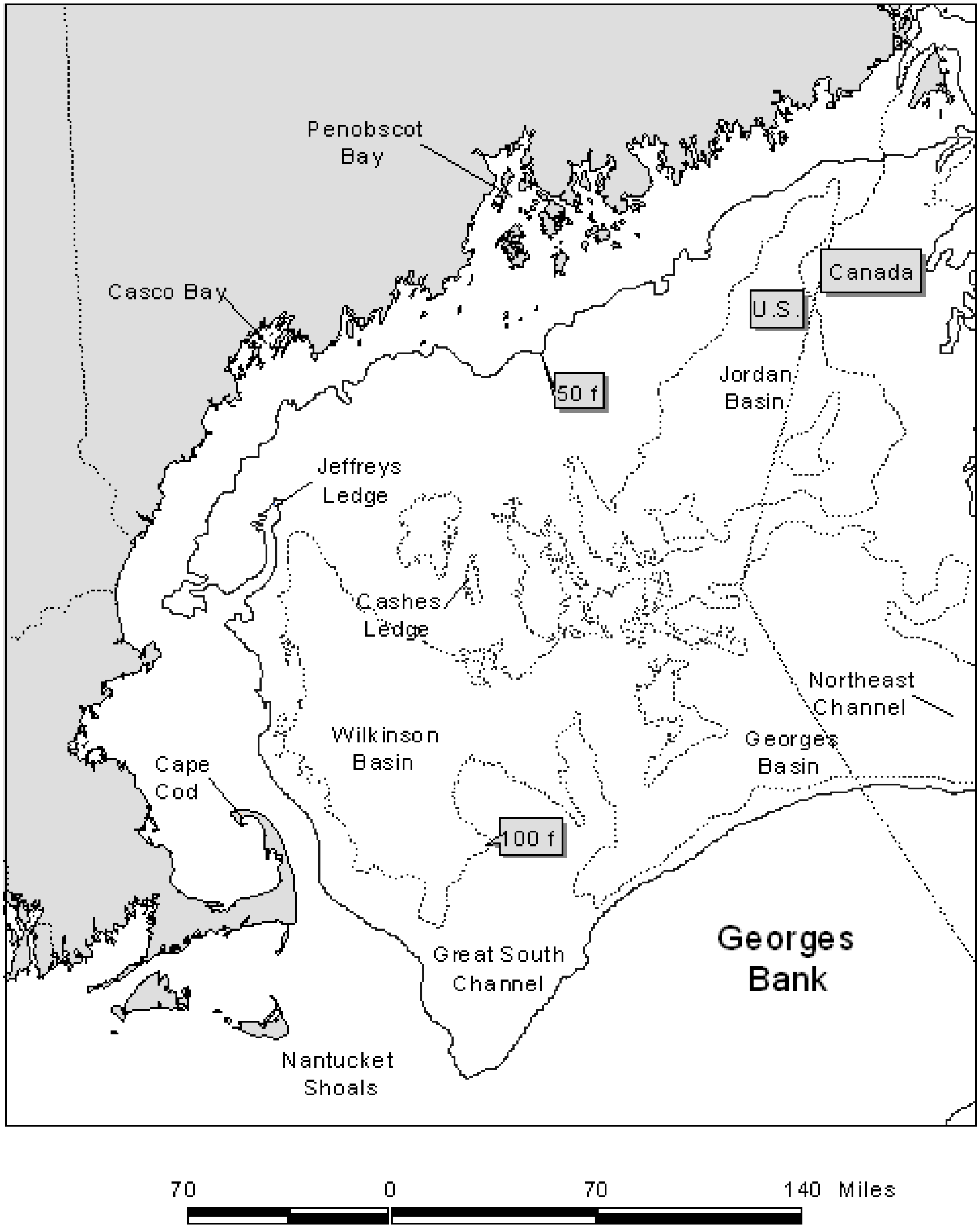


Figure 13 - Gulf of Maine



The GOM is topographically unlike any other part of the continental border along the U.S. Atlantic coast. The GOM's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. It contains twenty-one distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan (Figure 2). Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. The Northeast Channel between Georges Bank and Browns Bank leads into Georges Basin, and is one of the primary avenues for exchange of water between the GOM and the North Atlantic Ocean.

High points within the Gulf include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf that was left after most of it was removed by the glaciers. Others are glacial moraines and a few, like Cashes Ledge, are outcroppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the GOM, particularly in its deep basins (Figure 14). These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the GOM north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20 - 40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

An intense seasonal cycle of winter cooling and turnover, springtime freshwater runoff, and summer warming influences oceanographic and biologic processes in the GOM. The Gulf has a general counterclockwise nontidal surface current that flows around its coastal margin (Figure 15). It is primarily driven by fresh, cold Scotian Shelf water that enters over the Scotian Shelf and through the Northeast Channel, and freshwater river runoff, which is particularly important in the spring. Dense relatively warm and saline slope water entering through the bottom of the Northeast Channel from the continental slope also influences gyre

Figure 14 - Northeast region sediments, modified from Poppe et al. (1989a and b)

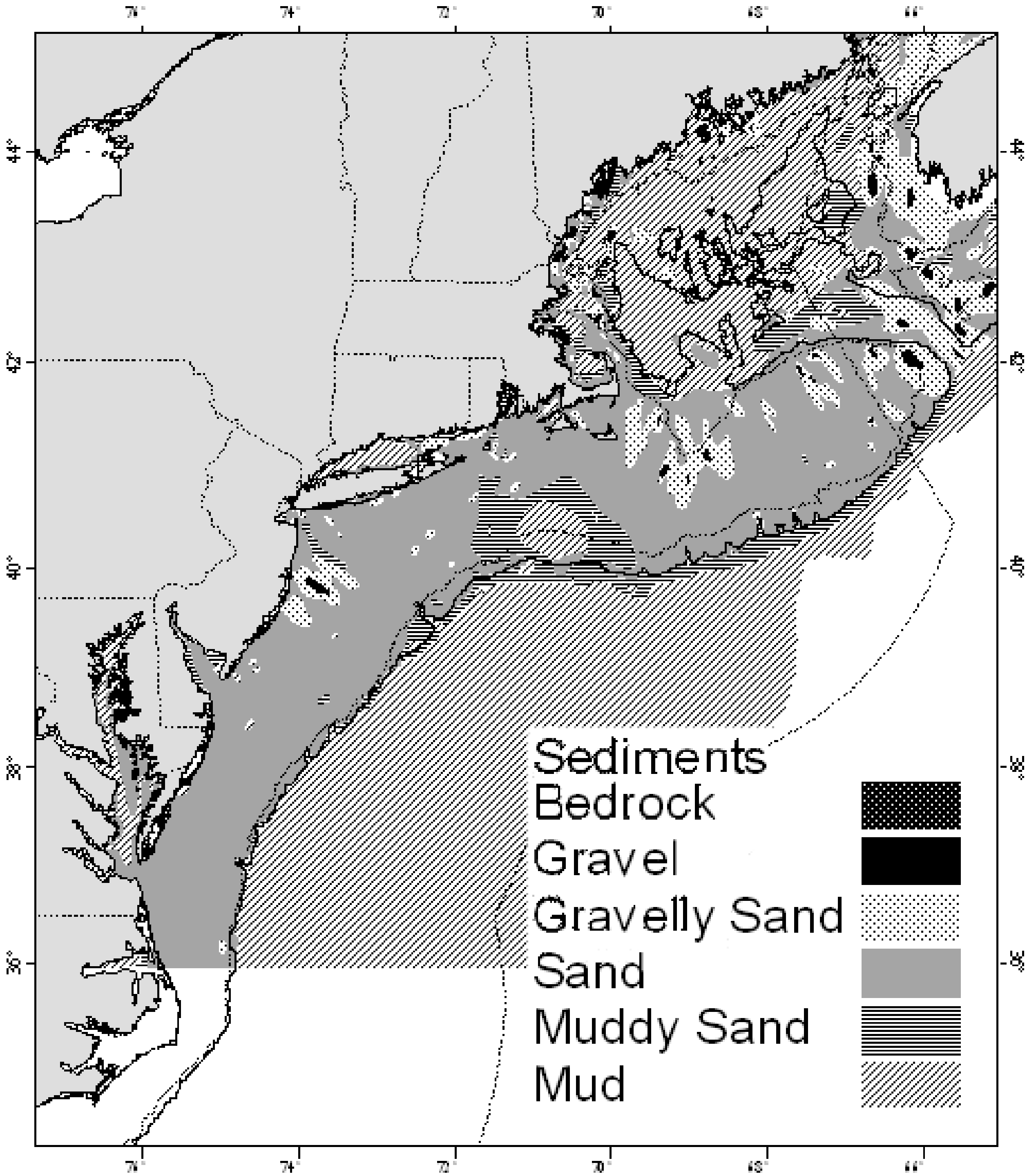
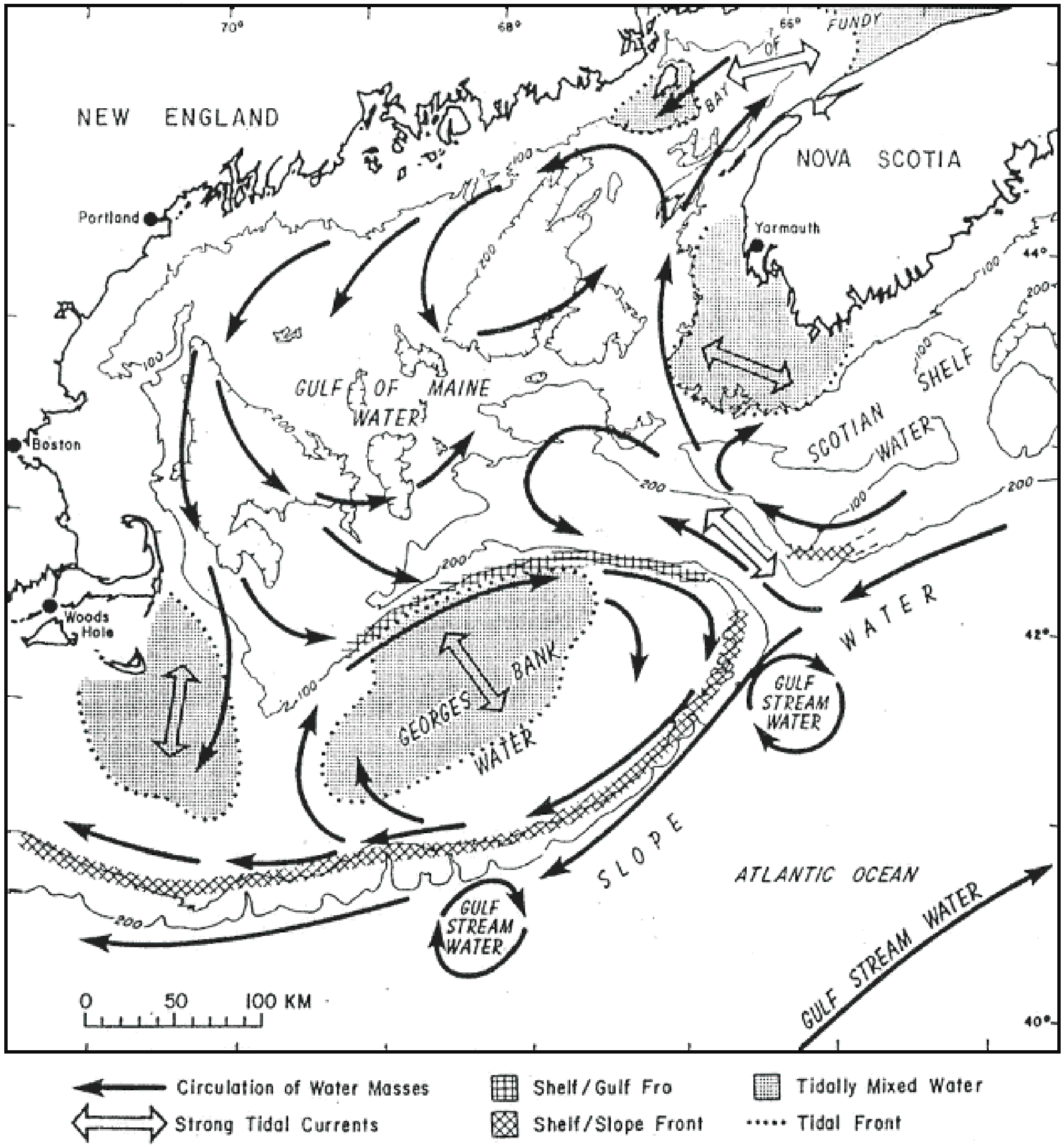


Figure 15 - Water mass circulation patterns in the Georges Bank - Gulf of Maine region



formation. Counterclockwise gyres generally form in Jordan, Wilkinson, and Georges Basins and the Northeast Channel as well. These surface gyres are more pronounced in spring and summer; with winter, they weaken and become more influenced by the wind.

Stratification of surface waters during spring and summer seals off a mid-depth layer of water that preserves winter salinity and temperatures. This cold layer of water is called "Maine intermediate water" (MIW) and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western GOM. Tidal mixing of shallow areas prevents thermal stratification and results in thermal fronts between the stratified areas and cooler mixed areas. Typically, mixed areas include Georges Bank, the southwest Scotian Shelf, eastern Maine coastal waters, and the narrow coastal band surrounding the remainder of the Gulf.

The Northeast Channel provides an exit for cold MIW and outgoing surface water while it allows warmer more saline slope water to move in along the bottom and spill into the deeper basins. The influx of water occurs in pulses, and appears to be seasonal, with lower flow in late winter and a maximum in early summer.

GOM circulation and water properties can vary significantly from year to year. Notable episodic events include shelf-slope interactions such as the entrainment of shelf water by Gulf Stream rings (see the "Gulf Stream and Associated Features" section, below), and strong winds that can create currents as high as 1.1 m/s over Georges Bank. Warm core Gulf Stream rings can also influence upwelling and nutrient exchange on the Scotian shelf, and affect the water masses entering the GOM. Annual and seasonal inflow variations also affect water circulation. Internal waves are episodic and can greatly affect the biological properties of certain habitats. Internal waves can shift water layers vertically, so that habitats normally surrounded by cold MIW are temporarily bathed in warm, organic rich surface water. On Cashes Ledge, it is thought that deeper nutrient rich water is driven into the photic zone, providing for increased productivity. Localized areas of upwelling interaction occur in numerous places throughout the Gulf.

6.1.1.2 Benthic Invertebrates

Based on 303 benthic grab samples collected in the GOM during 1956-1965, Theroux and Wigley (1998) reported that, in terms of numbers, the most common groups of benthic invertebrates in the GOM were annelid worms (35%), bivalve mollusks (33%), and amphipod crustaceans (14%). Biomass was dominated by bivalves (24%), sea cucumbers (22%), sand dollars (18%), annelids (12%), and sea anemones (9%). Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven bottom assemblages. These assemblages are identified in Table 38 and their distribution is indicated in Figure 16. This classification system considers predominant taxa, substrate types, and seawater properties.

6.1.1.3 Demersal Fish

Demersal fish assemblages for the GOM and Georges Bank were part of broad scale geographic investigations conducted by Gabriel (1992) and Mahon *et al.* (1998). Both these studies and a more limited study by Overholtz and Tyler (1985) found assemblages that were consistent over space and time in this region. In her analysis, Gabriel (1992) found that the most persistent feature over time in assemblage structure from Nova Scotia to Cape Hatteras was the boundary separating assemblages between the GOM and Georges Bank, which occurred at approximately the 100 m isobath on northern Georges Bank. Overholtz and Tyler (1985) identified five assemblages for this region. The Gulf of Maine-deep assemblage included a number of species found in other assemblages, with the exception of American plaice and witch flounder, which was unique to this assemblage. Gabriel's approach did not allow species to co-occur in assemblages, and classified these two species as unique to the deepwater Gulf of Maine-Georges Bank assemblage. Results of these two studies are compared in Table 39.

Table 38 - Gulf of Maine benthic assemblages as identified by Watling (1998)

Benthic Assemblage	Benthic Community Description
1	Comprises all sandy offshore banks, most prominently Jeffreys Ledge, Fippennies Ledge, and Platts Bank; depth on top of banks about 70 m; substrate usually coarse sand with some gravel; fauna characteristically sand dwellers with an abundant interstitial component.
2	Comprises the rocky offshore ledges, such as Cashes Ledge, Sigsbee Ridge and Three Dory Ridge; substrate either rock ridge outcrop or very large boulders, often with a covering of very fine sediment; fauna predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers; overlying water usually cold Gulf of Maine Intermediate Water.
3	Probably extends all along the coast of the Gulf of Maine in water depths less than 60 m; bottom waters warm in summer and cold in winter; fauna rich and diverse, primarily polychaetes and crustaceans, probably consists of several (sub-) assemblages due to heterogeneity of substrate and water conditions near shore and at mouths of bays.
4	Extends over the soft bottom at depths of 60 - 140 m, well within the cold Gulf of Maine Intermediate Water; bottom sediments primarily fine muds; fauna dominated by polychaetes, shrimp, and cerianthid anemones.
5	A mixed assemblage comprising elements from the cold water fauna as well as a few deeper water species with broader temperature tolerances; overlying water often a mixture of Intermediate Water and Bottom Water, but generally colder than 7°C most of the year; fauna sparse, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present.
6	Comprises the fauna of the deep basins; bottom sediments generally very fine muds, but may have a gravel component in the offshore morainal regions; overlying water usually 7 - 8°C, with little variation; fauna shows some bathyal affinities but densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipod.
7	The true upper slope fauna that extends into the Northeast Channel; water temperatures are always above 8°C and salinities are at least 35 ppt; sediments may be either fine muds or a mixture of mud and gravel.

Geographical distribution of assemblages is shown in Figure 5.

Figure 16 - Distribution of the seven major benthic assemblages in the Gulf of Maine.

Distribution determined from both soft bottom quantitative sampling and qualitative hard bottom sampling. The assemblages are characterized as follows: 1. Sandy offshore banks; 2. Rocky offshore ledges; 3. Shallow (< 50 m) temperate bottoms with mixed substrate; 4. Boreal muddy bottom, overlain by Maine Intermediate Water, 50 - 160 m (approximate); 5. Cold deep water, species with broad tolerances, muddy bottom; 6. Deep basin warm water, muddy bottom; 7. Upper slope water, mixed sediment. Source: Watling (1998).

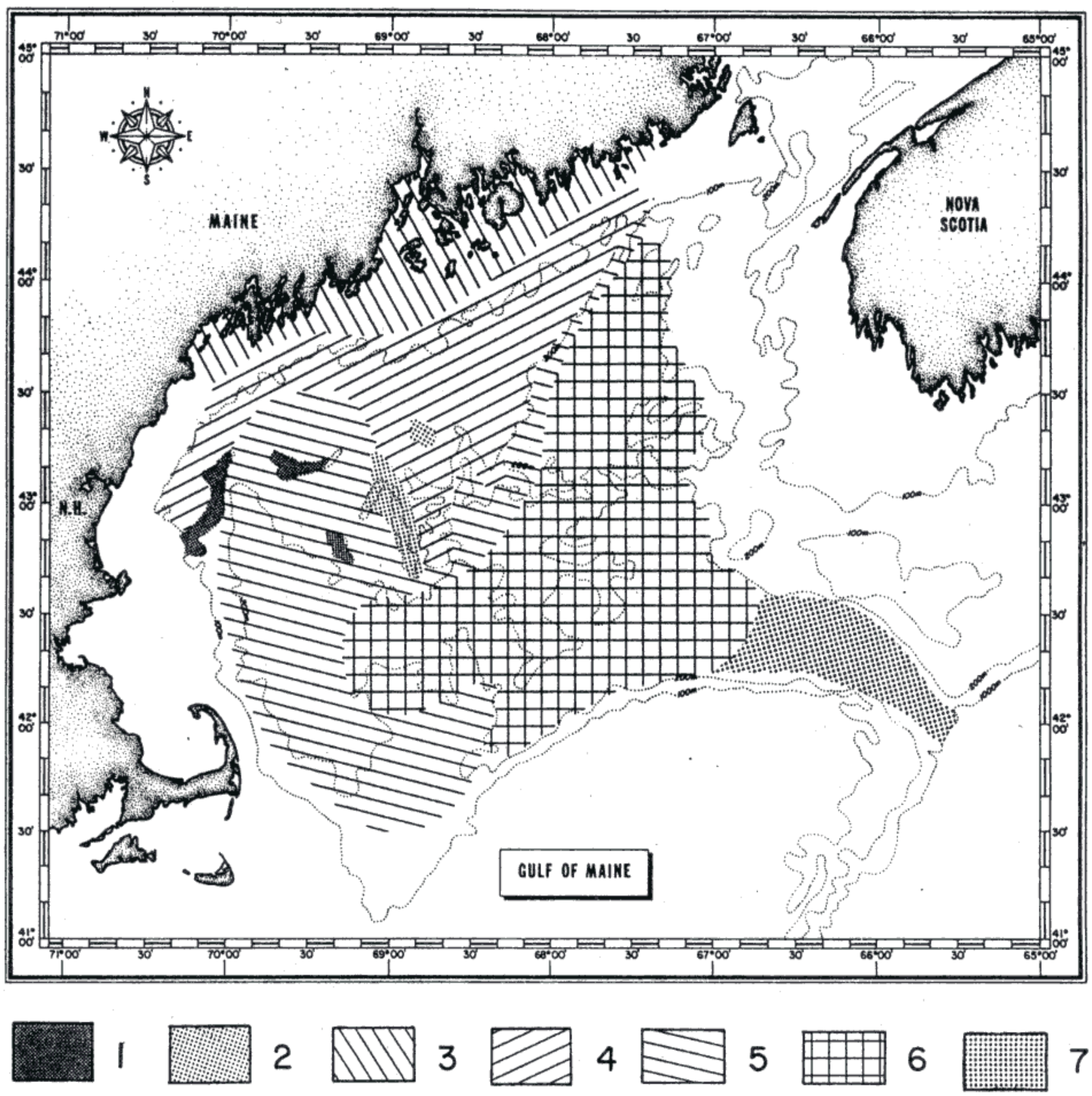


Table 39 - Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine

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 yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin summer flounder sea raven, sand lance	Atlantic cod haddock pollock yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin	Gulf of Maine-Georges Bank Transition Zone (*see below also*) 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 (*see above also*)

6.1.2 Georges Bank

6.1.2.1 Physical Environment

Georges Bank is a shallow (3 - 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed by the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. 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 will reduce the amount of sand available to the sand sheets, and cause an overall coarsening of the bottom sediments (Valentine *et al.* 1993).

Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the eastern section of Georges Bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. The strong, erosive currents affect the character of the biological community. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin (see the “Continental Slope” section, below, for more on canyons). The interaction of several environmental factors, including availability and type of sediment, current speed and direction, and bottom topography, has formed seven sedimentary provinces on eastern Georges Bank (Valentine and Lough 1991), which are described in Table 40 and depicted in Figure 17. The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

The central region of the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. In an area that lies between the central part and Northeast Peak, Almeida *et al.* (2000) identified high-energy areas as between 35 - 65 m deep, where sand is transported on a daily basis by tidal currents, and a low-energy area at depths > 65 m that is affected only by storm currents.

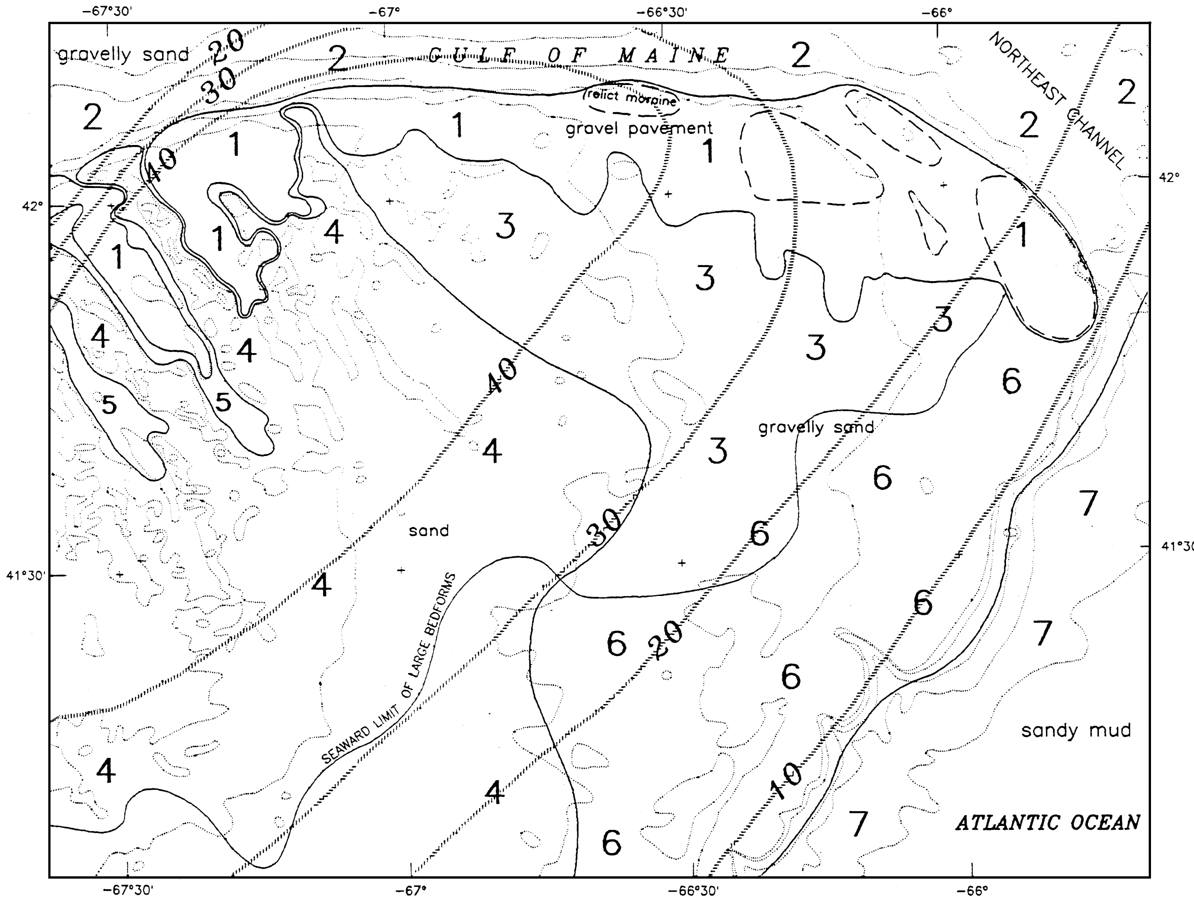
The area west of the Great South Channel, known as Nantucket Shoals (Figure 13), is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of travelling dune and swale morphology is also found in the Mid-Atlantic Bight, and further described in that section of the document. The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. 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 (Valentine, pers. comm.).

Table 40 - Sedimentary provinces and associated benthic landscapes of Georges Bank

Sedimentary Province	Depth (m)	Description	Benthic Assemblage
Northern Edge / Northeast Peak (1)	40 - 200	Dominated by gravel with portions of sand, common boulder areas, and tightly packed pebbles. Representative epifauna (bryozoa, hydrozoa, anemones, and calcareous worm tubes) are abundant in areas of boulders. Strong tidal and storm currents.	Northeast Peak
Northern Slope and Northeast Channel (2)	200 - 240	Variable sediment type (gravel, gravel-sand, and sand) scattered bedforms. This is a transition zone between the northern edge and southern slope. Strong tidal and storm currents.	Northeast Peak
North /Central Shelf (3)	60 - 120	Highly variable sediment type (ranging from gravel to sand) with rippled sand, large bedforms, and patchy gravel lag deposits. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Central and Southwestern Shelf - shoal ridges (4)	10 - 80	Dominated by sand (fine and medium grain) with large sand ridges, dunes, waves, and ripples. Small bedforms in southern part. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Central and Southwestern Shelf - shoal troughs (5)	40 - 60	Gravel (including gravel lag) and gravel-sand between large sand ridges. Patchy large bedforms. Strong currents. (Few samples – submersible observation noted presence of gravel lag, rippled gravel-sand, and large bedforms.) Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Southeastern Shelf (6)	80 - 200	Rippled gravel-sand (medium and fine grained sand) with patchy large bedforms and gravel lag. Weaker currents; ripples are formed by intermittent storm currents. Representative epifauna includes sponges attached to shell fragments and amphipods.	Southern Georges
Southeastern Slope (7)	400 - 2000	Dominated by silt and clay with portions of sand (medium and fine) with rippled sand on shallow slope and smooth silt-sand deeper.	none

Sediment provinces as defined by Valentine *et al*. (1993) and Valentine and Lough (1991), with additional comments by Valentine (pers. comm.) and benthic assemblages assigned by Theroux and Grosslein (1987). See text for further discussion on benthic assemblages.

Figure 17 - Sedimentary provinces of eastern Georges Bank. Based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/s). Relict moraines (bouldery seafloor) are enclosed by dashed lines. See Table 3 for descriptions of provinces. Source: Valentine and Lough (1991).



Oceanographic frontal systems separate water masses of the GOM and Georges Bank from oceanic waters south of the Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution. Currents on Georges Bank include a weak, persistent clockwise gyre around the Bank, a strong semidiurnal tidal flow predominantly northwest and southeast, and very strong, intermittent storm induced currents, which all can occur simultaneously (Figure 15). Tidal currents over the shallow top of Georges Bank can be very strong, and keep the waters over the Bank well mixed vertically. This results in a tidal front that separates the cool waters of the well mixed shallows of the central Bank from the warmer, seasonally stratified shelf waters on the seaward and shoreward sides of the Bank. The clockwise gyre is instrumental in distribution of plankton, including fish eggs and larvae.

6.1.2.2 Invertebrates

Amphipod crustaceans (49%) and annelid worms (28%) numerically dominated the contents of 211 samples collected on Georges Bank during 1956-1965 (Theroux and Wigley 1998). Biomass was dominated by sand dollars (50%) and bivalves (33%). Theroux and Grosslein (1987) utilized the same database to identify four macrobenthic invertebrate assemblages. They noted that the boundaries between assemblages were not well defined because there is considerable intergrading between adjacent assemblages. Their assemblages are associated with those identified by Valentine and Lough (1991) in Table 40.

The Western Basin assemblage is found in the upper Great South Channel region at the northwestern corner of the Bank, in comparatively deepwater (150 - 200 m) with relatively slow currents and fine bottom sediments of silt, clay and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers. Valentine and Lough (1991) did not identify a comparable assemblage; however, this assemblage is geographically located adjacent to Assemblage 5 as described by Watling (1998) (Table 38, Figure 16).

The Northeast Peak assemblage is found along the Northern Edge and Northeast Peak, which varies in 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 the 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.

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

6.1.2.3 Demersal Fish

Along with high levels of primary productivity, Georges Bank has 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 GOM 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 2. Mahon *et al.* (1998) found similar results.

6.1.3 Mid-Atlantic Bight

6.1.3.1 Physical Environment

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 12). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5 - 10 cm/s at the surface and 2 cm/s or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/s that increases to 100 cm/s near inlets.

Slope water tends to be warmer than shelf water because of its proximity to the Gulf Stream, and tends to be more saline. The abrupt gradient where these two water masses meet is called the shelf-slope front. This front is usually located at the edge of the shelf and touches bottom at about 75 - 100 m depth of water, and then slopes up to the east toward the surface. It reaches surface waters approximately 25 - 55 km further offshore. The position of the front is highly variable, and can be influenced by many physical factors. Vertical structure of temperature and salinity within the front can develop complex patterns because of the interleaving of shelf and slope waters; *e.g.*, cold shelf waters can protrude offshore, or warmer slope water can intrude up onto the shelf.

The seasonal effects of warming and cooling increase in shallower, nearshore waters. Stratification of the water column occurs over the shelf and the top layer of slope water during the spring-summer and is usually established by early June. Fall mixing results in homogenous shelf and upper slope waters by October in most years. A permanent thermocline exists in slope waters from 200 - 600 m deep. Temperatures decrease at the rate of about 0.02ºC per meter and remain relatively constant except for occasional incursions of Gulf stream eddies or meanders. Below 600 m, temperature declines, and usually averages about 2.2ºC at 4000 m. A warm, mixed layer approximately 40 m thick resides above the permanent thermocline.

The "cold pool" is an annual phenomenon particularly important to the Mid-Atlantic Bight. It stretches from the Gulf of Maine along the outer edge of Georges Bank and then southwest to Cape Hatteras. It becomes identifiable with the onset of thermal stratification in the spring and lasts into early fall until normal seasonal mixing occurs. It usually exists along the bottom between the 40 and 100 m isobaths and extends up into the water column for about 35 m, to the bottom of the seasonal thermocline. The cold pool usually represents about 30% of the volume of shelf water. Minimum temperatures for the cold pool occur in early spring and summer, and range from 1.1 - 4.7ºC.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 - 200 m water depth) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (see the “Continental Slope” section, below). The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales (Figure 18 and Figure 19).

Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of glacier outwash that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf, with the exception of the Hudson Shelf Valley that is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island (Figure 18 and Figure 19). Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

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.

Some sand ridges (Figure 18) are more modern in origin than the shelf’s glaciated morphology. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10 - 50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents, and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the physically less rigorous conditions.

Figure 18 - Mid-Atlantic Bight submarine morphology. Source: Stumpf and Biggs (1988).

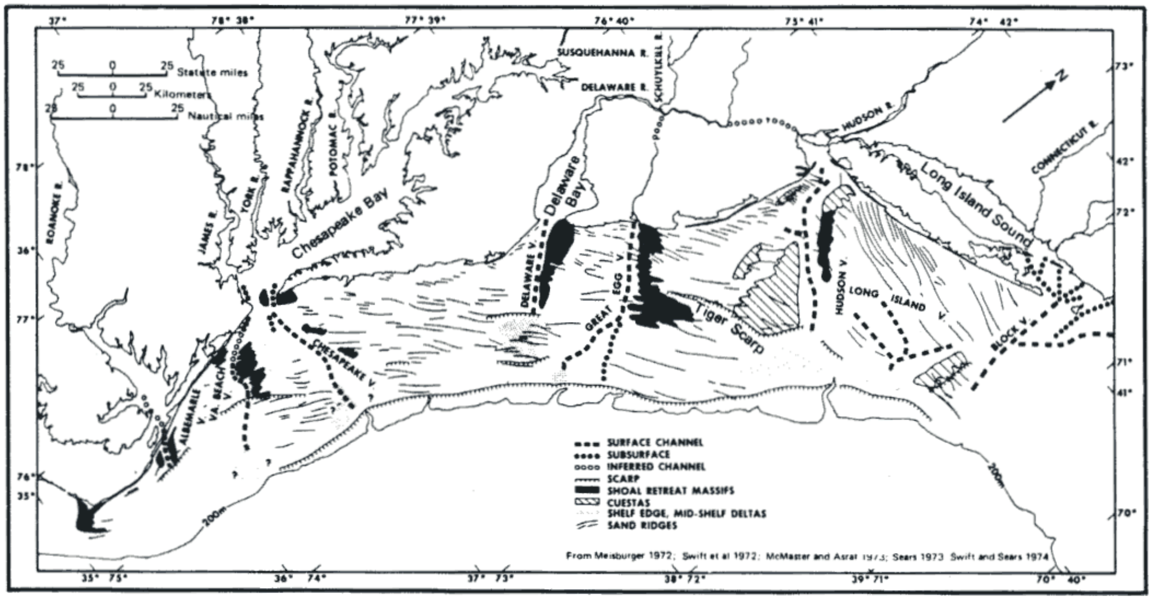
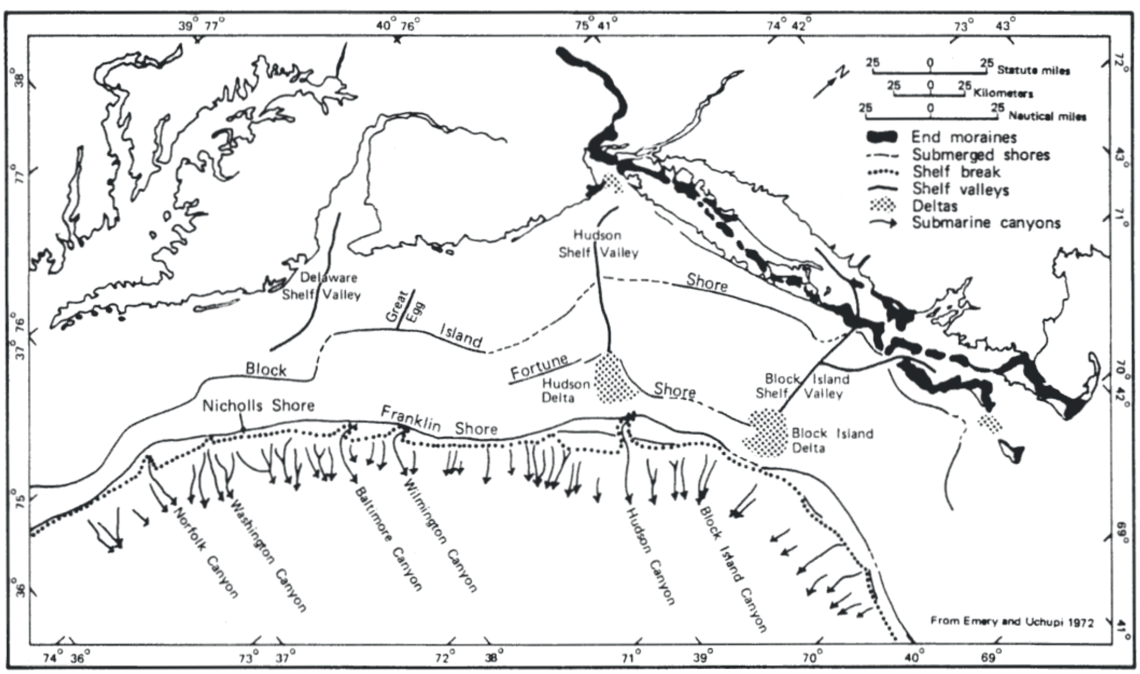


Figure 19 - Major features of the mid-Atlantic and southern New England continental shelf. Source: Stumpf and Biggs (1988).



Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

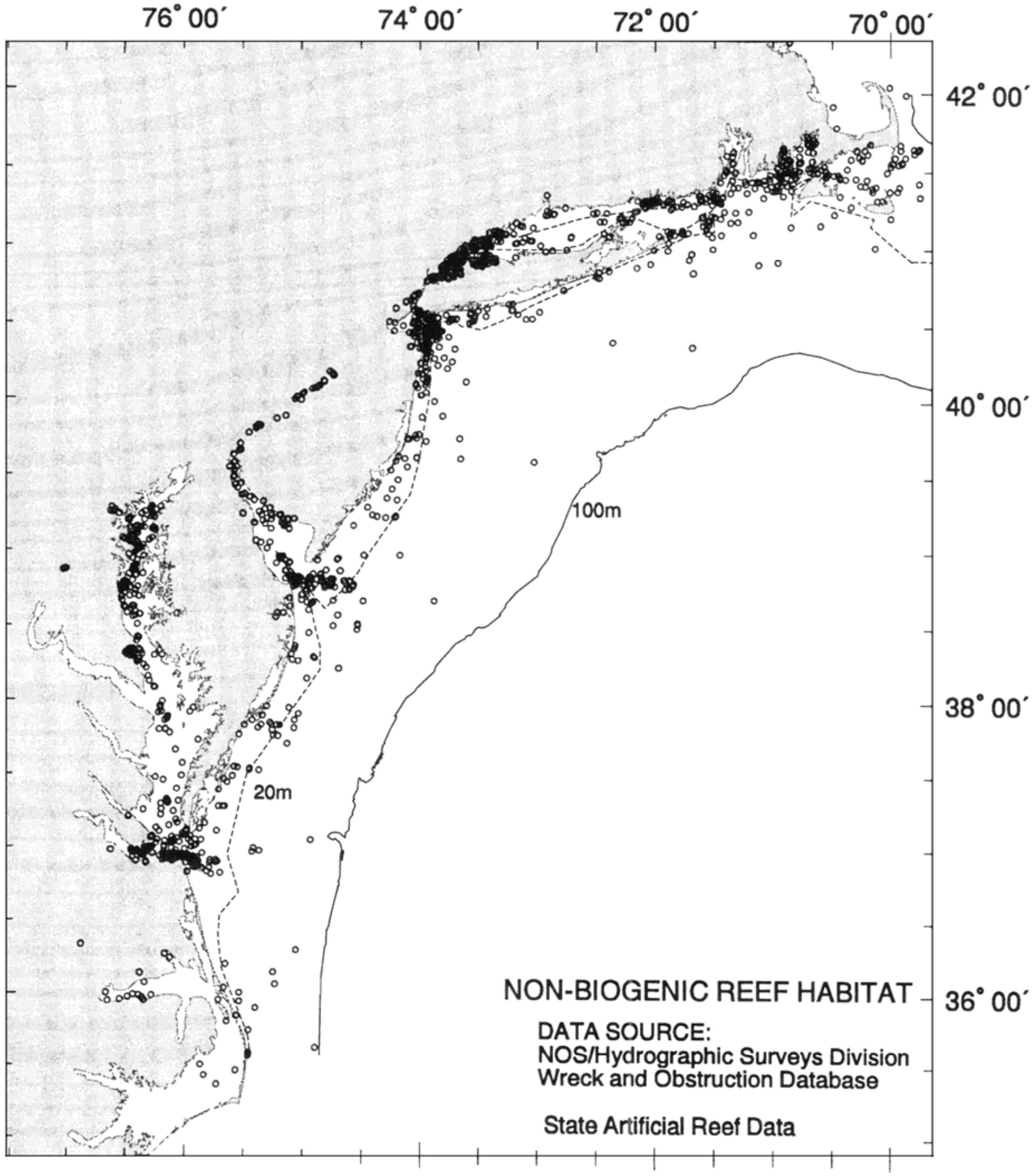
Sediments are uniformly distributed over the shelf in this region (see Figure 14). A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the “mud line,” and sediments are 70 - 100% fines on the slope.

The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. Most of this area was discussed under Georges Bank; however, one other formation of this region deserves note. The mud patch is located just southwest of Nantucket Shoals and southeast of Long Island and Rhode Island (Figure 14). Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally re-suspended by large storms. This habitat is an anomaly of the outer continental shelf.

Artificial reefs are another significant Mid-Atlantic 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). While some of materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure. The overview by Steimle and Zetlin (2000) used NOAA hydrographic surveys to plot rocks, wrecks, obstructions, and artificial reefs, which together were considered a fairly complete list of nonbiogenic reef habitat in the Mid-Atlantic estuarine and coastal areas (Figure 20).

Figure 20 - Summary of all reef habitats (except biogenic, such as mussel or oyster beds) in the Mid-Atlantic Bight.

Source: Steimle and Zetlin (2000).



6.1.3.2 Invertebrates

Wigley and Theroux (1981) reported on the faunal composition of 563 bottom grab samples collected in the Mid-Atlantic Bight during 1956-1965. Amphipod crustaceans and bivalve mollusks accounted for most of the individuals (41% and 22%, respectively), whereas mollusks dominated the biomass (70%). Three broad faunal zones related to water depth and sediment type were identified by Pratt (1973). The "sand fauna" zone was defined for sandy sediments (1% or less silt) that are at least occasionally disturbed by waves, from shore out to 50 m (Figure 10). The "silty sand fauna" zone occurred 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, and support the "silt-clay fauna."

Building on Pratt's work, the Mid-Atlantic shelf was further divided by Boesch (1979) into seven bathymetric/morphologic subdivisions based on faunal assemblages (Table 41). Sediments in the region studied (Hudson Shelf Valley south to Chesapeake Bay) were dominated by sand with little finer materials. Ridges and swales are important morphological features in this area. Sediments are coarser on the ridges, and the swales have greater benthic macrofaunal density, species richness, and biomass. Faunal species composition differed between these features, and Boesch (1979) incorporated this variation in his subdivisions. Much overlap of species distributions was found between depth zones, so the faunal assemblages represented more of a continuum than distinct zones.

6.1.3.3 Demersal Fish

Demersal fish assemblages were described at a broad geographic scale for the continental shelf and slope from Cape Chidley, Labrador to Cape Hatteras, North Carolina (Mahon *et al.* 1998) and from Nova Scotia to Cape Hatteras (Gabriel 1992). Factors influencing species distribution included latitude and depth. Results of these studies were similar to an earlier study confined to the Mid-Atlantic Bight continental shelf (Colvocoresses and Musick 1984). In this study, there were clear variations in species abundances, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. This is especially true for five strongly recurring species associations that varied slightly by season (Table 41). The boundaries between fish assemblages generally followed isotherms and isobaths. The assemblages were largely similar between the spring and fall collections, with the most notable change being a northward and shoreward shift in the temperate group in the spring.

Steimle and Zetlin (2000) described representative epibenthic/epibiotic, motile epibenthic, and fish species associated with sparsely scattered reef habitats that consist mainly of manmade structures (Table 42).

Figure 21 - Schematic representation of major macrofaunal zones on the mid-Atlantic shelf. Approximate location of ridge fields indicated. Source: Reid and Steimle (1988).

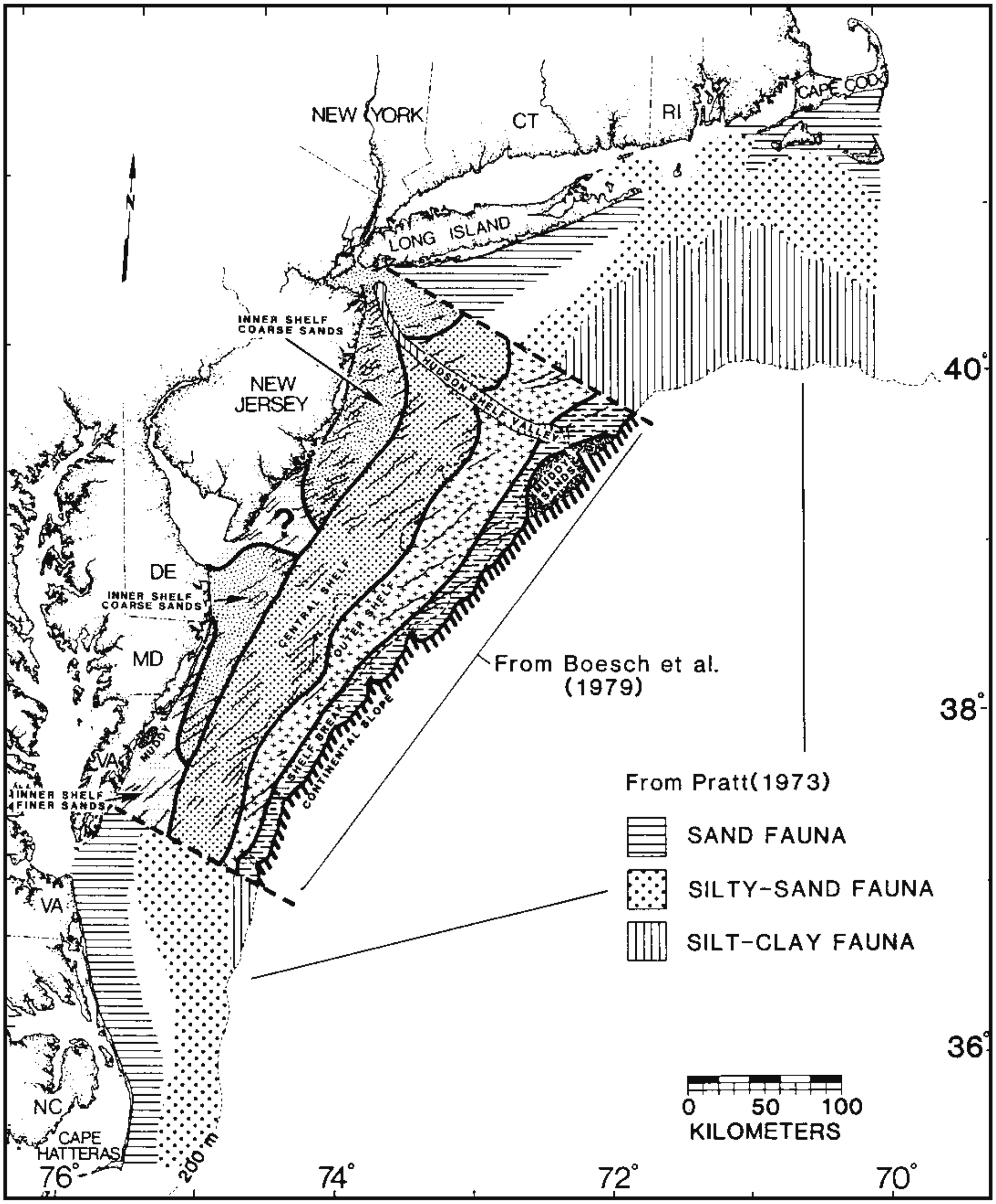


Table 41 - Mid-Atlantic habitat types.

Habitat Type [after Boesch (1979)]	**Description**		
	Depth (m)	**Characterization [Pratt (1973) faunal zone]**	**Characteristic Benthic Macrofauna**
Inner shelf	0 - 30	characterized by coarse sands with finer sands off MD and VA (sand zone)	Polychaetes: *Polygordius, Goniadella, Spiophanes*
Central shelf	30 - 50	(sand zone)	Polychaetes: *Spiophanes, Goniadella* Amphipod: *Pseudunciola*
Central and inner shelf swales	0 - 50	occurs in swales between sand ridges (sand zone)	*Polychaetes: Spiophanes, Lumbrineris, Polygordius*
Outer shelf	50 - 100	(silty sand zone)	Amphipods: *Ampelisca vadorum, Erichthonius* Polychaetes: *Spiophanes*
Outer shelf swales	50 - 100	occurs in swales between sand ridges (silty sand zone)	Amphipods: *Ampelisca agassizi, Unciola, Erichthonius*
Shelf break	100 - 200	(silt-clay zone)	not given
Continental slope	> 200	(none)	not given

As described by Pratt (1973) and Boesch (1979) with characteristic macrofauna as identified in Boesch (1979).

Table 42 - Major recurrent demersal finfish assemblages of the Mid-Atlantic Bight during spring and fall.

Season	Species Assemblage				
	Boreal	**Warm temperate**	**Inner shelf**	**Outer shelf**	Slope
Spring	Atlantic cod little skate sea raven goosefish winter flounder longhorn sculpin ocean pout silver hake red hake white hake spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin	windowpane	fourspot flounder	shortnose greeneye offshore hake blackbelly rosefish white hake
Fall	white hake silver hake red hake goosefish longhorn sculpin winter flounder yellowtail flounder witch flounder little skate spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin smooth dogfish	windowpane	fourspot flounder fawn cusk eel gulf stream flounder	shortnose greeneye offshore hake blackbelly rosefish white hake witch flounder

As determined by Colvocoresses and Musick (1984).

Table 43 - Mid-Atlantic reef types, location, and representative flora and fauna

Location (Type)	Representative Flora and Fauna		
	Epibenthic/Epibiotic	**Motile Epibenthic Invertebrates**	**Fish**
Estuarine (oyster reefs, blue mussel beds, other hard surfaces, semi-hard clay and *Spartina* peat reefs)	Oyster, barnacles, ribbed mussel, blue mussel, algae, sponges, tube worms, anemones, hydroids, bryozoans, slipper shell, jingle shell, northern stone coral, sea whips, tunicates, caprellid amphipods, wood borers	Xanthid crabs, blue crab, rock crabs, spider crab, juvenile American lobsters, sea stars	Gobies, spot, striped bass, black sea bass, white perch, toadfish, scup, drum, croaker, spot, sheepshead porgy, pinfish, juvenile and adult tautog, pinfish, northern puffer, cunner, sculpins, juvenile and adult Atlantic cod, rock gunnel, conger eel, American eel, red hake, ocean pout, white hake, juvenile pollock
Coastal (exposed rock/soft marl, harder rock, wrecks and artificial reefs, kelp, other materials)	Boring mollusks (piddocks), red algae, sponges, anemones, hydroids, northern stone coral, soft coral, sea whips, barnacles, blue mussel, horse mussel, bryozoans, skeleton and tubiculous amphipods, polychaetes, jingle shell, sea stars	American lobster, Jonah crab, rock crabs, spider crab, sea stars, urchins, squid egg clusters	Black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black grouper, smooth dogfish, summer flounder, scad, bluefish, amberjack, Atlantic cod, tautog, ocean pout, conger eel, sea raven, rock gunnel, radiated shanny
Shelf (rocks and boulders, wrecks and artificial reefs, other solid substrates)	Boring mollusks (piddocks) red algae, sponges, anemones, hydroids, stone coral, soft coral, sea whips, barnacles, blue mussels, horse mussels, bryozoans, amphipods, polychaetes	American lobster, Jonah crabs, rock crabs, spider crabs, sea stars, urchins, squid egg clusters (with addition of some deepwater taxa at shelf edge)	Black sea bass, scup, tautog, cunner, gag, sheepshead, porgy, round herring, sardines, amberjack, spadefish, gray triggerfish, mackerels, small tunas, spottail pinfish, tautog, Atlantic cod, ocean pout, red hake, conger eel, cunner, sea raven, rock gunnel, pollock, white hake
Outer shelf (reefs and clay burrows including "pueblo village community")			Tilefish, white hake, conger eel

As described in Steimle and Zetlin (2000).

6.1.4 Continental Slope

6.1.4.1 Physical Environment

The continental slope extends from the continental shelf break, at depths between 60 - 200 m, eastward to a depth of 2000 m. The width of the slope varies from 10 - 50 km, with an average gradient of 3 - 6°; however, local gradients can be nearly vertical. The base of the slope is defined by a marked decrease in seafloor gradient where the continental rise begins.

The morphology of the present continental slope appears largely to be a result of sedimentary processes that occurred during the Pleistocene, including, 1) slope upbuilding and progradation by deltaic sedimentation principally during sea-level low stands; 2) canyon cutting by sediment mass movements during and following sea-level low stands; and 3) sediment slumping.

The slope is cut by at least 70 large canyons between Georges Bank and Cape Hatteras (Figure 22 and Figure 23) and numerous smaller canyons and gullies, many of which may feed into the larger canyon systems. The New England Seamount Chain including Bear, Mytilus, and Balanus Seamounts occurs on the slope southwest of Georges Bank. A smaller chain (Caryn, Knauss, etc.) occurs in the vicinity in deeper water.

A “mud line” occurs on the slope at a depth of 250 - 300 m, below which fine silt and clay-size particles predominate (Figure 14). Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope because of glacial rafting. Sand pockets may also be formed because of downslope movements.

Gravity induced downslope movement is the dominant sedimentary process on the slope, and includes slumps, slides, debris flows, and turbidity currents, in order from thick cohesive movement to relatively nonviscous flow. Slumps may involve localized, short, down-slope movements by blocks of sediment. However, turbidity currents can transport sediments thousands of kilometers.

Submarine canyons are not spaced evenly along the slope, but tend to decrease in areas of increasing slope gradient. Canyons are typically “v” shaped in cross section and often have steep walls and outcroppings of bedrock and clay. The canyons are continuous from the canyon heads to the base of the continental slope. Some canyons end at the base of the slope, but others continue as channels onto the continental rise. Larger and more deeply incised canyons are generally significantly older than smaller ones, and there is evidence that some older canyons have experienced several episodes of filling and re-excavation. Many, if not all, submarine canyons may first form by mass-wasting processes on the continental slope, although there is evidence that some canyons were formed because of fluvial drainage (*e.g.*, Hudson Canyon).

Canyons can alter the physical processes in the surrounding slope waters. Fluctuations in the velocities of the surface and internal tides can be large near the heads of the canyons, leading to enhanced mixing and sediment transport in the area. Shepard *et al.* (1979) concluded that the strong turbidity currents initiated in study canyons were responsible for enough sediment erosion

Figure 22 - Principal submarine canyons on southern flank of Georges Bank. Depths in meters.

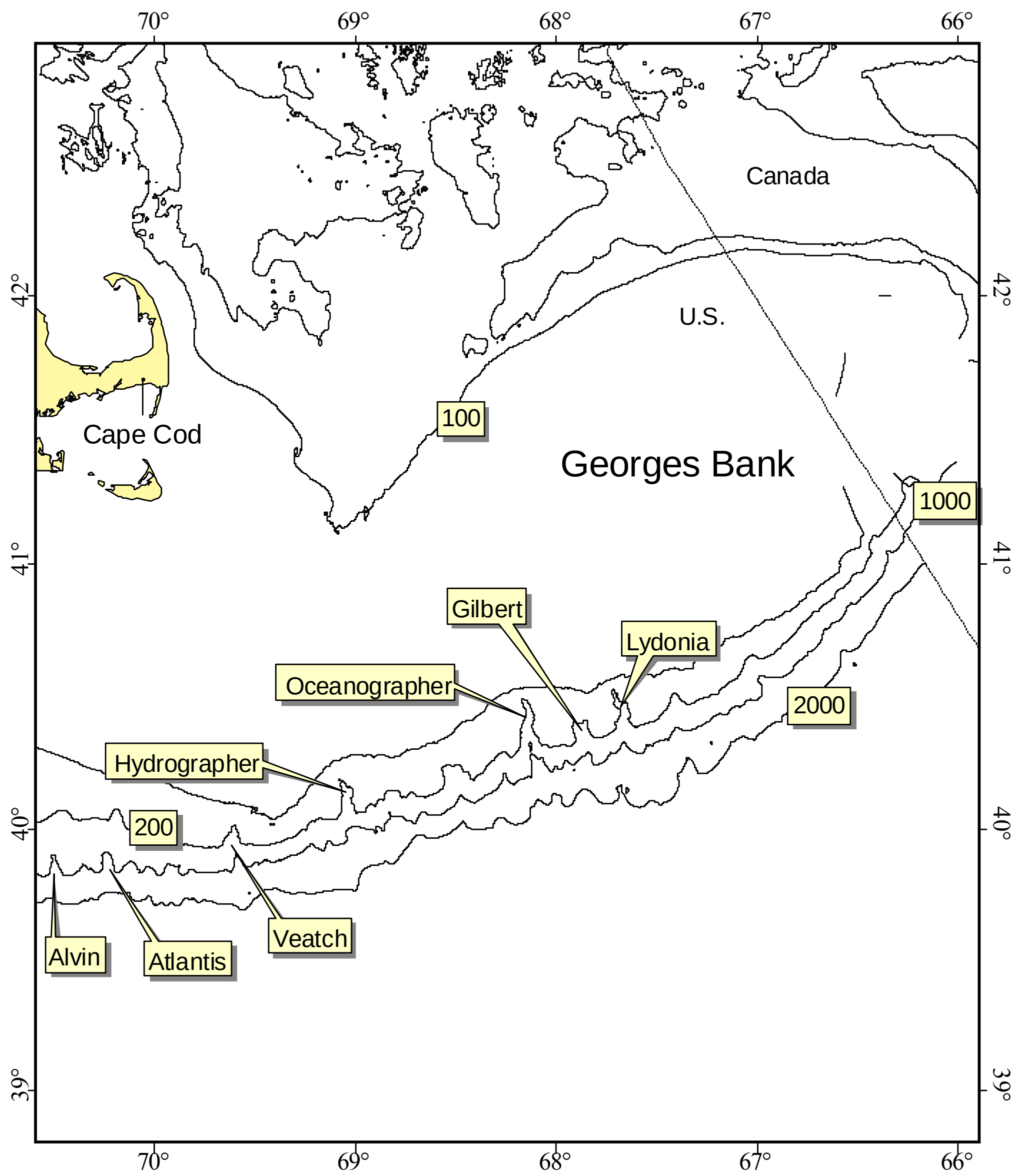


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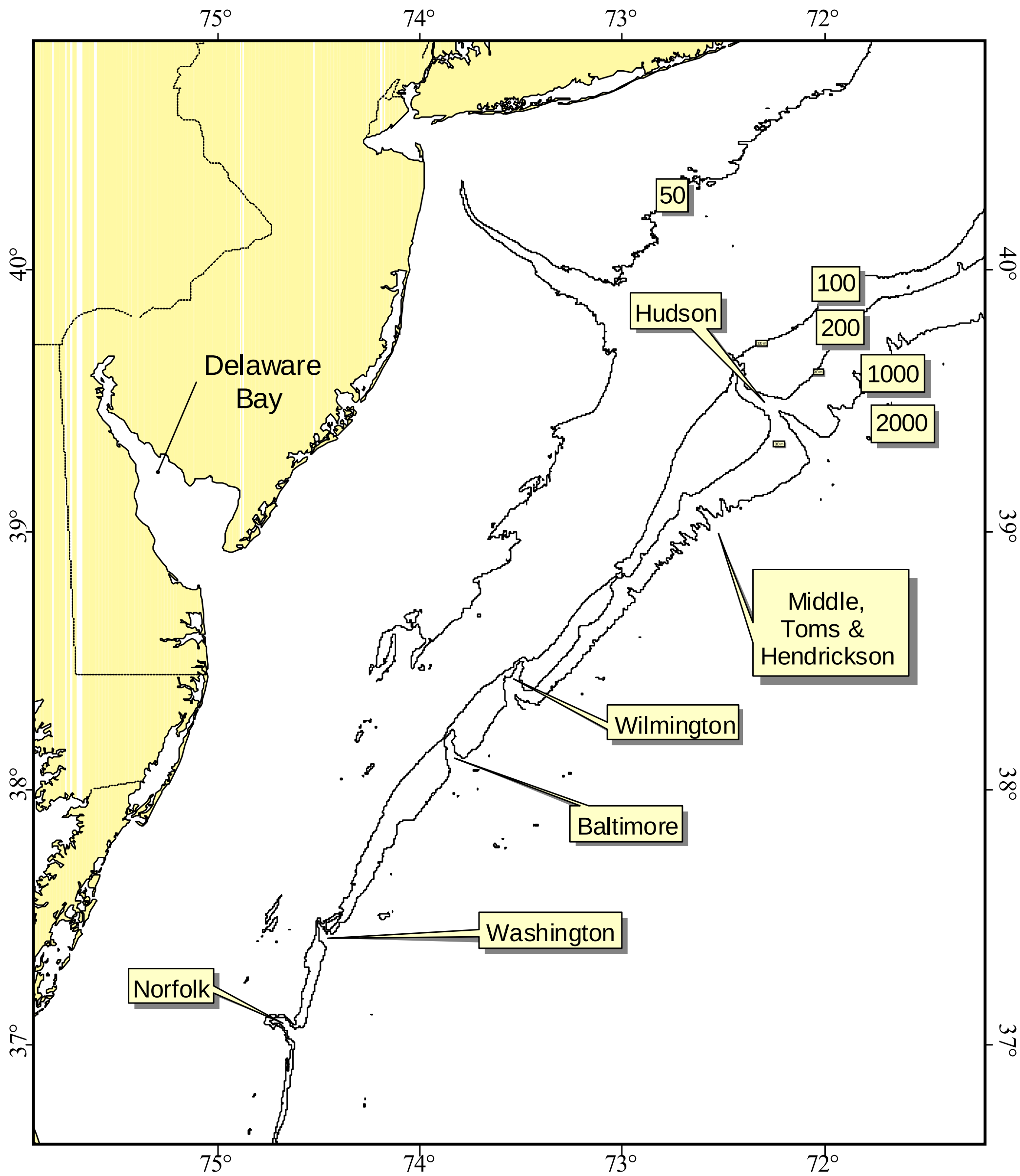
Figure 23 - Principal submarine canyons in Mid-Atlantic Bight. Depths in meters.



and transport to maintain and modify those canyons. Since surface and internal tides are ubiquitous over the continental shelf and slope, it can be anticipated that these fluctuations are important for sedimentation processes in other canyons as well. In Lydonia Canyon, Butman *et al.* (1982) found that the dominant source of low frequency current variability was related to passage of warm core Gulf Stream rings rather than the atmospheric events that predominate on the shelf.

The water masses of the Atlantic continental slope and rise are essentially the same as those of the North American Basin [defined in Wright and Worthington (1970)]. Worthington (1976) divided the water column of the slope into three vertical layers: deepwater (colder than 4°C), the thermocline (4 - 17°C), and surface water (warmer than 17°C). In the North American Basin, deepwater accounts for two-thirds of all the water, the thermocline for about one-quarter, and surface water the remainder. In the slope water north of Cape Hatteras, the only warm water occurs in the Gulf Stream and in seasonally influenced summer waters.

The principal cold water mass in the region is the North Atlantic Deep Water. North Atlantic Deep Water is comprised of a mixture of five sources: Antarctic Bottom Water, Labrador Sea Water, Mediterranean Water, Denmark Strait Overflow Water, and Iceland-Scotland Overflow Water. The thermocline represents a straightforward water mass compared with either the deepwater or the surface water. Nearly 90% of all thermocline water comes from the water mass called the Western North Atlantic Water. This water mass is slightly less saline northeast of Cape Hatteras due to the influx of southward flowing Labrador Coastal Water. Seasonal variability in slope waters penetrates only the upper 200 m of the water column.

In the winter months, cold temperatures and storm activity create a well mixed layer down to about 100 - 150 m, but summer warming creates a seasonal thermocline overlain by a surface layer of low density water. The seasonal thermocline, in combination with reduced storm activity in the summer, inhibits vertical mixing and reduces the upward transfer of nutrients into the photic zone.

Two currents found on the slope, the Gulf Stream and Western Boundary Undercurrent, together represent one of the strongest low frequency horizontal flow systems in the world. Both currents have an important influence on slope waters. Warm and cold core rings that spin off the Gulf Stream are a persistent and ubiquitous feature of the northwest Atlantic Ocean (see the "Gulf Stream" section). The Western Boundary Undercurrent flows to the southwest along the lower slope and continental rise in a stream about 50 km wide. The boundary current is associated with the spread of North Atlantic Deep Water, and it forms part of the generally westward flow found in slope water. North of Cape Hatteras it crosses under the Gulf Stream in a manner not yet completely understood.

Shelf and slope waters of the northeast region are intermittently affected by the Gulf Stream. The Gulf Stream begins in the Gulf of Mexico and flows northeastward at an approximate rate of 1 m/s (2 knots), transporting warm waters north along the eastern coast of the United States, and then east towards the British Isles. Conditions and flow of the Gulf Stream are highly variable on time scales ranging from days to seasons. Intrusions from the Gulf Stream constitute the principal source of variability in slope waters off the northeastern shelf.

The location of the Gulf Stream's shoreward, western boundary is variable because of meanders and eddies. Gulf Stream eddies are formed when extended meanders enclose a parcel of seawater and pinch off. These eddies can be cyclonic, meaning they rotate counterclockwise and have a cold core formed by enclosed slope water (cold core ring), or anticyclonic, meaning they rotate clockwise and have a warm core of Sargasso Sea water (warm core ring). The rings are shaped like a funnel, wider at the top and narrower at the bottom, and can have depths of over 2000 m. They range in size from approximately 150 - 230 km in diameter. There are 35% more rings and meanders near Georges Bank than in the Mid-Atlantic region. A net transfer of water on and off the shelf may result from the interaction of rings and shelf waters. These warm or cold core rings maintain their identity for several months until they are reabsorbed by the Gulf Stream. The rings and the Gulf Stream itself have a great influence over oceanographic conditions all along the continental shelf.

6.1.4.2 Invertebrates

Polychaete annelids represent the most important slope faunal group in terms of numbers of individuals and species (Wiebe *et al.* 1987). Ophiuroids (brittle stars) are considered to be among the most abundant slope organisms, but this group is comprised of relatively few species. The taxonomic group with the highest species diversity is the peracarid crustaceans (which includes amphipods, cumaceans, and isopods). Some species of the slope are widely distributed, while others appear to be restricted to particular ocean basins. The ophiuroids and bivalves appear to have the broadest distributions, while the peracarid crustaceans appear to be highly restricted because they brood their young, and lack a planktonic stage of development. In general, gastropods do not appear to be very abundant; however, past studies are inconclusive since they have not collected enough individuals for large-scale community and population studies.

In general, slope inhabiting benthic organisms are strongly zoned by depth and/or water temperature, although these patterns are modified by the presence of topography, including canyons, channels, and current zonations (Hecker 1990). Moreover, at depths of less than 800 m, the fauna is extremely variable and the relationships between faunal distribution and substrate, depth, and geography are less obvious (Wiebe *et al.* 1987). Fauna occupying hard surface sediments are not as dense as in comparable shallow water habitats (Wiebe *et al.* 1987), but there is an increase in species diversity from the shelf to the intermediate depths of the slope. Diversity then declines again in the deeper waters of the continental rise and plain. Hecker (1990) identified four megafaunal zones on the slope of Georges Bank and southern New England (Table 43).

One group of organisms of interest because of the additional structure they can provide for habitat and their potential long life span are the Alcyonarian soft corals. Soft corals can be bush or treelike in shape; species found in this form attach to hard substrates such as rock outcrops or gravel. These species can range in size from a few millimeters to several meters, and the trunk diameter of large specimens can exceed 10 cm. Other Alcyonarians found in this region include sea pens and sea pansies (Order Pennatulacea), which are found in a wider range of substrate types.

As opposed to most slope environments, canyons may develop a lush epifauna. Hecker *et al.* (1983) found faunal differences between the canyons and slope environments. Hecker and Blechschmidt (1979) suggested that faunal differences were due at least in part to increased environmental heterogeneity in the canyons, including greater substrate variability and nutrient enrichment. Hecker *et al.* (1983) found highly patchy faunal assemblages in the canyons, and also found additional faunal groups located in the canyons, particularly on hard substrates, that do not appear to occur in other slope environments. Canyons are also thought to serve as nursery areas for a number of species (Cooper *et al.* 1987; Hecker 2001). The canyon habitats in Table 7. were classified by Cooper *et al.* (1987).

6.1.4.3 Demersal Fish

Most finfish identified as slope inhabitants on a broad spatial scale (Colvocoresses and Musick 1984; Overholtz and Tyler 1985; Gabriel 1992) (Tables 2) are associated with canyon features as well (Cooper *et al.* 1987) (Table 44). Finfish identified by broad studies that were not included in Cooper *et al.* (1987) include offshore hake, fawn cusk-eel, longfin hake, witch flounder, and armored searobin. Canyon species (Cooper *et al.* 1987) that were not discussed in the broad scale studies include squirrel hake, conger eel, and tilefish. Cusk and ocean pout were identified by Cooper *et al.* (1987) as canyon species, but classified in other habitats by the broad scale studies.

Table 44 - Faunal zones of the continental slope of Georges Bank and Southern New England.

Zone	Approximate Depth (m)	Gradient	Current	Fauna
Upper Slope	300 - 700	Low	Strong	Dense filter feeders; Scleratinians (*Dasmosmilia lymani*, *Flabellum alabastrum*), quill worm (*Hyalinoecia*)
Upper Middle Slope	500 - 1300	High	Moderate	Sparse scavengers; red crab (*Geryon quinqueidens*), long-nosed eel (*Synaphobranchus*), common grenadier (*Nezumia*). Alcyonarians (*Acanella arbuscula*, *Eunephthya florida*) in areas of hard substrate
Lower Middle Slope/Transition	1200 - 1700	High	Moderate	Sparse suspension feeders; cerianthids, sea pens (*Distichoptilum gracile*)
Lower Slope	> 1600	Low	Strong	Dense suspension and deposit feeders; ophiurid (*Ophiomusium lymani*), cerianthids, sea pens

From Hecker (1990)

Table 45 – Georges Bank Habitat Types

Habitat Type	**Geologic Description:** Habitat types for the canyons of Georges Bank, including characteristic fauna.	Canyon Locations	Most Commonly Observed Fauna
I	Sand or semiconsolidated silt substrate (claylike consistency) with less than 5% overlay of gravel. Relatively featureless except for conical sediment mounds.	Walls and axis	Cerianthid, pandalid shrimp, white colonial anemone, Jonah crab, starfishes, portunid crab, greeneye, brittle stars, mosaic worm, red hake, fourspot flounder, shellless hermit crab, silver hake, gulf stream flounder
II	Sand or semiconsolidated silt substrate (claylike consistency) with more than 5% overlay of gravel. Relatively featureless.	Walls	Cerianthids, galatheid crab, squirrel hake, white colonial anemone, Jonah crab, silver hake, sea stars, ocean pout, brittle stars, shellless hermit crab, greeneye
III	Sand or semiconsolidated silt (claylike consistency) overlain by siltstone outcrops and talus up to boulder size. Featured bottom with erosion by animals and scouring.	Walls	White colonial anemone, pandalid shrimp, cleaner shrimp, rock anemone, white hake, sea stars, ocean pout, conger eel, brittle stars, Jonah crab, lobster, blackbelly rosefish, galatheid crab, mosaic worm, tilefish
IV	Consolidated silt substrate, heavily burrowed/excavated. Slope generally more than 5º and less than 50º. Termed “pueblo village” habitat.	Walls	Sea stars, blackbelly rosefish, Jonah crab, lobster, white hake, cusk, ocean pout, cleaner shrimp, conger eel, tilefish, galatheid crab, shellless hermit crab
V	Sand dune substrate.	Axis	Sea stars, white hake, Jonah crab, goosefish

From Cooper *et al.* (1987). Faunal characterization is for depths < 230 m only.

6.1.5 Essential Fish Habitat

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 NE Multispecies; 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 Fishery Management Plans. 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 geographic range, depth, and bottom types for all the benthic life stages of the species managed under these FMPs are summarized in the following table.

Table 46 - EFH descriptions for all benthic life stages of federally-managed species in the U.S. Northeast Shelf Ecosystem. Species with EFH vulnerable to bottom tending gear are shaded (see Stevenson et al. 2004).

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150	Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175	Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75	Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOME, GB	100 - 700	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic herring	eggs	GOME, GB and following estuaries: Englishman/Machias Bay, Casco Bay, and Cape Cod Bay	20 – 80	Bottom habitats attached to gravel, sand, cobble or shell fragments, also on macrophytes

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110	Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110	Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100	Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150	Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Monkfish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Monkfish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	eggs	GOME, GB, southern NE, and middle Atlantic south to Delaware Bay, and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts and Cape Cod Bay	<50	Bottom habitats, generally in hard bottom sheltered nests, holes, or crevices
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay		Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80	Bottom habitats, often smooth bottom near rocks or algae

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Offshore hake	juvenile	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170 - 350	Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380	Bottom habitats
Pollock	juvenile	GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 – 250	Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100	Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay		Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOME, southern edge of GB	25 - 400	Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOME, southern edge of GB	50 - 350	Bottom habitats with a substrate of silt, mud, or hard bottom
White hake	adult	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 325	Bottom habitats with substrate of mud or fine grained sand

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Silver hake	juvenile	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 – 270	Bottom habitats of all substrate types
Silver hake	adult	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30 – 325	Bottom habitats of all substrate types
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100	Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75	Bottom habitats with substrate of mud or fine grained sand
Winter flounder	eggs	GB, inshore areas of GOME, southern NE, and middle Atlantic south to Delaware Bay	<5	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)	Bottom habitats with a substrate of mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100	Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	juvenile	GOME, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Bottom habitats with fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50	Bottom habitats with substrate of sand or sand and mud

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50	Bottom habitats with substrate of sand or sand and mud
Red crab	juvenile	Southern flank of GB and south the Cape Hatteras, NC	700 - 1800	Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Red crab	adult	Southern flank of GB and south the Cape Hatteras, NC	200 - 1300	Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Ocean quahog	juvenile	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Ocean quahog	adult	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 -185)	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary	Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Demersal waters and estuaries
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Longfin squid	eggs	GB, southern NE and middle Atlantic to mouth of Chesapeake Bay	<50	Egg masses attached to rocks, boulders and vegetation on sand or mud bottom

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Golden crab	juvenile	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570	Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570	Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91	Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91	Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile		18 - 2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult		18 - 2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

6.1.6 Habitat Effects of Fishing

Amendment 13 (NEFMC 2003) describes the general effects of bottom trawls and dredges 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 2000) that identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats. 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 can affect 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 (<u>changes are always permanent</u> and lead to an overall change in habitat diversity, which can in turn lead to the local loss of species and species assemblages dependant on such features);

Loss of structure-forming organisms such as bryozoans, tube-dwelling polychaetes, hydroids, seapens, sponges, mussel beds, and oyster beds (<u>changes may be permanent</u> and can lead to an overall change in habitat diversity which can in turn lead to the local loss of species and species assemblages dependant 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 decease in the physical patchiness of the sea floor (<u>changes are not likely to be permanent</u>);

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

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 by the Committee included bottom otter trawls and beam trawls. Dredge gear included hydraulic clam dredges, non-hydraulic oyster, conch, and crab dredges, and scallop dredges with and without teeth. This report identified four general conclusions regarding the types of habitat modifications caused by trawls and dredges.

Trawling and dredging reduce habitat complexity
Repeated trawling and dredging result in discernable changes in benthic communities
Bottom trawling reduces the productivity of benthic habitats
Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance

An additional source of information 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 New England and Mid-Atlantic Fishery Management Councils 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 was convened for the purpose of assisting the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (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, New Bedford style scallop dredges, and hydraulic clam dredges. Relying on this information plus professional judgment, the panel identified the effects, and the degree of impact, of these three gears plus bottom gillnets, pots, and longlines on mud, sand, and gravel/rock bottom habitats.

Additional information is provided in this report on the recovery times for each type of impact for all three gears 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 and dredging, although other factors such as frequency of disturbance from fishing and from natural events are also important. In general, impacts were determined to be greater in gravel/rock habitats with attached epifauna. Impacts on biological structure were ranked higher than impacts on physical structure and otter trawls and scallop dredges were ranked much higher than hydraulic dredges or stationary gears. 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. For scallop dredges in gravel, recovery from impacts to biological structure was estimated to take several years and, for impacts to physical structure, months to years. In sand, biological structure was estimated to recover within months to years and physical structure within days to months.

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 ten different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls and dredges have very high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. As in the ICES and NRC reports, individual types of trawls and dredges were not evaluated. The impacts of bottom gill nets, traps, and longlines were limited to warm or shallow-water environments with rooted aquatic vegetation or "live bottom" environments (*e.g.*, coral reefs).

Results of a review of 44 gear effect studies published through the summer of 2002 that were relevant (same gears and habitats) to the NE region of the U.S. (see Stevenson et al. 2004) are also summarized in Amendment 13. Based on these studies, positive and negative effects of bottom otter trawls, New Bedford-style scallop dredges, and hydraulic clam dredges are summarized by substrate type in Amendment 13, along with recovery times (when known). Whenever possible, only statistically significant results were reported. In general, these studies confirm the previous determinations of potential adverse impacts of trawls and dredges found in the ICES (2000), NRC (2002), NEFSC (2002), and Morgan and Chuenpagdee (2003) reports. The results of these 44 studies are summarized below for each gear/habitat type combination. Studies of the effects of multiple gear types are not included. Physical and biological effects for each gear-substrate category are summarized in separate paragraphs. When necessary, biological effects are summarized separately for single disturbance and repeated disturbance experimental studies, and for non-experimental studies. For more detailed information, including the identification of each study, see Stevenson et al. (2004). An up-dated summary of gear effects research studies that are relevant to the NE region will be included in the revised gear effects section of the NEFMC Omnibus EFH Amendment 2 (Phase 2), which is currently being developed.

6.1.6.1 Otter Trawls – Mud

Results of 11 studies are summarized, five done in North America, four in Europe, and one in Australia. One was performed in an inter-tidal habitat, one in very deep water (250 m), and the rest in a depth range of 14-90 meters. Seven of them were experimental studies, three were observational, and one was both. Two examined physical effects, six of them assessed biological effects, and three studies examined physical and biological effects. One study evaluated geochemical sediment effects. In this habitat type, biological evaluations focused on infauna: all nine biological assessments examined infaunal organisms and four of them also included epifauna. Habitat recovery was monitored on five occasions. Two studies evaluated the long-term effects of commercial trawling, one by comparing benthic samples from a fishing ground with samples collected near a shipwreck, while another evaluated changes in macrofaunal abundance during periods of low, moderate, and high fishing effort during a 27-year time period. Four of the experimental studies were done in closed or previously un-trawled areas and three in commercially fished areas. One study examined the effects of a single tow and six involved multiple tows, five restricted trawling to a single event (*e.g.*, one day) and two examined the cumulative effects of continuous disturbance.

6.1.6.1.1 Physical Effects

Trawl doors produce furrows up to 10 cm deep and berms 10-20 cm high on mud bottom. Evidence from four studies indicates that there is a large variation in the duration of these features (2-18 months). There is also evidence that repeated tows increase bottom roughness, fine surface sediments are re-suspended and dispersed, and rollers compress sediment. A single pass of a trawl did not cause sediments to be turned over, but single and multiple tows smoothed surface features.

6.1.6.1.2 Biological Effects

Single disturbance experimental studies
Two single-event studies were conducted in commercially trawled areas. Experimental trawling in intertidal mud habitat in the Bay of Fundy (Canada) disrupted diatom mats and reduced the abundance of nematodes in trawl door furrows, but recovery was complete after 1-3 months. There were no effects on infaunal polychaetes. In a sub-tidal mud habitat (30-40 m deep), benthic infauna were not affected. In two assessments performed in areas that had not been affected by mobile bottom gear for many years, effects were more severe. In both cases, total infaunal abundance and the abundance of individual polychaete and bivalve species declined immediately after trawling. In one of these studies, there were also immediate and significant reductions in the number of species and species diversity. Positive effects included reduced porosity, increased food value, and increased chlorophyll production in surface sediments. Most

of these effects lasted less than 3.5 months. In the other, two tows removed 28% of the epifauna on mud and sand substrate and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for mud bottom.

Repeated disturbance experimental studies
Two studies of the effects of repeated trawling were conducted in areas that had been closed to fishing for six years and >25 years. In one, multiple tows were made weekly for a year and, in the other, monthly for 16 months. In one case, 61% of the benthic species sampled tended to be negatively affected, but significant reductions were only noted for brittlestars. In the other, repeated trawling had no significant effect on the numbers of infaunal individuals or biomass. In this study, the number of infaunal species increased by the end of the disturbance period. Some species (*e.g.*, polychaetes) increased in abundance, while others (*e.g.*, bivalves) decreased. Community structure was altered after five months of trawling and did not fully recover until 18 months after trawling ended.

Observational studies
An analysis of benthic sample data collected from a fishing ground over a 27-year period of high, medium, and low levels of fishing effort showed an increased abundance of organisms belonging to taxa that were expected to increase at higher disturbance levels, whereas those that were expected to decrease did not change in abundance. Results of another study indicated that a trawling ground had fewer benthic organisms and fewer species than an un-exploited site near a shipwreck. Trawling in deep water apparently dislodged infaunal polychaetes, causing them to be suspended in near-bottom water.

6.1.6.2 Otter Trawls – Sand

Results of 14 studies are summarized. Six studies were conducted in North America (three in a single long-term experiment on the Grand Banks), four in Australia, and four in Europe. Ten are experimental studies. Eight of them were done in depths less than 60 m, one at 80 m, and four in depths greater than 100 m. Three studies examined the physical effects of trawling, ten were limited to biological effects, and one examined both. Five of the biological studies were restricted to epifauna, one only examined infauna, and five included epifauna and infauna. The only experiment that was designed to monitor recovery was the one on the Grand Banks, although surveys conducted in Australia documented changes in the abundance of benthic organisms five years after closed areas were established. Two studies compared benthic communities in trawled areas of sandy substrate with undisturbed areas near a shipwreck. Six studies were performed in commercially exploited areas, five in closed areas, two compared closed and open areas, and one was done in a test tank. All the experimental studies examined the effects of multiple tows (up to 6 per unit area of bottom) and observational studies in Australia assessed the effects of 1-4 tows on emergent epifauna. Trawling in four studies was limited to a single event (1 day to 1 week), whereas the Grand Banks experiment was designed to evaluate the immediate and cumulative effects of annual 5-day trawling events in a closed area over a three-year period.

6.1.6.2.1 Physical effects

A test tank experiment showed that trawl doors produce furrows in sandy bottom that are 2 cm deep, with a berm 5.5 cm high. In sandy substrate, trawls smoothed seafloor topographic features, re-suspended and dispersed finer surface sediment, but had no lasting effects on sediment composition. Trawl door tracks lasted up to one year in deep water, but only for a few days in shallow water. Seafloor topography recovered within a year.

6.1.6.2.2 Biological effects

Single disturbance experimental studies
Two single-event studies were conducted in commercially trawled areas. In one of these studies, otter trawling caused high mortalities of large sedentary and/or immobile epifaunal species. In the other, there were no effects on benthic community diversity. Neither of these studies investigated effects on total abundance or biomass. Two studies were performed in un-exploited areas. One study documented effects on attached epifauna. In one, single tows reduced the density of attached macrobenthos (>20 cm) by 15% and four tows by 50%. In the other, two tows removed 28% of the epifauna on mud and sand substrate and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for sand bottom. Total infaunal abundance was not affected, but the abundance of one family of polychaetes was reduced.

Repeated disturbance experimental studies
Intensive experimental trawling on the Grand Banks reduced the total abundance and biomass of epibenthic organisms and the biomass and average size of a number of epibenthic species. Significant reductions in total infaunal abundance and the abundance of 15 taxa (mostly polychaetes) were detected during only one of three years, and there were no effects on biomass or taxonomic diversity.

Observational studies
Changes in macrofaunal abundance in a lightly trawled location in the North Sea were not correlated with historical changes in fishing effort, but there were fewer benthic organisms and species in a trawling ground in the Irish Sea than in an un-exploited site near a shipwreck. In the other "shipwreck study," however, changes in infaunal community structure at increasing distances from the wreck were related to changes in sediment grain size and organic carbon content. The Alaska study showed that epifauna attached to sand were less abundant inside a closed area, significantly so for sponges and anemones. A single tow in a closed area in Australia removed 89% of the large sponges in the trawl path.

6.1.6.3 Otter Trawls – Gravel/Rocky Substrate

Three studies of otter trawl effects were conducted on gravel and rocky substrates. All three were conducted in North America. Two were done in glacially-affected areas in depths of about 100 to 300 meters using submersibles and the third was done in a shallow coastal area in the southeast U.S. One involved observations made in a gravel/boulder habitat in two different years before and after trawling affected the bottom. The other two were experimental studies of the effects of single trawl tows. One of these was done in a relatively un-exploited gravel habitat and the other on a smooth rock substrate in an area not affected by trawling. Two studies examined effects to the seafloor and on attached epifauna and one only examined effects on epifauna. There were no assessments of effects on infauna. Recovery was evaluated in one case for a year.

6.1.6.3.1 Physical effects

Trawling displaced boulders and removed mud covering boulders and rocks and rubber tire ground gear left furrows 1-8 cm deep in less compact gravel sediment.

6.1.6.3.2 Biological effects

Trawling in gravel and rocky substrate reduced the abundance of attached benthic organisms (*e.g.*, sponges, anemones, and soft corals) and their associated epifauna and damaged sponges, soft corals, and brittle stars. Sponges were more severely damaged by a single pass of a trawl than soft corals, but 12 months after trawling all affected species – including one species of stony coral – had fully recovered to their original abundance and there were no signs of damage.

6.1.6.4 Otter Trawls – Mixed Substrates

Three studies of the effects of otter trawls on mixed substrates are summarized. All three were conducted in North America and relied on sonar and observations made by divers or from a submersible. One of them combined submersible observations and benthic sampling to compare the physical and biological effects of trawling in a lightly fished and heavily fished location in California with the same depth and variety of sediment types. One was a survey of seafloor features produced by trawls in a variety of bottom types and the other primarily examined the physical effects of single trawl tows on sand and mud bottom.

6.1.6.4.1 Physical effects

Trawl doors left tracks in sediments that ranged from less than 5 cm deep in sand to 15 cm deep in mud. In mud, fainter marks were also made between the door tracks, presumably by the footgear. A heavily trawled area had fewer rocks, shell fragments, and biogenic mounds than a lightly trawled area.

6.1.6.4.2 Biological effects

The heavily trawled area in California had lower densities of large epifaunal species (*e.g.*, sea slugs, sea pens, starfish, and anemones) and higher densities of brittle stars and infaunal nematodes, oligochaetes, and one species of polychaete. There were no differences in the abundance of molluscs, crustaceans, or nemerteans between the two areas. However, since this was not a controlled experiment, these differences could not be attributed to trawling. Single trawl tows in Long Island Sound attracted predators and suspended epibenthic organisms into the water column.

6.1.6.5 New Bedford Scallop Dredges – Sand

Three studies of the effects of New Bedford scallop dredges on sand substrate were conducted, one in an estuary on the Maine coast and two on offshore banks in the Gulf of Maine. Two of them were observational in nature, but did not include any direct observations of dredge effects. The other one was a controlled experiment conducted in an unexploited area in which a single dredge was towed repeatedly over the same area of bottom during a single day. One study examined physical effects and two examined physical and biological effects. One of them included an analysis of geochemical effects to disturbed silty-sand sediments.

6.1.6.5.1 Physical effects

Dredging disturbed physical and biogenic benthic features (sand ripples and waves, shell deposits, and amphipod tube mats, caused the loss of fine surficial sediment, and reduced the food quality of the remaining sediment. Sediment composition was still altered six months after dredging, but the food quality of the sediment had recovered by then.

6.1.6.5.2 Biological effects

There were significant reductions in the total number of infaunal individuals in the estuarine location immediately after dredging and reduced abundances of some species (particularly one family of polychaetes and photid amphipods), but no change in the number of taxa. Total abundance was still reduced four months later, but not after six months. The densities of two megafaunal species (a tube-dwelling polychaete and a burrowing anemone) on an offshore bank were significantly reduced after commercial scallop vessels had worked the area.

6.1.6.6 New Bedford Scallop Dredges - Mixed Substrates

Three studies have been conducted on mixed glacially-derived substrates. All were done in the northwest Atlantic (one in the U.S. and two in Canada) at depths of 8 to 50 m. Two observational studies examined physical effects and one experimental study examined effects on sediment composition to a sediment depth of 9 cm. The experimental study evaluated the immediate effects of a single dredge tow. None of these studies evaluated habitat recovery or biological effects, although one examined geochemical effects.

6.1.6.6.1 Physical effects

Direct observations in dredge tracks in the Gulf of St. Lawrence documented a number of physical effects to the seafloor, including bottom features produced by dredge skids, rings in the chain bag, and the tow bar. Gravel fragments were moved and overturned and shells and rocks were dislodged or plowed along the bottom. Sampling one day after a single dredge tow revealed that surficial sediments were re-suspended and lost and that the dredge tilled the bottom, burying surface sediments and organic matter to a depth of 9 cm, increasing the grain size of sediments above 5 cm, and disrupting a surface diatom mat. Microbial biomass at the sediment surface increased as a result of dredging.

6.1.6.7 Hydraulic Clam Dredges – Sand

Six hydraulic dredge studies were conducted in sandy substrates. Five of them examined the effects of "cage" dredges of the type used in the Northeast region of the U.S. and one examined the effects of escalator dredges, which affect sandy bottom habitats similarly to "cage" dredges. Three were performed in North America (two in the U.S. and one in Canada), one in the Adriatic Sea and two in Scotland. There have been no published studies in North America since 1982. One of the North American studies was conducted on the U.S. continental shelf at a depth of 37 m and two in near shore waters and depths of 7 – 12 m. The two European studies were done in even shallower water (1.5 – 7 m). The North American studies were all observational in nature and the European studies were controlled experiments. One study compared effects in commercially dredged and un-dredged areas and four were conducted in un-dredged areas. The sixth study compared infaunal communities in an actively dredged, a recently dredged, and an un-dredged location off the New Jersey coast. All six studies examined physical and biological effects of dredging. Recovery was evaluated in four cases for periods ranging from just a few minutes (sediment plumes) to 11 weeks.

6.1.6.7.1 Physical effects

Hydraulic clam dredges created steep-sided trenches 8-30 cm deep that started deteriorating immediately after they were formed. Trenches in a shallow, inshore location with strong bottom currents filled in within 24 hours. Trenches in shallow, protected, coastal lagoons were still visible two months after they were formed. Hydraulic dredges also fluidized sediments in the bottom and sides of trenches, created mounds of sediment along the edges of the trench, re-suspended and dispersed fine sediment, and caused a re-sorting of sediments that settled back into trenches. In one study, sediment in the bottom of trenches was initially fluidized to a depth of 30 cm and in the sides of the trench to 15 cm. After 11 weeks, sand in the bottom of the trench was still fluidized to a depth of 20 cm. Silt clouds only last for a few minutes or hours. Complete recovery of seafloor topography, sediment grain size, and sediment water content was noted after 40 days in a shallow, sandy environment that was exposed to winter storms.

6.1.6.7.2 Biological effects

Some of the larger infaunal organisms (*e.g.*, polychaetes, crustaceans) retained on the wire mesh of the conveyor belt used in an escalator dredge, or that drop off the end of the belt, presumably die. Benthic organisms that are dislodged from the sediment, or damaged by the dredge, temporarily provided food for foraging fish and invertebrates. Hydraulic dredging caused an immediate and significant reduction in the total number of infaunal organisms in two studies and in the number of macrofaunal organisms in a third study. There were also significant reductions in the number of infaunal species in one case and in the number of macrofaunal species and biomass in another. In this study, polychaetes were most affected. One study failed to detect any reduction in the abundance of individual taxa. Evidence from the study conducted off the New Jersey coast indicated that the number of infaunal organisms and species, and species composition, were the same in actively dredged and un-dredged locations.

Recovery times for infaunal communities were estimated in three studies. All of them were conducted in very shallow (1.5-7 m) water. Total infaunal abundance and species diversity had fully recovered only five days after dredging in one location where tidal currents reach maximum speeds of three knots. Some species had recovered after 11 weeks. Total abundance recovered 40 days after dredging in another location exposed to winter storms, when the site was re-visited for the first time. Total infaunal abundance (but not biomass) recovered within two months at a protected, commercially exploited site, where recovery was monitored at three-week intervals for two months, but not at a nearby, unexploited site. The actual recovery time at the exposed sub-tidal site was probably much quicker than 40 days, the only point in time when the post-experimental observations were made.

6.1.6.8 Hydraulic Clam Dredges - Mixed Substrates

An *in situ* evaluation of hydraulic dredge effects in sand, mud, and coarse gravel in the mid-Atlantic Bight indicated that trenches fill in quickly, within several days in fine sediment and more rapidly than that in coarse gravel. Dredging dislodged benthic organisms from the sediment, attracting predators.

6.1.7 Description of the Managed Species

The management unit is described in Amendments 7 and 9 to the FMP. One change is proposed (see below). 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.

This action proposes to add Atlantic wolffish (*Anarhichas lupus*) to the management unit. An Essential Fish Habitat source document has not yet been prepared for this species. The following information briefly describes the species characteristics and life history. It was extracted from working papers prepared for a Data Poor Working Group meeting held in 2008 by the Northeast Fisheries Science Center.

With the addition of Atlantic wolffish, the managed stocks/stocks in the fishery will be:

- 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

6.1.7.1 Atlantic Wolffish Basic Biology and Ecology

Geographic Range

Atlantic wolffish (*Anarhichas lupus*) can be found in northern latitudes of the eastern and western North Atlantic Ocean. In the north and eastern Atlantic they range from eastern Greenland to Iceland, along northern Europe and the Scandinavian coast extending north and west to the Barents and White Sea's. In the northwest Atlantic they are found from Davis Straits off of western Greenland, along Newfoundland and Labrador and continue southward through the Canadian Maritime Provinces to Cape Cod, USA. They are found infrequently in southern New England to New Jersey (Rountree, R.A. 2002). Northeast Fishery Science Centers Bottom Trawl surveys have only encountered 1 fish southwest of Martha's Vineyard, Massachusetts since 1963.

Habitats

Atlantic wolffish are a demersal species which prefer complex habitats with large stones and rocks which provide shelter and nesting sites (Pavlov and Novikov 1993). They are occasionally seen in soft sediments such as sand or mud substrate and likely forage for food sources in these habitats (Rountree, R.A. 2002; Falk-Petersen and Hansen 1991). They are believed to be relatively sedentary and populations localized. Tagging studies from Newfoundland, Greenland and Iceland indicate that most individuals were recaptured within short distances, ~8km, of the original tagging sites (Templeman 1984; Riget and Messtorff 1988; Jonsson 1982). Three significantly longer migrations were reported in Newfoundland ranging from 338 – 853 km (Templeman 1984).

Atlantic wolffish occupy varying depth ranges across its geographic range. In the Gulf of Maine they inhabit depths of 40 – 240 m, in Greenland and Newfoundland 0 – 600 m, in Iceland 8 – 450 m and in Norway and the Barents Sea from 10 – 215 m (Riget and Messtorff 1988; Albikovskaya 1982; Templeman 1984; Jonsson 1982; Falk-Petersen and Hansen 1991). In U.S. waters, abundance appears to be highest in the southwestern portion of the Gulf of Maine, from Jefferies Ledge to the Great South Channel, corresponding to the 100 m depth contour (Nelson and Ross 1992). Similarly, abundance is highest in the Browns Bank, Scotian shelf and northeast peak of Georges Bank areas in the Canadian portion of the Gulf of Maine (Nelson and Ross 1992). Atlantic wolffish in Newfoundland and Icelandic waters were identified as most abundant in depths 101 – 350 m and 40 - 180 m, respectively (Albikovskaya 1982; Jonsson 1982).

Temperature ranges where Atlantic wolffish occurs also deviate slightly with geographic region. Historically in the Gulf of Maine they have been associated with temperatures ranging from 0 – 11.1°C (Bigelow and Schroeder 1953). Bottom temperatures collected from NEFSC bottom trawl surveys where wolffish were encountered range from 0 – 10°C in spring and 0 – 14.3°C in fall. In Newfoundland wolffish thermal habitat ranged from -1.9 – 11.0 °C, Norway from -1.3 - 11 °C and in Iceland and Northern Europe -1.3 – 10.2 °C (Rountree, R.A. 2002; Falk-Petersen and Hansen 1991; Jonsson 1982). Laboratory studies indicate wolffish can survive a wide span of temperatures -1.7 – 17.0°C and that feeding is negatively correlated with the higher temperature extremes (Hagen and Mann 1992; King et al. 1989).

Reproduction

In general Atlantic wolffish are solitary in habit, except during mating season when bonded pairs form in spring/summer depending on geographic location (Rountree, R.A. 2002; Keats et al. 1985; Pavlov and Novikov 1993). Spawning is believed to occur in September through October in the Gulf of Maine but is likely to depend on temperature and possibly photoperiod (Rountree, R.A. 2002; Pavlov and Moksness 1994). Spawning is reported to occur from August – September in Nova Scotia, during autumn in Newfoundland, September – October in Iceland, July – October in Norway, and late summer – early autumn in the White Sea (Keats et al. 1985; Templeman 1986; Jonsson 1982; Falk-Petersen and Hansen 1991; Pavlov and Novikov 1993). In the Gulf of Maine there is weak indication of a seasonal migration as wolffish may travel from shallow to deep in autumn and then deep to shallow in spring (Nelson and Ross 1992). Similar migrations occur in Iceland and the White Sea where wolffish migrate to colder temperatures before the spawning season (Pavlov and Novikov 1993; Jonsson 1982). Atlantic wolffish have the lowest fecundity compared to their relatives, the spotted wolffish (*Anarhichas minor*) and the northern wolffish (*Anarhichas denticulus*). Fecundity is related to fish size and body mass in this species and increases exponentially with length. Newfoundland mean fecundity estimates, combined from several NAFO statistical areas, range from 2,440 eggs at 40 cm to 35,320 eggs at 120 cm (Templeman 1986). In Norway a female at 60 cm produces approximately 5,000 eggs while a female 80-90 cm will lay 12,000 eggs (Falk-Petersen and Hansen 1991). Potential fecundity of wolffish in Iceland was measured between 400 and 16,000 eggs for fish at lengths of 25 and 83 cm respectively (Gunnarsson et al. 2006). Mature eggs are large measuring 5.5 – 6.8 mm in diameter (Rountree, R.A. 2002). Male Atlantic wolffish have small testes and produce small amounts of sperm peaking during late summer and autumn. These data along with morphological development of a papilla on the urogenital pore during spawning suggest internal fertilization (Pavlov and Novikov 1993; Pavlov and Moksness 1994, Johannessen et at. 1993). Males have been observed guarding egg clusters for several months but it is not certain if they continue until hatching (Keats et al. 1985; Rountree, R.A. 2002). Hatching may take 3 to 9 months depending on temperature (Rountree, R.A. 2002). There is some anecdotal information from Canadian scientists that indicate Atlantic wolffish may lay eggs in various types of habitat (rather than just rocky areas), and that the eggs may occasionally be caught in mobile gear (Chad Keith, NEFSC, pers. comm.)

Food Habits

The diet of Gulf of Maine and Georges Bank wolffish consist primarily of bivalves, gastropods, decapods and echinoderms (Nelson and Ross 1992). Wolffish possess specialized teeth, including protruding canine tusks (hence its name) and large rounded molars, which allow for removal of organisms from the sea floor and crushing of hard shelled prey (Rountree, R.A. 2002). Due to diet teeth are replaced annually (Albikovskaya 1983; Collete and Klein-MacPhee 2002). Fish have also been reported as an important food source in other regions along with amphipods and euphausiid shrimp for smaller individuals, 1 – 10 cm (Rountree, R.A. 2002; Albikovskaya 1983; Bowman et al. 2000). Travel between shelters and feeding grounds occurs during feeding periods as evidenced by crushed shells and debris observed in the vicinity of occupied shelters (Rountree, R.A. 2002; Pavlov and Novikov 1993). Fasting does occur for several months while replacing teeth, spawning and nest guarding occurs (Rountree, R.A. 2002).

Size

In the Gulf of Maine and Georges Bank regions individuals may attain lengths of 150 cm and weights of 18 kg (Goode 1884; Idoine 1998). Northeast Fishery Science Center bottom trawl surveys have captured animals ranging in size from 3 – 137 cm in spring and 4 – 120 cm in fall and with a maximum weight of 11.77 kg.

Age and Growth

Mean length at age for Atlantic wolffish in the Gulf of Maine was determined to be 22 years at 98 cm and 0 years at 4 cm (Nelson and Ross 1992). Fish over 100 cm were not sampled extensively in this study, 10 fish from 100-118 cm. Ages in the Gulf of Maine are comparable to wolffish ages in other regions, such as 21 years in east Iceland and 23 years in Norway (Gunnarsson et al. 2006; Falk-Petersen and Hansen 1991). Age 0 fish grow quickly in Icelandic waters and may reach 10.5 cm in the first year (Jonsson 1982). Gulf of Maine wolffish have faster growth rates than fish in Iceland but grow fastest in the North Sea region (Nelson and Ross 1992; Liao and Lucas 2000). Growth in the Gulf of Maine for both male and female wolffish was best estimated using a Gompertz growth function, $L\infty = 98.9$ cm, $K = 0.22$ and $t_0 = 4.74$ (Nelson and Ross 1992). Female growth from Iceland has been modeled using a logistic growth function and coefficients estimated using non-linear optimization (Gauss-Newton method), results from the east and west regions were: $L\infty = 90.919$, $K = 0.230$ and $t_0 = 8.837$ and $L\infty = 70.046$, $K = 0.378$ and $t_0 = 4.691$, respectively (Gunnarsson et al. 2006). Von Bertalanffy growth parameters for the North Sea population of wolffish were $L\infty = 111.2$, $K = 0.12$ and $t_0 = -0.43$ and $L\infty = 115.1$, $K = 0.11$ and $t_0 = -0.39$, for males and females respectively (Liao and Lucas 2000).

Maturity

In the Gulf of Maine individuals are believed to reach maturity by age 5-6 when they reach approximately 47 cm total length (Nelson and Ross 1992; Templeman 1986). Size at fifty percent maturity (L_{50}) of females varies latitudinally which is likely due to the effects of temperature. Templeman (1986) showed that northern fish mature at smaller sizes than faster growing southern fish in Newfoundland. L_{50} was reported as 51.4 cm in the northern area, 61.0 cm in the intermediate region and 68.2 cm in the south. In a study somewhat contradictory to Templeman 1986, Atlantic wolffish in east Iceland, where water temperatures are colder, had larger L_{50} values than fish in the relatively warmer waters of east Iceland (Gunnarsson et al. 2006). Authors indicate that maturity may be difficult to determine using visual methods in females because of large eggs size in this species. Second generation eggs are visible in young, immature fish when the reach the cortical alveolus stage but they may not be able to spawn for several more years (Gunnarsson et al. 2006; Templeman 1986).

A logistic maturity ogive was developed for female Atlantic wolffish based on spring and fall NEFSC survey. L_{50} was estimated at approximately 35 cm from these data. This L_{50} for female wolffish is lower than estimates reported in Newfoundland and Iceland where females containing second generation eggs were considered immature (Templeman 1986; Gunnarsson et al. 2006). NEFSC maturity data is based on visual inspection of the reproductive organs. Fish are classified into 1 of 7 stages of maturity (Burnett et al 1989). Fish classifications for females include immature, developing, ripe, eyed (unique for redfish), ripe and running, spent and resting. This analysis considered fish that were in the developing through resting stages as a mature and immature were those fish that contained no visible eggs. Size at maturity may be difficult to interpret for wolffish from these data as they may have an additional developing stage, or a set of second generation eggs which may last for several years, where fish are reproductively immature (Gunnarsson et al. 2006). These immature fish would likely be classified as developing in NEFSC surveys and were considered mature in the ogive thereby reducing the size at 50% mature.

6.1.8 Regulated Groundfish Stock Status

The Groundfish Assessment Review Meeting (GARM) conducted during October 2007 – August 2008 provide benchmark assessments for the 19 groundfish stocks managed under the Northeast Multispecies Fishery Management Plan. The GARM III process involved in-depth reviews of the data, models, biological reference points, and assessments of each of the 19 groundfish stocks. This section summarizes the stock status in terms of biomass (B) or spawning stock biomass (SSB) and fishing mortality (F) through 2007 as reported in NEFSC (2008).

The GARM III results show which groundfish stocks were overfished or experiencing overfishing in 2007 (Table 1). A total of 13 stocks were overfished (B less than ½ B_{MSY}) while 6 stocks were not overfished. Similarly, a total of 13 stocks were experiencing overfishing (F greater than F_{MSY}) while 6 stocks were not experiencing overfishing. Eleven of the stocks are both overfished and experiencing overfishing. Pollock, witch flounder, Georges Bank (GB) winter flounder, Gulf of Maine (GOM) winter flounder and northern windowpane have deteriorated in status, while GOM cod has improved. GOM cod is still experiencing overfishing but is no longer overfished. Four stocks (redfish, American plaice, GB haddock, and GOM haddock) were classified as not overfished and not experiencing overfishing. Note the GOM winter flounder status determination was uncertain and judged as likely overfished and probably experience overfishing. In addition to GARM III, in fall 2008 the NDWG met and assessed Atlantic wolffish. The stock was determined to be overfished but the stock's status with respect to overfishing is uncertain.

Of the 14 groundfish stocks assessed in GARM III using an analytical assessment model, 7 stocks exhibited retrospective patterns that were considered severe enough that an adjustment to the population numbers and fishing mortality in 2007 was deemed necessary before determining current stock status and subsequently conducting projections. Retrospective pattern adjustments were done one of two ways. Either a split in the survey time series during the mid 1990s or an adjustment to the population numbers at age in the terminal year based upon a measure of the age-specific retrospective pattern during the past seven years. Only for American plaice and redfish were the population numbers adjusted. For the other five stocks (GB cod, GB yellowtail, witch flounder, GOM winter flounder, SNE winter flounder) the split survey was used. The remaining seven stocks were judge to have a mild retrospective pattern that did not require an adjustment.

Since GARM II, many stocks have exhibited long term declines in weights-at-age. Age-specific fishery selectivity has also shifted in many stocks to older age groups due to a combination of reduced growth, fishery management measures, and changing fishing practices. These trends were incorporated into the updated biological reference points for the 19 groundfish stocks, and as a consequence many of the newly-estimated biomass reference points are now lower and the fishing mortality reference points higher than those estimated in GARM II. However, a direct one-to-one comparison between the old and new BRPs is inappropriate because of these changes in weights and partial recruitment at age.

Analyses from an ecosystem basis suggest current biomass management targets (B_{MSY}s) for GARM stocks are reasonable. The current targets compare favorably with the results of recent and historical studies in the region and are also in general agreement with results of many studies for other worldwide ecosystems. New summed BRPs for the GARM stocks are similar to BRPs from an aggregate surplus production model for these stocks. Aggregate model results suggest that the overall fishing mortality rate should be relatively low (F=0.15) to obtain MSY for this complex of GARM stocks.

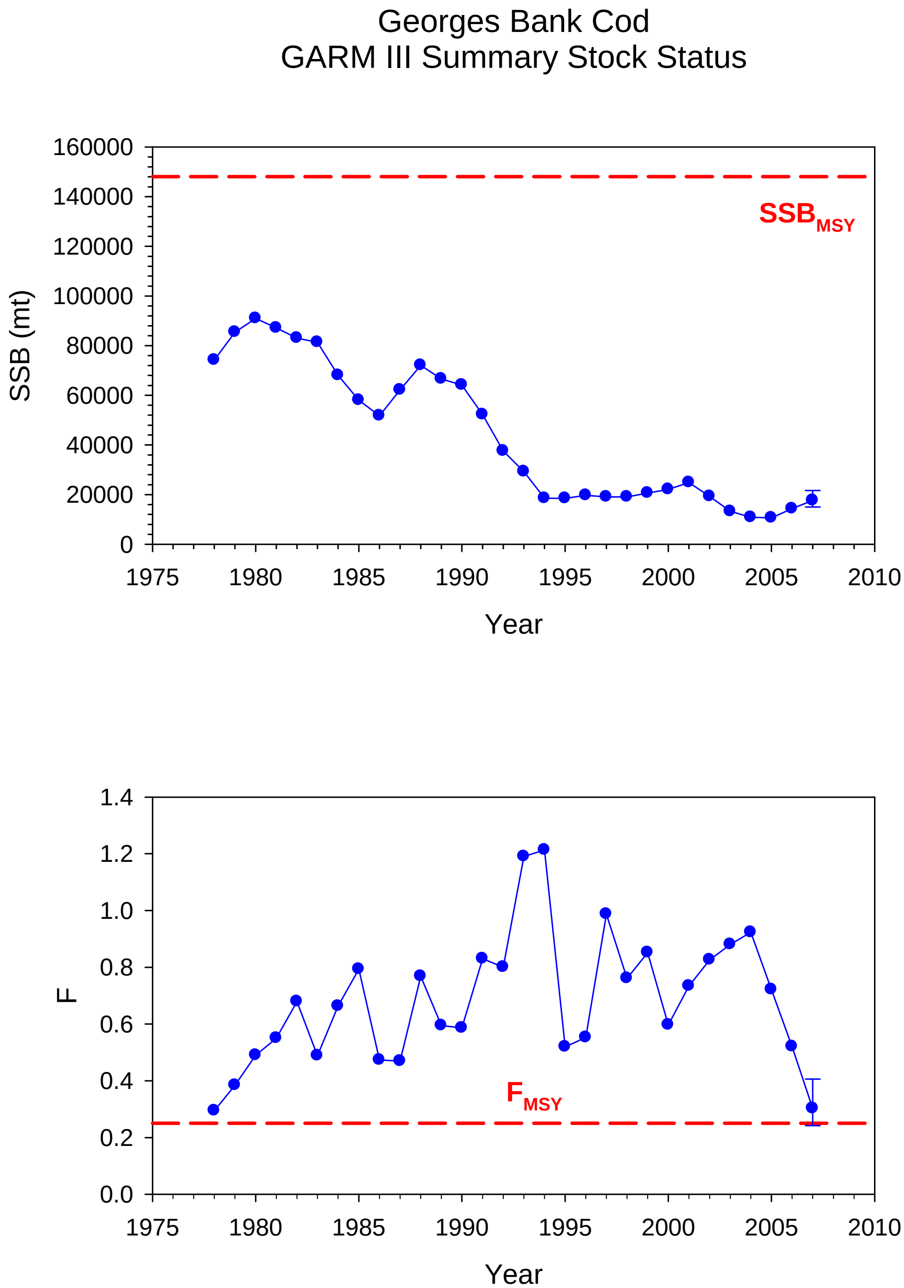
Table 47 - Summary of groundfish stock status in 2007

Stock	Estimated F in 2007	Fmsy	Percent F Reduction to Fmsy	Biomass in 2007	Bmsy	Percent change in Biomass to achieve Bmsy	MSY	2007 Overfished Status	2007 Overfishing Status
Georges Bank cod	0.303	0.247	18%	17,672	148,084	738%	31,159	Overfished	Overfishing
Gulf of Maine cod	0.456	0.237	48%	33,878	58,248	72%	10,014	Not Overfished	Overfishing
Georges Bank haddock	0.229	0.350	none	315,975	158,873	above Bmsy	32,746	Not Overfished	No Overfishing
Gulf of Maine haddock	0.346	0.430	none	5,850	5,900	1%	1,360	Not Overfished	No Overfishing
Georges bank Yellowtail	0.289	0.254	12%	9,527	43,200	353%	9,400	Overfished	Overfishing
Southern New England-Mid Atlantic Yellowtail	0.413	0.254	38%	3,508	27,400	681%	6,100	Overfished	Overfishing
Cape Cod-Gulf of Maine yellowtail	0.414	0.239	42%	1,922	7,790	305%	1,720	Overfished	Overfishing
American plaice	0.094	0.190	none	11,106	21,940	98%	4,011	Not Overfished	No Overfishing
Witch flounder	0.292	0.200	32%	3,434	11,447	233%	2,352	Overfished	Overfishing
Georges Bank winter flounder	0.282	0.260	8%	4,964	16,000	222%	3,500	Overfished	Overfishing
Gulf of Maine winter flounder	0.417	0.283	32%	1,100	3,792	245%	917	Overfished	Overfishing
Southern New England-Mid-Atlantic winter flounder	0.649	0.248	62%	3,368	38,761	1051%	9,742	Overfished	Overfishing
Acadian redfish	0.007	0.038	none	172,342	271,000	57%	10,139	Not Overfished	No Overfishing
white hake	0.150	0.125	17%	19,800	56,254	184%	5,800	Overfished	Overfishing
pollock [1,4]	10.975 [2]	5.66	48%	0.754 [3]	2	165%	11,320	Not Overfished	Overfishing
northern windowpane [1]	1.96	0.50	74%	0.24 [3]	1.4	483%	700	Overfished	Overfishing
southern windowpane [1]	1.85	1.47	21%	0.19 [3]	0.34	79%	500	Not Overfished	Overfishing
ocean pout [1]	0.38	0.76	none	0.48	4.94	929%	3,754	Overfished	No Overfishing
Atlantic halibut	0.065	0.073	none	1,300	49,000	3669%	3,500	Overfished	No Overfishing

[1] *Fmsy and Bmsy index proxies are listed for pollock, ocean pout, southern and northern windowpane.*
[2] *GARM III values are equal to the catch in 2007 / average 2006 & 2007 indices (Updated relative F using the average of 2006, 2007 & 2008 is 10.46).*
[3] *Index point estimates are in the table. Status determination is made using the 3 year average (pollock = 0.90, N windowpane = 0.53, S windowpane = 0.21 kg / tow).*
[4] *Status determination for amendment 16 will be based on calculations including the 2008 fall survey index.*

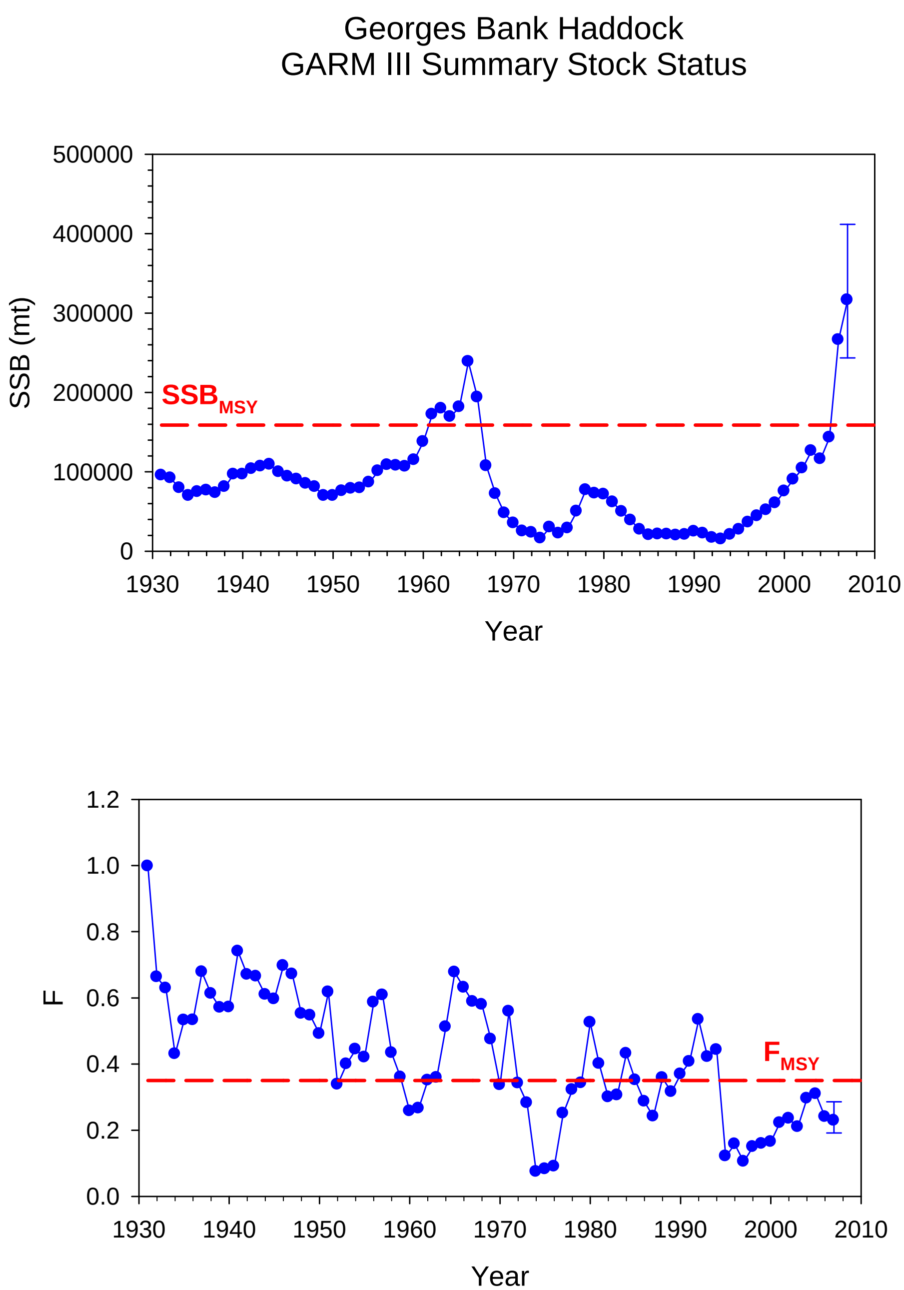
A. <u>Georges Bank cod was overfished and was experiencing overfishing in 2007</u>.
Spawning biomass has remained low since 1994. Fishing mortality has been decreasing since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 24 - Georges Bank cod spawning stock biomass (SSB) and fishing mortality (F) estimates during 1978-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



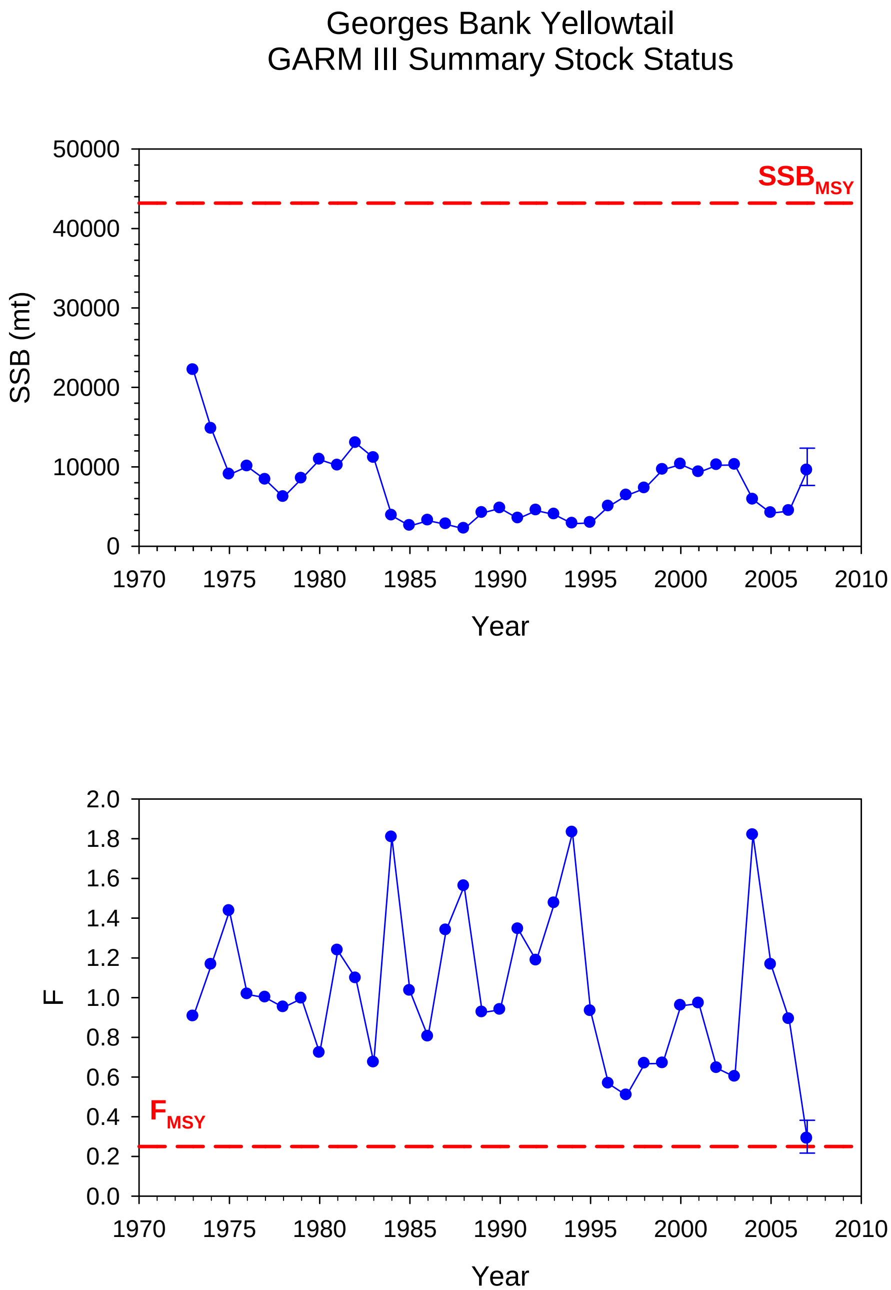
<u>B. Georges Bank haddock was not overfished and was not experiencing overfishing in 2007.</u>
Georges Bank haddock has been rebuilt to about twice B_{msy}. Spawning biomass has increased since 1993. Fishing mortality has remained below F_{msy} since 1995. The partial recruited strong 2003 year class made up most of the catch in 2007. No retrospective adjustment was made for Georges Bank haddock.

Figure 25 - Georges Bank haddock spawning stock biomass (SSB) and fishing mortality (F) estimates during 1931-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



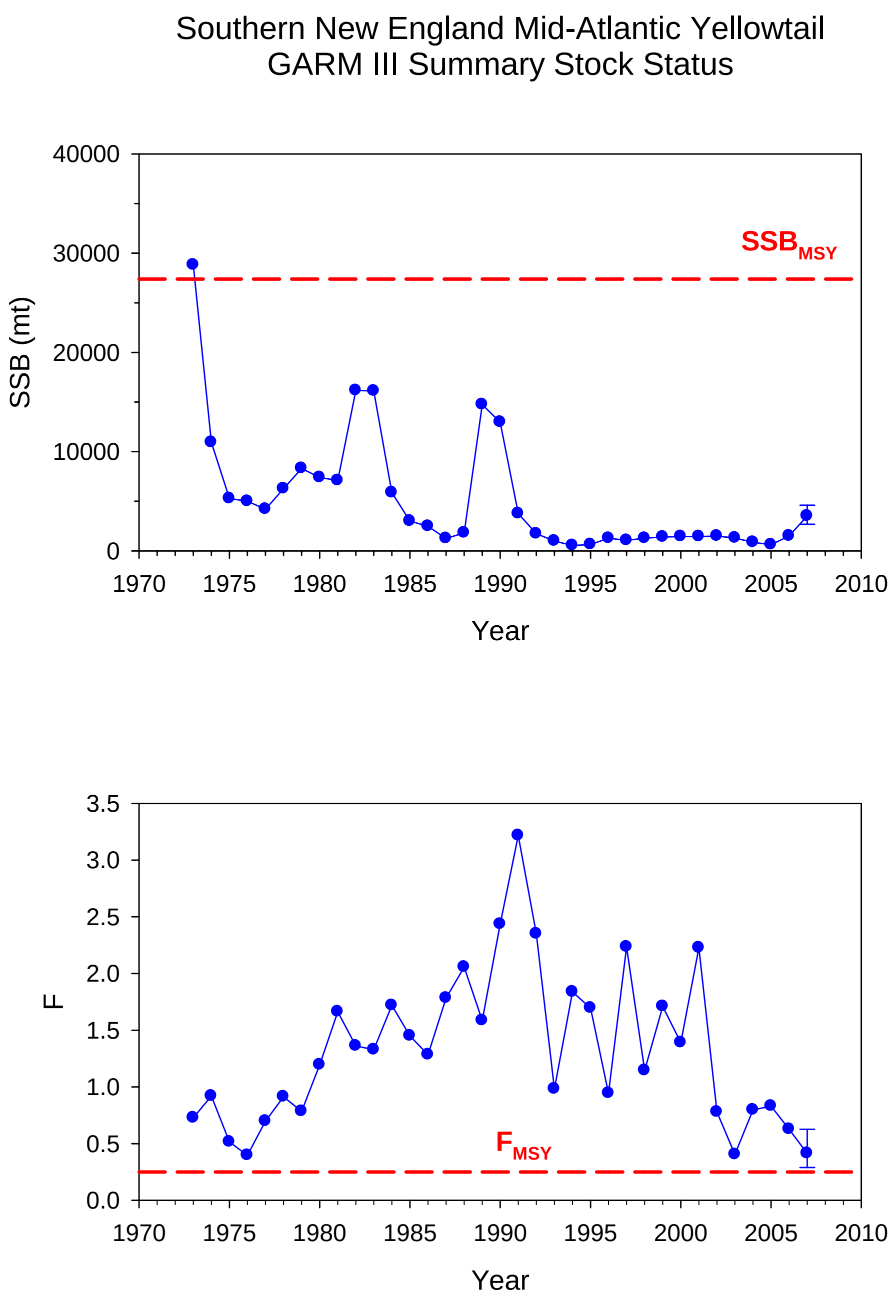
C. Georges Bank yellowtail flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has been relatively low since 1984. There has been a slight increase in spawning biomass since the late 1980s. Fishing mortality has had a decreasing trend since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 26 - Georges Bank yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1973-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



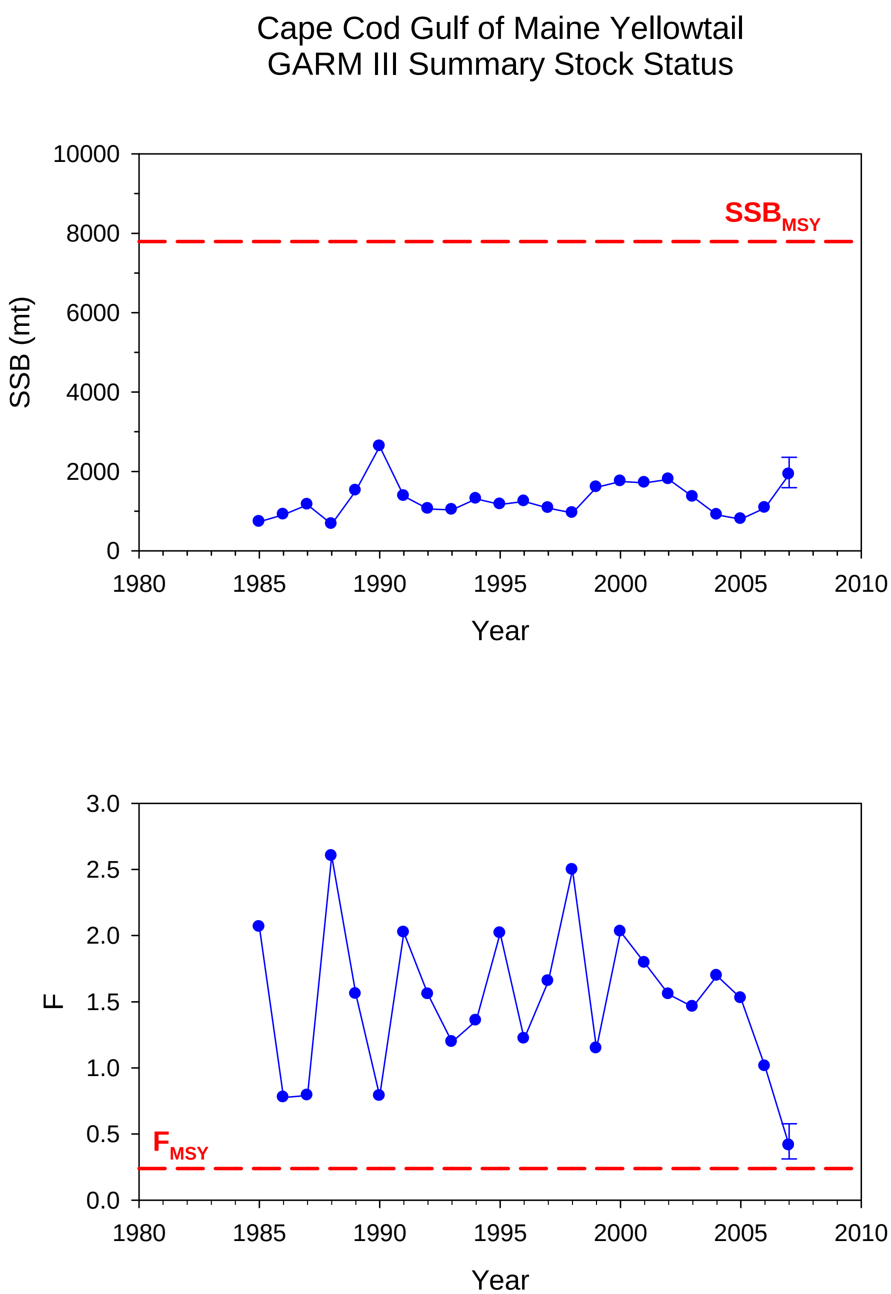
D. Southern New England/Mid-Atlantic yellowtail flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has been low since 1991. There are some signs of rebuilding from a strong 2005 year class. Fishing mortality has had a decreasing trend since 2001 but remains slightly above F_{MSY}. No retrospective adjustment was made for SNE/Mid-Atlantic yellowtail flounder.

Figure 27 - Southern New England/Mid-Atlantic yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1973-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



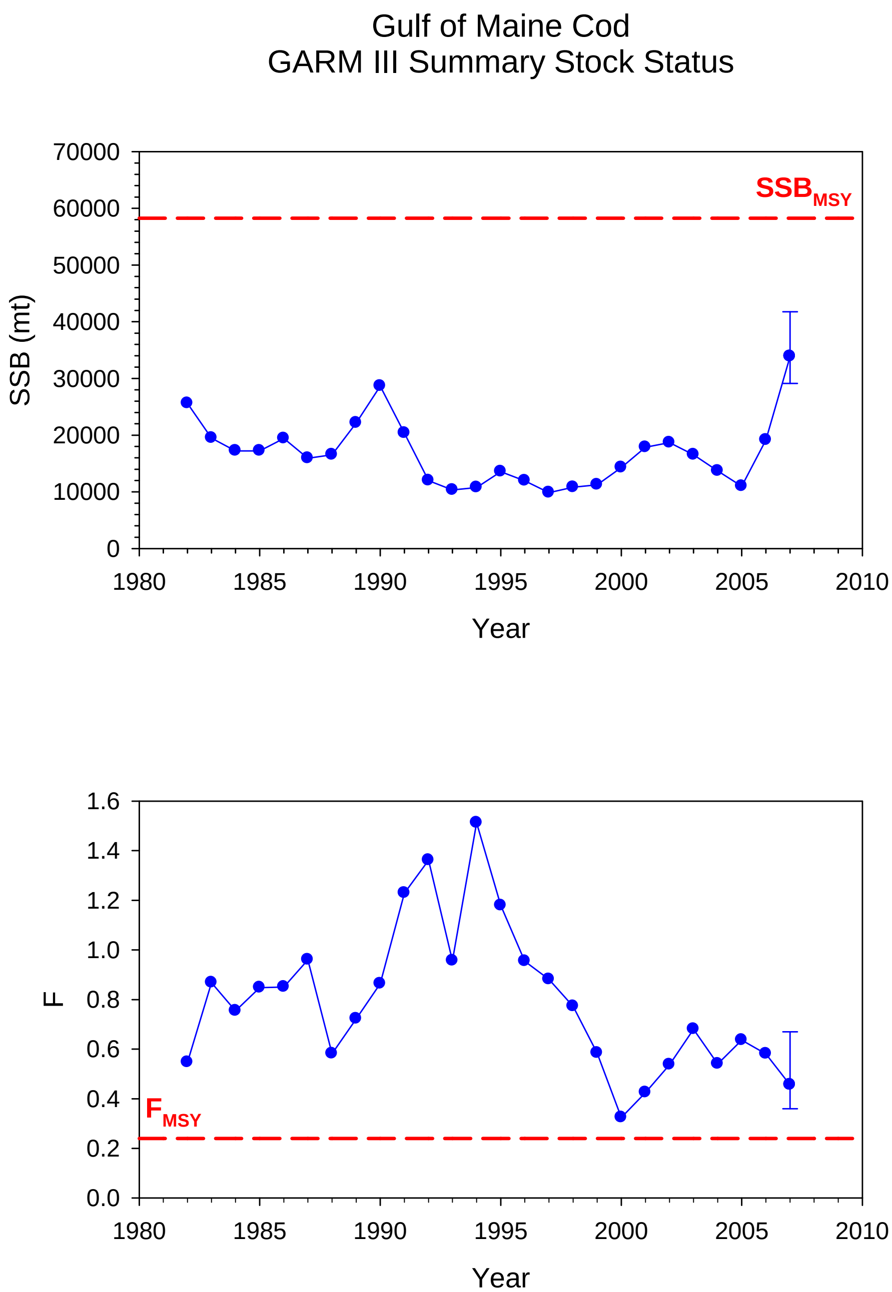
<u>E. Cape Cod/Gulf of Maine yellowtail flounder was overfished and was experiencing overfishing in 2007.</u> Spawning biomass been relatively low over the time series. There appears to be a moderately strong 2005 year class. Fishing mortality has decreased since 2004. No retrospective adjustment was made for Cape Cod/Gulf of Maine yellowtail flounder.

Figure 28 - Cape Cod/Gulf of Maine yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1985-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



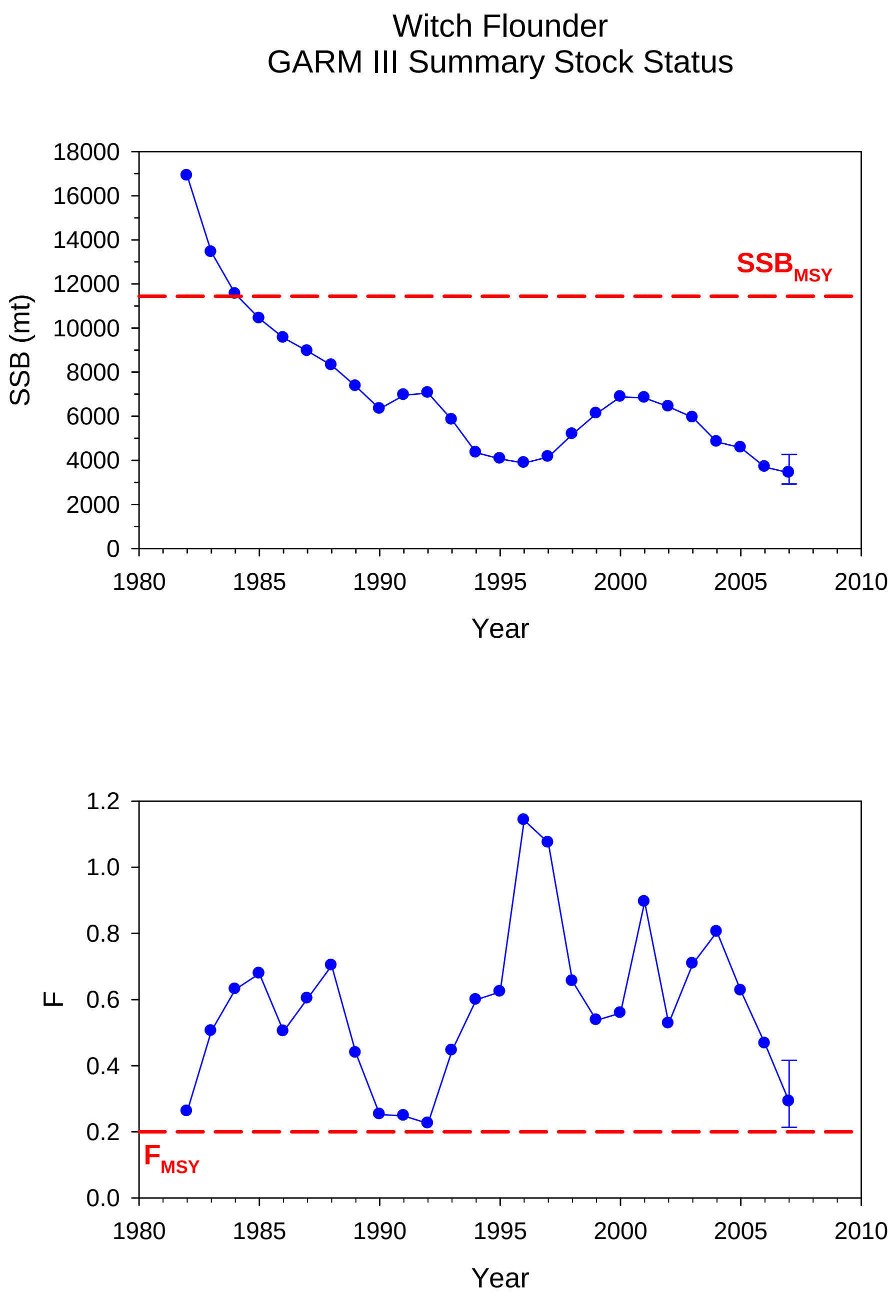
F. Gulf of Maine cod was not overfished but was experiencing overfishing in 2007. Spawning biomass increased in 2006 and 2007. An above average 2005 year class was estimated. Fishing mortality decreased from 1994 to 2000 but has remained above F_{msy} since then. No retrospective adjustment was made for Gulf of Maine Cod.

Figure 29 - Gulf of Maine cod spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 using GARM III data along with 80% confidence intervals for 2007 estimates.



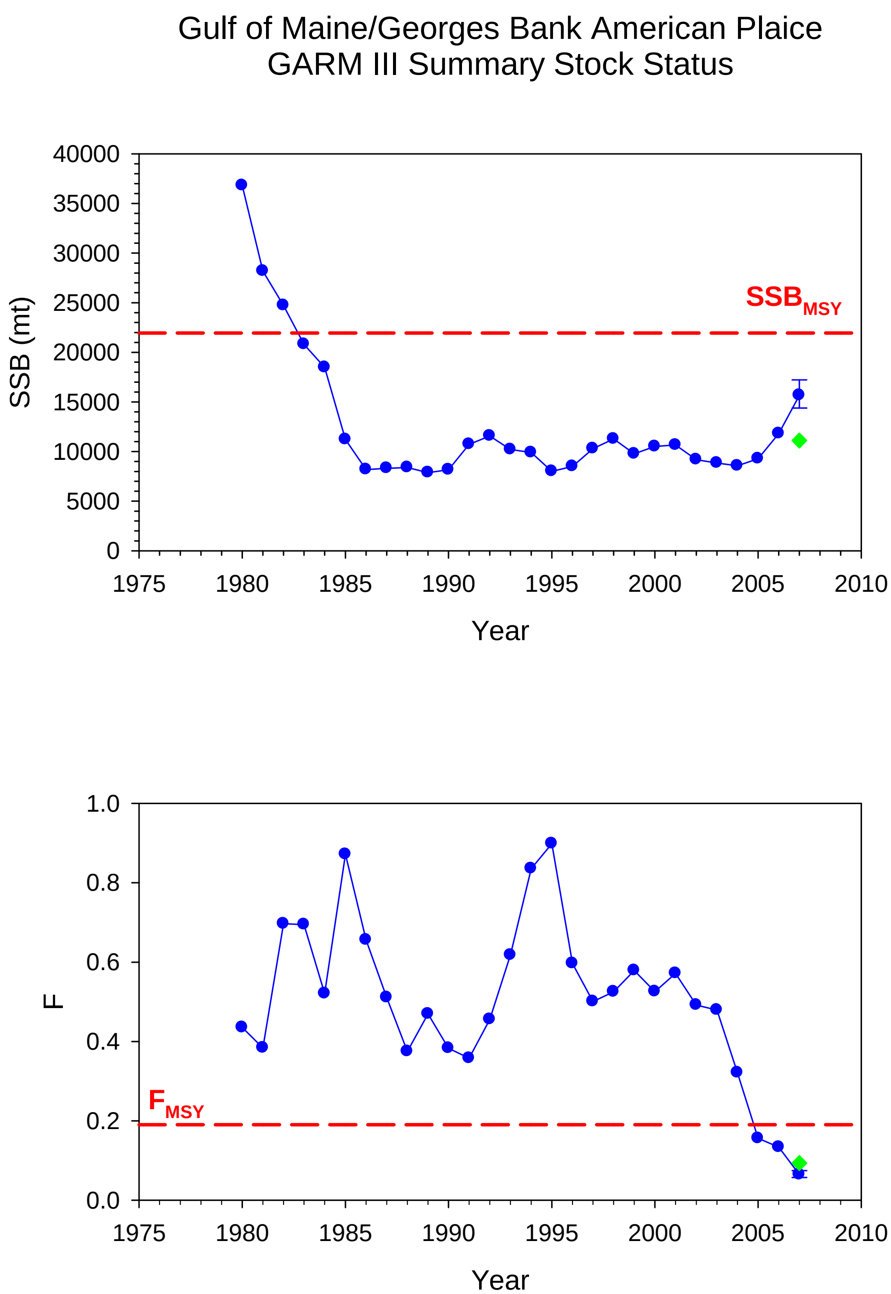
G. Witch flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has declined since 2001 to a record low in 2007. Fishing mortality has decreased since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 30 - Witch flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



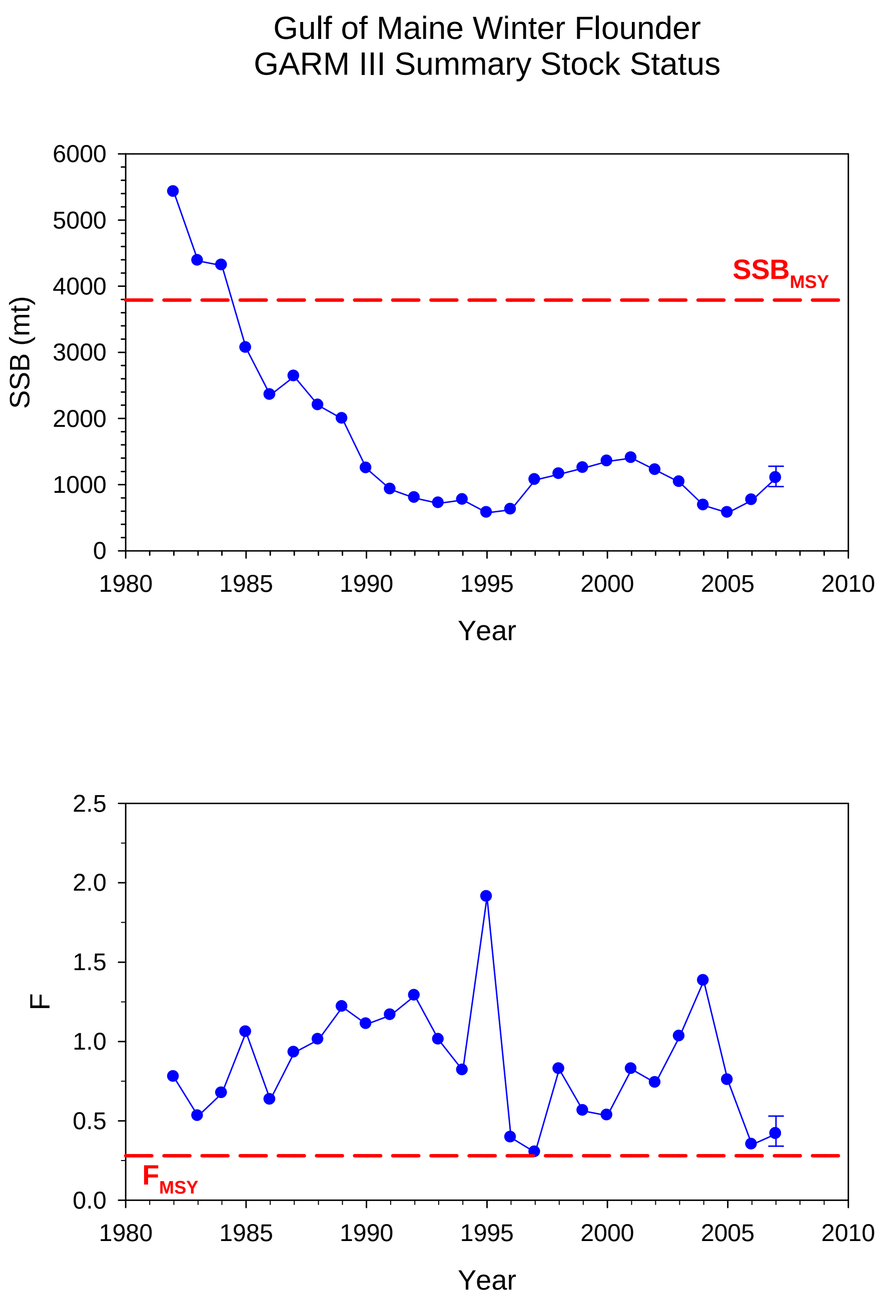
H. American plaice was not overfished and was not experiencing overfishing in 2007. Spawning biomass has been low with a slight increasing trend since 1986. Fishing mortality has had a decreasing trend since 1995. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 31 - American plaice spawning stock biomass (SSB) and fishing mortality (F) estimates during 1980-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates. Mohn's rho adjusted SSB and F are shown in the terminal year with a green diamond.



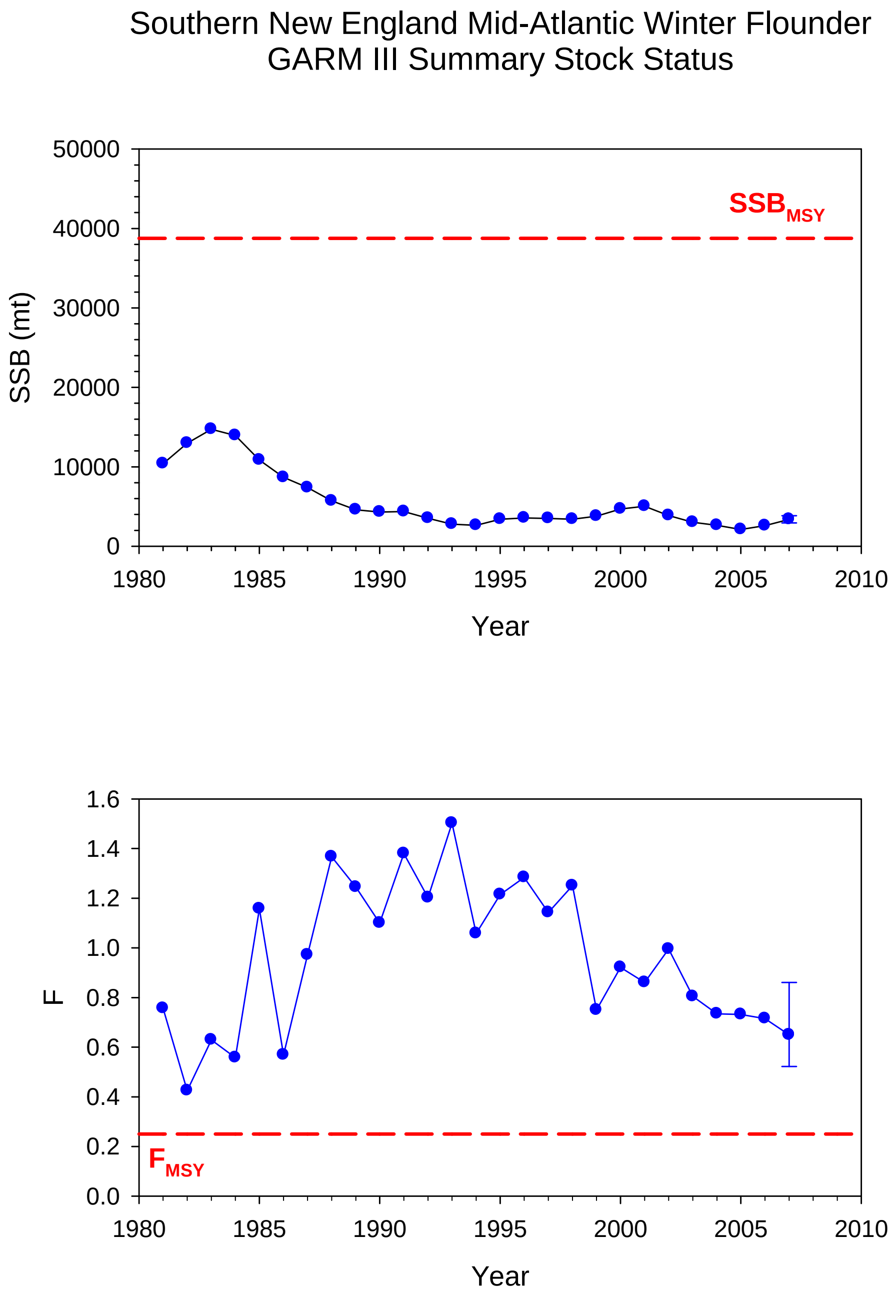
I. Gulf of Maine winter flounder status determination is unknown. Exact status determination was unknown due to the severity of the retrospective pattern and the magnitude of the change with a retrospective adjustment. However SSB appears to be well below B_{msy} and fishing mortality is likely above F_{msy}.

Figure 32 - Gulf of Maine winter flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates from the split survey run. *This assessment was not accepted*.



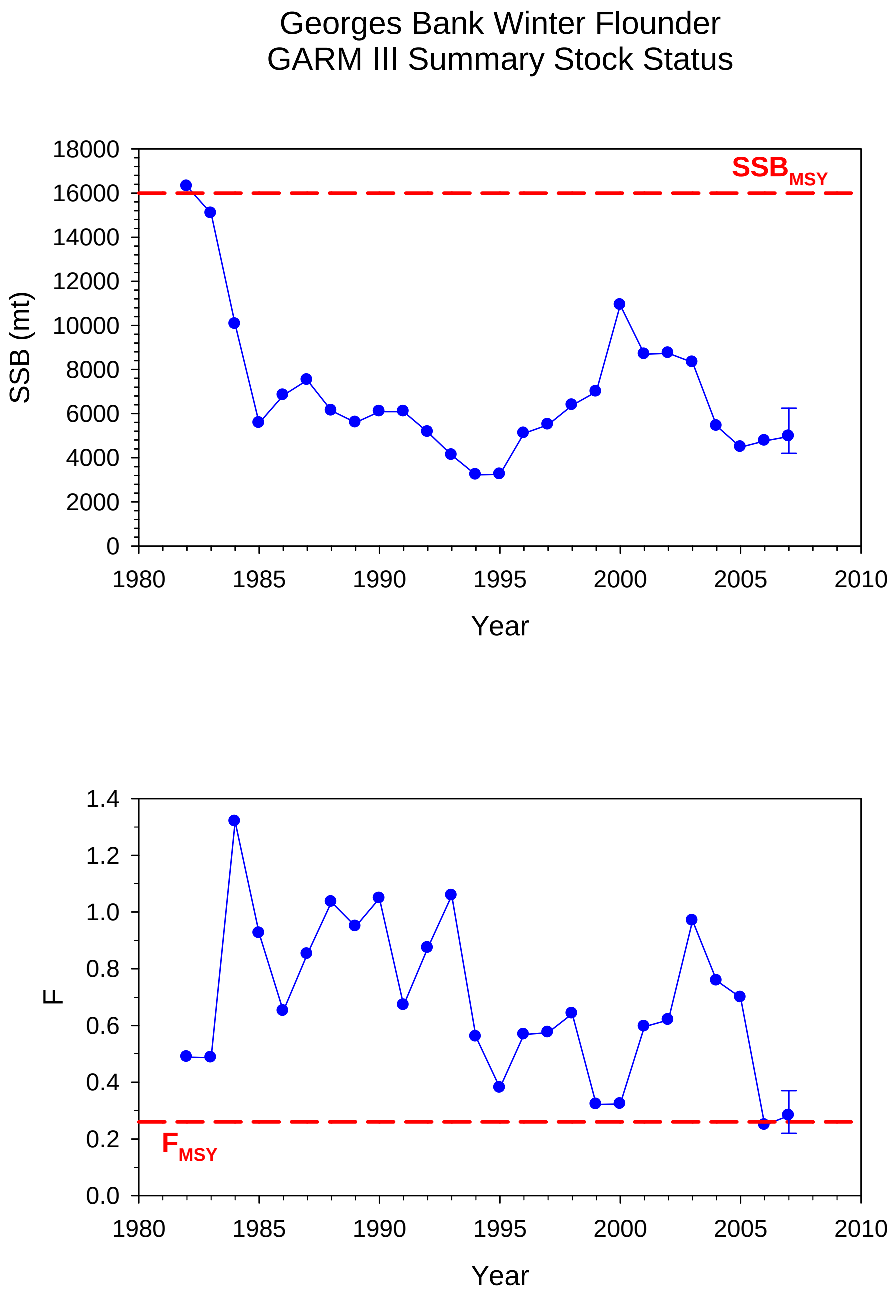
J. Southern New England/Mid-Atlantic winter flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has been very low since the late-1980s. Fishing mortality has been declining since 1993 but remain well above F_{msy}. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 33 - Southern New England/Mid-Atlantic winter flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1981-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



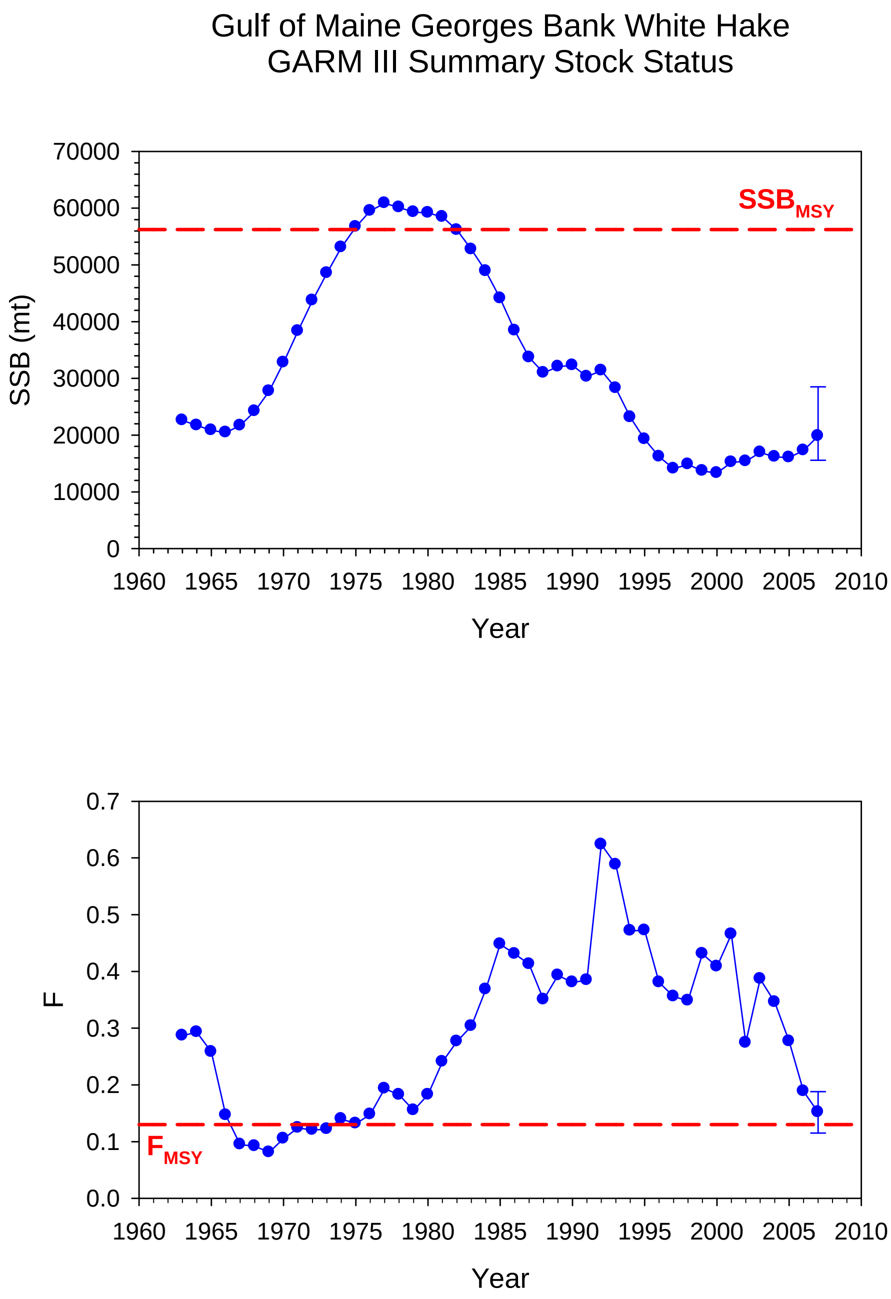
K. Georges Bank winter flounder was overfished and was experiencing overfishing in 2007. Spawning Biomass has declined since 2000. Fishing mortality declined from 2003 but was just above F_{msy} in 2007. No retrospective adjustment was made for Georges Bank winter flounder.

Figure 34 - Georges Bank winter flounder spawning stock biomass (B) and fishing mortality (F) estimates during 1982-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



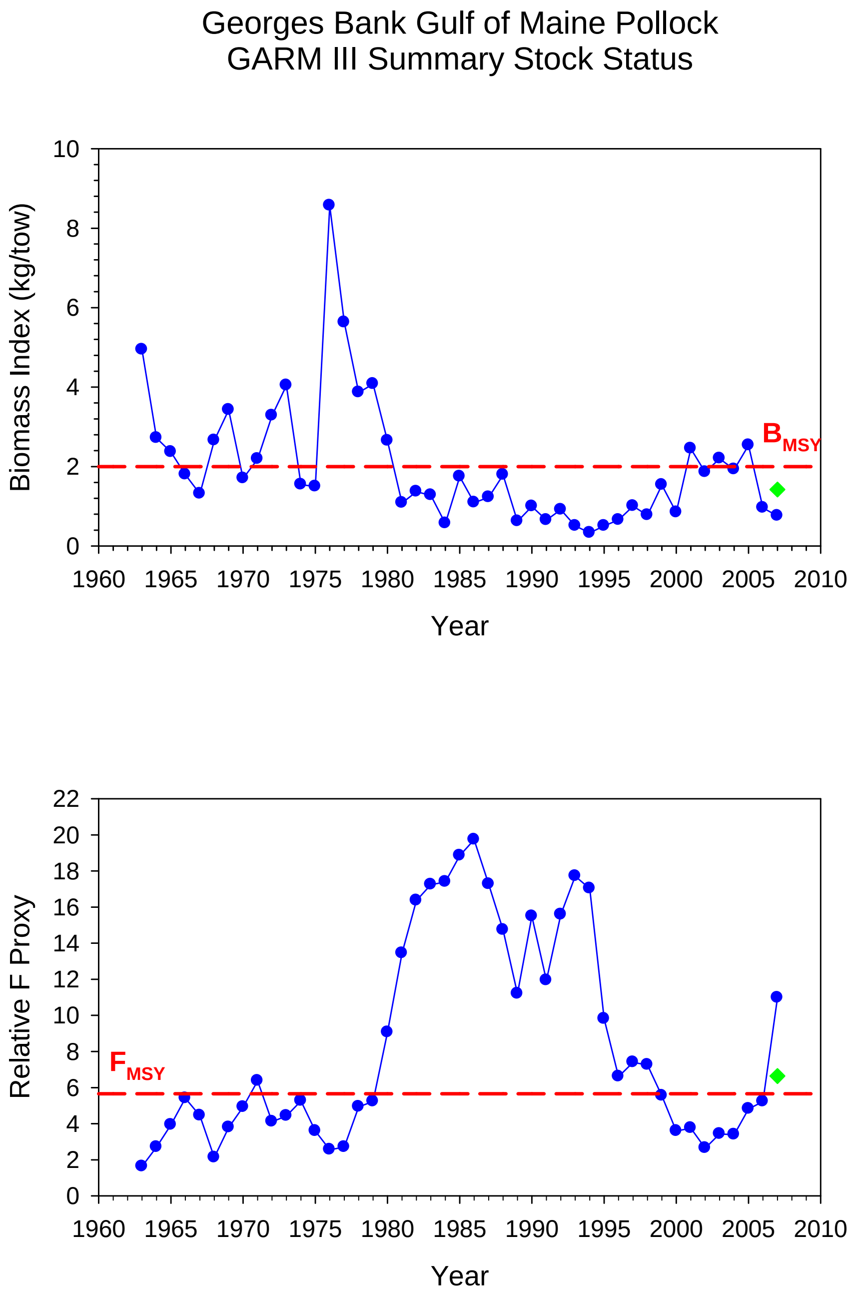
L. White hake was overfished and was experiencing overfishing in 2007. Biomass increased slightly during 2000-2007. Fishing mortality has declined since 2003. No retrospective adjustment was made for white hake.

Figure 35 - Georges Bank/Gulf of Maine white hake spawning stock biomass (SSB) and fishing mortality rate (F) during 1963-2007 reported in GARM III.



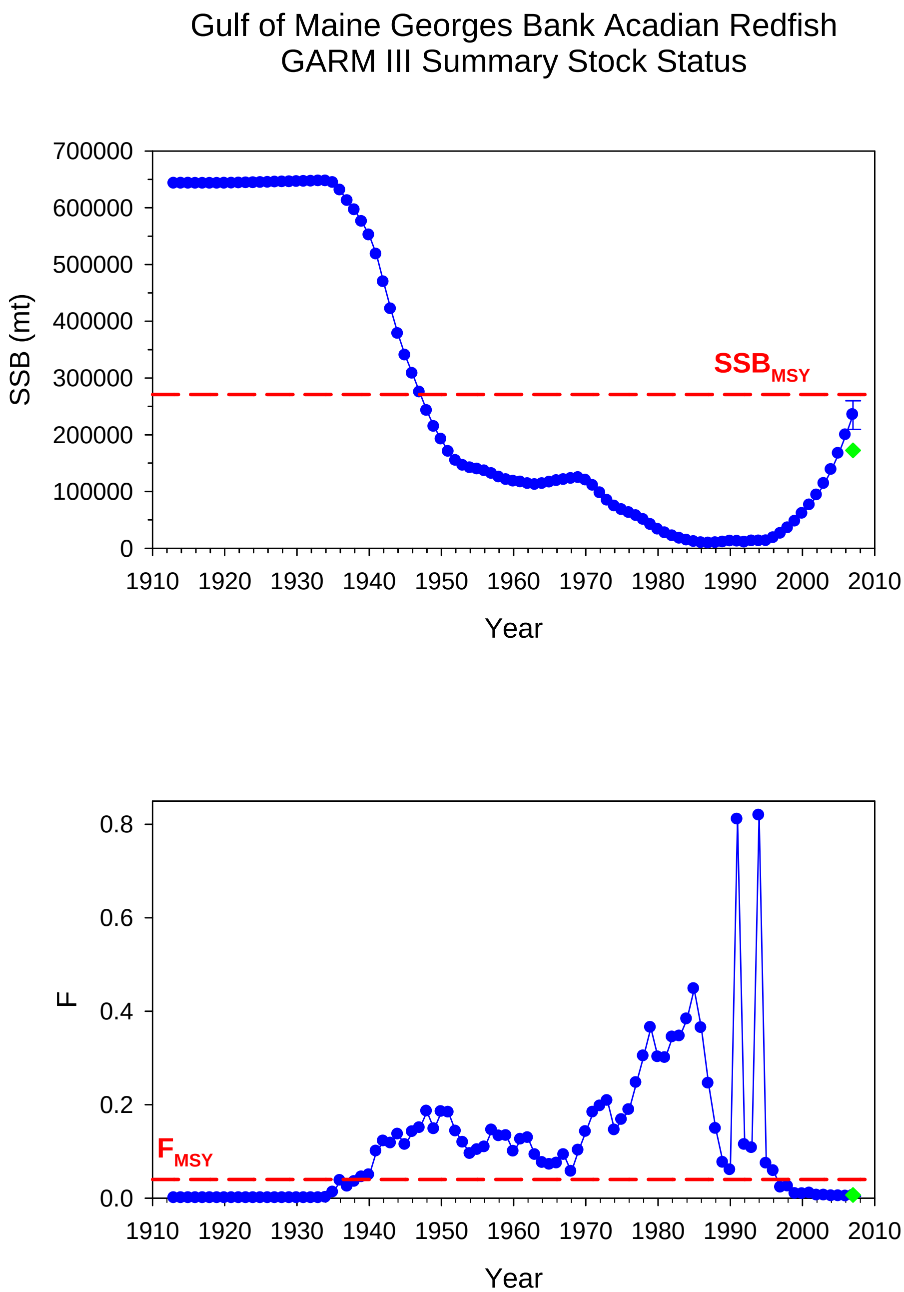
M. Pollock was overfished and was experiencing overfishing in 2008. Biomass index has decreased since 2005. Biomass status determination is made using the three year moving average of the biomass index. Relative Fishing mortality has increased since 2002.

Figure 36 - Georges Bank/Gulf of Maine pollock biomass index (B) and relative exploitation rate (F) during 1963-2008 based on the fall survey index. Status determination is based on the three year average plotted with a green diamond.



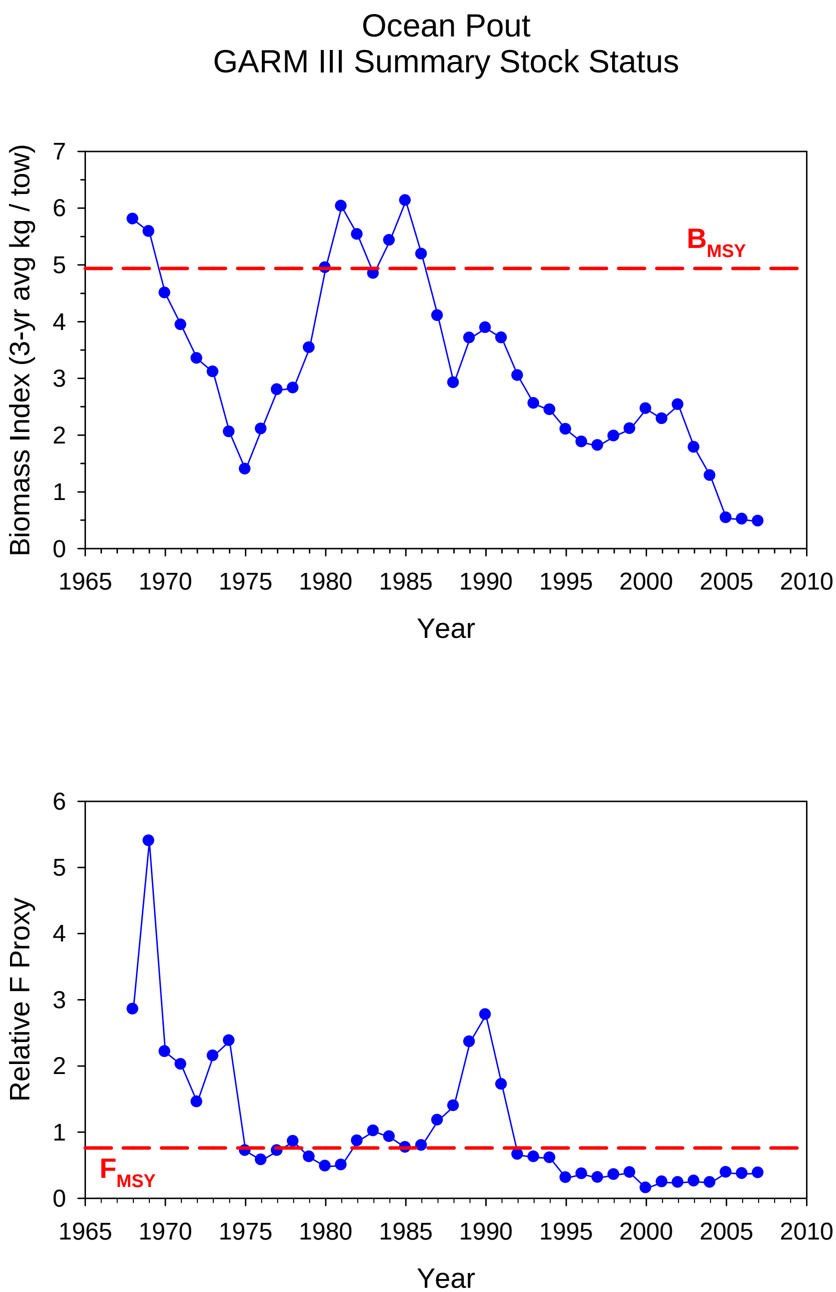
N. Acadian redfish was not overfished and was not experiencing overfishing in 2007. Spawning biomass has increased substantially since the mid-1990s. Fishing mortality has been below F_{msy} since 1997. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 37 - Gulf of Maine/Georges Bank Acadian redfish spawning stock biomass (SSB) and fishing mortality (F) estimates during 1913-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates. Mohn's rho adjusted SSB and F are shown in the terminal year with a green diamond.



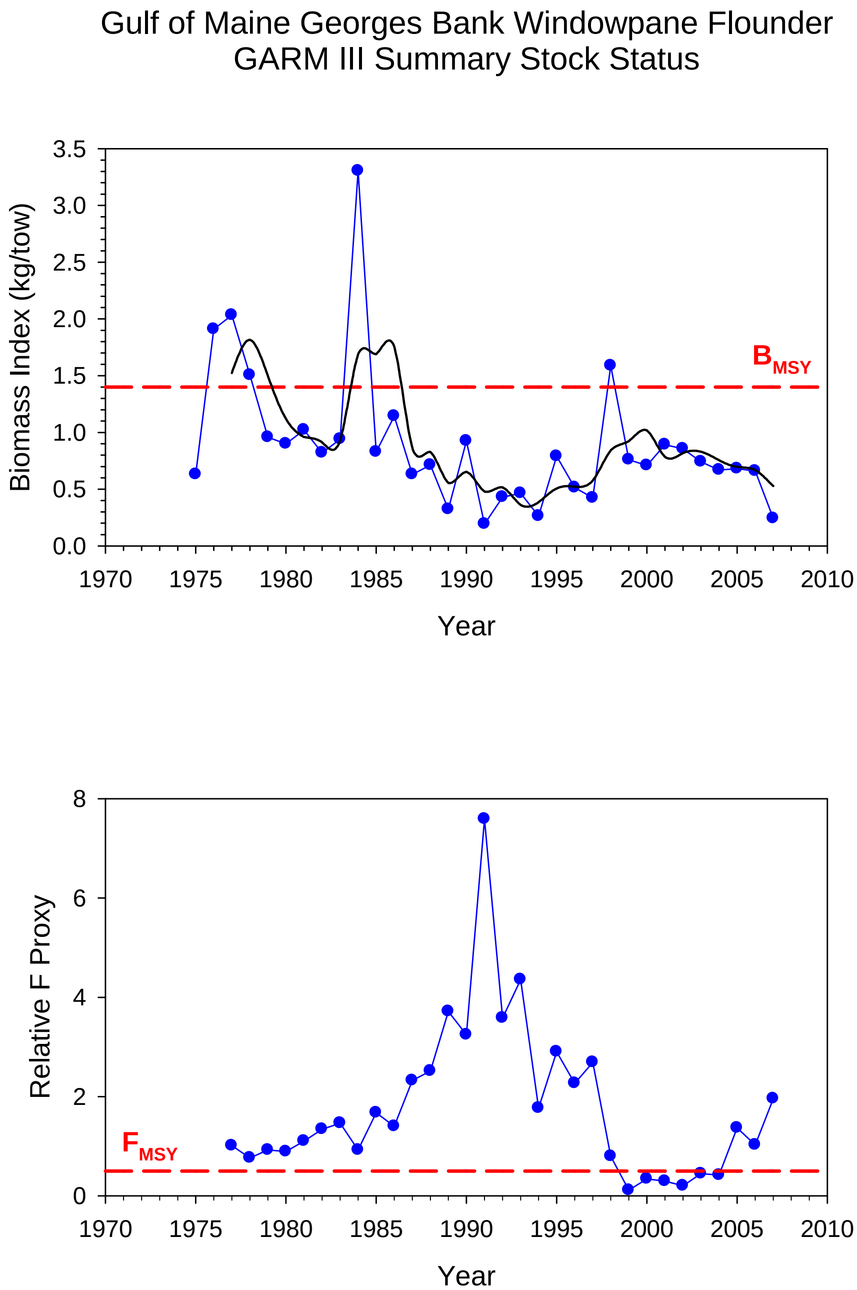
O. Ocean pout was overfished and was not experiencing overfishing in 2007. Biomass has had a decreasing trend since 2002. Fishing mortality has been well below F_{msy} since 1992. There are no signs of stock rebuilding despite that fishing mortality is relatively low.

Figure 38 - Ocean pout biomass index (B) and relative exploitation rate (F) during 1968-2007 reported in GARM III.



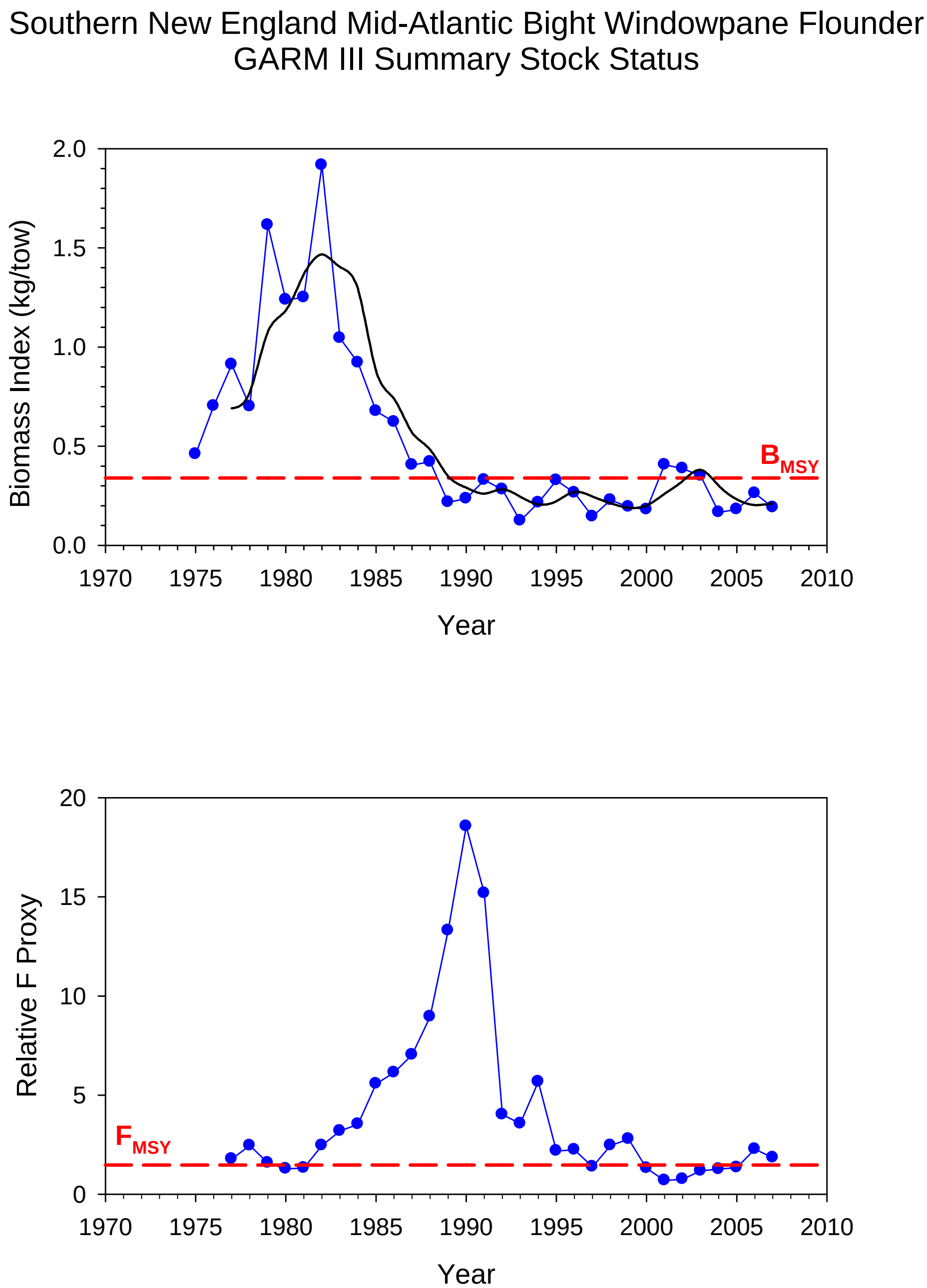
P. Northern windowpane flounder was overfished and was experiencing overfishing in 2007. Biomass has decreased since 2001. Fishing mortality has been increasing since 2002.

Figure 39 - Gulf of Maine/Georges Bank windowpane flounder biomass index (B) and relative exploitation rate (F) during 1975-2007 reported in GARM III. Biomass status determination is based on the three year average plotted with a green diamond.



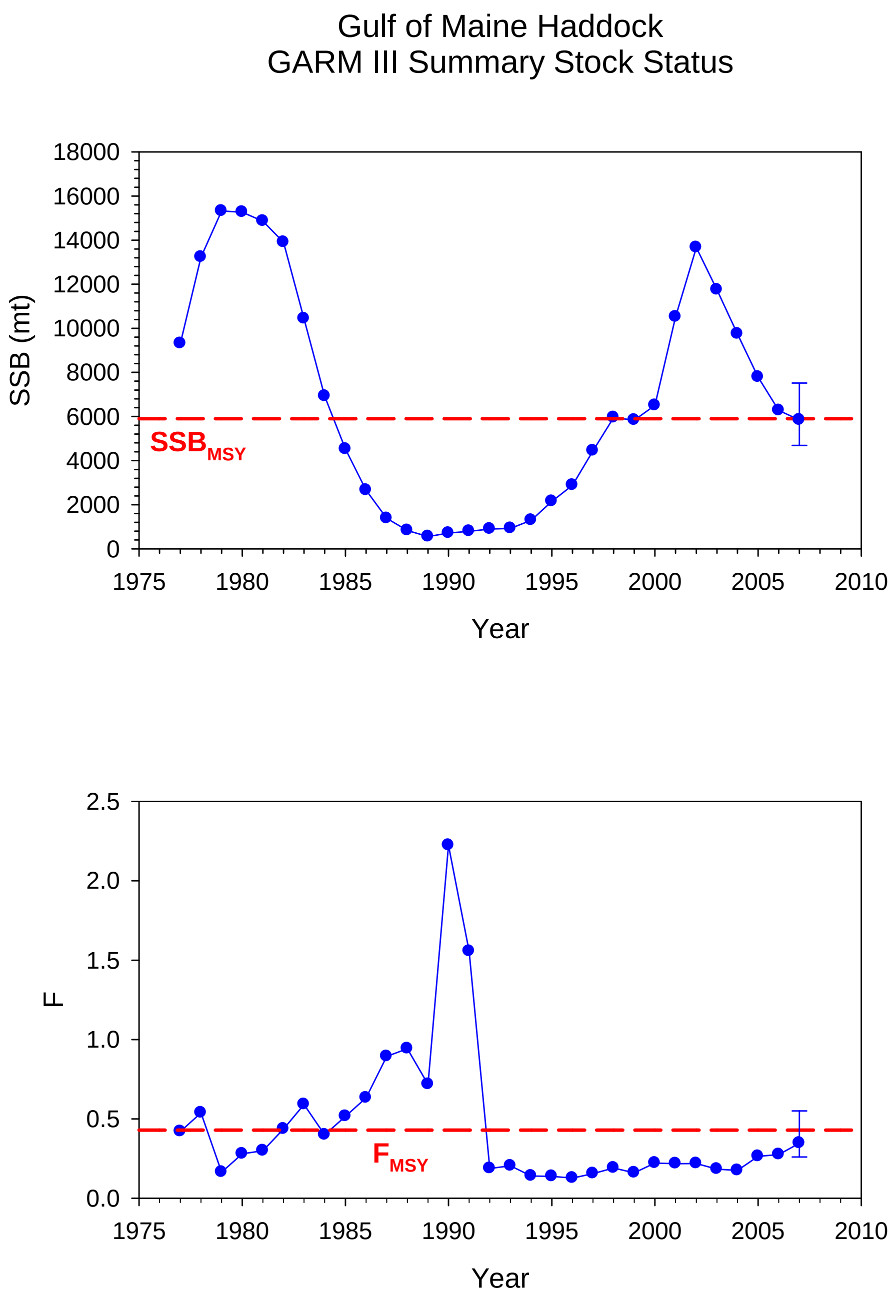
Q. Southern windowpane flounder was not overfished and was experiencing overfishing in 2007. Biomass has been low and fluctuated without trend since the late-1980s. The relative F has increased above F_{msy} in 2006 and 2007.

Figure 40 - Southern New England/Mid-Atlantic windowpane flounder biomass index (B) and relative exploitation rate (F) during 1975-2007 reported in GARM III. Biomass status determination is based on the three year average plotted with a green diamond.



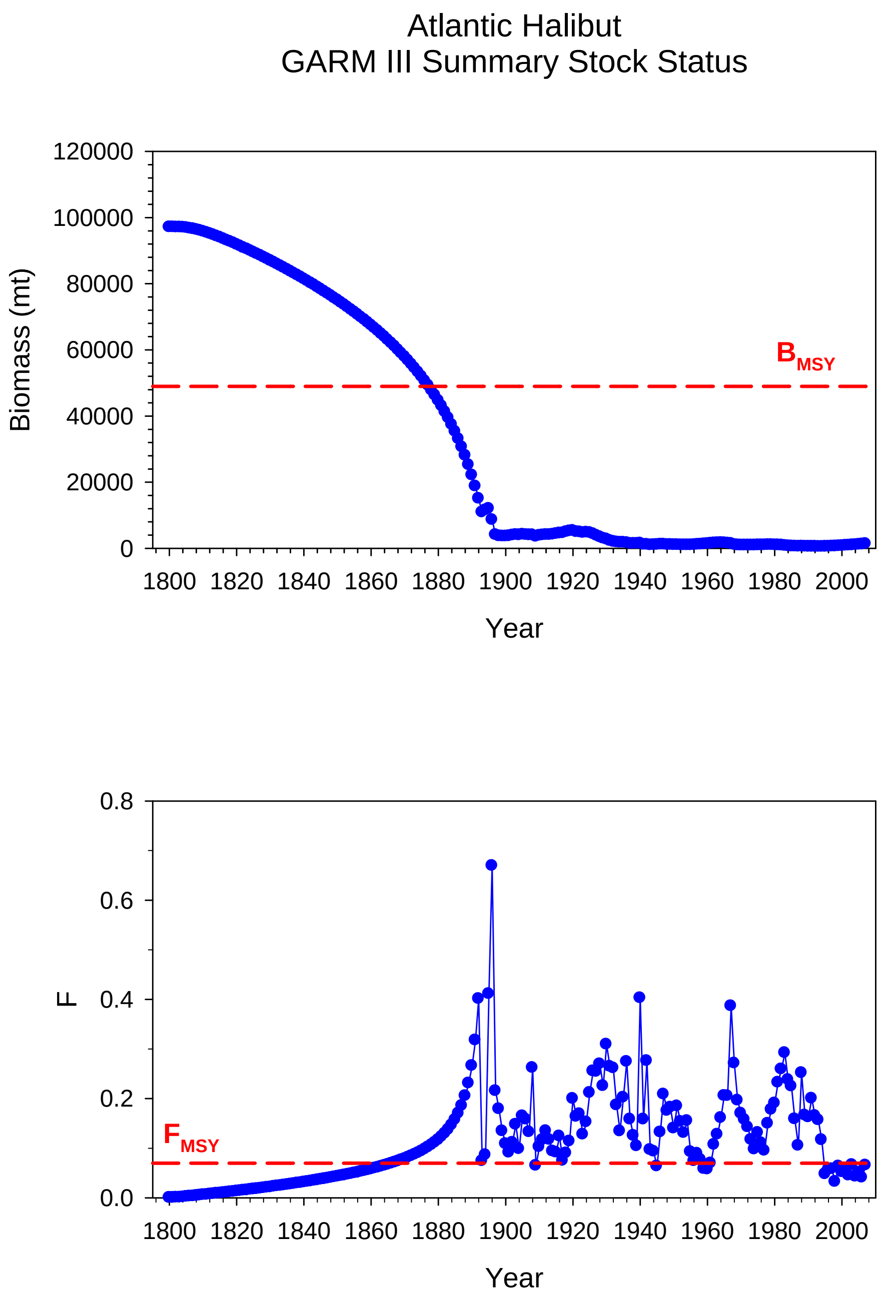
R. Gulf of Maine haddock was not overfished and was not experiencing overfishing in 2007.
Spawning biomass increased from 1989 to 2002 and has decreased since then. Fishing mortality has been below F_{msy} since 1992. No retrospective adjustment was made for Gulf of Maine haddock.

Figure 41 - Gulf of Maine haddock spawning stock biomass (SSB) and fishing mortality (F) during 1977-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



S. Atlantic halibut was overfished and was not experiencing overfishing in 2007. Biomass has been stable and well below B_{msy} since the late 1800s. Fishing mortality has been below F_{msy} since 1995.

Figure 42 - Atlantic halibut biomass (B) and fishing mortality rate (F) during 1800-2007 reported in GARM III.



6.1.9 Non-Groundfish Stock Status

6.1.9.1 Monkfish

Monkfish on GB tend to occur in the deeper waters (the canyon areas) during the winter months. The Monkfish FMP uses the NMFS fall bottom trawl survey to determine monkfish stock status (biomass) relative to management reference points. Based on the 2007 monkfish stock assessment (Northeast Data Poor Stocks Working Group 2007), which used a new method for determining stock status, and recommended revised biological reference points, the northern and southern stock components are both above the minimum biomass threshold, and are therefore not overfished. This is a change from 2005 – 2006, when both stocks were considered overfished. The Councils are currently in the process of updating the biological reference points in the Monkfish FMP, through Framework Adjustment 5, to be consistent with this assessment.

6.1.9.2 Dogfish

The Northwest Atlantic spiny dogfish stock is no longer classified as overfished, nor is overfishing occurring. Short term forecasts of spiny dogfish biomass (mt) are influenced by the current biomass and size structure of the population. Biomass of mature female spiny dogfish is expected to continue increasing through 2008 and 2009 as fish <80cm grow into mature size ranges. Subsequently, the biomass should decline due to the low number of recruits that were born during 1997-2003. If recruitment returns to levels consistent with expected size-specific reproduction, the biomass should begin to rebound again by 2015 (NMFS, 43rd SAW).

6.1.9.3 Skates

There are seven skate species managed under the NE Skate Complex FMP (Skate FMP). Three species commonly occur on GB: winter, little, and barndoor skates. Two species are more common in the GOM: thorny and smooth skates. The remaining two species in the complex, clearnose and rosette skates, are mainly distributed in Mid-Atlantic waters. Catches of these species are largely interrelated with the NE multispecies, monkfish, and scallop fisheries. The Skate FMP was implemented in 2003, after it was determined that barndoor, thorny, and smooth skates were overfished. Possession of these species is currently prohibited. The NMFS bottom trawl survey is used to monitor stock status, and a stock assessment was completed for all seven species in the complex in 2006 (SAW 44). Winter skate was determined to be overfished, and an amendment to the Skate FMP is under development to rebuild this, and other overfished skate stocks.

The stock status of the skate complex is updated annually, and the most recent update (June 2008) determined the following: Winter, thorny, and smooth skates are in an overfished condition. Thorny skate is also subject to overfishing, despite a prohibition on possession since 2003. Barndoor skate is not overfished and is rebuilding toward its biomass target. Little skate is not overfished, although it is close to the overfished biomass threshold. Clearnose and rosette skates are not overfished or experiencing overfishing.

6.1.10 Marine Mammals and Protected Species

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.

6.1.10.1 Species Present in the Area

Table 48 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 48 - 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 (*Tursiops truncatus*)[a]	Protected
White-beaked dolphin (*Lagenorhynchus albirostris*)	Protected
Harbor Porpoise (*Phocoena phocoena*)	Protected

Table 48 (cont.)

Species	Status
Sea Turtles	
Hawksbill sea turtle (*Eretmochelys imbricate)*	Endangered
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.

On January 5, 2009, NMFS announced a 90-day finding for a petition, submitted on October 1, 2008, to list Atlantic wolffish (*Anarhichas lupus*) as endangered or threatened under the ESA, and to request information to determine if the petition action is warranted (74 *Federal Register* 249). On February 10, 2009, the Council voted to include wolffish in the multispecies management unit, impose a prohibition on retention of wolffish by commercial and (private, party and charter) recreational fishermen, and to designate wolffish EFH. If NMFS finds that the requested petition action may be warranted, the Secretary of Commerce (who has delegated the authority to the NOAA Assistant Administrator for Fisheries) will conduct a status review and make a finding within 12 months of the receipt of the petition. NMFS has commenced the status review procedure. Thus, the outcome of the potential listing under the ESA is pending the final decision, expected by the end of 2009.

6.1.10.2 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, and thus the groundfish 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), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

6.1.10.3 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. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). 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. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species 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).

6.1.10.4 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, and 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). 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.

6.1.10.5 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).

6.1.10.6 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).

6.1.10.7 Species Not Likely to be Affected

NMFS has determined that the action being considered in the EA (i.e., approval of the NEFS-I Operations Plan) 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 groundfish fishery, but they are unlikely to occur in the area where the groundfish 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 fishery, 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 groundfish 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 groundfish fishery 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 groundfish fishery 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 (NMFS 2009a). Since operation of the groundfish 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 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 groundfish 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 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, NMFS has determined that the continued authorization of the multispecies fishery, and therefore the groundfish fishery, would 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 would not affect the availability of prey for foraging humpback or fin whales. Moreover, none of the turtle species are known to feed upon groundfish.

6.1.10.8 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 (NMFS 2009b). Table 49 identifies the classifications used in the List of Fisheries (LOF) proposed for FY 2010 (50 CFR 229), which are broken down into Tier 2 Categories I, II, and III).

Table 49 - 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 Sector 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 50 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 2010 (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 50 - Marine Mammal Impacts Based on Ground-fishing Gear and Northeast Multispecies Fishing Areas (based on 2010 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	7,596	Bottlenose dolphin, western north Atlantic (WNA), coastal[a]
			Bottlenose dolphin, WNA, offshore
			Common dolphin, WNA
			Gray seal, WNA
			Harbor porpoise, Gulf of Maine(GOM)/Bay of Fundy(BOF)
			Harbor seal, WNA
			Harp seal, WNA
			Humpback whale, GOM
			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	>6,455	Bottlenose dolphin, WNA, offshore
			Common dolphin, WNA
			Fin whale, WNA
			Gray seal, WNA
			Harbor porpoise, GOM/BOF [a]
			Harbor seal, WNA
			Harp seal, WNA
			Hooded seal, WNA
			Humpback whale, GOM
			Minke whale, Canadian east coast
			North Atlantic right whale, WNA
			Risso's dolphin, WNA
			White-sided dolphin, WNA

Table 50 (cont.)

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	>1,000	Common dolphin, WNA [a] Long-finned pilot whale, WNA [a] Short-finned pilot whale, WNA [a] White-sided dolphin, WNA [a]
	Northeast bottom trawl	1,600	Common dolphin, WNA Gray seal, WNA[b] Harbor porpoise, GOM/BF Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA [a]
	Atlantic mixed species trap/pot [c]	>429	Fin whale, WNA [d] Humpback whale, GOM
Tier 2, Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	46	None documented in recent years

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, impacts to sea turtles under the Proposed Action would be similar to those in the Common Pool. 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.

6.2 Human Communities and the Fishery

6.2.1 Overview

The Affected Human Environment section describes the New England multispecies fishery, examining how management actions and changes in fishing activity have shaped the fishing industry and fishing communities over time. Social, economic and fishery information presented in this section are useful in describing the response of the fishery to past management actions and predicting how the present action may affect the multispecies fishery. Additionally, this section of the document establishes a descriptive baseline for the fishery with which to compare actual and predicted future changes that result from management actions. While some information is presented beginning in FY 2001, the focus is on changes since the adoption of Amendment 13 in FY 2004 and FW 42 in FY 2006. For a complete discussion of prior management actions leading up to Amendment 16, refer to section 3.1, "Brief History of Prior Management Actions."

This information helps to meet the legal requirements of the Council under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), the National Environmental Policy Act (NEPA), and other applicable laws. Specifically, it addresses National Standard 8, established in a 1996 amendment to the Magnuson-Stevens Act. National Standard 8 of the MSFCMA states that: *Conservation and management measures shall, consistent with the conservation requirements of this act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (a) provide for sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.*

National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. "Sustained participation" is interpreted as continued access to the fishery within the constraints of the condition of the resource.

NEPA requires federal agencies to consider the interactions of natural and human environments and the impacts on both systems of any changes due to governmental activities or policies. This analysis should be done by means of "a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences ... in planning and decision-making" [NEPA section 102(2)(a)]. Environmental values must be considered and weighed on par with technical and economic considerations. Environmental values include angler satisfaction, job satisfaction, an independent life-style for commercial fishermen, and the opportunity to see species in the wild for the non-consumptive user of marine fishery resources.

NEPA specifies that the term *human environment* shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment [40 CFR 1508.14]. When analyses predict that a fishery management action or policy will have a *significant* effect on the human environment, a detailed Environmental Impact Statement (EIS) with analysis of these impacts must be prepared. Amendment 16 addresses this requirement with a complete, detailed EIS.

A full range of impact assessments – ecological, economic, and social – are necessary not only to meet MSFCMA and NEPA requirements, but also to improve the Council's decision-making process. The following discussion provides a useful tool for assessing the environmental impacts of Amendment 13 and the cumulative effects of past, present and future management actions.

The Affected Human Environment of the multispecies fishery was described in detail in section 9.4 of Amendment 13. That discussion described the Northeast Multispecies fishery from FY 1994 (the year of implementation of Amendment 5) through 2001 since, for the most part, data was only available to describe the fishery through FY 2001. The information provided in that discussion is useful for understanding the response of the fishery to past management actions and in predicting how the fishery may respond to the management actions implemented by Amendment 13. That discussion also helps meet the M-S Act requirement to take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of those communities, and, consistent with the conservation requirements of the M-S Act, to the extent practicable, minimize the adverse economic impacts on such communities. Section 9.4 of Amendment 13 also helps fill a NEPA requirement to consider the interactions of the natural and human environments and the impacts on both systems of any changes due to governmental actions or policies.

Substantial changes took place in the multispecies fishery after FY 2001. In FY 2002 and 2003, the fishery was managed under provisions implemented as a result of a lawsuit (*Conservation Law Foundation et al v. Donald Evans*) that imposed additional restrictions that were not in place in FY 2001: reductions in effort, additional closed areas, changes in gear, mesh size, etc. In FY 2004, Amendment 13 again modified the management program in order to adopt formal rebuilding programs. The next major modification was when FW 42 was implemented in November, 2006, in order to continue the rebuilding programs adopted by Amendment 13.

The Affected Human Environment section is organized in the following format:

Section 6.2.3 - Commercial Harvesting Sector
This section describes the composition of the fleet in terms of permit category, gear type, vessel size, and home port state. Discussion of the multispecies fishery focuses primarily on the years 2001 through 2007, inclusive. Because of their significant effects on the multispecies fishery, Amendments 5 (1994) and 7 (1996) to the multispecies plan are used as historical markers to frame the discussion of the commercial harvesting sector.

Section 6.2.5 - Recreational Harvesting Sector
The recreational harvesting sector, which comprises both individual anglers and charter/party boats, is described independent of the commercial sector. While the recreational sector is increasing in magnitude within the multispecies fishery, it cannot be analyzed in conjunction with the commercial sector because of differences in the way landings data are reported and managed. The recreational catch is composed primarily of cod, haddock and winter flounder. Pollock, other flounder and hake contribute to a less substantial portion of the recreational catch.

Section 6.2.6 - Wholesale Trade and Processing Sector
This section describes the processing sector, distinguishing between the fresh fish processing and frozen fish processing industries. In addition, it includes information on wholesale firms, which do not process fish but buy from processors and sell to retail outlets, institutions, and other consumers.

6.2.2 Comparison of Catches to Target TACs

The implementation of ACLs (section 5.2.1) will require evaluations of management uncertainty. One indicator of uncertainty will be a comparison of the ACL to actual catch levels. If the ACL is frequently exceeded that implies that the management measures are not controlling catch and a larger difference may be needed between the ACL and the ABC to avoid overfishing. If catches fall well below the ACL, then it may be that management measures are overly restrictive and need to be relaxed to allow for harvesting additional yield.

While the Northeast Multispecies FMP will not implement ACLs until this action is implemented, since FY 1996 the FMP has specified target total allowable catches (TTACs) to use as an indicator of plan performance. Initially specific TTACs were only specified for five major stocks: GB and GOM cod, GB haddock, and GB and SNE yellowtail flounder. With the implementation of Amendment 13 in FY 2004 TTACs were specified for eighteen of the nineteen groundfish stocks, the exception being Atlantic halibut. There is one period – FY 2002 and FY 2003 – when neither TTACs nor management measures were identified by the Council as a result of a court order, and there have been isolated instances where a specific TTAC was not specified due to problems with an assessment or a projection. In most instances the TTAC is the median catch expected to result from the target fishing mortality (F_{MSY} if the stock is not in a rebuilding program, Frebuild for stocks in a rebuilding program). It is important to note that the TTAC for stocks in a rebuilding program is not set at the F_{MSY} level – it is set at Frebuild. From FY 2004 through FY 2008, there were rebuilding mortality targets that exceeded F_{MSY} for several stocks.

Table 51 reports the ratio of actual catch to the specified TTAC. For this table "catch" includes the elements of removals (landings, discards, recreational harvest) that were used to develop the TTAC and is not the same for every stock. Because of the timing of the multispecies fishing year, which begins on May 1, there is always a problem in comparing catch to TTAC. The TTAC is actually calculated for a calendar year but is implemented for the fishing year. To develop the table catches for a calendar year were compared to the TTAC. While this conflicts with the way TTACs are implemented, it is more consistent with how fishing mortality and TTACs are actually calculated. It also allows the comparison to use catch as estimated by the assessment, which allows for a more accurate estimate of discards.

Since Amendment 7, the Council has recommended 99 TTACs through FY 2007. In that same period 30 of the TTACs have been exceeded (30 percent). 23 of those instances occurred from 1996 through 2001. Since the implementation of Amendment 13 in FY 2004, there have been 70 TTACs specified and 7 TTACs have been exceeded (10 percent). Amendment 13 was implemented on May 1, 2004 and 2005 was the first year that the regulations were implemented for an entire calendar year. Since 2005 there have been 54 TTACs specified and 3 exceeded (5.6 percent). For the stocks with a TTAC, on average catches were 59 percent of the TTAC since 2004. Catches ranged from a low of 5 percent of the TTAC (ocean pout, 2005) to a high of 253 percent of the TTAC (SNE/MA yellowtail flounder, 2006).

When TTACs were specified by the NEFSC for 2004 and 2005, the projections used the same recruitment and other assumptions that were used for the determination of status determination criteria. While at the time this seemed appropriate so that the TTACs were consistent with the target fishing mortality rates and biomass targets, in hindsight this ignored short-term recruitment and resource condition patterns that differed from long-term expectations. As a result, TTACs were likely set too high and comparing catch to the TTACs does not provide a useful indication of whether overfishing was occurring or not. Indeed, Council members questioned some of these TTACs when voting on Amendment 13. For 2006, 2007, and 2008, the TTACs were calculated using more realistic assumptions (recruitment, weights at age, selectivity, etc.) that were agreed upon by the review panel. This meant that short-term TTACs were based on more current conditions for this stock. This does not appear to have improved the performance of the TTACs as indicators of overfishing.

Since 2004, the management measures have succeeded in keeping catches below the specified TTACs for 95 percent of the TTACs specified, yet overfishing continues on thirteen stocks (GARM III) and fishing mortality exceeded rebuilding targets for many stocks. One possible interpretation of these results is that the TTACs were mis-specified and did not adequately incorporate scientific uncertainty. As previously explained, the way TTACs were calculated by the NEFSC in 2004 and 2005 lends support to this argument for those two years. Since 2006, when more realistic assumptions were used in the projections, the explanation weakens when specific stocks are examined. For example, witch flounder catches from 2005 – 2007 were 40 percent or less of the TTAC and yet fishing mortality in 2007 was estimated as 1.5 times the overfishing level; GOM cod catch in 2007 was 53 percent of the TTAC yet fishing mortality in 2007 was over twice F_{MSY}. It will be difficult for ACLs to incorporate enough uncertainty to account for such large differences between predicted catches and realized fishing mortality rates unless there is substantial improvement in the performance of projections.

Table 51 – Comparison of catch to TTAC, 1996 – 2007. Instances where catch exceeded TTAC are underlined and in bold-face.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GOM COD	**2.77**	**2.20**	**2.53**	**6.10**	**5.31**				**1.20**	0.88	0.88	0.53
GB COD	**3.79**	**2.07**	**1.48**	**1.51**	**1.84**	**2.17**			**1.22**	0.67	0.44	0.44
GB HADDOCK	0.11	0.55	0.38	0.50	0.54	0.41			0.56	0.59	0.11	0.05
GB YTF	**4.35**	**2.83**	**1.69**	**1.79**	**1.53**	**1.13**			**1.06**	0.85	0.76	**1.74**
SNE/MA YTF	**5.03**	**1.51**	**1.36**	**1.33**	**1.33**	**1.33**			0.87	0.19	**2.53**	**1.86**
GOM HADDOCK									0.20	0.20	0.48	0.55
CC/GOM YTF									**1.35**	0.81	0.95	0.58
PLAICE									0.55	0.43	0.36	0.38
WITCH									0.62	0.40	0.35	0.23
REDFISH									0.24	0.33	0.26	0.38
WHITE HAKE									0.94	0.72	0.87	0.94
POLLOCK									0.69	0.79	0.59	0.75
GOM WINTER									0.21	0.15		
GB WINTER									0.95	0.70	0.62	0.49
SNE/MA WINTER									0.65	0.57	0.63	0.64
WINDOWPANE - N									0.05	0.09	0.12	0.31
WINDOWPANE - S									0.21	0.14	0.32	0.49
OCEAN POUT									0.07	0.05	0.13	0.09
HALIBUT												

6.2.3 Commercial Harvesting Sector

The multispecies fishery in the Northeastern United States is made up of a commercial sector and a recreational sector, which target the twelve species that constitute the large-mesh multispecies management unit and the three small-mesh species managed as a separate multispecies unit. This section focuses on the commercial harvesting sector.

The commercial sector consists of a wide range of vessels of different sizes using different gear types. These vessels are homeported in several coastal states, with most vessels claiming homeports in Maine, New Hampshire, Massachusetts, and Rhode Island. Gears that are typically used in the fishery include otter trawls, sink gillnets, bottom longlines, and hook gear. Detailed descriptions of these gears, and their impacts on EFH, are provided in section 9.2.3 of Amendment 13. A short summary is provided in section 6.1.6.

In addition to information on fishing effort, landings, and revenues, this section includes brief overviews of several management programs that were adopted in Amendment 13 or subsequent frameworks and are being considered for modification or renewal in this action. These programs include the DAS leasing program, the CAI Hook Gear Haddock SAP, and the Eastern U.S./CA Area Haddock SAP. While the CAII yellowtail flounder SAP may be modified in this action, there hasn't been any activity in this SAP since FY 2004 that was summarized in FW 42.

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

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

A. Individual
B. Fleet
C. Small vessel exemption
D. Hook gear
E. Combination vessel
F. Large mesh individual DAS

G. Large mesh fleet DAS

The open access categories were:

H. Handgear permit
I. Scallop multispecies possession limit permit
J. Non-regulated multispecies permit
K. Charter/party (vessels cannot sell their catch and this is not considered a commercial permit)

Amendment 13 modified groundfish permit categories by eliminating the Fleet DAS category, creating a limited access Handgear A category, and changing the designation of open-access handgear permits to a Handgear B permit category.

Limited Access Permit Categories

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

(B) Fleet DAS:
Fleet DAS vessels are subject to DAS restrictions. Any vessel issued one of the following permits as of July 1, 1996 was assigned to the Fleet DAS category in Amendment 7: Fleet DAS permit, Gillnet permit, limited access Hook-Gear permit, "Less than or equal to 45 ft (13.7 m)" permit to a vessel larger than 20 ft (6.1 m) in length as determined by its most recent permit application.

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

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

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

(F) Large Mesh Individual DAS:

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

(G) Large Mesh Fleet DAS:
Large mesh fleet DAS vessels are subject to DAS restrictions. Large Mesh Fleet vessels were required to fish with trawl gear with a minimum size of 8.5-inch (21.59-cm) diamond or square mesh.

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

Open Access Permit Categories

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

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

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

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

Unlike previous reports, this section does not combine handgear permits with other permit categories so that the trends in groundfish landings by this category can be identified. In addition, both large mesh permit categories (fleet and individual DAS) are combined so that comparisons can be made before and after implementation of Amendment 13. Totals do not include data that cannot be reported due to confidentiality concerns.

Number of Vessels by Permit Category
The total number of permits is separated into the seven limited access permit categories below (Table 52). These categories are the primary commercial categories, and do not include party/charter permits, permits for small mesh fisheries, and the scallop vessel possession permit. The total number of multispecies permits decreased from 3,263 permits in 2004 to 2,515 permits in 2007, a decline of 23%. The number declined steadily in each year between 2004 and 2007. For all years from 2004-2007, Handgear B permits make up the greatest percentage of permits, while Individual DAS vessels make up the greatest percentage of DAS vessels. In general, while numbers of individual, fleet DAS, and small vessel exemption permits declined from 2001 to 2004, numbers of combination vessel permits remained relatively constant across the time period.

Table 52 – Number of groundfish permits by permit category, FY 2004 – FY 2007

Year	2004	2005	2006	2007	2008
Individual DAS	1,249	1,215	1,205	1,196	1,082
Fleet DAS	47				
Small Vessel Exemption	8	8	7	14	13
Hook Gear	119	103	93	87	73
Combination Vessel	47	47	50	48	47
Large Mesh Individual DAS	62	50	46	38	33
Handgear A	177	173	149	147	130
Handgear B	1,554	1,495	1,361	1,292	1,137
Grand Total	**3,263**	**3,091**	**2,911**	**2,822**	**2,515**

6.2.3.1 Commercial Harvesting Sector Data Caveats

Data Sources
NMFS Dealer Database
NMFS Permit Database
NMFS Enforcement Database
NMFS Observer Database

Reported Numbers of Vessels
When evaluating the number of vessels reported in any given table in the following sections it is necessary to understand exactly which vessels those numbers represent. Depending on the way in which the data were queried, a different number of vessels will emerge. In each of the following sections, there are two tables describing the landings and revenues of vessels permitted in the multispecies fishery. The first is associated with total landings by permitted multispecies vessels. In this table, the number given for each fishing year is the quantity of vessels which possess multispecies permits and were active in *any* fishery, which may or may not include the regulated multispecies fishery, in that given fishing year. The second table is associated with groundfish landings only. In this table, the number given for each fishing year is the landings of vessels which possess multispecies permits and were active in the *groundfish* fishery, having landed at least one pound of regulated groundfish, in that given fishing year. In all sections, the fishing activity discussed is associated only with vessels that hold a multispecies permit--one large-mesh limited access multispecies permit *OR* one or more open access multispecies permits.

6.2.3.2 DAS Allocations and Use

One of the principal management measures used to control groundfish fishing mortality is limits on the amount of time (days-at-sea, or DAS) that permit holders can fish for regulated groundfish. Most permits are allocated a fixed number of DAS. As mentioned previously, Amendment 13 reduced overall DAS allocations and categorizes DAS into four categories. Category A DAS can be used to fish for any regulated groundfish stock and are similar to the DAS that were allocated before Amendment 13. Category B (regular) and (reserve) DAS can only be used to target healthy groundfish stocks within specific management programs that include controls on the incidental catch of unhealthy stocks. Category C DAS cannot be used until some point in the future. FW 42 reduced the number of Category A DAS to permit holders, and increased the number of Category B DAS by the same amount. This change reduced the number of Category A DAS available to each permit by 8.3 percent.

Interpreting the relationship of DAS data to actual time spent fishing is complicated by changes in how DAS were tracked and charged. After FY 1996, most limited access permits were required to use DAS, and they were tracked through calls made by the vessel operator prior to sailing and upon return. When trip limits were imposed that were based on DAS charged, some vessel operators would either start their clock before leaving the dock or would let the clock run after returning. Day gillnet vessels were charged a minimum of fifteen hours for any trip longer than three hours, regardless of time spent fishing. By FY 2004, the number of vessels using a Vessel Monitoring System (VMS) increased, and by FY 2006 all DAS vessels were required to use this equipment. VMS does not start tracking DAS until a vessel crosses a demarcation line that is outside the port, as opposed to when the vessel left the dock as under the call-in system. FY 2004 also marked the start of a program that does not charge DAS for vessels transiting to fish only in the Eastern U.S./Canada area. Starting in FY 2006, in some areas DAS were charged at a differential rate to reduce effort in those areas. The information in the following tables represents DAS charged and takes into account differential DAS, transit time to the Eastern U.S./Canada area that is not charged DAS, etc.

DAS Use by Multispecies Permit Category

From FY 2001 through FY 2003, Fleet vessels received and used the greatest number of DAS of all the permit categories (Table 53). From FY 2004 through FY 2007, Individual DAS vessels received and used the most by a large margin. In FY 2007, 94.1% of all DAS were used by Individual DAS vessels. Individual permit vessels also used the greatest percentage of their allocated days, with the exception of combination vessels which used up to 92.9% of the allocated and net leased days in some years. The overall percentage of DAS used in the largest categories generally increased each year.

DAS Use by Length Class

The total number of vessels using DAS in FY 2007 was 52% of the number in 2001 (Table 54). Between FY 2001 and FY 2007, the total number of permitted limited access vessels declined by 20 percent. Generally, larger vessels used a higher percentage of their allocated DAS in all years. Active limited access vessels generally used a greater percentage of their allocated DAS in FY 2007 than in FY 2001, with the exception of vessels less than 30 feet in length. Vessels in the 30-49 foot length class used the greatest raw number of DAS in each year except FY 2005, when vessels in the 50-74 foot length class used the most.

DAS Use by Gear Type

For this discussion, refer to Table 55. Primary gear is listed on the permit application and may not match the gear actually used on a given trip.

Bottom Trawl:
In FY 2001 there were 650 active vessels in the bottom trawl sector, 77% of the total number of permitted bottom trawl vessels. The percentage of active vessels decreased over the next six years, reaching 49% in FY 2007. DAS use by bottom trawl vessels generally increased from 2001 to 2007. 66% of the DAS allocated to active permitted bottom trawl vessels were used by these vessels in FY 2001 and 80% of allocated and net leased DAS were used by active bottom trawl vessels in FY 2007.

Bottom Longline:
In FY 2001 there were 115 active vessels in the bottom longline sector, 52% of the total number of permitted bottom longline vessels. The percentage of active vessels decreased over the next six years, reaching 27% in FY 2007. DAS use by bottom longline vessels generally increased from FY 2001 to FY 2007. 38% of the DAS allocated to active permitted bottom longline vessels were used by these vessels in FY 2001 and 41% of allocated and net leased DAS were used by active bottom longline vessels in FY 2007.

Hook and Line:
In FY 2001 there were 84 active vessels in the hook and line sector, 49% of the total number of permitted hook and line vessels. The percentage of active vessels decreased over the next six years, reaching 14% in FY 2007. DAS use by hook and line vessels generally increased from FY 2001 to FY 2007. 24% of the DAS allocated to active permitted hook and line vessels were used by these vessels in FY 2001 and 51% of allocated and net leased DAS were used by active hook and line vessels in FY 2007.

Sink Gillnet:
In FY 2001 there were 228 active vessels in the sink gillnet sector, 71% of the total number of permitted sink gillnet vessels. The percentage of active vessels decreased over the next six years, reaching 59% in FY 2007. DAS use by sink gillnet vessels increased steadily throughout the FY 2001-FY 2007 time period. 59% of the DAS allocated to active permitted sink gillnet vessels were used by these vessels in FY 2001 and 74% of allocated and net leased DAS were used by active sink gillnet vessels in FY 2007.

DAS Use by Home Port State
Table 56 describes DAS use by homeport state, as reported on the vessel's permit application. These data illustrate the relative changes in the distribution of fishing activity on a regional basis.

Active vessels in Maine and New Hampshire have generally used a higher percentage of allocated DAS than vessels in other states since FY 2001, but Massachusetts has been using an equivalent percentage in recent years. All states except Connecticut, New York, and New Jersey used greater than 70% of their allocated DAS in FY 2007. Active vessels in New York and New Jersey have generally used a lower percentage of allocated DAS than vessels in other states since FY 2001. In FY 2007, active vessels in New York and New Jersey used 61% and 59% of their allocated and net leased DAS, respectively. Those numbers are substantially higher than the percentage of DAS used in FY 2001.

Table 53 – Multispecies Limited Access A Days-at-Sea Used by Multispecies Permit Category

	Categories	Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2001	Individual	137	17,819	132	17,356		16,347
	Fleet	1,169	111,737	789	76,277		40,690
	Combination	47	2,348	23	1,681		1,102
	Hook Gear	174	16,646	95	9,104		2,356
	Large Mesh	62	7,682	58	7,171		4,853
	Total	**1,589**	**156,233**	**1,097**	**111,589**		**65,347**
2002	Individual	138	13,888	131	13,629		12,400
	Fleet	1,041	48,063	734	40,882		24,878
	Combination	47	1,637	16	962		705
	Hook Gear	120	3,649	61	2,432		875
	Large Mesh	56	4,033	50	3,858		2,849
	Total	**1,402**	**71,270**	**992**	**61,763**		**41,707**
2003	Individual	139	14,247	132	13,908		12,994
	Fleet	1,047	48,468	683	39,192		25,492
	Combination	47	1,651	15	928		727
	Hook Gear	115	3,466	54	2,127		760
	Large Mesh	56	3,511	47	3,178		2,374
	Total	**1,404**	**71,344**	**931**	**59,334**		**42,347**
2004	Individual	1,188	40,111	692	36,982		27,924
	Combination	37	1,509	25	1,450		1,090
	Hook Gear	115	1,374	38	1,085		455
	Large Mesh	57	987	17	766		617
	Small Vessel Exemption	7	20	0	0		0
	N/A	80	492	1	33		10
	Total	**1,484**	**44,492**	**773**	**40,317**		**30,096**
2005	Individual	1,128	45,969	619	34,529	41,022	29,898
	Combination	46	649	11	472	485	423
	Hook Gear	94	1,682	31	1,119	1,105	387
	Large Mesh	44	1,680	24	1,127	1,540	1,064
	Small Vessel Exemption	8	38	0	0	0	0
	Total	**1320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	Individual	1107	46,240	568	31,184	40,137	30,072
	Combination	47	439	3	189	169	157
	Hook Gear	82	2,413	22	1,472	1,479	337
	Large Mesh	41	1,692	32	1,261	1,631	1,229
	Small Vessel Exemption	7	37	0	0	0	0
	Total	**1284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	Individual	1,099	45,835	524	28,721	40,637	31,595
	Combination	47	415	5	204	296	234
	Hook Gear	79	2,287	19	1,277	1,265	270
	Large Mesh	33	1,034	25	956	990	693
	Small Vessel Exemption	13	138	1	12	12	12
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**

Table 54 – Days-At-Sea Usage by Vessel Length Class, 2001-2006

Categories		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2001	1- 29 feet	122	11,293	66	6,404		1474
	30-49 feet	890	87,062	588	58,365		30,365
	50-74 feet	407	40,666	321	33,250		23,144
	75+ feet	170	17,212	122	13,571		10,364
	Total	**1,589**	**156,233**	**1,097**	**111,589**		**65,347**
2002	1- 29 feet	93	2,546	43	1,497		527
	30-49 feet	751	33,815	525	28,562		16,895
	50-74 feet	393	24,008	303	21,839		16,035
	75+ feet	165	10,901	121	9,864		8,250
	Total	**1,402**	**71,270**	**992**	**61,763**		**41,707**
2003	1- 29 feet	102	3,115	41	1,419		500
	30-49 feet	762	33,928	492	27,424		17,176
	50-74 feet	382	23,442	288	20,742		16,267
	75+ feet	158	10,859	110	9,750		8,403
	Total	**1,404**	**71,344**	**931**	**59,334**		**42,347**
2004	1- 29 feet	162	1,264	24	563		231
	30-49 feet	743	19,650	405	17,534		11,841
	50-74 feet	361	15,546	248	14,757		11,571
	75+ feet	159	7,757	96	7,463		6,454
	Unknown	59	275				0
	Total	**1,484**	**44,492**	**749**	**40,317**		**30,096**
2005	1 - 29 feet	178	2,018	18	518	536	117
	30-49 feet	670	22,350	350	17,166	19,139	11,924
	50-74 feet	320	16,727	221	12,888	15,778	12,088
	75+ feet	152	8,923	96	6,675	8,700	7,645
	Total	**1320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	1 - 29 feet	216	3,500	8	420	420	75
	30 - 49 feet	621	22,827	336	16,470	19,702	12,536
	50 - 74 feet	300	16,416	202	11,858	15,523	12,012
	75+ feet	147	8,077	79	5,358	7,771	7,171
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	1 - 29 feet	261	3,560	6	357	347	56
	30-49 feet	577	22,163	308	15,423	19,721	13,042
	50-74 feet	287	15,570	178	10,181	14,831	12,010
	75+ feet	146	8,416	82	5,208	8,301	7,696
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**

Table 55 – Multispecies limited access A Days-At-Sea used by primary gear type, FY 2001-FY 2006

	Categories	Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2001	Bottom Trawl	841	82,442	650	66,458		44,011
	Midwater Trawl	3	294	2	196		130
	Other Trawl	12	1,215	8	823		558
	Longline	222	21,368	115	11,064		4,217
	Hand Line	170	16,363	84	8,145		1,960
	Gillnet	321	32,593	228	23,925		14,044
	Pots and Traps	12	1,176	5	490		72
	Other	8	782	5	488		356
	Total	**1,589**	**156,233**	**1,097**	**111,589**		**65,347**
2002	Bottom Trawl	787	45,473	620	41,454		29,183
	Midwater Trawl	4	182	3	164		69
	Other Trawl	11	549	8	495		336
	Longline	170	5,746	87	4,061		1,801
	Hand Line	124	3,494	56	2,156		866
	Gillnet	287	15,069	207	12,819		9,115
	Pots and Traps	13	372	5	228		78
	Other	6	385	6	385		260
	Total	**1,402**	**71,270**	**992**	**61,763**		**41,707**
2003	Bottom Trawl	793	45,954	574	39,904		29,909
	Midwater Trawl	5	254	3	179		118
	Other Trawl	10	524	7	449		322
	Longline	170	5,759	75	3,647		1,553
	Hand Line	124	3,484	57	2,047		769
	Gillnet	285	14,692	207	12,621		9,400
	Pots and Traps	12	354	3	163		71
	Other	5	324	5	324		206
	Total	**1,404**	**71,344**	**931**	**59,334**		**42,347**
2004	Bottom Trawl	794	30,463	502	28,338		21,739
	Midwater Trawl	6	131	2	109		30
	Other Trawl	10	279	6	278		230
	Longline	163	2,621	59	2,065		1,014
	Hand Line	133	1,332	35	964		481
	Gillnet	282	8,817	160	8,174		6,337
	Pots and Traps	11	85	2	85		50
	Other	85	764	7	303		215
	Total	**1,484**	**44,492**	**773**	**40,317**		**30,096**

	Categories	Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	Bottom Trawl	765	34,982	456	26,305	31,634	23,595
	Midwater Trawl	5	223	3	175	191	55
	Other Trawl	9	382	5	278	370	297
	Longline	135	2,916	42	1,970	2,050	918
	Hand Line	60	952	18	595	634	302
	Rod and Reel	64	615	12	400	400	174
	Gillnet	259	9,420	139	7,102	8,449	6,199
	Pots and Traps	10	49	2	49	49	5
	Other	11	395	6	269	291	191
	Total	**1,318**	**49,934**	**683**	**37,143**	**44,068**	**31,735**
2006	Bottom Trawl	764	34,077	410	23,117	29,741	23,017
	Midwater Trawl	4	167	2	122	137	93
	Other Trawl	11	560	6	315	472	415
	Longline	118	3,043	33	1,996	2,107	865
	Hand Line	56	1,004	9	401	457	197
	Rod and Reel	62	797	8	496	511	162
	Gillnet	240	10,503	148	7,163	9,494	6,765
	Pots and Traps	10	46	1	46	46	14
	Other	17	525	7	394	394	210
	Total	**1,282**	**50,722**	**624**	**34,050**	**43,360**	**31,739**
2007	Bottom Trawl	767	33,642	376	21,163	30,108	23,986
	Midwater Trawl	4	133	2	122	122	81
	Other Trawl	14	648	6	302	522	504
	Longline	110	2,668	30	1,833	1,922	717
	Hand Line	57	1,075	8	374	407	207
	Rod and Reel	58	754	8	431	431	160
	Gillnet	233	10,212	138	6,700	9,415	6,993
	Pots and Traps	8	46	1	46	46	11
	Other	20	531	5	198	227	146
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**

Table 56 – Multispecies limited access A Days-At-Sea used by home port state, FY 2001-FY 2006

State (Homeport)		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2001	Maine	213	21,141	130	13,517		9,397
	New Hampshire	77	7,791	62	6,331		4,647
	Massachusetts	847	83,956	629	64,591		39,617
	Rhode Island	127	12,452	86	8,510		4,701
	Connecticut	17	1,606	13	1,214		647
	New York	155	14,932	94	9,138		3,248
	New Jersey	89	8,367	50	4,990		1,428
	Other	64	5,988	33	3,299		1,664
	Total	**1,589**	**156,233**	**1,097**	**111,589**		**65,347**
2002	Maine	180	9,615	118	8,136		5,957
	New Hampshire	73	4,266	56	3,816		2,615
	Massachusetts	752	40,589	567	36,275		24,725
	Rhode Island	107	5,848	83	5,187		3,761
	Connecticut	17	871	12	732		370
	New York	136	5,084	91	4,139		2,112
	New Jersey	79	2,866	41	2,013		1,108
	Other	58	2,131	24	1,465		1,059
	Total	**1,402**	**71,270**	**992**	**61,763**		**41,707**
2003	Maine	187	10,394	119	8,680		6,898
	New Hampshire	68	4,220	53	3,714		2,733
	Massachusetts	752	40,347	522	34,465		24,226
	Rhode Island	115	5,975	84	5,264		4,044
	Connecticut	17	848	13	716		400
	New York	129	4,713	76	3,406		1,928
	New Jersey	85	2,965	46	1,949		1,213
	Other	51	1,882	18	1,141		905
	Total	**1,404**	**71,344**	**931**	**59,334**		**42,347**
2004	Maine	209	7,053	98	6,521		5,477
	New Hampshire	75	2,836	47	2,577		2,101
	Massachusetts	744	26,765	451	24,835		18,388
	Rhode Island	116	3,146	67	2,899		1,997
	Connecticut	19	436	12	393		250
	New York	128	1,934	56	1,506		792
	New Jersey	83	1,129	33	901		499
	Other	110	1,194	9	686		592
	Total	**1,484**	**44,492**	**110**	**40,317**		**30,096**

State (Homeport)		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	Maine	200	8,206	91	5,479	7,412	5,731
	New Hampshire	73	3,302	45	2,608	3,029	2,217
	Massachusetts	675	29,306	385	21,669	25,878	18,734
	Rhode Island	114	3,859	68	3,505	3,675	2,661
	Connecticut	19	635	12	535	535	258
	New York	111	2,363	47	1,741	1,905	1,094
	New Jersey	80	1,387	24	1,020	969	450
	Other	48	961	13	689	750	629
	Total	**1,320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	Maine	202	8,928	85	5,389	7,223	5,173
	New Hampshire	73	3,176	37	2,117	2,764	2,210
	Massachusetts	639	30,349	332	19,619	26,425	19,542
	Rhode Island	111	3,419	66	3,048	3,142	2,445
	Connecticut	18	580	10	447	457	347
	New York	114	2,235	47	1,702	1,685	948
	New Jersey	81	1,272	36	1,174	998	535
	Other	46	861	12	610	724	595
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	Maine	191	7,708	71	4,456	6,692	5,377
	New Hampshire	70	3,464	36	2,078	2,997	2,398
	Massachusetts	646	30,529	300	18,130	26,546	19,714
	Rhode Island	113	3,645	67	2,982	3,447	3,110
	Connecticut	16	482	8	382	426	279
	New York	107	1,934	40	1,459	1,418	858
	New Jersey	82	1,271	39	1,182	1,053	620
	Other	46	676	13	501	621	448
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**

6.2.3.3 Landings and revenues

The commercial harvesting sector may be described as a function of its multiple components, including gear types, vessels, and communities. In this section, activity in the commercial sector is characterized in terms of **permit category**, **vessel length class**, **gear type, home port state, and landing port state**. Because of the way in which the data is queried for each of these descriptive approaches, total numbers of vessels, landings and revenues may differ slightly among the four sections. Where such anomalies occur, we have attempted to provide a clear explanation. Revenue is reported as gross revenue and does not take into account the changes in fixed and operating costs over time (net revenue).

Landings and revenues by fishing year were summarized in Amendment 13, FW 40A, FW 40B, FW 41, and FW 42. This section updates this information for FY 2004 through 2007. Minor differences exist between the information previously reported and this section due to updates to the databases and revisions to data queries. The data are also reported in different categories than in previous reports in order to capture changes in permit categories and changes in landings and revenues in communities.

Regulated groundfish (cod, haddock, yellowtail flounder, winter flounder, witch flounder, windowpane flounder, plaice (dabs), pollock, redfish, Atlantic halibut, white hake, red/white hake mixed) and ocean pout landings and revenues are summarized in Table 57. This table includes all landings reported to the NMFS dealer database system, regardless of whether the landings can be attributed to a multispecies permit. It includes aggregate landings reported by states and landings that cannot be attributed to a permit as well as landings by vessels that did not possess a federal multispecies permit (i.e. landings from state registered vessels fishing in state waters). Regulated groundfish landings declined from 80 million pounds in FY 2004 to 61 million pounds (landed weight) in FY 2007, or 24 percent. Nominal revenues increased 9.9 percent from FY 2004 ($96.7 million) to FY 2007 ($106.2 million), but revenues in constant 1999 dollars declined slightly from $84.5 million in FY 2004 to $84.2 million in FY 2007, or 0.3 percent. The sections following this table summarize landings and revenues for groundfish permit holders only.

Table 57 – Total Groundfish Landings and Revenues, FY 2004 - FY 2007

Fishing Year	2004	2005	2006	2007
Total Groundfish Landed (Live weight)	87,021,916	71,809,881	54,812,140	67,212,138
Total Groundfish Landed (landed weight)	79,619,512	65,497,279	49,956,475	60,584,026
Nominal Revenues	96,674,423	97,934,270	90,992,393	106,206,490
Constant (1999) Revenues	84,489,706	85,074,085	76,800,650	84,241,285

6.2.3.3.1 Landings and Revenues by Permit Category

From FY 2001 to FY 2003, the highest total landings were brought in by Fleet DAS and Open Access vessels (Table 59). From FY 2004 to FY 2007, the highest total landings were seen in the Individual DAS, Handgear B, and Open Access fisheries. Individual DAS vessels, and Fleet DAS through FY 2003, also landed a substantially greater percentage of total landings than vessels in other categories. This proportion of total landings attributed to vessels in Fleet DAS and Individual DAS categories decreased slightly from 49% in FY 2001 to 45% in FY 2007, with the FY 2007 landings consisting only of the Individual DAS category. Other categories increased their contribution to total landings during these years, notably Large Mesh Individual DAS vessels which expanded their total landings from 1,241,612 pounds in FY 2001 to 4,144,467 pounds in FY 2007. Total and groundfish (large-mesh regulated multispecies) landings have generally demonstrated a negative trend from FY 2001 to FY 2007 (Table 60). Groundfish landings decreased, on average, 7.2% annually during that period. Groundfish revenues also decreased 36.9% during that time period. Both groundfish landings and groundfish revenue saw an incremental decrease in each year from the preceding one, except in 2007, when both landings and revenue were slightly increased from 2006 levels.

Groundfish landings generally declined in each permit group, with the exception that some groups saw a spike in landings in FY 2004, including Individual DAS, Hook Gear, Large Mesh Individual DAS, and Handgear. Individual DAS permits were by far the leading contributor to groundfish landings, with 96.8% of all landings in FY 2006. That category also appears to have experienced the least steep decrease in groundfish landings, although several groups fluctuated more severely. As discussed previously, these changes primarily represent shifts in participation among different permit categories rather than extensive movement in and out of the fishery entirely. Vessels in the Small Vessel Exemption category contributed least to groundfish landings in all years. To maintain confidentiality, landings associated with the small number of Small Vessel Exemption vessels were not reported.

Total revenue trends were similar to those for total landings across permit categories, but perhaps slightly more constant. Across all years, Individual DAS vessels were more financially dependent on groundfish than vessels in other permit categories. Groundfish revenues accounted for, on average, 37% of total revenues in this permit category.

The total number of vessels active in the groundfish fishery, or those which landed at least one pound of groundfish in each of the given fishing years is reported in Table 58. These vessels are associated with groundfish landings (Table 60) and groundfish revenues (Table 62). The number of total active vessels (those which landed at least one pound of any species) generally trended downward from FY 2004 to FY 2007. Active Individual DAS vessels decreased each year, with 76.7% of the number of active vessels in FY 2007 compared with FY 2004. Large Mesh Individual DAS and Handgear A vessels both decreased substantially, with FY 2007 seeing 37.0% and 52.2% of FY 2004 levels in FY 2007, respectively. The total numbers of vessels active in the groundfish fishery decreased an average of 7.5% per year across that time period.

Table 58 - Total number of multispecies vessels landing groundfish by permit category, FY 2004-FY 2007

Year	2004	2005	2006	2007
Individual DAS	691	637	590	530
Fleet DAS				
Small Vessel Exemption	2	1	2	4
Hook Gear	34	32	20	18
Combination Vessel	16	16	10	16
Large Mesh Ind. DAS	27	22	16	10
Large Mesh Fleet DAS	1			
Handgear Open Access	0			
Handgear - A	44	32	26	23
Handgear - B	75	63	59	73
Other Open Access	65	57	64	65
Total	**955**	**860**	**787**	**739**

Table 59 - Total Landings (in lbs.) of Multispecies Vessels by Permit Category, FY 2001-FY 2007

Permit Category	2001	2002	2003	2004	2005	2006	2007
Individual DAS	67,082,886	60,555,258	55,545,268	242,216,070	203,926,862	197,040,056	197,707,109
Fleet DAS	231,268,872	188,132,355	186,143,621	604,024			
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	119,178
Hook-Gear	2,770,964	1,675,134	1,818,524	8,659,676	2,879,912	1,208,856	1,067,947
Combination Vessel	12,926,924	13,218,161	17,743,414	14,555,114	11,253,416	12,057,866	10,342,028
Large Mesh Individual DAS	1,241,612	671,808	741,089	12,537,228	4,882,785	4,304,701	4,144,467
Large Mesh Fleet DAS	7,070,364	6,743,331	7,050,035	150,183			
Handgear Permit	126,761,476	72,361,485	143,865,251	37,656			
Handgear A				2,237,854	29,716,819	17,976,142	7,607,092
Handgear B				150,143,857	147,995,484	113,703,477	125,831,090
Other Open Access Combined	157,128,632	96,729,305	100,873,093	119,729,642	97,673,044	90,880,903	96,170,025
Grand Total	**606,251,730**	**440,086,837**	**513,780,295**	**550,871,304**	**498,328,322**	**437,172,001**	**442,988,936**

Table 60 – Groundfish landings of multispecies vessels by permit category, FY 2001-FY 2007

Permit Category	2001	2002	2003	2004	2005	2006	2007
Individual DAS	50,301,967	40,864,820	38,216,342	71,419,801	61,129,151	46,431,701	57,383,983
Fleet DAS	45,007,575	38,017,046	37,911,377	95,194			
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	1,848
Hook-Gear	1,098,050	528,342	478,978	627,033	517,076	183,794	192,508
Combination Vessel	3,820,879	2,465,981	2,839,056	1,884,694	845,275	397,290	557,921
Large Mesh Individual DAS	630,967	301,661	526,329	1,513,209	667,854	589,244	162,909
Large Mesh Fleet DAS	2,048,611	1,050,912	777,373	10,308			
Handgear Permit	454,907	178,787	136,244				
Handgear A				243,634	30,436	122,380	78,723
Handgear B				68,427	49,167	45,221	150,401
Open Access Combined	49,841	69,615	137,776	100,601	58,987	198,214	115,879
Grand Total	**103,412,797**	**83,477,164**	**81,023,475**	**75,962,901**	**63,297,946**	**47,967,844**	**58,644,172**

Table 61 – Total revenues by multispecies vessels by permit category, FY 2001-FY 2007

Permit Category	2001	2002	2003	2004	2005	2006	2007
Individual DAS	63,005,926	61,734,890	52,738,496	161,345,808	180,720,578	162,456,700	148,031,135
Fleet DAS	120,721,087	117,177,937	112,644,270	597,359			
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	146,985
Hook-Gear	2,854,182	2,676,627	2,445,595	3,802,250	3,847,800	3,632,903	2,984,595
Combination Vessel	27,857,876	31,513,079	33,708,899	40,408,428	47,519,266	45,235,888	38,476,835
Large Mesh Individual DAS	1,389,315	780,598	559,777	6,395,127	6,673,046	4,811,600	3,618,879
Large Mesh Fleet DAS	7,963,406	7,431,761	6,403,526	107,855			
Handgear Permit	28,884,772	24,452,876	28,581,585	51,059			
Handgear A				1,331,175	4,869,667	4,011,817	3,029,108
Handgear B				28,537,771	58,199,971	55,049,963	55,395,127
Other Open Access Combined	140,342,092	158,078,405	185,176,530	244,899,234	283,197,167	256,177,755	258,103,859
Grand Total	**393,018,657**	**403,846,172**	**422,258,677**	**487,476,065**	**585,027,495**	**531,376,627**	**509,786,521**

Table 62 – Groundfish revenues by multispecies vessels by permit category, FY 2001-FY 2007

Permit Category	2001	2002	2003	2004	2005	2006	2007
Individual DAS	47,329,837	45,305,967	36,299,927	65,626,188	68,122,719	60,126,373	62,490,491
Fleet DAS	43,106,389	44,351,025	39,424,405	60,968			
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	2,987
Hook-Gear	1,258,845	762,310	645,903	824,186	820,322	338,831	337,265
Combination Vessel	3,802,377	2,903,858	2,958,558	1,752,166	1,195,012	535,507	729,559
Large Mesh Individual DAS	497,441	275,430	348,782	1,380,613	757,251	552,363	201,407
Large Mesh Fleet DAS	2,129,146	1,336,680	839,130	11,148			
Handgear Permit	463,326	243,824	170,583				
Handgear A				177,697	46,031	117,683	108,658
Handgear B				90,013	76,550	66,820	205,424
Open Access Combined	44,302	82,275	127,506	105,319	83,439	294,492	168,277
Grand Total	**98,631,663**	**95,261,368**	**80,814,794**	**70,028,298**	**71,101,325**	**62,032,069**	**62,244,069**

Table 63 – Average regulated groundfish revenues per permit by permit type, FY 2004-FY 2007

Permit Category	2004	2005	2006	2007
Individual DAS	94,973	106,943	101,909	117,907
Fleet DAS				
Small Vessel Exemption	Conf.	Conf.	Conf.	747
Hook Gear	24,241	25,635	16,942	18,737
Combination Vessel	109,510	74,688	53,551	45,597
Large Mesh	49,308	34,421	34,523	20,141
Handgear Open Access				
Handgear – A	4,039	1,438	4,526	4,724
Handgear – B	1,200	1,215	1,133	2,814
Other Open Access	1,620	1,464	4,601	2,589
Total	**73,328**	**82,676**	**78,821**	**86,934**

Summary
The total number of multispecies permits declined from each year, for a total 23% decline between FY 2004 and FY 2007. The number of active groundfish vessels has also declined each year from 1996 to FY 2001.

From FY 2001 to FY 2003, the highest total landings were brought in by Fleet DAS and Open Access vessels. From FY 2004 through FY 2007, Individual DAS, Open Access, and Handgear vessels brought the highest landings. Fleet DAS and Individual DAS vessels combined also landed the large majority of groundfish landings in the entire time period. Vessels in the Small Vessel Exemption category contributed least to groundfish landings in all years, but the numbers were so low that they are considered confidential.

Total revenues trends did not closely mimic total landings trends across all years due to changes in species composition of total landings and the differing market values of those species. Groundfish revenues were variable across permit categories. For Individual DAS vessels, the greatest groundfish revenues were seen in FY 2005, while groundfish revenues in the fishery overall declined steadily from FY 2001-FY 2006 and increased only slightly in FY 2007. Across all years, Individual DAS vessels were more financially dependent on groundfish than vessels in other permit categories. This is also reflected in day-at-sea use by Individual DAS vessels, which generally used the greatest percentage of their allocated category DAS in each year from FY 2001 to FY 2007.

6.2.3.3.2 Landings and Revenues by Vessel Length Class

Data on fishing activity were compiled by length classes. Based on the recommendations of the NEFMC Groundfish Oversight Committee for Amendment 13, four distinct ranges were identified as separate vessel length classes.

Length Class 1: Vessels less than 30 feet in length
Length Class 2: Vessels 30 feet to less than 50 feet in length
Length Class 3: Vessels 50 feet to less than 75 feet in length
Length Class 4: Vessels greater than or equal to 75 feet in length

Data Caveats
The vessel length data were gathered from the vessels' permit applications for each fishing year and compiled on a trip-by-trip basis. The total number of vessels by length class was generated from the NMFS permit database and includes all active and inactive permitted multispecies vessels with reported lengths. Data are reported since FY 2001.

Landings and Revenues by Vessel Length Class
Vessels greater than 75 feet in length demonstrated the greatest total decrease in landings between the years FY 2001 and FY 2007. However, total revenues for those vessels stayed roughly constant. Revenues for other length classes were also relatively constant, with most classes peaking in revenue in FY 2005 (vessels less than 30 feet in length peaked in FY 2004). Revenues in FY 2007 were similar to those in FY 2001 for all length classes except 50 to 75 feet, which had a FY 2007 level at 73.9% of that in FY 2001.

Groundfish landings generally decreased across all length classes each year between FY 2001 and FY 2006, and increased in FY 2007 (Table 66). Vessels 75 feet and greater had the highest total landings each year by a large margin. However, vessels 50-75 feet were responsible for the highest groundfish landings in every year except FY 2005 and FY 2007, when vessels greater than 75 feet had the most landings. After those two groups, vessels 30-50 feet had the most groundfish landings, followed by vessels under 30 feet, which had substantially fewer. Groundfish landings of vessels 75 feet and greater decreased by 38.2%, those by vessels 50-75 feet decreased by 54.8%, 30-50 feet decreased by 28.1%, and the smallest vessels saw landings decline by 91.6% between FY 2001 and FY 2007.

Groundfish revenues decreased each year in each length class, with the exceptions of FY 2005, which saw slightly higher revenues than FY 2004 for vessels of 30-50 feet and FY 2007, which saw slightly higher revenues for vessel 30-50 feet and 75+ feet.

Vessels less than 30 feet saw the biggest decrease in revenue each year, with an 88.8% change between FY 2001 and FY 2007. The 30-50 foot vessels saw the smallest decreases each year between FY 2005 and FY 2007, while vessels over 75 feet had the least decreasing revenues from FY 2001 through FY 2004.

Summary

The largest vessels demonstrated the greatest annual percent decreases in total landings on average from FY 2001 to FY 2007. However, revenues for these vessels stayed fairly constant during that same time period. All length classes experienced relative constancy in total revenues through FY 2007, with the exception of 75+ foot vessels, which saw an overall increase.

Groundfish landings generally decreased across all length classes between FY 2001 and FY 2007. The largest vessels, while making up the smallest percentage of total vessels, were responsible for the highest total landings in every year from FY 2001 to FY 2007. However, vessels 50 to less than 75 feet contributed to the highest *groundfish* landings in each year except FY 2005 and FY 2007, with vessels 75 feet and greater taking the lead in those two years and following closely in the others. The smallest vessels contributed the least groundfish landings in all years from FY 2001 to FY 2007, and also showed the greatest percent decrease in those landings. Groundfish revenues essentially decreased in all length classes from FY 2001 to FY 2007, with the exception of a slight increase in revenue for vessels 20 to 50 feet in length from FY 2004 to FY 2005 and slight increases for two categories in FY 2007.

Table 64 – Total Landings (in lbs.) by Multispecies Vessels by Length Class, FY 2001-FY 2007

Length Group	2001	2002	2003	2004	2005	2006	2007
Less than 30	1,495,389	1,014,569	803,224	1,762,725	1,583,527	1,209,049	839,026
30 to less than 50	52,543,920	45,049,181	48,202,346	47,152,085	47,212,707	47,103,674	53,155,303
50 to less than 75	151,531,804	136,713,383	129,204,193	172,834,208	113,620,241	107,944,193	112,217,122
75 and over	400,687,205	257,309,891	335,571,309	329,131,596	335,943,482	280,935,636	276,777,485
Grand Total	**606,258,318**	**440,087,024**	**513,781,072**	**550,880,614**	**498,359,957**	**437,192,552**	**442,988,936**

Table 65 – Constant Total Revenues by Multispecies Vessels by Length Class, FY 2001-FY 2007

Length Group	2001	2002	2003	2004	2005	2006	2007
Less than 30	1,426,091	1,120,241	1,173,094	1,969,399	1,494,803	1,677,300	1,600,751
30 to less than 50	57,010,963	52,429,810	50,153,461	50,536,025	77,855,390	70,126,484	69,293,709
50 to less than 75	122,110,693	126,424,416	127,033,443	134,992,516	156,895,340	144,967,040	131,991,842
75 and over	212,478,201	223,871,947	243,899,903	299,988,103	348,882,156	314,645,068	306,900,219
Grand Total	**393,025,947**	**403,846,414**	**422,259,902**	**487,486,042**	**585,127,690**	**531,415,891**	**509,786,521**

Table 66 – Groundfish Landings (in lbs.) by Multispecies Vessels by Length Class, FY 2001-FY 2007

Length Group	2001	2002	2003	2004	2005	2006	2007
Less than 30	839,251	396,167	354,991	482,878	145,521	111,514	70,572
30 to less than 50	23,905,156	17,927,058	18,436,523	15,305,823	15,187,939	13,507,713	17,196,345
50 to less than 75	43,518,214	34,342,719	32,791,598	30,707,862	23,931,730	18,228,960	19,685,786
75 and over	35,155,672	30,811,275	29,440,367	29,467,357	24,034,939	16,120,399	21,691,469
Grand Total	**103,418,293**	**83,477,219**	**81,023,479**	**75,963,920**	**63,300,129**	**47,968,586**	**58,644,172**

Table 67 – Constant Groundfish Revenues by Multispecies Vessels by Length Class, FY 2001-FY 2007

Length Group	2001	2002	2003	2004	2005	2006	2007
Less than 30	942,778	570,899	461,981	521,190	198,993	133,510	105,316
30 to less than 50	23,409,792	21,922,821	19,423,441	16,633,176	18,179,777	16,469,091	18,479,430
50 to less than 75	40,340,343	37,897,022	32,001,358	26,182,897	26,170,241	23,571,617	22,036,277
75 and over	33,944,381	34,870,693	28,928,019	26,692,254	26,553,928	21,858,434	23,623,046
Grand Total	**98,637,293**	**95,261,434**	**80,814,800**	**70,029,516**	**71,102,940**	**62,032,652**	**64,244,069**

6.2.3.3.3 Landings and Revenues by Gear Type

Many different gear types are used to harvest the resource in the multispecies fishery. These gears are described in detail under “Gear Descriptions” (Section 6.1.6 of the Amendment 16 EFH DEIS). The four primary gear types in the multispecies fishery, as determined from the monetary value of landings associated with that type of gear, are the bottom trawl, bottom longline, hook and line and sink gillnet.

Vessel owners are required to report their primary gear type on their multispecies permit application. On each Vessel Trip Report, the permit holder is instructed to list the actual gear used to harvest the landed catch on that trip. The gear actually used to catch the fish landed may or may not coincide with the primary gear designation on the vessel’s permit application.

<u>Data Caveats</u>

Primary Gear Types and Landings by Gear

Total and groundfish landings in this section are reported by the gear type physically used to harvest the fish landed. In some cases, the gear used to harvest the catch on a specific trip was not equivalent to the gear reported by the vessel owner as the primary gear type.

"All other" gears represent permits that did not report a primary gear type or permits indicating actual gear types that do not fall into any of the specific categories listed. For landings and revenues, the values associated with the "other" gear category may also represent aggregate records reported by dealers that include multiple trips of one or more vessels.

Landings and Revenues by Gear Used

Between FY 2001 and FY 2007, bottom trawls accounted for an average of 34% of the total landings in each year (Table 68). Following bottom trawls, the next top contributor to total landings were midwater trawls. In 2003, midwater trawls accounted for the greatest percentage of total landings by gear type. On average, the midwater trawl accounted for 30% of the total landings each year. Bottom trawl also accounted for most groundfish landings, while the sink gillnet was the second highest contributor to groundfish landings in 2001-2007. From 2001 to 2007, groundfish landings by all gear types generally decreased; with the exception of gillnet landings, which were roughly even, and the "other" category, which was highly variable. Bottom trawl groundfish landings in 2007 were only 46.3% of the 2001 level. Total revenues trends mirrored changes in total landings (Table 69). Total revenues increased substantially for bottom trawls and bottom longline, as did landings for those gear types.

Summary

Between FY 2001 and FY 2007, bottom trawls and midwater trawls accounted for a large majority of total landings in each year. Bottom trawls, followed by sink gillnets, accounted for the majority of groundfish landings. Total bottom trawl landings decreased in nearly every year except FY 2004, and groundfish landings by bottom trawls decreased significantly in every year over this time period as well. Sink gillnets landed the second highest percentage of groundfish, and both total and groundfish landings by gillnets were variable in the years FY 2001 to FY 2007. Bottom longlines ranked third in contribution to groundfish landings from FY 2001 until FY 2004, while handlines took the third place category (aside from the "other" category) from FY 2005 through FY 2007. Revenue trends generally mimicked landings trends from FY 2001 to FY 2007.

DAS use generally increased from FY 2001 to FY 2007 for each of the four primary gear types. Bottom trawls and sink gillnets used the greatest percentage of allocated DAS from FY 2001 to FY 2007, while hook and line and bottom longline vessels utilized the smallest percentage of days allocated.

Table 68 – Total Landings by Multispecies Vessels by Gear Used, FY 2001-FY 2007

Gear Type	2001	2002	2003	2004	2005	2006	2007
Bottom Trawl	195,992,377	179,789,028	176,247,913	208,338,991	160,900,699	142,688,719	123,799,904
Bottom Longline	7,278,587	4,734,742	4,249,204	10,753,969	7,199,368	2,381,495	2,875,352
Handline	2,029,456	1,162,090	1,384,449	23,201,144	12,821,990	4,154,438	5,985,994
Sink Gillnet	33,552,326	28,087,121	36,058,742	23,574,454	28,933,039	25,186,771	29,308,595
Midwater Trawl (incl. Pair)	250,058,561	124,735,845	186,731,452	110,915,255	157,938,719	114,912,196	106,555,960
Shrimp Trawl	1,369,085	3,104,192	2,634,737	356,845	661,406	1,834,648	2,818,288
Scallop Dredge	43,247,915	45,266,061	52,766,019	9,848,621	14,396,264	14,683,209	14,125,605
Lobster Trap	4,845,280	4,467,043	4,274,235	467,676	2,356,615	2,511,930	3,447,414
All Other	67,884,731	48,740,902	49,434,321	163,423,659	113,151,857	128,839,146	154,071,824
Grand Total	**606,258,318**	**440,087,024**	**513,781,072**	**550,880,614**	**498,359,957**	**437,192,552**	**442,988,936**

Table 69 – Total Revenues by Multispecies Vessels by Gear Used, FY 2001-FY 2007

Gear Type	2001	2002	2003	2004	2005	2006	2007
Bottom Trawl	159,707,220	159,907,512	148,349,751	131,291,504	120,112,958	112,153,218	95,337,271
Bottom Longline	6,902,400	4,857,510	3,975,729	10,780,452	11,770,691	5,578,215	6,270,107
Handline	2,464,483	1,710,137	3,325,285	12,173,621	8,877,416	4,673,652	4,665,844
Sink Gillnet	32,598,537	28,585,146	27,652,098	20,716,466	32,083,345	24,265,770	25,772,266
Midwater Trawl (incl. Pair)	15,140,883	8,287,353	12,794,603	10,104,041	16,401,457	10,463,464	8,744,783
Shrimp Trawl	2,945,162	4,205,916	1,689,778	906,078	186,459	1,186,078	3,286,048
Scallop Dredge	145,774,673	171,670,973	198,494,372	52,225,265	91,194,920	78,817,853	73,713,026
Lobster Trap	12,015,343	11,042,575	10,757,238	1,125,364	11,408,839	10,405,449	13,654,031
All Other	15,477,244	13,579,292	15,221,048	248,163,252	293,091,605	283,872,191	278,343,145
Grand Total	**393,025,947**	**403,846,414**	**422,259,902**	**487,486,042**	**585,127,690**	**531,415,891**	**509,786,521**

Table 70 – Groundfish Landings by Multispecies Vessels by Gear Used, FY 2001-FY 2007

Gear Type	2001	2002	2003	2004	2005	2006	2007
Bottom Trawl	84,308,388	71,063,869	67,531,780	53,405,649	42,809,308	32,340,596	39,031,897
Bottom Longline	2,755,125	1,017,788	1,128,411	2,042,216	1,583,607	135,470	303,335
Handline	1,646,085	758,320	567,999	1,695,734	1,960,885	852,496	868,345
Sink Gillnet	13,460,168	10,390,033	11,656,348	8,844,219	10,448,082	9,275,963	12,815,233
Midwater Trawl (incl. Pair)	0	0	0	770,843	40,625	13,663	11,198
Shrimp Trawl	2,015	1,243	4,001			84	Conf.
Scallop Dredge	341,310	146,469	11,645	55,148	448,987	14,915	48,190
Lobster Trap	11,478	18,279	7,261	19,843	796	50,244	Conf.
All Other	893,724	81,218	116,034	9,130,268	6,007,839	5,285,155	5,565,863
Grand Total	**103,418,293**	**83,477,219**	**81,023,479**	**75,963,920**	**63,300,129**	**47,968,586**	**58,644,061**

Table 71 – Groundfish Revenues by Multispecies Vessels by Gear Used, FY 2001-FY 2007

NEGEAR	2001	2002	2003	2004	2005	2006	2007
Bottom Trawl	80,407,068	80,426,445	67,609,349	47,842,264	48,311,017	43,339,021	42,713,114
Bottom Longline	3,213,920	1,511,030	1,370,218	2,553,701	1,638,912	229,876	448,629
Handline	1,893,450	1,091,279	807,151	2,122,008	2,738,158	1,402,637	1,334,871
Sink Gillnet	11,980,657	11,952,152	10,887,616	8,037,747	10,607,098	9,633,514	11,996,375
Midwater Trawl (incl. Pair)	0	0	0	837,476	34,894	22,529	14,679
Shrimp Trawl	3,022	1,062	6,616			140	Conf.
Scallop Dredge	292,846	140,308	11,840	68,002	345,663	20,301	78,255
Lobster Trap	10,076	18,289	8,778	26,497	1,365	34,148	Conf.
All Other	836,254	120,870	113,232	8,541,822	7,425,834	7,350,486	7,658,021
Grand Total	**98,637,293**	**95,261,434**	**80,814,800**	**70,029,516**	**71,102,940**	**62,032,652**	**64,243,943**

6.2.3.3.4 Landings and Revenues by Home Port State

Data Caveats

Home Port vs. Principal Port

In order to examine dependence on the groundfish fishery by state, the number of vessels and their associated landings and revenues are reported primarily by home port state. Home port state is indicated on the permit and represents the state in which the associated vessel resides. Principal port is also indicated on the permit and represents the state in which the associated vessel reports the majority of its landings. This is declared by the permit holder. Principal port and home port may be one and the same or may differ. For example, a vessel which obtained its permit in Stonington, Connecticut may land its catch in Point Judith, Rhode Island. In this case, the home port state is Connecticut while the principal port state is Rhode Island. Principal port may also differ from principal port of *landing*, which is determined based on the actual port in which the vessel landed the majority of its catch over the year, as determined solely from dealer records. For example, a vessel may declare a principal port of Portsmouth, New Hampshire with the intention of landing the majority of its annual catch there but actually land a greater percentage of its catch in Gloucester, Massachusetts within a given fishing year. Principal port is not discussed in the Affected Human Environment of Amendment 16. However, where home port was not reported or documented incorrectly, principal port state replaced home port state. The majority of the permits were associated with a true home port.

"Other" States

States in which the number of vessels made up less than 1% of the total number in each fishing year from FY 2001 to FY 2007 were combined into an "Other" category. The landings associated with these states are very low.

Landings and Revenues by Home Port State

Total and groundfish landings were highest for Massachusetts vessels in all years from FY 2001 to FY 2007. Massachusetts landings declined from FY 2001 to FY 2002, reached a small peak in FY 2004, and decreased through FY 2006, and rose slightly in FY 2007. Total Massachusetts landings decreased 26% from FY 2001 to FY 2006. Rhode Island, New Jersey, and Maine contributed the next highest total landings during this period. For vessels with home ports in Rhode Island, landings decreased 49.5% from FY 2001 to FY 2002, then increased 12.5% in FY 2003 and stayed roughly constant through FY 2006 before dropping again in FY 2007. Total landings by New Jersey vessels decreased 20.2% from FY 2001 to FY 2002, increased 9.4% in FY 2003, and then decreased steadily through FY 2006 and rose slightly in FY 2007. In Maine, landings decreased steadily from FY 2001 to FY 2006, with a 36% decrease in landings in those years, and increased slightly in FY 2007.

Massachusetts groundfish landings decreased steadily from FY 2001 to FY 2007, with FY 2006 levels at 45% of FY 2001 levels. Groundfish landings in Maine decreased 24% between FY 2001 and FY 2002, and then remained relatively constant through FY 2005 before decreasing again in FY 2006 to 56% of FY 2001 levels. Rhode Island made up the third highest percentage of the total groundfish landings in FY 2001-FY 2006, with New Hampshire having slightly more landings in FY 2007. New Hampshire groundfish landings remained relatively constant after decreasing between FY 2001 and FY 2002, while Rhode Island landings stayed constant from FY 2001 until FY 2003 and then declined steadily each year thereafter. In FY 2006, New Hampshire and Rhode Island landed 57% and 50% of their FY 2001 groundfish catch, respectively.

Groundfish landings in all other states generally decreased except Connecticut, which fluctuated, and New Jersey, which dropped 41% from FY 2001 to FY 2002 and stayed more constant than most states thereafter. Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut all saw increases in groundfish landings between FY 2006 and FY 2007.

For the most part, changes in total revenues did not closely reflect landings trends and have fluctuated, increased, or stayed roughly constant in all states. Groundfish revenues, however, decreased from FY 2001-FY 2006 in nearly every state except Connecticut, which fluctuated greatly. Groundfish revenue in Maine, New Hampshire, Massachusetts and Connecticut increased in FY 2007 from FY 2006 levels. Massachusetts, Rhode Island, New Jersey and Maine generated the greatest *total* revenues from FY 2001 to FY 2007 while Massachusetts, Maine, New Hampshire and Rhode Island generated greatest *groundfish* revenues in those years. Permitted multispecies vessels with home ports in some southern New England and mid-Atlantic states, though contributing a high percentage of landings to the total, are less active than Maine and New Hampshire vessels in the groundfish fishery. Those states may be more dependent on non-groundfish fisheries such as scup, squid, mackerel and butterfish. Maine and Massachusetts, however, clearly are the largest stakeholders in the New England groundfish fishery with highest groundfish landings and revenues in FY 2001 through FY 2007.

In examining groundfish revenues as a percentage of total revenues, however, Maine fisheries are most heavily dependent on groundfish, with groundfish revenues making up 35% of total revenues in FY 2006. The dependence of multispecies vessels from New Hampshire on groundfish as a percent of total fishery revenues was second to that of Maine vessels, with 19% of the revenues coming from groundfish. Massachusetts and Rhode Island each had 16% of revenues being created by the groundfish fishery. It is important to note that although the home ports of these vessels are associated with certain states, these are not necessarily the states in which the vessels are landing their catches. Instead, examining fishing activity by home port state is a means of predicting where the revenue streams are moving geographically.

Summary

Total and groundfish landings were highest for Massachusetts vessels in all years from FY 2001 to FY 2007. Landings in Massachusetts, Rhode Island, and New Jersey, three of the four highest contributing states to total landings, generally declined from about FY 2001 to around FY 2003, increased slightly or stayed constant, declined again through FY 2006, and increased in FY 2007. Maine, the other state with the greatest contribution to total landings, saw a steady decrease in those landings from FY 2001 to FY 2006, and a slight increase in FY 2007. Massachusetts and Rhode Island groundfish landings decreased fairly steadily from FY 2001 to FY 2006, with Massachusetts increasing in FY 2007. New Hampshire and Maine groundfish landings also saw decreases, but mixed with periods of constancy. Groundfish landings also generally decreased each year in all other states except New Jersey (which decreased through FY 2002 and then remained constant) and Connecticut, which fluctuated.

For the most part, changes in revenues do not reflect landings trends and have generally fluctuated, increased, or stayed roughly constant in all states. Groundfish revenues, however, decreased in nearly every state except Connecticut, which fluctuated greatly, through FY 2006 and rose slightly in several states in FY 2007. Maine fisheries are most heavily dependent on groundfish, followed by New Hampshire fisheries.

In general, all of the New England states increased their use of allocated DAS. Active vessels in Maine, New Hampshire, and, in recent years, Massachusetts have used a higher percentage of allocated DAS than vessels in other states since FY 2001. Active vessels in New York and New Jersey have used a lower percentage of allocated DAS than vessels in other states since FY 2001.

Table 72 – Total landings of multispecies vessels by home port state, FY 2001-FY 2007

Home Port State	2001	2002	2003	2004	2005	2006	2007
ME	78,724,996	59,323,936	57,293,476	54,335,286	53,307,720	50,063,714	54,070,207
NH	13,367,647	5,642,063	12,581,323	40,061,562	27,599,192	14,189,368	21,726,043
MA	283,227,205	198,514,601	255,231,528	266,992,307	240,251,664	208,220,796	210,129,498
RI	75,348,434	38,070,333	43,504,270	45,785,822	46,260,462	47,737,012	43,897,683
CT	363,090	439,728	1,436,588	1,828,590	2,483,749	1,598,696	2,487,205
NY	30,724,670	27,716,785	26,217,127	22,378,153	18,671,348	18,133,476	19,148,734
NJ	88,004,781	70,218,101	77,464,613	74,989,884	73,607,227	63,994,508	64,853,141
DE	1,263,676	885,613	973,135	1,221,721	1,381,627	1,291,219	786,599
MD	1,124,305	1,109,931	911,642	1,090,051	1,091,078	1,085,870	1,122,030
VA	11,467,791	11,450,314	11,345,162	11,748,455	7,476,507	8,569,082	7,721,828
NC	19,079,500	23,031,633	22,944,851	26,319,436	22,513,372	19,574,812	15,158,525
FL	507,722	531,941	569,839	699,280	531,931	613,777	606,366
Other	3,054,501	3,152,045	3,307,518	3,430,067	3,184,080	2,120,222	1,281,077
Grand Total	**606,258,318**	**440,087,024**	**513,781,072**	**550,880,614**	**498,359,957**	**437,192,552**	**442,988,936**

Table 73 – Groundfish landings by multispecies vessels by home port state, FY 2001-FY 2007

Home Port State	2001	2002	2003	2004	2005	2006	2007
ME	15,319,317	11,649,857	12,854,761	12,015,318	11,531,491	8,544,873	11,206,799
NH	4,712,053	3,313,107	3,445,717	3,262,416	3,065,318	2,679,237	3,915,885
MA	67,392,307	54,942,388	50,527,509	49,674,945	39,614,736	30,536,323	37,530,105
RI	7,239,855	7,225,382	7,596,776	6,101,959	5,294,117	3,622,723	3,564,536
CT	115,152	206,295	205,084	164,476	96,101	159,799	189,617
NY	4,199,723	3,589,125	3,373,185	1,722,828	1,315,533	1,000,326	959,129
NJ	854,198	502,831	658,452	681,537	599,701	556,646	518,097
DE	795,924	510,232	520,868	738,535	669,252	456,846	383,076
MD	2,115	2,437	423	459	39	439	Conf.
VA	847,588	149,890	271,458	166	343		16,938
NC	1,254,276	866,766	1,010,968	1,356,422	1,113,498	411,144	359,947
FL		Conf.	Conf.				
Other	2,057,355	1,554,819	1,674,084	734,577	0	Conf.	0
Grand Total	**104,789,863**	**84,513,129**	**82,139,285**	**76,453,638**	**63,300,129**	**47,968,356**	**58,644,129**

Table 74 - Total revenues by multispecies vessels by home port state, FY 2001-FY 2007

Home Port State	2001	2002	2003	2004	2005	2006	2007
ME	26,626,551	24,710,117	23,252,319	24,778,275	29,174,304	26,237,018	28,500,653
NH	8,428,811	7,087,426	6,097,642	9,159,192	18,301,880	13,349,220	14,907,755
MA	195,349,374	204,157,832	203,395,819	225,750,058	276,523,602	253,381,480	241,560,702
RI	30,777,543	28,525,346	31,448,563	30,242,667	33,294,134	34,836,424	28,625,153
CT	611,048	730,789	2,994,566	5,065,869	7,016,385	4,821,562	5,862,407
NY	26,398,229	25,128,722	23,437,366	20,882,126	23,132,279	21,249,142	17,476,226
NJ	44,292,729	47,745,282	57,987,717	77,069,709	98,205,867	91,877,333	96,093,461
DE							947,335
MD	980,287	898,948	861,623	1,066,747	2,816,776	2,404,277	1,731,485
VA	30,649,471	32,985,010	35,855,793	44,616,140	42,132,583	34,936,780	28,942,471
NC	20,069,579	24,660,941	28,587,578	36,901,254	43,366,772	37,128,899	36,891,040
FL	1,576,335	1,933,314	2,103,079	3,281,641	3,525,639	3,171,669	3,069,369
Other	5,989,691	4,245,209	5,066,585	7,204,746	5,709,251	6,426,242	5,178,464
Grand Total	**391,749,648**	**402,808,936**	**421,088,649**	**486,018,426**	**583,199,472**	**529,820,046**	**509,786,521**

Table 75 – Groundfish revenues by multispecies vessels by home port state, FY 2001-FY 2007

Home Port State	2001	2002	2003	2004	2005	2006	2007
ME	14,080,005	12,309,933	11,464,247	10,620,918	12,035,740	9,302,543	10,171,625
NH	4,343,507	3,715,925	3,318,173	3,205,983	3,086,101	2,542,924	3,508,104
MA	65,020,184	64,152,683	52,129,610	47,096,109	46,217,349	40,920,743	42,524,732
RI	6,971,015	8,150,757	7,457,243	4,790,717	5,586,243	5,455,708	4,841,772
CT	99,883	214,561	229,002	161,469	89,676	266,773	281,002
NY	4,066,979	4,120,634	3,352,344	1,594,984	1,632,795	1,490,096	1,282,824
NJ	708,091	511,135	719,633	686,845	634,854	872,590	807,000
DE	792,687	550,411	531,387	732,081	797,839	563,008	328,244
MD	2,415	2,864	160	443	15	1,029	Conf.
VA	833,612	209,756	246,452	116	203	0	31,984
NC	1,108,424	851,153	888,326	914,520	1,022,124	616,975	466,700
FL		Conf.	Conf.	0	0	0	0
Other	610,491	470,625	478,117	225,332	0	Conf.	0
Grand Total	98,637,293	95,260,436	80,814,694	69,388,232	71,102,940	62,032,388	63,745,304

6.2.3.3.5 Landings and Revenues by Port Group

Amendment 13 identified port groups that participated in the groundfish fishery and described changes in landings and revenues over time for those port groups. This section updates that information for the period FY 2001 – FY 2007. Amendment 13 was adopted in FY 2004, and FW 42 in the middle of FY 2007. These data reflect landings in a port group by vessels with a multispecies permit, regardless of the homeport state of the vessel that landed the catch. It does not include landings of groundfish by vessels that did not have a groundfish permit (primarily state registered and permitted vessels fishing in state waters).

New Bedford/Fairhaven is the port group with the largest total landings and total revenues, driven by the scallop fishery. In FY 2001, New Bedford/Fairhaven led all port groups in groundfish landings and revenues, followed by Lower Midcoast Maine (which includes Portland, ME), and

Gloucester and the North Shore of Massachusetts. By FY 2004, Gloucester and the North Shore had surpassed Lower Midcoast Maine, but New Bedford/Fairhaven remained the top groundfish port. This changed in FY 2006, when Gloucester and the North Shore and New Bedford/Fairhaven were essentially equal. In FY 2007, Gloucester and the North Shore replaced New Bedford/Fairhaven as the leading groundfish port and Boston edged Lower Midcoast Maine as the third larges port. All four of these ports showed an increase in groundfish revenues (in constant 1999 dollars) from FY 2006 to FY 2007. Groundfish revenues for Gloucester and the North Shore (+26%) and Boston MA (+52%) increased in FY 2004 compared to FY 2007, while those in New Bedford/Fairhaven (-23%) and Lower Midcoast Maine (-45%) declined. Of the four leading ports, Gloucester and the North Shore and Boston saw an increase in groundfish revenues in FY 2007 compared to FY 2001.

For smaller groundfish ports the changes are mixed. FY 2007 revenues were lower than FY 2004 revenues in Southern Maine (-65%), Upper Midcoast Maine (-67%), Coastal New Hampshire (-33%) and the Cape and Islands (-21%). They were higher for Downeast Maine, Coastal Rhode Island (+70%), Long Island (+94%), and Northern Coastal New Jersey (+36%).

Overall, seventy-eight percent of groundfish revenues were landed in Massachusetts port groups in FY 2007, compared to seventy-two percent in FY 2004 and FY 2001. Twenty-nine percent were landed in Gloucester and the North Shore, compared to nineteen percent in FY 2001. The changes since FY 2001 reflect a shift in groundfish landings to the Gloucester and North Shore area, and away from New Bedford/Fairhaven and Lower Midcoast Maine. The declines in the latter two ports may be due to a combination of reduced opportunities to target offshore stocks as regulations restricted landings of GB yellowtail flounder, GB cod, GB winter flounder, and SNE/MA yellowtail flounder, as well as increased costs for fishing in certain areas. These increased costs are both monetary (e.g. fuel and other expenses) and regulatory, as some areas became subject to differential DAS beginning in FY 2006.

Table 76 – Total landings by multispecies vessels by landing state, FY 2001-FY 2007

Landing State	Port Group	2001	2002	2003	2004	2005	2006	2007
ME	Downeast ME	607,957	512,139	1,370,037	1,274,174	999,460	834,302	1,858,545
	Lower Midcoast ME	86,291,510	48,763,435	57,138,362	45,978,105	38,458,095	39,418,323	27,954,654
	Southern ME	409,035	424,372	374,822	931,542	695,755	1,231,166	1,177,854
	Upper Midcoast ME	45,475,509	20,846,839	21,739,636	33,528,959	21,042,891	36,338,043	35,614,097
ME Total		132,784,011	70,546,785	80,622,857	81,712,780	61,196,201	77,870,961	68,638,751
NH	Coastal NH	13,944,028	18,220,967	23,343,645	19,849,330	18,297,245	9,088,603	7,940,577
MA	Boston & South Shore	10,456,302	9,540,137	8,317,949	6,839,322	7,855,272	7,740,693	10,286,150
	Cape & Islands	18,744,749	14,965,246	12,666,623	40,818,905	12,819,653	11,029,049	11,433,592
	Gloucester & North Shore	114,314,736	55,069,635	98,413,636	74,246,256	115,774,868	90,244,680	84,519,555
	New Bedford Coast	81,867,937	82,353,878	101,154,939	128,434,197	110,614,144	90,501,567	107,137,964
MA Total		225,495,383	161,946,593	220,635,534	250,340,211	247,063,937	199,524,840	213,377,261
RI	Coastal RI	79,009,995	49,433,268	50,983,080	46,635,969	51,379,551	52,422,454	42,639,491
RI Total		79,009,995	49,547,268	51,633,902	46,921,181	51,725,779	52,473,648	42,737,257
CT	Coastal CT		147,133	1,327,493	1,902,366	3,397,472	1,392,442	1,271,979
CT Total			147,133	1,327,493	1,902,366	3,397,472	1,392,442	1,271,979
NY	Long Island	22,558,582	20,447,040	18,375,148	16,475,538	13,402,603	14,972,980	15,148,057
NY Total		22,575,236	20,451,462	18,380,795	17,246,399	13,977,386	15,074,856	15,576,195
NJ	Northern Coastal NJ	24,017,723	22,609,450	19,766,855	19,487,126	19,236,557	20,574,777	19,021,190
	Southern Coastal NJ	49,755,926	55,551,760	61,286,494	76,677,688	56,524,469	36,338,991	51,890,087
NJ Total		75,069,695	78,387,448	81,065,938	96,171,896	75,761,026	56,916,429	70,936,472
All Other		40,634,389	23,733,957	16,716,456	15,122,632	14,091,326	12,151,416	22,510,444
Total		**606,258,318**	**440,087,024**	**513,781,072**	**550,880,614**	**498,359,957**	**437,192,552**	**442,988,936**

Table 77 – Groundfish landings by multispecies vessels by landing state, FY 2001-FY 2007

Landing State	Port Group	2001	2002	2003	2004	2005	2006	2007
ME	Downeast ME	Conf.	Conf.	0	0	2,815	1,780	3,191
	Lower Midcoast ME	18,548,510	14,065,240	13,844,756	13,757,184	11,345,929	6,878,560	7,247,383
	Southern ME	360,248	261,089	299,639	554,850	456,484	271,646	223,246
	Upper Midcoast ME	1,776,235	1,495,340	1,453,711	645,998	607,614	50,527	148,784
ME Total		20,684,993	15,821,669	15,598,106	14,958,032	12,412,842	7,204,272	7,622,604
NH	Coastal NH	3,881,879	2,625,237	2,926,183	3,441,705	3,234,133	3,166,754	2,805,957
NH Total		3,881,879	2,625,237	2,926,183	3,441,705	3,234,133	3,166,754	2,824,558
MA	Boston & South Shore	5,974,231	5,907,806	5,650,258	4,969,629	4,968,219	4,331,004	7,930,363
	Cape & Islands	8,140,487	4,992,069	4,346,465	3,736,423	3,434,335	1,959,291	2,602,267
	Gloucester & North Shore	18,390,780	15,808,691	16,777,975	14,049,048	14,803,716	13,979,388	19,043,016
	New Bedford Coast	40,733,040	34,236,222	31,697,104	31,340,361	21,873,408	13,953,838	15,150,462
MA Total		73,333,041	60,953,767	58,471,802	54,095,461	45,079,678	34,223,521	44,726,108
RI	Coastal RI	3,582,482	3,224,566	2,859,158	2,546,180	1,873,226	2,295,496	2,512,394
RI Total		3,582,482	3,224,566	2,859,158	2,546,180	1,873,226	2,295,782	2,512,394
CT	Coastal CT			6,003	127,971	74,860	69,453	34,238
CT Total				6,003	127,971	74,860	69,453	34,238
NY	Long Island NY	1,319,273	584,058	658,362	347,996	321,838	552,296	496,455
NY Total		1,319,373	585,804	658,362	349,106	324,928	552,296	496,455
NJ	Northern Coastal NJ	578,599	262,028	498,746	432,743	296,348	450,506	423,069
	Southern Coastal NJ	5,217	2,238	1,278	2,691	1,437	4,406	3,669
NJ Total		584,016	264,266	500,024	435,434	297,785	454,912	426,738
All Other		3,601	1,620	3,841	10,031	2,677	1,596	3,046,756
Grand Total		**103,389,385**	**83,476,929**	**81,023,479**	**75,963,920**	**63,300,129**	**47,968,586**	**58,644,172**

Table 78 – Total revenue by multispecies vessels by landing state, FY 2001-FY 2007

Landing State	Port Group	2001	2002	2003	2004	2005	2006	2007
ME	Downeast ME	1,841,756	1,861,686	1,565,858	1,099,357	1,790,079	1,641,812	2,602,007
	Lower Midcoast ME	26,960,777	24,214,776	21,468,003	20,573,299	18,494,977	14,121,435	11,371,640
	Southern ME	363,648	463,259	356,085	883,076	802,925	1,520,904	1,150,217
	Upper Midcoast ME	5,531,333	3,988,340	3,648,877	3,510,311	4,087,171	5,144,139	6,097,392
ME Total		34,697,513	30,528,060	27,038,823	26,066,043	25,175,153	22,443,685	21,728,031
NH	Coastal NH	7,947,105	7,030,472	5,722,055	7,367,827	16,241,046	12,660,016	12,172,296
NH Total		7,947,105	7,030,472	5,722,055	7,367,827	16,241,046	12,660,016	12,191,413
MA	Boston & South Shore	8,784,135	10,806,196	9,205,128	8,085,309	11,386,626	12,473,823	13,801,858
	Cape & Islands	19,566,974	16,027,211	15,035,559	12,703,283	22,963,765	17,506,442	15,175,811
	Gloucester & North Shore	31,318,638	27,533,121	30,353,512	24,917,816	38,421,389	34,745,884	35,213,714
	New Bedford Coast	137,369,392	153,726,636	155,861,625	189,719,996	243,432,295	236,939,514	219,970,264
MA Total		197,174,488	208,147,476	210,513,640	235,436,029	316,204,075	301,703,155	284,161,648
RI	Coastal RI	33,069,263	29,055,085	30,485,588	31,455,781	43,545,682	48,685,053	32,197,558
RI Total		33,069,263	29,065,109	30,523,314	31,487,802	43,590,727	48,776,388	32,417,630
CT	Coastal CT		14,839	1,817,751	4,340,438	6,300,880	3,328,720	3,168,412
CT Total			14,839	1,817,751	4,340,438	6,300,880	3,328,720	3,168,412
NY	Long Island	18,951,602	17,191,381	15,872,243	15,161,391	17,015,234	17,660,874	15,477,766
NY Total		18,963,405	17,196,949	15,877,382	15,646,073	17,384,383	17,719,525	15,724,025
NJ	Northern Coastal NJ	23,185,875	24,435,522	26,241,720	30,143,180	39,263,607	34,010,437	34,029,971
	Southern Coastal NJ	26,453,501	28,914,474	37,040,064	56,660,451	52,831,196	37,081,284	52,103,173
NJ Total		50,531,813	53,566,294	63,299,858	86,808,275	92,094,803	71,105,798	86,266,281
All Other		50,642,359	58,297,215	67,467,079	80,333,554	68,136,624	53,678,604	54,129,082
Grand Total		**393,025,947**	**403,846,414**	**422,259,902**	**487,486,042**	**585,127,690**	**531,415,891**	**509,786,521**

Table 79 – Groundfish revenues by multispecies vessels by landing state, FY 2001-FY 2007

Landing State	Port Group	2001	2002	2003	2004	2005	2006	2007
ME	Downeast ME	Conf.	Conf.			11,443	7,640	13,113
	Lower Midcoast ME	17,072,559	14,930,932	12,514,645	12,248,116	11,724,020	7,714,260	6,730,880
	Southern ME	316,120	291,448	259,009	580,519	452,935	310,299	205,649
	Upper Midcoast ME	1,534,707	1,544,064	1,315,051	545,995	677,830	66,618	181,213
ME Total		18,923,386	16,766,444	14,088,704	13,374,630	12,866,229	8,102,478	7,130,854
NH	Coastal NH	3,673,222	3,131,381	2,826,691	3,373,548	3,134,910	2,662,336	2,268,581
NH Total		3,673,222	3,131,381	2,826,691	3,373,548	3,134,910	2,662,336	2,280,575
MA	Boston & South Shore	5,892,094	7,126,012	6,326,092	5,236,242	5,950,222	5,939,630	7,945,214
	Cape & Islands	8,333,913	6,434,570	4,919,719	4,554,852	4,692,072	2,971,938	3,604,305
	Gloucester & North Shore	18,324,684	18,678,838	18,002,399	14,678,112	17,186,493	16,474,988	18,424,213
	New Bedford Coast	38,358,940	38,389,226	30,448,335	25,722,575	24,001,568	20,526,038	19,828,780
MA Total		71,013,353	70,644,631	59,696,545	50,191,781	51,830,356	45,912,593	49,802,512
RI	Coastal RI	3,299,551	3,703,841	2,871,007	2,087,821	2,338,379	3,698,120	3,550,362
RI Total		3,299,551	3,703,841	2,871,007	2,087,821	2,338,379	3,698,460	3,550,362
CT	Coastal CT			5,029	105,846	77,576	112,854	58,504
CT Total				5,029	105,846	77,576	112,854	58,504
NY	Long Island	1,214,417	696,270	739,255	373,996	439,623	810,574	726,750
NY Total		1,214,608	697,880	739,255	374,742	440,875	810,574	726,750
NJ	Northern Coastal NJ	485,725	313,869	584,559	507,672	411,796	725,035	690,755
	Southern Coastal NJ	2,172	1,971	1,270	3,243	1,314	6,804	3,215
NJ Total		487,989	315,840	585,828	510,915	413,110	731,839	693,970
All Other		1,474	1,131	1,740	10,235	1,504	1,517	541
Grand Total		**98,613,583**	**95,261,148**	**80,814,800**	**70,029,516**	**71,102,940**	**62,032,652**	**64,244,069**

6.2.3.3.6 Landings and Revenues for Primary Fishing Ports

Amendment 13 identified eight primary groundfish ports (see section 6.5.5). This section summarizes recent activity in those ports. All ports, except Boston and Eastern Long Island, experienced a decline in the number of vessels with groundfish permits that landed regulated groundfish. The largest decline was in Portsmouth, which experienced a 54 percent decline in the number of permitted vessels landing regulated groundfish. Chatham/Harwichport experienced the second largest decline, 49 percent, over this period. Gloucester and New Bedford/Fairhaven, two other large ports, respectively experienced an 18 percent and a 9 percent decline.

Most ports experienced a decline in total landings between FY 2001 and FY 2007, with New Bedford and Boston the sole exceptions. Boston, New Bedford/Fairhaven, and Gloucester saw an increase in total revenues, while all other ports experienced a decline. Groundfish landings increased in Gloucester and Boston, and declined in all other ports. Groundfish landings declined 59 percent in Portland and 63 percent in New Bedford/Fairhaven, and increased 10 percent in Gloucester. Landings declined 70 percent in Chatham/Harwichport.

Table 80 – Number of vessels landing groundfish by port, FY 2004-FY 2007

Port	2004	2005	2006	2007
Portland ME	111	109	94	75
Portsmouth NH	41	25	27	19
Gloucester MA	202	203	168	166
Boston MA	24	29	24	32
Chatham/Harwichport MA	116	96	71	59
New Bedford/Fairhaven MA	182	158	153	165
Pt Judith RI	78	75	74	76
Eastern Long Island NY	69	62	79	74

Table 81 – Total landings of multispecies vessels by landing port, FY 2001-FY 2007

Port	2001	2002	2003	2004	2005	2006	2007
Portland ME	75,554,441	46,867,048	56,192,626	44,330,373	37,095,011	37,078,662	26,230,582
Portsmouth NH	4,290,244	2,639,830	5,447,754	3,622,453	2,740,709	2,543,267	1,174,551
Gloucester MA	112,723,002	53,717,051	97,359,033	73,215,332	115,101,665	89,449,904	83,743,114
Boston MA	7,835,595	6,245,445	5,619,980	5,449,678	5,972,573	5,851,506	8,264,696
Chatham/Harwichport MA	11,284,149	7,675,769	8,832,267	7,244,056	7,643,926	7,070,652	7,368,030
New Bedford/Fairhaven MA	80,549,608	81,598,357	99,595,979	109,957,181	93,618,200	79,529,725	100,390,066
Pt Judith RI	35,696,124	37,656,523	38,237,745	33,777,861	37,323,069	37,173,851	30,102,612
Eastern Long Island NY	20,953,207	18,458,011	16,745,447	14,291,397	11,646,338	13,429,984	13,985,621
Grand Total	**348,886,370**	**254,858,034**	**328,030,831**	**291,888,331**	**311,141,491**	**272,127,551**	**271,259,272**

Table 82 – Groundfish landings by multispecies vessels by landing port, FY 2001-FY 2007

Port	2001	2002	2003	2004	2005	2006	2007
Portland ME	17,127,475	13,120,369	13,248,132	13,336,041	10,916,605	6,424,222	7,022,856
Portsmouth NH	2,292,399	1,249,678	1,574,926	1,604,137	1,162,945	1,243,795	539,957
Gloucester MA	16,995,463	14,766,480	15,911,942	13,755,265	14,612,245	13,811,580	18,852,948
Boston MA	4,179,936	4,023,466	3,614,632	3,846,639	3,777,135	3,440,531	6,876,819
Chatham/Harwichport	6,568,867	3,621,805	3,385,319	2,742,502	2,719,987	1,547,488	1,950,982
New Bedford/Fairhaven MA	40,730,450	34,234,312	31,693,078	31,339,886	21,862,612	13,943,843	15,150,104
Pt Judith RI	2,206,179	1,863,781	1,602,789	1,685,393	1,322,237	1,895,221	1,988,119
Eastern Long Island NY	1,163,630	546,352	615,226	337,261	291,363	492,911	456,849
Grand Total	**91,264,399**	**73,426,243**	**71,646,044**	**68,647,124**	**56,665,129**	**42,799,591**	**52,838,634**

Table 83 – Total revenues by multispecies vessels by landing port, FY 2001-FY 2007

Port	2001	2002	2003	2004	2005	2006	2007
Portland ME	24,492,427	22,408,828	20,431,170	19,590,657	17,342,076	12,964,153	10,119,019
Portsmouth NH	4,344,821	3,438,192	2,599,265	3,341,081	2,868,611	2,590,482	1,593,287
Gloucester MA	29,682,600	25,628,287	28,947,402	24,260,338	36,273,126	32,342,134	33,083,655
Boston MA	6,161,983	7,261,531	5,990,071	6,406,083	7,559,978	7,869,313	8,860,509
Chatham/Harwichport MA	9,196,598	6,974,961	7,523,908	7,536,609	10,559,562	8,859,087	8,413,117
New Bedford/Fairhaven MA	135,473,081	152,728,842	154,473,400	185,918,232	228,493,307	222,152,859	216,125,108
Pt Judith RI	21,622,547	20,459,470	21,103,854	22,396,590	26,501,537	29,538,487	20,867,699
Eastern Long Island NY	17,519,661	15,704,263	14,462,531	13,571,759	15,217,042	15,991,848	13,906,444
Grand Total	**248,493,718**	**254,604,374**	**255,531,602**	**283,021,349**	**344,815,238**	**332,308,363**	**312,968,838**

Table 84 – Groundfish revenues by multispecies vessels by landing port, FY 2001-FY 2007

Port	2001	2002	2003	2004	2005	2006	2007
Portland ME	15,831,973	13,949,319	11,940,738	11,833,754	11,333,926	7,372,058	6,562,637
Portsmouth NH	1,954,723	1,287,453	1,272,101	1,372,199	993,292	938,511	363,121
Gloucester MA	16,909,239	17,328,174	16,926,894	14,306,231	16,904,699	16,218,901	18,159,498
Boston MA	4,213,026	4,861,423	3,854,806	3,947,175	4,308,760	4,479,993	6,363,534
Chatham/Harwichport MA	6,827,926	4,812,280	3,803,943	3,422,921	3,836,214	2,289,157	2,583,334
New Bedford/Fairhaven MA	38,355,882	38,386,869	30,446,143	25,722,137	23,984,942	20,509,976	19,828,362
Pt Judith RI	2,053,878	2,154,229	1,696,455	1,425,630	1,718,495	3,062,600	2,890,548
Eastern Long Island NY	1,082,762	657,188	696,782	363,029	391,002	714,862	657,784
Grand Total	**87,229,410**	**83,436,935**	**70,637,862**	**62,393,076**	**63,471,329**	**55,586,058**	**57,408,818**

6.2.3.4 Vessel Trip Costs

The NMFS observer program collects cost information on selected observed trips. Data were queried to provide information on variable trip costs in recent fishing years. A value per day absent was calculated for each trip and then an annual average value determined for the primary groundfish gears. Data for FY 2007 is incomplete and only reflects trips through the beginning of February, 2008. Table 85 provides a summary of these data for trips that reported keeping regulated groundfish. Note that this information does not reflect all vessel costs. In addition to fixed costs that are not reported, costs to lease DAS are not included. Nominal values are shown.

Variable costs on these observed trips increased between FY 2003 and FY 2007 with much of the increase due to increased fuel costs. Total costs per day absent declined slightly for gillnet gear from FY 2005 to FY 2006, and for longline gear between FY 2004 and FY 2006, while costs for trawl gear increased steadily. Using FY 2004 as a base year (implementation of Amendment 13), total costs for gillnet gear increased by 17 percent, for longline gear increased by 11 percent, and for trawl gear increased by 47 percent. Fuel costs per gallon more than doubled for all three gear categories. Examining average fuel costs for FY 2007 indicate that fuel prices climbed steadily through the period observed, from about $2.40/gallon at the beginning of the fishing year to over $3.20/gallon by January. The average price for FY 2007 is likely to be higher than shown here when all data are available. Fuel costs did decline in late 2008, but data are not yet available to determine the magnitude.

Table 85 – Variable costs on observed trips landing regulated groundfish (FY 2007 data incomplete). Data are averages.

Gear	Data	FY 2003	2004	2005	2006	2007
Gillnet	Number of Trips	38	174	184	108	87
	CREW	3	3	3	3	3
	GRTONS	18	20	21	25	18
	BHP	378	337	330	328	302
	STEAMTIM	3.2	2.2	3.0	3.9	2.7
	FOODCOST/DA	$32	$27	$29	$31	$31
	ICECOST/DA	$15	$23	$21	$27	$22
	FUELPRICE/DA	$1.36	$1.57	$2.16	$2.30	$2.68
	FUELCOST/DA	$105	$79	$122	$149	$143
	MISCCOST/DA	$60	$89	$88	$39	$47
	TOTALCOST/DA	$192	$195	$244	$225	$228
Longline	Number of Trips	3	44	45	32	9
	CREW	2	2	2	2	2
	GRTONS	20	16	21	20	18
	BHP	305	356	387	357	422
	STEAMTIM	2.0	3.6	5.5	4.3	5.8
	FOODCOST/DA	$13	$25	$27	$24	$23
	ICECOST/DA	$15	$46	$23	$25	$33
	FUELPRICE/DA	$1.35	$1.82	$2.30	$2.23	$2.94
	FUELCOST/DA	$72	$195	$227	$200	$308
	MISCCOST/DA	$68	$393	$236	$201	$332
	TOTALCOST/DA	$158	$618	$493	$423	$689
Trawl	Number of Trips	78	281	379	257	255
	CREW	3	3	3	3	3
	GRTONS	121	104	90	108	97
	BHP	548	525	482	545	490
	STEAMTIM	9.8	10.0	8.9	10.6	9.1
	FOODCOST/DA	$86	$82	$68	$78	$73
	ICECOST/DA	$105	$78	$87	$86	$82
	FUELPRICE/DA	$1.24	$1.63	$2.11	$2.26	$2.65
	FUELCOST/DA	$419	$541	$601	$769	$795
	MISCCOST/DA	$102	$122	$89	$83	$164
	TOTALCOST/DA	$681	$793	$817	$989	$1,084

6.2.3.5 Category B (regular) Day-at-Sea Program

FW 40A implemented a pilot project which allowed the use of Category B (regular) DAS to target healthy stocks. This program ran for four consecutive quarters, from November 19, 2004 to its termination on October 6, 2005. The program included strict reporting requirements, limits on the incidental catch of unhealthy stocks, and a limit on the total number of DAS used in each quarter. A review of the first three quarters of the program was included in FW 42 (NEFMC 2006). A total of 600 trips were taken in the Category B (regular) DAS pilot program during these three quarters, and 2,021 B (regular) DAS were used. Six species accounted for approximately 85% of the total catch: skates (21%), monkfish (16%), haddock (15%), yellowtail (13%) winter skate (11%) and winter flounder (9%).

FW 42 reauthorized the Category B (regular) DAS program with several notable modifications. The program was revised to encourage its use to target healthy stocks – primarily GB haddock – while minimizing the ability of vessel operators to use the program to target unhealthy stocks. First, vessels fishing in the program using trawl gear were required to use a haddock separator trawl (or other approved gear – no other gear was authorized until FY 2008). These vessels also had to comply with the low landing limits for species that are not expected to be caught in the trawl (flounders, monkfish, lobsters, skates, etc.). Gillnet gear was not subject to the same requirements. Second, FW 40A limited the amount of monkfish that can be retained while using a Category B DAS, essentially eliminating an earlier provision that allowed vessels with a monkfish Category C or D permit to use a Category B DAS while targeting monkfish. Finally, the number of DAS that could be used in the program was reduced to 3,500 DAS. These changes became effective when FW 42 was implemented November 22, 2006.

Analysis of data for the Category B (regular) DAS program requires matching trips across several databases. A small number of trips cannot be matched in this fashion. In order to represent a clearer picture of total activity, the data provided in this following discussion uses estimates of activity (DAS, landings, revenues) based on expanding the data from matched trips to all trips in the program.

Fishing Activity

There were 76 trips in the Category B (regular) DAS program in FY 2006, using about 189 DAS. The number of trips increased to 257 trips in FY 2007, using about 485 DAS, with most of the trips (206) between May and October, 2007. Landing (pounds, live weight) are shown by quarter and fishing year in Table 86. Total landings for the period were 3.8 million pounds (live weight). Skates were the principal species landed, exceeding 1.5 million pounds in FY 2007. The landings data reveal a shift to targeting pollock in FY 2007, with over one million pounds landed. The combination of pollock and skates accounted nearly 85 percent of the landings. Relatively little haddock was landed – only 66 thousand pounds in FY 2007.

Landings and Revenues

Nominal revenues in this program were just under half a million dollars in FY 2006 and increased to 1.1 million dollars in FY 2007 (Table 87). Pollock accounted for 66 percent of the revenues in FY 2006 and 45 percent in FY 2007. Skates were the second largest component of revenues. Haddock and monkfish accounted for about 6 percent of revenues for the entire period. In each of the four quarters, average revenues per DAS charged were in the range of $2,100 to $2,900.

Incidental Catch TACs

FW 42 allocated small amounts of stocks of concern to this program in each quarter. Exceeding these incidental catch TACs would trigger a closure of the program for the remainder of the quarter, regardless of how many DAS were used. Through the six quarters of the program, none of the incidental catch TACs has been exceeded. Indeed, only a fraction of these TACs have been caught. The largest percentage caught was for CC/GOM yellowtail flounder, at 18 percent of the TAC in the first quarter of FY 2007. Fifteen percent of the white hake and GOM cod TACs were caught on two occasions. Less than ten percent of the TAC was caught for all other stocks, in all quarters.

DAS Flipping Rates

In this program, if a vessel operator exceeds the low catch limits for stocks of concern, the operator is supposed to "flip" from a Category B DAS to a Category A DAS. Analyses for FW 42 found that the flipping rates on observed trips in the Pilot Program were lower than on unobserved trips, implying that fishermen were likely to comply with the requirement to flip to a Category A DAS when an observer was not present. This behavior was examined for the reauthorized program.

For this analysis, flipping behavior for 15 observed trips in FY 2006 and 72 observed trips in FY 2007 was compared to 74 unobserved trips in FY 2006 and 204 unobserved trips in FY 2007 (Table 88). There were insufficient observations to perform the analysis by quarter or by year, as was done for FW 42, so the data from the two years was pooled. A likelihood ratio test of the null hypothesis that the flipping rates on observed and unobserved trips were the same could not be rejected. Unlike the analysis for FW 42, flipping behavior between observed and unobserved trips does not appear to be different in FY 2006 and FY 2007 (Table 89).

Table 86 – Landings (lbs., live weight) under the Category B (regular) DAS program, by fishing year and quarter (Source: NMFS dealer, DAS, and VTR databases)

	2006		2007				Total
COMMON NAME	3	4	1	2	3	4	
BLUEFISH			3,542	414			3,956
COD, ATLANTIC	1,282	6,777	3,395	7,049	3,160	6,577	28,240
CUSK	605	2,728	250	1,208	186	2,030	7,008
DOGFISH, SPINY	98		19,042	70			19,210
FLOUNDER, PLAICE, AMERICAN (DAB)	42	1,078	1,137	1,376	335	810	4,778
FLOUNDER, SUMMER (FLUKE)			10				10
FLOUNDER, WINTER		35	209		235	2	481
FLOUNDER, WITCH (GRAY SOLE)	61	782	2,839	1,040	640	997	6,359
FLOUNDER, YELLOWTAIL		18	626	72	22	2	740
GOOSEFISH	8,286	9,195	37,679	23,642	5,479	8,002	92,282
HADDOCK	850	13,036	10,166	21,457	4,229	30,813	80,550
HAKE, ATLANTIC,WHITE	1,516	3,982	1,558	9,878	1,655	2,754	21,342
HAKE, SILVER UNC (WHITING)		1	2			5	8
HALIBUT, ATLANTIC			26	142		56	223
LOBSTER, AMERICAN	424	34	1,880	2,565		297	5,200
OCEAN PERCH, (REDFISH)	2,604	19,407	4,483	49,083	14,073	47,413	137,063
POLLOCK, ATLANTIC	77,230	454,482	62,194	437,530	267,022	256,398	1,554,855
SKATE, SMOOTH			41,524				41,524
SKATE, THORNY	10	45		93			148
SKATE, WINTER	9,075		732,172	152,626	798	203	894,874
SKATES	266,641	58,480	177,755	317,901	86,072		906,850
WOLFFISH, ATLANTIC	8	164	328	281	33	113	926
Grand Total	368,732	570,242	1,100,818	1,026,426	383,939	356,471	3,806,628

Table 87 – Nominal revenues, by species, for landings under the Category B (regular) DAS program

Sum of Estimated Value	Year 2006	Quarter	2007				Grand Total
COMMON NAME	3	4	1	2	3	4	
BLUEFISH			$1,125	$184			$1,309
COD, ATLANTIC	$3,078	$15,902	$4,490	$12,019	$6,116	$12,789	$54,396
CUSK	$579	$2,748	$145	$625	$157	$1,175	$5,429
DOGFISH, SPINY	$25		$4,043	$13			$4,081
FLOUNDER, PLAICE, AMERICAN (DAB)	$90	$2,366	$1,617	$2,257	$560	$1,864	$8,754
FLOUNDER, SUMMER (FLUKE)			$28				$28
FLOUNDER, WINTER		$64	$595		$784	$5	$1,448
FLOUNDER, WITCH (GRAY SOLE)	$265	$2,415	$6,346	$2,790	$1,721	$2,417	$15,954
FLOUNDER, YELLOWTAIL		$28	$818	$40	$42	$4	$932
GOOSEFISH	$12,367	$11,391	$40,025	$27,129	$7,419	$8,464	$106,795
HADDOCK	$1,861	$28,500	$14,235	$27,998	$6,795	$28,009	$107,399
HAKE, ATLANTIC, WHITE	$2,471	$7,521	$1,169	$9,373	$1,875	$5,309	$27,719
HAKE, SILVER UNC (WHITING)		$1	$1			$2	$4
HALIBUT, ATLANTIC			$138	$602		$341	$1,080
LOBSTER, AMERICAN	$1,356	$168	$8,714	$9,428		$1,505	$21,170
OCEAN PERCH, (REDFISH)	$2,378	$14,448	$1,763	$20,437	$9,155	$30,038	$78,218
POLLOCK, ATLANTIC	$55,688	$244,595	$21,045	$191,082	$97,593	$190,800	$800,804
SKATE, SMOOTH			$8,937				$8,937
SKATE, THORNY	$1	$12		$15			$28
SKATE, WINTER	$2,293		$136,897	$28,230	$235	$70	$167,725
SKATES	$67,332	$18,223	$36,655	$64,033	$20,982		$207,224
WOLFFISH,ATLANTIC	$7	$264	$155	$288	$43	$202	$958
Grand Total	$149,793	$348,645	$288,941	$396,543	$153,477	$282,995	$1,620,393

Table 88 - Number of flipped and unflipped B-regular DAS program trips and flipping rates on unobserved and observed trips in fishing years 2006 and 2007, by quarter.

		Trip Count						
		Unobserved Trips			Observed Trips			Grand Total
FY	QTR	No Flip	Flip	Total	No Flip	Flip	Total	
2006	1		3	3		1	1	4
	2					1	1	1
	3	25	2	27	3	1	4	31
	4	41	3	44	9		9	53
2006 Total		66	8	74	12	3	15	89
2007	1	78	3	81	34	1	35	116
	2	72	6	78	23	1	24	102
	3	20	1	21	6		6	27
	4	22	2	24	6	1	7	31
2007 Total		192	12	204	69	3	72	276
Grand Total		258	20	278	81	6	87	365

Note only trips which began on a B DAS

Data Source: DAS Database, VMS Database, and OBSCON data

Table 89 – Results of Pearson Chi-Square and Likelihood ratio test of Cat B (regular) DAS flipping behavior

	Observed Counts				Expected Counts	
	OBSERVED	**UNOBSERVED**	**Total**		**OBSERVED**	**UNOBSERVED**
FLIP	6(1.644%)	20(5.479%)	26(7.123%)	FLIP	6.197	19.803
NOFLIP	81(22.192%)	258(70.685%)	339(92.877%)	NOFLIP	80.803	258.197
Total	**87(23.836%)**	**278(76.164%)**	**365(100.0%)**	**Total**	**87(23.836%)**	**278(76.164%)**

Test Statistic	Value	df	p-value
Pearson Chi-square	0.009	1.000	0.925
Likelihood Ratio Chi-square	0.009	1.000	0.925

6.2.3.6 Haddock Separator Trawl Performance

Two existing programs require the use of specific trawl gear designed to allow targeting haddock while reducing catches of cod, flounders, skates, and other bottom-dwelling species. These programs are the Eastern U.S. /Canada Haddock SAP and the Category B (regular) DAS Program. This action proposes to extend the Eastern U.S./CA Haddock SAP. At present, two trawl configurations are authorized for use: the separator trawl and a trawl called the haddock Ruhle trawl (previously referred to as the rope trawl). There are a limited number of observed trips by vessels using the separator trawl in the commercial fishery which can be used to supplement experimental data on the performance of the trawl, while as of November 2007 there were no observed trips using the Ruhle trawl in the commercial fishery. This section updates and corrects information presented in FW 42. The information in FW 42 incorrectly combined tows that used a separator trawl with those that did not.

The observer (OBDBS) database was queried to identify trawl trips that used a separator panel (excluder device='3') in FY 2004 through November, FY 2007. Additional observed trips may have occurred but were not yet entered into the database when the analyses were completed. Trips were recorded as either U.S./CA area trips or Category B (regular) DAS trips. This designation is made by the observer, and it is possible that they are not exclusive (e.g. a Category B (regular) program trip may occur in the U.S./CA area). Twenty-four trips were coded as U.S./CA area trips, and seventeen were coded as Category B (regular) DAS program trips.

Total catches (kept and discarded) of the top twenty-five species on tows using a separator panel are shown in Table 91. This table includes corrections to data reported in FW 42 and differs from that information. Over the period evaluated, regulated groundfish accounted for sixty-seven percent of the catch, with haddock, pollock, yellowtail flounder, and winter flounder as the four largest regulated groundfish components. Skates (all species) accounted for nearly twenty-six percent of the catch on these tows. Only five percent of the catch was cod. Pollock was a large part of the catch for tows observed in the Gulf of Maine, but not on Georges Bank.

Catches on observed tows using a separator trawl are shown by year in Table 92. From this table it is clear that fishermen began using the gear to target pollock in FY 2006, primarily in the Gulf of Maine. Table 93 shows the observed ratios of haddock to other species. The ratio of haddock to cod has not approached the 20:1 ratio reported by Canadian fishermen and some separator trawl experiments, though it does appear to have improved in FY 2007. The ratios of haddock to flounders, skates, and monkfish - demersal species expected to be released by the net – were low during FY 2004 and FY 2005, but increased in FY 2006 and FY 2007. This may be due to regulations adopted in FY 2006 that only allow landing small quantities of these species when a separator trawl is required. It may also be due to a change in the target species to pollock rather than haddock, as pollock is less likely to be found in areas with yellowtail and winter flounder.

Haddock discards accounted for seventeen percent of the haddock catch (48,799 lbs.), with almost all discards due to the fish being smaller than the regulatory minimum. Most of the haddock discards occurred in FY 2006 and are probably from the 2003 year class. Cod discards accounted for forty-one percent (24,776 lbs.) of the cod catch; sixty percent of these discards were due to a filled vessel quota, twenty percent were due to high grading, and various other reasons were given for the remaining discards. This suggests that the performance of the separator trawl does not limit cod catches to less than the trip limit.

Catch composition on tows using the separator trawl was examined by trip, focusing on regulated groundfish. Thirty-nine of the forty-one trips caught haddock and cod while using a separator trawl, thirty-four caught monkfish, thirty-two caught plaice, twenty-nine trips caught yellowtail or witch flounder, and twenty-seven trips caught winter flounder. The ratio of haddock to cod for the thirty-nine trips ranged from 0:1 to 63.9:1. The ratio of haddock to winter flounder ranged from 0:1 to 159:1, while the ratio of haddock to yellowtail flounder ranged from 0.1:1 to nearly 4,000:1.

There were a total of 585 observed tows that used a separator trawl on these forty-one trips. Over these tows, haddock was caught on 521 tows (eighty-nine percent), cod on 451 tows (eighty-two percent), yellowtail flounder on 325 tows (fifty-five percent), and winter flounder on 295 tows (fifty percent). The average catch per tow, by year, for each of these species is shown in Table 94. A pairwise analysis of variance was used to determine if catches per tow in each fishing year were statistically different. The highest haddock catches were in FY 2004 at 778 lbs./tow, followed by FY 2006 at 528 lbs/tow. FY 2004 was significantly different than FY 2005 and FY 2007. Cod catch per tow was lowest in FY 2007; this value is significantly different than the other three years. Yellowtail flounder catches per tow were lower in FY 2006 and FY 2007; these were significantly different than FY 2005. Winter flounder catches per tow were highest in FY 2005, and this was significantly different than in any of the other three years.

Catch rates are often assumed to bear a relationship to stock size. The decline in the average haddock catch per tow does not seem consistent with the rapid increase in the GB haddock stock. Part of the explanation may be the increased targeting of pollock in recent years. It may also be partly explained by the structure of the GB haddock biomass in recent years. In 2004, there was over 37,000 mt of mean biomass consisting of fish age 5 or older, which increased to nearly 71,000 mt in 2005 before declining to about 33,000 mt 2007. The population has been dominated by the 2003 year class which has been smaller at age than other recent year classes. If this is the case, catch rates for GB haddock while using the separator trawl should increase as the 2003 year class enters older ages.

Over the four year period, there were fourteen observed trips that made tows with and without using the separator panel. Taking a closer look at these trips might reduce some of the variation due to differences between vessels or operators. These trips did not always use both configurations in the same area, and there are too few trips and tows to analyze the information by year or statistical area because of confidentiality concerns. While recognizing that target species may differ between areas and years, the ratios of haddock to cod were examined for this subset of the separator trawl trips. Examining the catches on a trip basis, the ratio of haddock to cod while using a separator trawl was higher on eight trips and lower on six trips; this is not a statistically significant difference when examined using a Fisher's sign test. When catches of cod and haddock are combined over all of these trips the ratio to haddock to cod while using the separator trawl was 3:1. When the panel was not used the ratio was 1.8:1.

Overall, the haddock separator trawl has had mixed results in commercial fishing operations. Gear performance has been variable on observed trips. The ratios of haddock to cod that were expected when this gear was adopted have not been realized. Catches of other demersal species – flounders, skates, monkfish, – have been higher than expected based on experimental results. Still, the separator trawl has reduced catches of these species compared to normal fishing practices and there is evidence that in recent years the ratios of haddock caught to flounders caught has increased.

Table 90 – Observed trips using a separator panel, FY 2004- November, FY 2007. Rows do not add to column total because individual trips may fish in more than one area.

FY	MONTH	AREA										
		464	513	514	515	521	522	525	552	561	562	Total
						US/CA Area						
2004	01										1	1
	03					1				3	3	5
	05										1	1
2005	05						1			5	5	5
	06						1	1			2	3
	07							1		1	1	1
	11				1	1						1
2006	05						1	2			2	3
	06						1	1		1	1	2
	08									1		1
2007	11	1			1					1		1
	Total											24
						Category B (regular) DAS Program						
2004	03					1	1					1
2005	05							1			2	2
	06					2	2	1				2
	07						1					1
	08										1	1
2006	02			2								2
	03	1		2	1		1					2
	08						1					1
2007	05			1		1		1				2
	08		1	1		1						1
	09	1			1							1
	10			1								1
	Total											17

Table 91 – Catches (pounds, live weight, kept and discarded) by statistical area on observed tows using a haddock separator trawl, FY 2004 – November, FY 2007. Only top twenty-five species caught are shown.

Name	GOM	GB	Total
HADDOCK	2,182	282,739	284,921
POLLOCK	172,563	15,301	187,863
SKATE, NK	4	108,942	108,946
FLOUNDER, YELLOWTAIL	2	90,342	90,345
SKATE, WINTER (BIG)	40	87,384	87,424
SKATE, LITTLE	10	81,519	81,529
FLOUNDER, WINTER (BLACKBACK)	15	72,776	72,791
COD, ATLANTIC	1,429	59,040	60,469
MONKFISH (ANGLER, GOOSEFISH)	3,359	41,616	44,975
FLOUNDER, WITCH (GREY SOLE)	432	21,436	21,868
FLOUNDER, AMERICAN PLAICE	554	18,519	19,073
LOBSTER, AMERICAN	881	14,716	15,597
REDFISH, NK (OCEAN PERCH)	12,661	1,284	13,945
SKATE, BARNDOOR	37	12,807	12,844
DOGFISH, SPINY	658	7,826	8,484
FLOUNDER, SAND DAB (WINDOWPANE)	0	6,965	6,965
RAVEN, SEA	15	5,647	5,662
SCALLOP, SEA	0	3,742	3,742
HAKE, WHITE	952	2,773	3,725
FLOUNDER, SUMMER (FLUKE)	0	2,561	2,561
OCEAN POUT	0	2,305	2,305
FLOUNDER, FOURSPOT	18	2,084	2,101
SEAWEED, NK	0	1,057	1,057
SKATE, SMOOTH	111	835	945
STARFISH, SEASTAR,NK	0	791	791
Grand Total	195,922	945,005	1,140,927

Table 92 - Catches (pounds, live weight, kept and discarded) on observed tows using a haddock separator trawl, FY 2004 – November, FY 2007. Only top twenty-five species caught are shown.

	FY				
NAME	2004	2005	2006	2007	Total
HADDOCK	81,539	127,587	66,766	9,029	284,921
POLLOCK	605	4,480	83,140	99,638	187,863
SKATE, NK	3,831	102,055	3,055	5	108,946
FLOUNDER, YELLOWTAIL	12,369	69,200	8,731	45	90,345
SKATE, WINTER (BIG)	21,503	47,238	18,569	113	87,424
SKATE, LITTLE	9,792	48,850	22,767	121	81,529
FLOUNDER, WINTER	2,395	57,834	12,534	28	72,791
COD, ATLANTIC	14,824	31,136	13,508	1,002	60,469
MONKFISH	9,140	28,794	5,168	1,872	44,975
FLOUNDER, WITCH	11,808	8,490	1,105	464	21,868
FLOUNDER, AMERICAN PLAICE	909	14,843	2,277	1,044	19,073
LOBSTER, AMERICAN	2,265	11,671	1,135	526	15,597
REDFISH, NK (OCEAN PERCH)	571	420	5,118	7,836	13,945
SKATE, BARNDOOR	46	11,423	1,328	48	12,844
DOGFISH, SPINY	139	1,612	6,232	501	8,484
FLOUNDER, WINDOWPANE	1,794	2,270	2,881	20	6,965
RAVEN, SEA	172	3,474	1,986	30	5,662
SCALLOP, SEA	257	3,209	276		3,742
HAKE, WHITE	484	910	1,754	577	3,725
FLOUNDER, SUMMER	43	1,429	1,085	4	2,561
OCEAN POUT	9	767	1,529		2,305
FLOUNDER, FOURSPOT	2	2,061	21	18	2,101
SEAWEED, NK		51	6	1,000	1,057
SKATE, SMOOTH	18	515	378	35	945
STARFISH, SEASTAR,NK	10	771	8	2	791
Total	174,525	581,088	261,356	123,958	1,140,927

Table 93 – Observed ratios of haddock to other species on tows using a haddock separator trawl, FY 2004 – November, FY 2007

	FY				
	2004	2005	2006	2007	All Years
Had/Cod	5.50	4.10	4.94	9.01	4.71
Had/YTF	6.59	1.84	7.65	201.53	3.15
Had/WFL	34.05	2.21	5.33	322.45	3.91
Had/Monk	8.92	4.43	12.92	4.82	6.34
Had/Skate (All)	2.32	0.61	1.45	27.98	0.98

Table 94 – Average catch per tow (lbs.) on observed trips using a separator trawl

FY	Haddock	Cod	Yellowtail	Winter Flounder	Pollock
2004	778	155	136	26	7
2005	376	98	222	185	14
2006	528	103	70	95	662
2007	151	17	1	0.5	1,601

6.2.3.7 Days-At-Sea Leasing and Transfer Programs

Amendment 13 implemented two programs that allowed the transfer of DAS between permit holders. The DAS Leasing Program provided an opportunity for the temporary transfer of DAS from one permit to another vessel, while the DAS Transfer Program provided an opportunity for the permanent transfer of DAS from one groundfish permit to another. The DAS Leasing Program was most frequently used, with only limited participation in the DAS Transfer Program until recently. This section updates participation in both programs along with a more in-depth evaluation of the DAS Transfer Program.

6.2.3.7.1 DAS Leasing Program

The DAS Leasing Program was first implemented in FY 2004 and has not been revised to date. While Amendment 13 adopted the program for a period of two years, FW 42 extended the program indefinitely. Appendix I of FW 42 provides a detailed summary and analysis for the DAS Leasing Program through FY 2004.

Table 95 summarizes recent participation in the DAS Leasing Program during FYs 2005-2007. Participation in the DAS Leasing Program has gradually increased since the program's inception in 2004 in both number of permits involved and DAS transferred. The number of distinct permits participating in the program during FY 2007 represents nearly half of the number of valid limited access groundfish permits in the fishery and over 60 percent of the number of permits allocated DAS during FY 2007. While the number of DAS transferred has increased, the average number of DAS transferred with each approved lease request has declined.

Table 95 - General Summary of Participation in the DAS Leasing Program during Fishing Years 2005-2007

	2005	2006	2007
Total Leases Processed	376	493	677
Total Leases Approved	338	469	645
Number of Distinct Permits	336	542	626
Total DAS Transferred	8,129.04	11,244.69	13,909.79
Average Number of DAS Transferred	24.05	23.98	21.56
Average cost per DAS Transferred	$287.75	$379.39	$408.12
Highest cost per DAS Transferred	$3,409.09	$4,312.20	$10,000.00
Lowest cost per DAS Transferred	$0.00	$0.00	$0.00

Table 96 reveals that an increasing proportion of allocated DAS are being leased and that vessels are increasingly relying upon the DAS Leasing Program to acquire additional DAS to maintain vessel operations. In FY 2004, over 6,000 DAS were leased, or roughly 14 percent of all Category A DAS that were allocated and 20 percent of the Category A DAS that were used during FY 2004. In 2005, 8,129 DAS were leased, representing 16 percent of allocated Category A DAS and 25 percent of used Category A DAS. In FY 2006 and 2007, 11,245 and 13,910 DAS were leased, representing 23 percent and 29 percent of allocated Category A DAS and 35 percent and 42 percent of used DAS, respectively. It also appears that the recent increasing trend in DAS leasing activity continues during the first few months of FY 2008. Through September 12, 2008, over 6,600 DAS were leased, compared to just over 5,900 in FY 2007 (Table 97). Therefore, it is likely that the recent trend in DAS leasing will continue, with the number of DAS leased during FY 2008 likely to exceed the number of DAS leased during previous fishing years.

Table 96 - Number of DAS Leased as a Proportion of Category A DAS Allocated and Used by Fishing Year

Fishing Year	DAS Leased	Proportion of Allocated DAS	Proportion of Used DAS
2004	6,123	14%	20%
2005	8,129	16%	25%
2006	11,245	23%	35%
2007	13,910	29%	42%

Table 97 - Number of DAS Leased for Partial FY 2008 Compared to the Same Period FY 2007

Month	2007 Leased DAS	2008 Leased DAS
May	1,312.09	1,361.97
June	1,049.99	1,818.85
July	1,504.14	1,219.77
August	1,473.07	1,491.01
September*	570.29	741.94
Total	5,909.58	6,633.54

*Includes DAS Lease requests processed through September 12 of both years.

Leasing price data is entered by participants on the DAS leasing request form and is not independently verified. Average price per DAS leased was derived by taking the price listed on the form and dividing it by the number of DAS leased. Despite a distinct spike in prices in September, both the average number and price of DAS leased has decreased throughout the fishing year with highest numbers and prices observed in May and lowest in the following April (see Figure 43 through Figure 45).

Figure 43 - Average Price and DAS Leased by Month During Fishing Year 2005

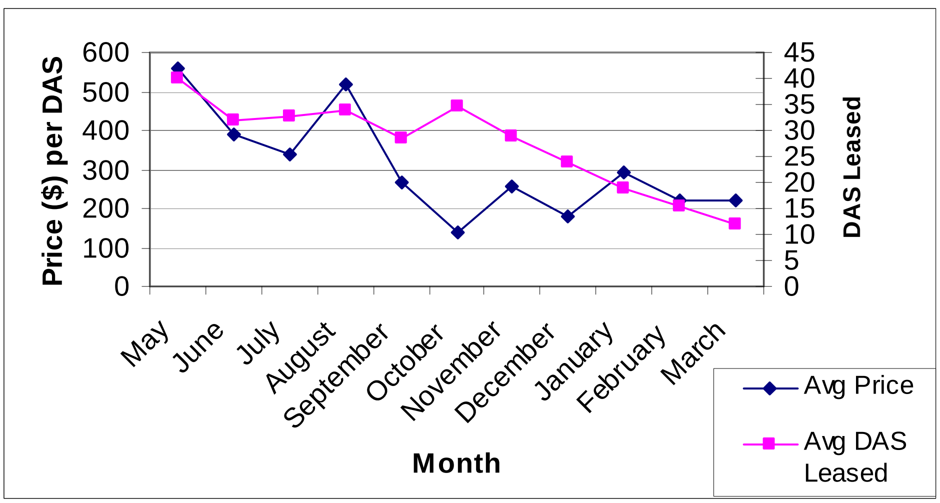


Figure 44 - Average Price and DAS Leased by Month During Fishing Year 2006

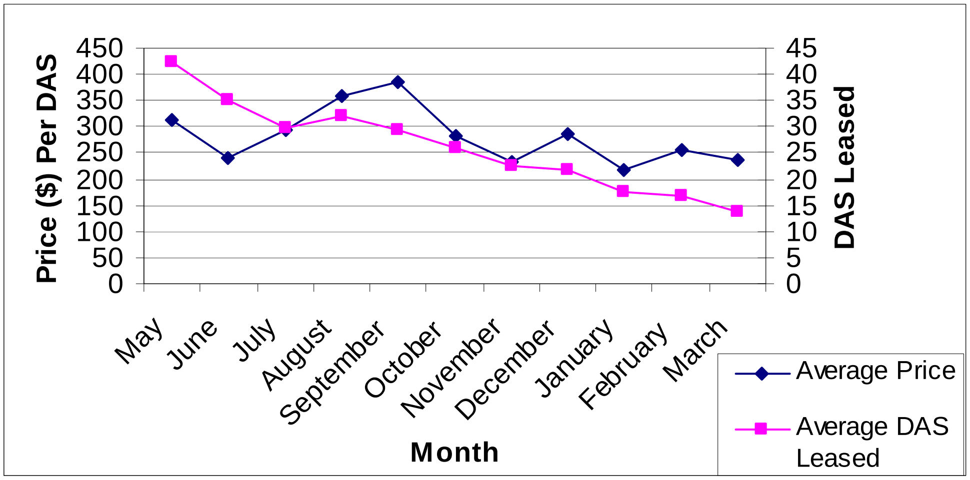
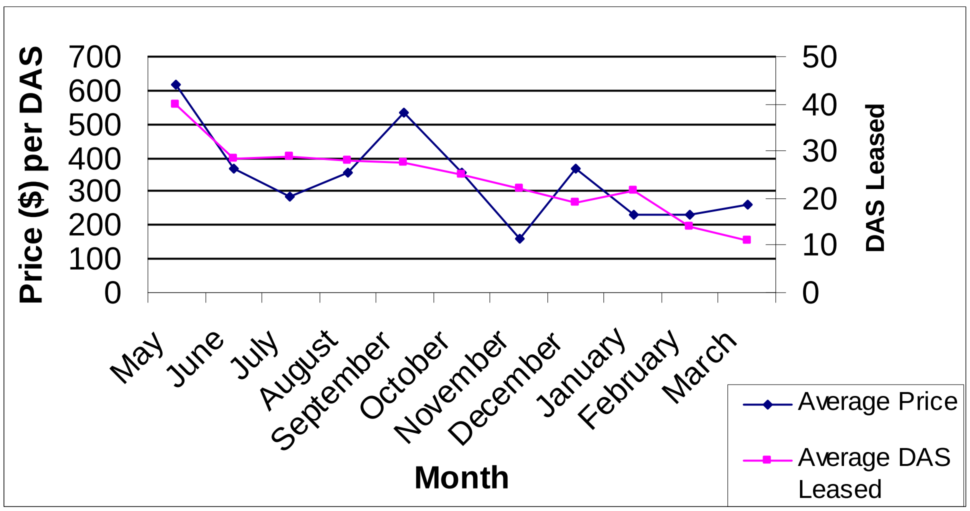


Figure 45 - Average Price and DAS Leased by Month During Fishing Year 2007

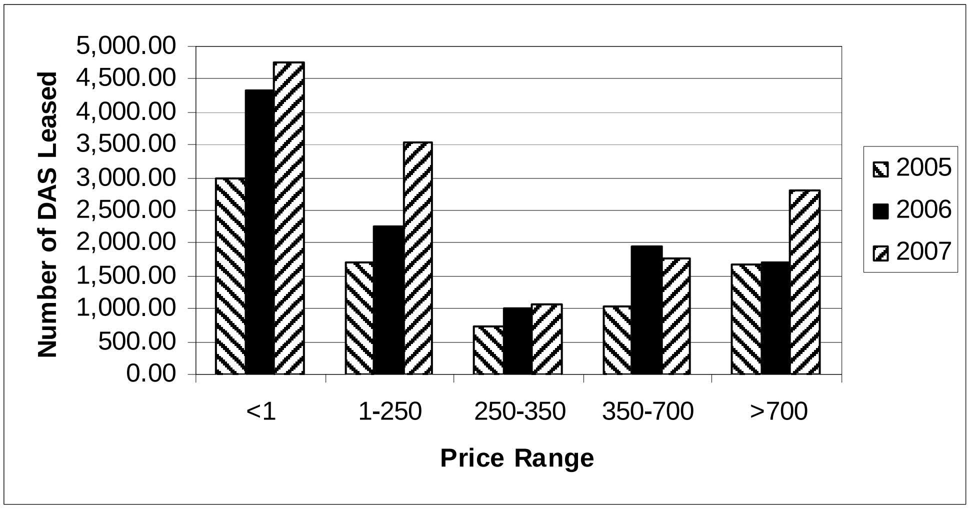


Overall, the average price paid for leased DAS has increased during FY 2005-2007 (Table 98). The maximum price per DAS observed during this time period ranged from $3,409 in 2005 to over $10,000 per DAS in 2007 (Table 95). Figure 46 shows the number of DAS leased within five price ranges as well as the trend of increasing prices since FY 2005. These data indicate that most DAS were leased for less than $1 per DAS. This suggests that vessel owners possess multiple groundfish DAS permits and lease to themselves. However, this suggestion should not be considered a definitive conclusion, as it is unknown whether the prices submitted on DAS lease request forms are accurate, or whether participants are refusing to provide such price information.

Table 98 - Average Price per DAS Leased During Fishing Years 2005-2007

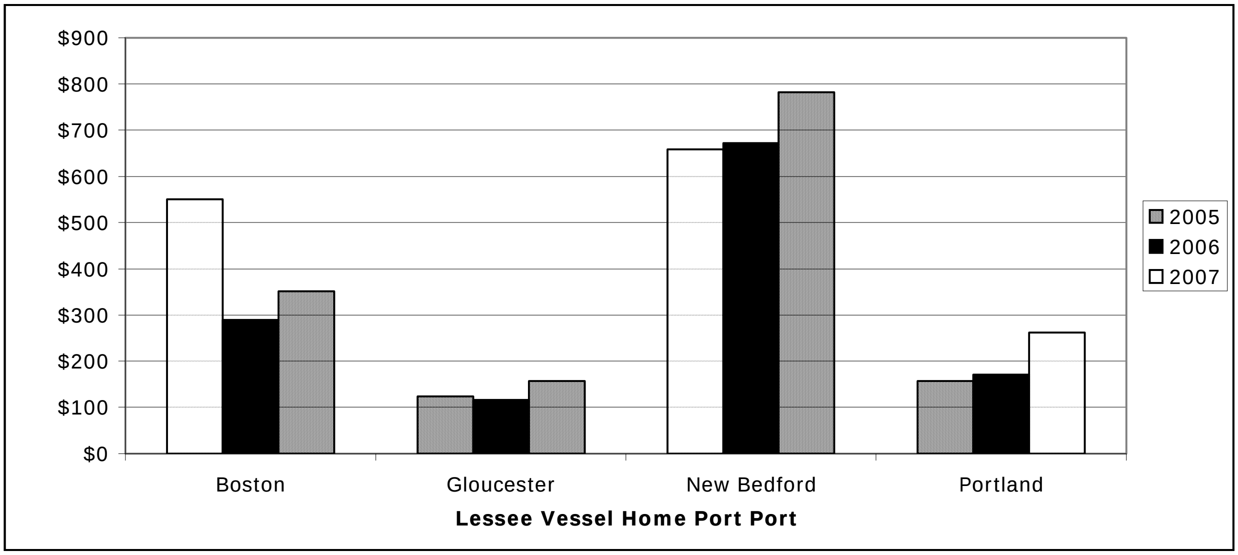
Fishing Year	Average Price per DAS Leased
2005	$287.74
2006	$283.13
2007	$313.21

Figure 46 - Number of DAS Leased by Price Range during Fishing Years 2005-2007



Of the primary groundfish ports, vessels based out of New Bedford have paid the highest average price per DAS leased since the development of the DAS Leasing Program, with an average price of just over $780 per DAS in FY 2007 (Figure 47). With the exception of Boston, the three other major ports show an increasing trend in average prices since FY 2005, although prices in Gloucester have remained relatively stable, increasing only $33 since FY 2005. However, for all ports, these recent prices are far below those offered during the first year of the program in FY 2004. Data presented in Framework 42 indicated average price per DAS in FY 2004 were just under $900 per DAS for New Bedford vessels, while Portland and Gloucester vessels paid just over $500 and $300, respectively.

Figure 47 - Number of DAS Leased by Price Range during Fishing Years 2005-2007



Consistent with earlier analysis in both Amendment 13 and Framework 42, DAS have been leased from southern states generally less active in the groundfish fishery to more northerly states that are more active in the groundfish fishery. Since the implementation of the DAS Leasing Program, vessels based out of Massachusetts have been the most active participants in the DAS Leasing Program, leasing in more DAS than any other state and leasing an increasing proportion of DAS leased overall (see Table 99 through Table 101). In general, there appears to be a funneling of DAS from other states to vessels based out of Massachusetts, although some intrastate leasing is also prevalent in states with the most active groundfish vessels such as Maine and New Hampshire. The existence of the DAS Leasing Program has allowed active groundfish vessels to continue fishing in the groundfish fishery despite recent reductions in fishing effort. This is particularly evident for vessels based out of Massachusetts where fishing effort has been substantially reduced due to the implementation of differential DAS counting in the inshore GOM since FY 2006. In addition, the DAS Leasing Program provides some revenue to those vessels that are less involved with the groundfish fishery. It is likely that the DAS Leasing Program benefited some SNE/MA stocks by shifting effort into the GOM and on GB, but in doing so it may have also contributed to increased catches of several GOM and GB stocks. However, as noted in previous analysis of the DAS Leasing Program, while leasing DAS may not be conservation neutral for all stocks, it is difficult to separate the biological impacts of other management measures from the impacts of the DAS Leasing Program.

Table 99 - Number of DAS Leased by Home Port State During Fishing Year 2005

Lessor Vessel Home Port by	Lessee Vessel Home Port by State							
	ME	NH	MA	RI	NY	DE	NC	Grand Total
ME	1,871	63	461	58				2,453
NH	108	363	225					695
MA	71	75	3,256	33	50	10		3,495
RI			238	98				336
CT			69					69
NY			98		145			242
NJ	94	20	254	85	20			473
PA			9					9
DE						89		89
VA			94					94
NC			68	20			40	128
FL			46					46
Grand Total	2,144	521	4,817	294	215	99	40	8,129
Net Change	-309	-175	1,323	-42	-28	10	-88	

Table 100 - Number of DAS Leased by Home Port State During Fishing Year 2006

Lessor Vessel Home Port State	Lessee Vessel Home Port State								
	ME	NH	MA	NY	RI	CT	DE	NC	Grand Total
ME	1,618	124	656						2,398
NH	63	650	290						1,002
MA	211	33	5,483	31	76				5,834
RI	20		298		142				460
CT			21	26		10			57
NY	10		417	63	20				510
NJ		18	445	55	68				587
PA			11						11
DE							89		89
VA			64						64
NC		20	112					60	192
FL			42						42
Grand Total	1,922	845	7,839	175	306	10	89	60	11,245
Net Change	1	-157	2,004	-335	-153	-47	0	-132	

Table 101 - Number of DAS Leased by Home Port State During Fishing Year 2007

Lessor Vessel	Lessee Vessel Home Port State								
Home Port State	ME	NH	MA	RI	CT	NY	DE	NC	Grand Total
ME	1,949	203	843	30					3,024
NH	81	671	132	30					915
MA	333	168	7,373	156		20			8,051
RI	20		315	136					471
CT			47	48	44				139
NY			402	18		34			454
NJ	27	5	224	197					453
PA			9						9
DE							74		74
VA			81						81
NC		26	65					107	198
FL			42						42
Grand Total	2,410	1,074	9,532	615	44	54	74	107	13,910
Net Change	-614	159	1,482	145	-95	-400	0	-91	

6.2.3.7.2 DAS Transfer Program

The DAS Transfer Program was first adopted by Amendment 13 in 2004, but has been revised twice in an attempt to increase participation in the program. Framework Adjustment 40B (2005) reduced the conservation tax applied to Category A and B DAS transferred from 40 percent to 20 percent and Framework Adjustment 42 (2006) eliminated the provision that the vessel transferring NE multispecies DAS to another vessel (i.e., the transferor vessel) must retire from all state and federal fisheries, among other revisions. In doing so, Framework Adjustment 42 allowed the vessel receiving NE multispecies DAS from another vessel (i.e., the transferee vessel) to retain all other limited access fishery permits not already issued to that vessel. Until both of these changes were made, no vessels participated in the DAS Transfer Program.

Table 102 summarizes recent participation in the DAS Transfer Program since its inception in FY 2004. Due to confidentiality issues, data from transfers occurring during FY 2008 cannot be released. In summary, participation in the program has increased between FYs 2006 and 2007, with over 430 DAS transferred among 14 permits during FY 2007. This represents only 0.6 percent of the total number of DAS (Category A and B only) allocated to the fishery as a whole and 1.3 percent of the number of DAS used during FY 2007.

With only two years of data and few transfers per year, it is difficult to draw any conclusions regarding trends in participation or price for the DAS Transfer Program. While the average number of DAS transferred has increased slightly, the average price paid per DAS has fallen by more than 50 percent since FY 2006. This is not necessarily a reflection of the true value of a DAS, but rather indicative of an incomplete data set, as more applicants reported prices on transfer request forms during FY 2006 than FY 2007. Because the price information is self-reported, there are concerns about the accuracy of the price data, including whether the price information submitted reflects the price paid per DAS, or for the total number of DAS to be transferred. In addition, price could also be affected by whether the individual purchased an operational fishing vessel associated with the permit, or a skiff temporarily holding the permit, as noted further below.

The average price per DAS transferred in Table 102 seems disproportionately low when compared to prices submitted for the DAS Leasing Program (see Table 95 above). Because leases are temporary, one would expect the price paid per DAS leased to be much lower than the prices paid per DAS transferred, which confers permanent use of transferred DAS. However, that was not observed, as the price paid per DAS transferred was lower than that paid for each DAS leased in FY 2007. However, when considering only reported total prices greater than $100, a likely more accurate depiction of the average price per DAS transferred, the average price per DAS transferred is closer to $1,400.

Table 102 - General Summary of Participation in the DAS Transfer Program

	FY 2006	FY 2007	FY 2008
Total Transfers Received	5	8	1
Total Transfers Approved	5	7	1
Number of Distinct Permits	9	14	2
Total DAS Transferred	260.75	436.52	Confidential
Category A DAS	142.90	223.43	Confidential
Category B Regular DAS	52.41	91.41	Confidential
Category B Reserve DAS	52.41	91.41	Confidential
Category C DAS	13.04	30.27	Confidential
Average Number of DAS Transferred	52.15	54.57	Confidential
Category A DAS	28.58	27.93	Confidential
Category B Regular DAS	10.48	11.43	Confidential
Category B Reserve DAS	10.48	11.43	Confidential
Category C DAS	2.61	3.78	Confidential
Average cost per DAS Transferred	$719.65	$338.93	Confidential
Highest cost per DAS Transferred	$1,704.55	$1,630.43	Confidential
Lowest cost per DAS Transferred	$0.01	$0.00	Confidential

Table 103 shows the total number of DAS transferred by home port state during FYs 2006 and 2007, while Table 104 through Table 107 break down these data by DAS category. Data for two states cannot be presented due to confidentiality concerns. In total, nearly 700 DAS were transferred under the DAS Transfer Program. Similar to the summary of DAS Leasing Program presented above, vessels based out of Massachusetts ports have acquired more DAS through the DAS Transfer Program than any other state. However, in contrast to the DAS Leasing Program, there appears to be no regional shift of DAS from more southerly states to states bordering the GOM. With the exception of two transfers of permits allocated only Category C DAS, most of the DAS transferred came from vessels within the same state, often within the same port as the transferee vessel. This later fact could be an artifact of the requirement that the individual requesting the DAS transfer already own both vessels. Further inquiry into previous ownership may reveal movement among home ports and associated states.

Table 103 - Total Number of DAS Transferred by Home Port State During FYs 2006 and 2007

Transferor Vessel Home Port State	Transferee Vessel Home Port State			
	ME	NH	MA	Grand Total*
ME	172.20			172.20
MA			473.78	473.78

*Data from two states cannot be presented due to confidentiality concerns.

Table 104 - Total Number of Category A DAS Transferred by Home Port State During FYs 2006 and 2007

Transferor Vessel Home Port State	Transferee Vessel Home Port State			
	ME	NH	MA	Grand Total*
ME	98.30			98.30
MA			252.39	252.39

*Data from two states cannot be presented due to confidentiality concerns.

Table 105 - Total Number of Category B Regular DAS Transferred by Home Port State During FYs 2006 and 2007

Transferor Vessel Home Port State	Transferee Vessel Home Port State			
	ME	NH	MA	Grand Total*
ME	34.17			34.17
MA			103.25	103.25

*Data from two states cannot be presented due to confidentiality concerns.

Table 106 - Total Number of Category B Reserve DAS Transferred by Home Port State During FYs 2006 and 2007

Transferor Vessel Home Port State	Transferee Vessel Home Port State			
	ME	NH	MA	Grand Total*
ME	34.17			34.17
MA			103.25	103.25

*Data from two states cannot be presented due to confidentiality concerns.

Table 107 - Total Number of Category C DAS Transferred by Home Port State During FYs 2006 and 2007

Transferor Vessel Home Port State	Transferee Vessel Home Port State			
	ME	NH	MA	Grand Total*
ME	5.57			5.57
MA			14.89	14.89

*Data from two states cannot be presented due to confidentiality concerns.

Table 108 indicates the average physical characteristics of vessels participating in the DAS Transfer Program. It should be noted that 8 out of the 14 transferor vessels during FYs 2006 and 2007 were less than 17 feet in length and are considered to be skiffs rather than operational fishing vessels. Because the current regulations require permits to be transferred in association with a vessel, these skiffs are often used as platforms to facilitate the exchange of permits without incurring the high cost of purchasing the larger fishing vessel that originally established the fishing history for the permit. Therefore, the size of the transferor vessel is not indicative of the fishing capacity being removed from Northeast fisheries, while the size of the transferee vessels represents actual ongoing fishing capacity, as these vessels are operational fishing platforms.

Table 108 - Average Physical Characteristics of Transferor and Transferee Vessels Participating in the DAS Transfer Program

	Transferor	Transferee
Length	23	52
Gross Tons	11	42
Horsepower	234	323

Due to confidentiality reasons, data on the numbers of DAS transferred among the various size categories cannot be presented. Because vessels can only transfer DAS to other vessels within specific size parameters (i.e., within 10% of the baseline length and within 20% of the baseline horsepower), most DAS were transferred within vessels of the same size category resulting in no net increase in fishing capacity due to this program.

As noted above, two fundamental changes to the DAS Transfer Program were thought necessary to entice vessels to participate in this program: (1) removal of the requirement to retire from all state and federal fisheries, and (2) reduction of the conservation tax. The removal of the requirement to retire from all fisheries in 2005 did not result in any new participation in the program, but reducing the conservation tax in 2006 did. It is important to describe the implications of both revisions on the current participation in the DAS Transfer Program.

The current regulations for the DAS Transfer Program allow the transferee vessel to be issued any of the limited access permits previously held by the transferor vessel, with the exception that any duplicate limited access permits must be forfeited. Table 109 lists the number of limited access permits gained and lost as a result of the DAS Transfer Program. Overall, participating vessels lost more permits than were gained. However, this is misleading and is not indicative of the benefits/costs of participating in this program. Most active fishing vessels have been issued American lobster permits, so forfeiting duplicate American lobster permits is not necessarily reducing fishing opportunity for these vessels. In fact, it may increase fishing opportunities by allowing the vessel owner to choose which American lobster permit to forfeit, enabling the vessel owner to retain the one with the best fishing history and, therefore, trap allocation. In addition, participating vessels gained more fishing opportunities through the acquisition of nine permits in Mid-Atlantic fisheries such as summer flounder, scup, black sea bass, and *Loligo*/butterfish. It is unclear whether such vessels will actually participate in those Mid-Atlantic fisheries, or whether the vessel owner will concentrate on increasing their participation in the groundfish fishery thanks to the additional DAS gained from the transfer.

Table 109 - Number of Limited Access Permits Gained and Lost Through the DAS Transfer Program

Species Permit	Number of Permits Gained	Number of Permits Lost
American Lobster	2	8
Summer Flounder	3	0
Monkfish	1	0
Black Sea Bass	1	2
***Loligo* /Butterfish**	1	1
Scup	1	4
Total	9	15

Out of the fourteen vessels that transferred NE multispecies DAS and other associated permits under the DAS Transfer Program, only two vessels continue to participate in any fisheries within the Northeast. After the transfer was approved, one vessel acquired additional limited access permits in several fisheries from another vessel, while the other vessel was issued only new open access permits. In any case, there is still a net reduction in fishing capacity throughout NE fisheries due to the forfeiture of 15 limited access permits as a result of this program.

On several occasions, the transferor vessel was issued nothing more than a NE multispecies permit with Category C DAS. While such permits would seemingly have minimal value, they do provide the opportunity for the transferee vessel to greatly increase the number of DAS it could lease from other vessels. This is because the current regulations governing the DAS Leasing Program limit the number of DAS that a vessel could lease by its 2001 DAS allocation. By combining fishing histories of the participating vessels, the transferee vessel is also combining the 2001 DAS allocations of the associated permits and, therefore, increasing the number DAS that the vessel could lease. In doing so, the transferee vessel is able to increase potential future revenue from landings associated with the use of additional groundfish DAS.

Table 110 highlights the number of DAS that were lost due to the conservation tax in the DAS Transfer Program. It is important to note that the number of DAS transferred (see Table 102 above) is not the same as the number of DAS that were taxed. This is because of a revision in Framework Adjustment 42 that allows the conservation tax to be applied to either the DAS associated with the transferor or transferee vessel. Most often, but not always, the vessel owner chose to apply the conservation tax to the vessel with the lowest DAS allocation to minimize the number of DAS lost due to the tax.

Currently, the tax applied to Category A and B DAS transferred is 20 percent, while Category C DAS transferred are taxed at a rate of 90 percent. The 14 transfers processed through FY 2007 reduced the number of Category A DAS available by 81.5 DAS, or roughly 0.2 percent of the 40,000 Category A DAS allocated to vessels during FY 2007. In total, the 148.22 Category A and B DAS eliminated by the DAS Transfer Program also represent 0.2 percent of the combined 77,000 Category A and B DAS allocated during FY 2007 and represent a net reduction in fishing effort.

Table 110 - Number of DAS Lost Due to the Conservation Tax in the DAS Transfer Program

DAS Category	DAS Originally Allocated	DAS Actually Transferred	DAS Lost Due to Conservation Tax
A DAS	407.61	326.09	81.52
B Regular DAS	166.76	133.41	33.35
B Reserve DAS	166.76	133.41	33.35
C DAS	462.68	46.27	416.41
Total	1203.81	639.17	564.64

6.2.3.8 Commercial Fishing Vessel Safety

The United States Coast Guard's First Coast Guard District Office maintains an extensive database of fishing vessel safety incidents that occurred in the northwest Atlantic since January 1, 1993. Most of the information is for reportable casualties, defined as:

- A grounding;
- Loss of propulsion, primary steering or any associated control system that reduces the maneuverability of the vessel;
- An occurrence materially and adversely affecting the vessel's seaworthiness including but not limited to: fire, collision, sinking and flooding;
- A loss of life;
- An injury that requires professional medical treatment and that renders the individual unfit to perform his or her routine duties;
- An occurrence causing property damage in excess of $25,000.

In addition, the database includes information on Emergency Position Indicating Radio Beacon (EPIRB) alerts and trip terminations because of safety violations. The data for 1993 through 2009 are available to the public via a website (http://www.uscg.mil/d1/prevention/MASTER%20REPORT.xlsl). In recent years the latitude and longitude of the incident is also provided.

While the data are not organized by fishery, in many instances the type of vessel (scalloper, longline, gillnet, trawler, etc.) is recorded. Trawls, gillnets, and longlines are three of the primary gear types used to catch groundfish. While these gears are used in a variety of fisheries, examining the number of accidents on vessels using these gear types may give an indication of the number of accidents that occurred in the groundfish fishery. Amendment 13 summarized this information for FY 1996 through 2001; this section updates that information for FY 2001 through FY 2008 (as of December 2008).

Figure 48 shows the number of accidents for all fisheries since FY 2001, reported by groundfish fishing year. The number of equipment problems increased in FY 2003 and FY 2004 –reversing a trend of a steady decline reported in Amendment 13 – before declining again in FY 2005-FY 2007. The number of EPRIB incidents greatly increased in FY 2007 and FY 2008 for unknown reasons. The number of fires decreased from FY 2001 to FY 2007, and most other incident categories varied without a clear trend. Figure 49 illustrates information on the same type of casualties, but only for incidents identified as being on trawl, gillnet, or longline vessels. The total number of incidents has declined since FY 2001. The number of groundings and fires declined while sinkings fluctuated without a clear trend.

Figure 50 summarizes the reported injuries and deaths for all fisheries. After a steep decline in injuries from FY 2001 to FY 2002, injuries appear to be increasing. The number of deaths has remained relatively constant. Figure 51 summarizes information for trawl, gillnet, and longline vessels; the patterns appear similar though the increasing trend in injuries is not as strong.

Figure 52 and Figure 53 summarize injuries on trawl, gillnet, and longline vessels using four size classifications based on length. Both reported injuries and deaths appear to occur more often on vessels over 50 feet in length.

One concern with the adoption of the differential DAS areas in FW 42 was that vessel operators would fish outside the range of their vessels and the number of accidents would increase just outside the areas. This was a particular concern for the GOM differential DAS area. The incident latitudes and longitudes reported by the U.S. Coast Guard were plotted in Figure 54 for trawl, gillnet, and longline vessels. There is little evidence in these plots that the differential DAS areas led to an increase in accidents just outside the areas. This brief review is not definitive, however, since not all incidents have valid recorded positions and it is possible that in some cases the incident began in a location different than the one plotted.

Figure 48 - Vessel safety incidents in all fisheries
*Source Data: USCG. *FY 2008 data are current through 12/31/08*
All years denote fishing years – May 1 – April 30.

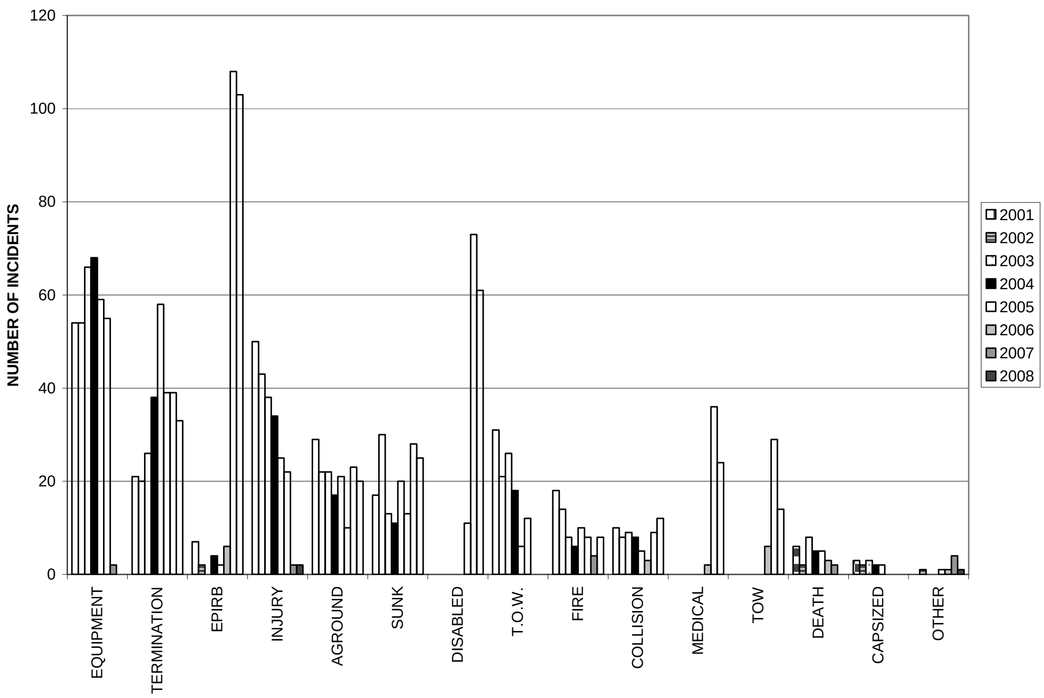


Figure 49 – Vessel safety incidents in trawl, gillnet, and longline fisheries

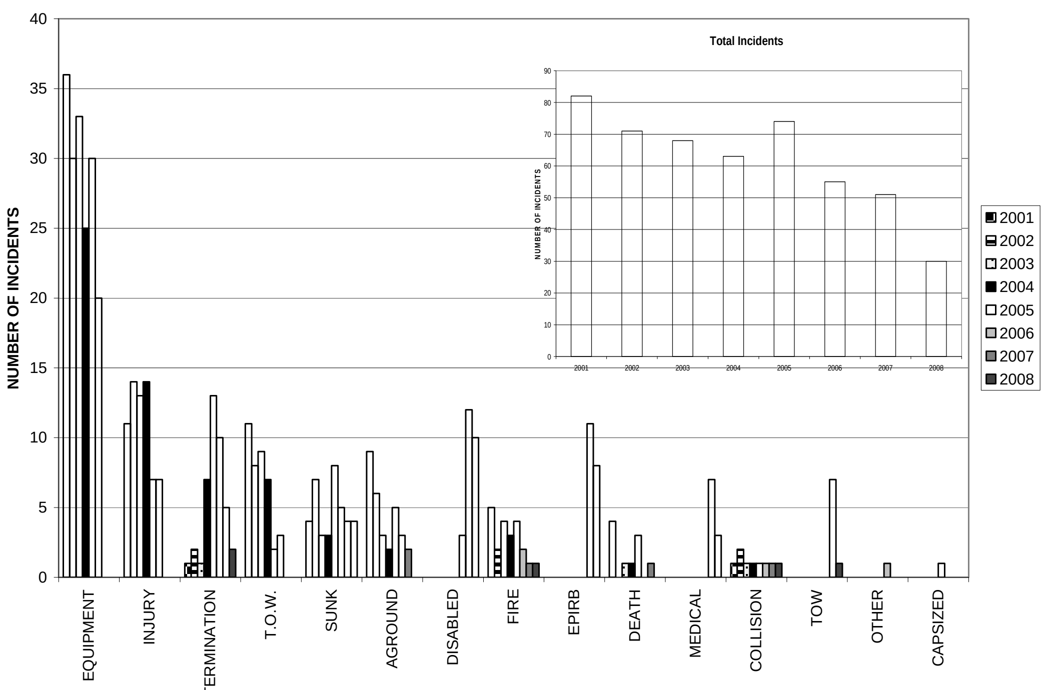


Figure 50 - Fishing vessel deaths and injuries in all fisheries
*Source Data: USCG. *20081 data are current through 12/31/08*

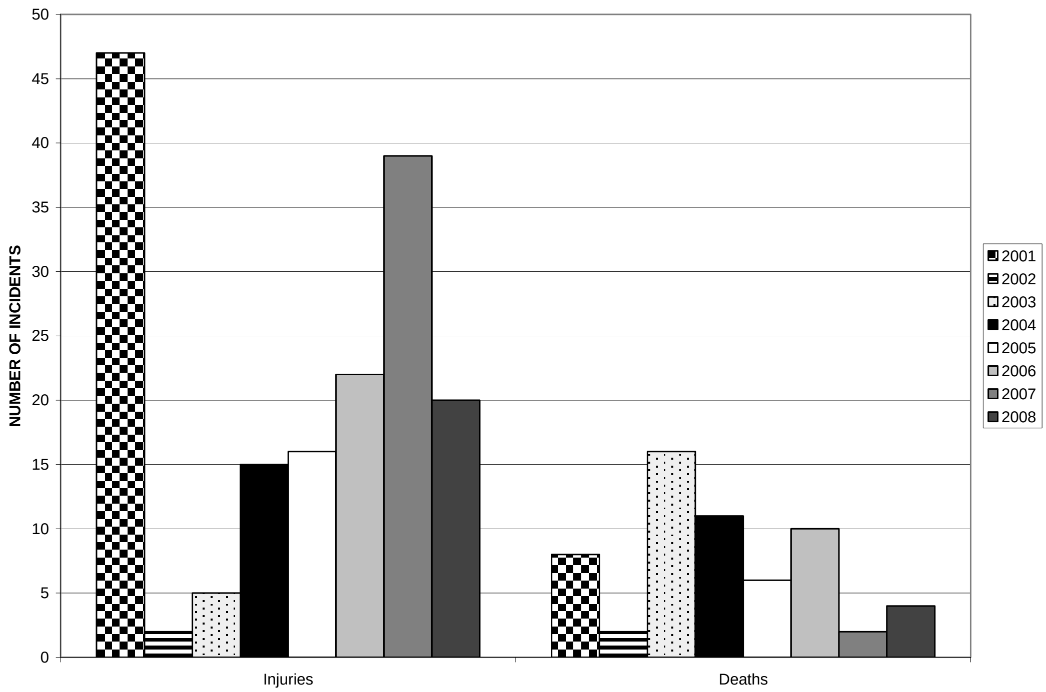


Figure 51 - Fishing vessel deaths and injuries on trawl, longline, and gillnet vessels
*Source Data: USCG. *2008 data are current through 12/31/08*

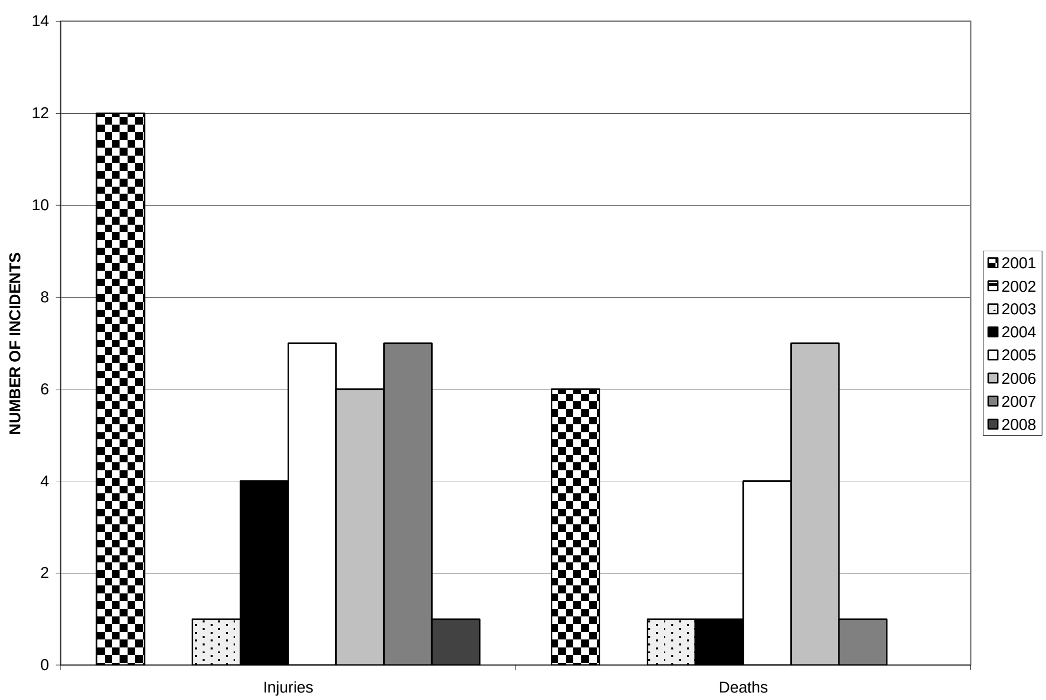


Figure 52 – Injuries on trawl, gillnet, or longline vessels, by size, FY 2001 – FY 2008

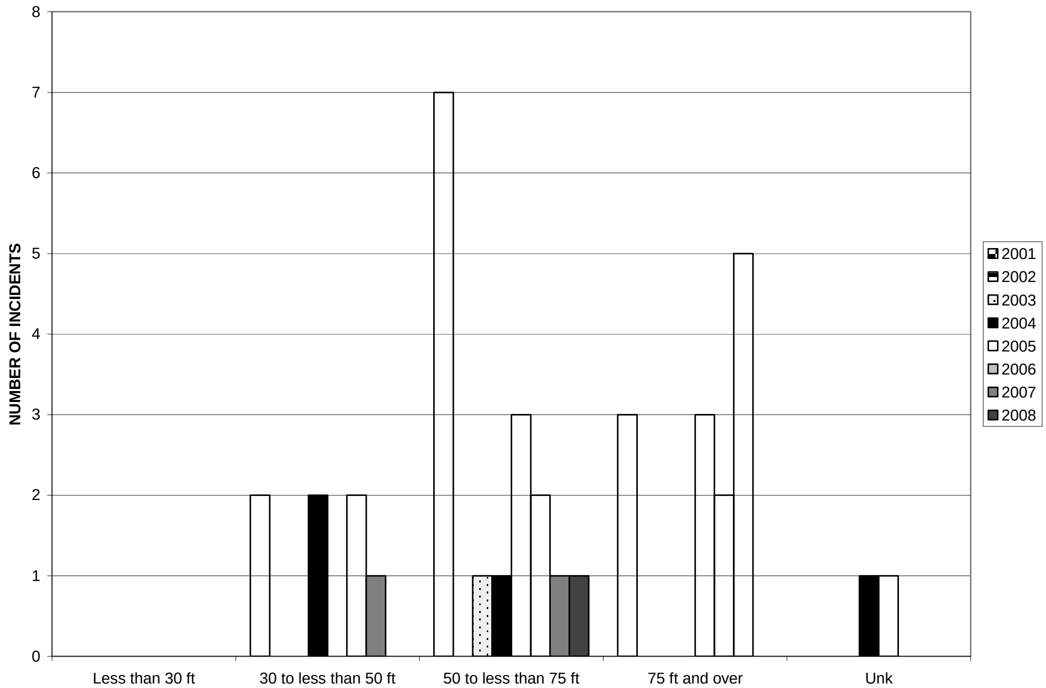


Figure 53 – Deaths on trawl, gillnet, or longline vessels, by size

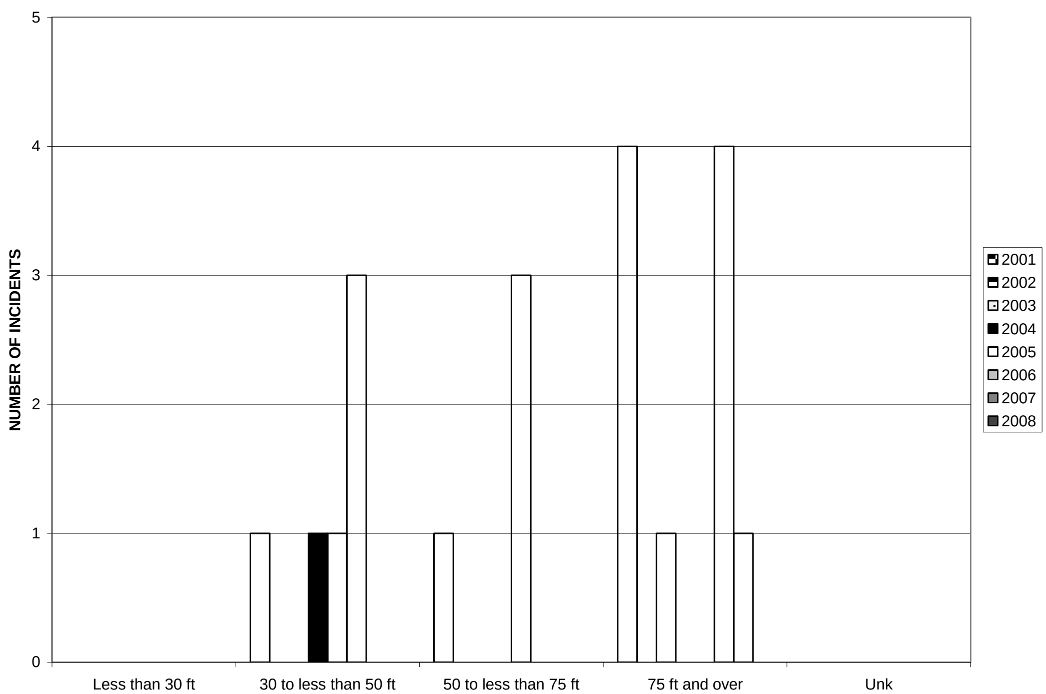
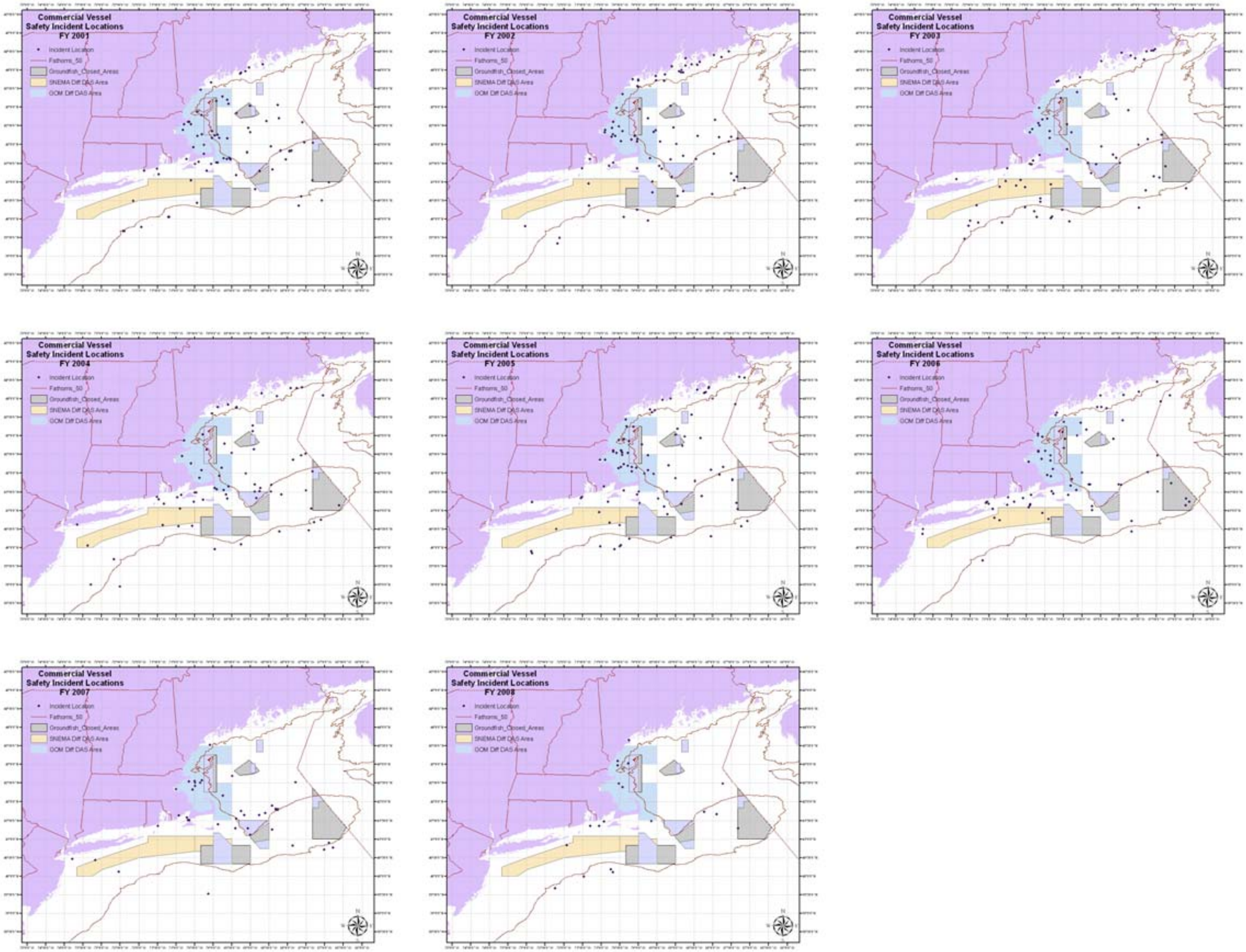


Figure 54 – Trawl, gillnet, and longline safety incident locations, FY 2001 – FY 2008



6.2.4 Sectors

This action may increase the number of operating sectors from two to nineteen. In addition, it proposes changes to the two existing sectors. Part of the rationale for the formation of sectors is to promote efficient operations, reduced discards, and foster better stewardship of the resource. The following sections briefly summarize the performance of the two existing sectors and, where possible, attempts to determine if the goals have been met.

6.2.4.1 GB Cod Hook Sector

The GB Cod Hook sector consists of vessels that have agreed to use hook gear (longlines, tub trawls, handlines), with quota that limits the catch of GB cod. Sector vessels operate primarily out of Cape Cod, MA, with almost all landings by sector vessels occurring in Chatham MA. Most sector vessels range from 25 to 70 feet in length. The GB Cod Hook Sector was the first sector authorized operations under the sector management system adopted in Amendment 13, and began operations in FY 2004. Fishing mortality is controlled through a quota on GB cod, and DAS are used to control mortality on other groundfish stocks. The number of permits, GB cod allocations, and GB cod landings (as reported in the sector annual reports) are shown in Table 111. Since its formation this sector has seen a steady decline in the number of permits that are members. The number of permits has declined more rapidly than the sector's share of the GB cod TTAC, but changes in calculating the share adopted by FW 40B may mask the actual decline in share. There has been some movement between sectors: at least three of the permits in the Fixed Gear Sector in 2008 were members of the Hook Sector in FY 2007.

As required by sector operating rules the sector submitted annual reports for every fishing year from FY 2004 – FY 2007. Unless specifically stated, this section does not draw data from that report but uses available NMFS databases instead. There are minor differences in GB cod landings between the two data sources but there is not a consistent bias. No attempt was made to account for the differences.

Table 111 – Number of permits, GB cod allocation, and GB cod landings (according to sector annual report) for the GB Cod Hook Sector

FY	Number of Permits	GB Cod Allocation (% of TTAC/mt)	Reported Landings (mt)
2004	58	12.6/371	130
2005	49	11.7/455	
2006	36	10.03/615	89
2007	25	8.02/675	86
2008	19	6.44/658	NA
2009	24	8.09/284	NA

6.2.4.1.1 Landings and Revenues

Species-specific landings and revenues for the permits in the sector are shown in Table 112 and Table 113. These data are from the NMFS dealer database, not the annual sector reports. Looking at the time series since the adoption of Amendment 13 in FY 2004 illustrates the effects of sector operations on each permit's landings and revenues, and can highlight changes in targeting behavior.

Total landings for sector vessels peaked at 2.7 million pounds in FY 2005 but declined to 1.4 million pounds in FY 2007. This represents a decline in landings of 48 percent. Groundfish, as a percent of total landings, declined from 74 percent in FY 2004 to 40 percent in FY 2007. While groundfish landings were highest in FY 2004, they have declined to about 600,000 pounds in FY 2007. Non-groundfish landings increased from about 600,000 pounds in FY 2004 to over a million pounds in FY 2005 and 2006, before declining to about 866,000 pounds in FY 2007. Cod, the primary target species for the sector, has remained relatively constant at between 200,000 and 280,000 pounds during the period. The sector also developed a fishery for haddock. Haddock landings peaked in FY 2004 at over 1.4 million pounds but declined to about 350,000 pounds in FY 2006 and FY 2007. The primary landing ports are Chatham and Harwichport, though small amounts are landed in other Barnstable County ports.

Total revenues for sector vessels declined from $3.4 million in FY 2004 to $2.6 million in FY 2007, a decline of 24 percent, about half the decline in landings. Groundfish revenues as a percent of total revenues declined from 69 percent to 41 percent over the same period. Groundfish revenues were similar in FY 2004 and FY 2005 (about $2.3 million) but were less than half that value in FY 2006 and FY 2007 (about $1 million). Cod revenues peaked in FY 2005 while haddock revenues peaked in FY 2004. The sector has only harvested a small percentage of its allocated cod quota.

This sector developed a SAP for haddock in CAI. This allowed the sector to increase its haddock catches in FY 2004 and FY 2005, but there was a sharp decline in the sector’s haddock landings in FY 2006 and FY 2007. Haddock revenues were the largest share of groundfish revenues for this sector in every year.

Because sector membership has declined, the declines in landings and revenues might merely reflect fewer sector members rather than other factors that affect catches. In order to evaluate how sector economic performance has changed over time, total and groundfish revenues in each year were divided by the number of permits in the sector to determine how the economic performance of the sector has changed over the four year period. Total revenues per permit increased from $58, 543 in FY 2004 to $102,647 in FY 2007. Groundfish revenues per permit peaked at $46,608 in FY 2005, declined to $28,720 in FY 2006, then rose to $41,924 in FY 2007.

The increase in total revenues per permit from FY 2004 to FY 2007 in spite of a decline in both total landings and groundfish landings reflects increased landing of high value species. Most notably, sector vessels increased their catches of whelk by nearly a factor of twelve during this period. Lobster and revenues also increased.

Table 112 – Landings (pounds, live weight) for GB Cod Hook Sector vessels

SPECIES	FY 2004	FY 2005	FY 2006	FY 2007
COD	252,926	283,029	196,842	205,936
FLOUNDER, AM. PLAICE	85	120	15	3
FLOUNDER, SAND-DAB	5	11		
FLOUNDER, WINTER	1,015	1,613	1,412	1,633
FLOUNDER, WITCH	2	24		
FLOUNDER, YELLOWTAIL	5	292	40	12
HADDOCK	1,406,476	1,228,658	324,828	361,355
HAKE, WHITE	26,357	32,910	11,846	4,104
HALIBUT, ATLANTIC	468	886	442	94
POLLOCK	44,913	25,843	18,673	3,529

SPECIES	FY 2004	FY 2005	FY 2006	FY 2007
POUT, OCEAN	4			
REDFISH	3,232	10,796	2,702	3,372
WOLFFISHES	6,140	8,831	5,168	1,280
ANGLER	7,844	4,672	2,396	1,656
BASS, STRIPED	33,128	31,419	41,746	7,362
BLUEFISH	65,772	124,186	12,006	16,758
BONITO		8		
BUTTERFISH				745
CATFISH, BLUE		60		
CLAM, SOFT		2,040	213	1,192
CONCHS		10,855	5,105	
CRAB, ROCK	462	28		
CUNNER		426	671	1,402
CUSK	32,971	42,404	18,152	7,935
DOGFISH SMOOTH		2,700	1,800	
DOGFISH SPINY	69,708	213,558	144,155	177,203
EEL, AMERICAN				20
FLOUNDER, SUMMER	46	244		1,700
HAKE MIX RED & WHITE	7,375			
HAKE, OFFSHORE	160	13		
HAKE, RED	185	2		1,682
HAKE, SILVER	93			25,889
JOHN DORY				85
LOBSTER	89,536	177,034	132,279	139,116
MACKEREL, ATLANTIC		3,102	958	600
PERCH, WHITE		2		
QUAHOG	107	123,706	56,266	74
SCALLOP, BAY		56		
SCALLOP, SEA	144,783	158,108	308,854	27,398
SCULPINS	9			
SCUP	9,464	7,759	9,003	8,720
SEA BASS, BLACK	29,760	48,733	83,841	25,805
SKATE, SMOOTH		9		
SKATE, THORNY			833	2,537
SKATE, WINTER(BIG)		5,771	10,183	7,198
SKATES	26,082	3,177	419	
SQUID (LOLIGO)		2,481	3,068	12,466
TAUTOG	2,138	2,596	4,457	183
TUNA, BLUEFIN	52,885		11,395	5,081
WEAKFISH, SQUETEAGUE				Conf.
WHELK, CHANNELED	Conf.	117,163	228,123	394,116
WHELK, KNOBBED	Conf.	Conf.	Conf.	Conf.
Total	2,314,136	2,675,325	1,637,891	1,448,241

Table 113 – Revenues (nominal dollars) for permits in the GB Cod Hook Sector vessels

SPECIES	FY 2004	FY 2005	FY 2006	FY 2007
COD	379,829	521,665	384,400	417,232
FLOUNDER, AM. PLAICE	120	200	31	7
FLOUNDER, SAND-DAB	9	12		
FLOUNDER, WINTER	1,375	2,428	2,442	2,830
FLOUNDER, WITCH	2	68		
FLOUNDER, YELLOWTAIL	5	447	68	22
HADDOCK	1,894,165	1,680,191	610,122	616,160
HAKE, WHITE	20,131	37,157	16,368	6,135
HALIBUT, ATLANTIC	2,346	4,358	2,229	583
POLLOCK	21,944	17,779	10,651	1,390
POUT, OCEAN	3			
REDFISH	1,833	10,266	2,545	2,419
WOLFFISHES	4,827	9,236	5,079	1,321
ANGLER	7,749	5,119	2,693	3,464
BASS, STRIPED	52,582	69,688	101,400	21,450
BLUEFISH	25,058	79,768	6,582	7,659
BONITO		20		
BUTTERFISH				712
CATFISH, BLUE		101		
CLAM, SOFT		3,456	301	1,855
CONCHS		1,357	651	
CRAB, ROCK	924	15		
CUNNER		233	707	1,420
CUSK	11,808	21,667	13,472	3,826
DOGFISH SMOOTH		615	438	
DOGFISH SPINY	12,714	48,585	36,049	38,984
EEL, AMERICAN				16
FLOUNDER, SUMMER	52	385		4,749
HAKE MIX RED & WHITE	3,710			
HAKE, OFFSHORE	24	4		
HAKE, RED	49	1		961
HAKE, SILVER	15			21,599
JOHN DORY				94
LOBSTER	419,592	985,615	758,619	768,825
MACKEREL, ATLANTIC		2,218	673	594
PERCH, WHITE		2		
QUAHOG	148	106,585	49,385	126
SCALLOP, BAY		122		
SCALLOP, SEA	90,980	139,448	253,919	25,256
SCULPINS	1			
SCUP	5,981	6,682	10,615	5,550
SEA BASS, BLACK	63,545	142,324	266,986	70,618
SKATE, SMOOTH		2		
SKATE, THORNY			221	543
SKATE, WINTER(BIG)		1,091	2,824	2,303
SKATES	3,925	694	115	
SQUID (LOLIGO)		2,171	2,446	14,542

SPECIES	FY 2004	FY 2005	FY 2006	FY 2007
TAUTOG	1,957	8,310	10,116	420
TUNA, BLUEFIN	337,656		86,957	94,881
WEAKFISH, SQUETEAGUE				Conf.
WHELK, CHANNELED	Conf.	145,554	309,766	427,559
Total	3,365,059	2,675,325	1,637,891	1,448,235

6.2.4.2 GB Cod Fixed Gear Sector

The Fixed Gear Sector consists of vessels that have agreed to use fixed gear (sink gillnets, tub trawls, handlines), with quota that limits the catch of GB cod. Sector vessels operate primarily out of Cape Cod, MA, with almost all landings by sector vessels occurring in Chatham MA. Most sector vessels range from 35 to 5o feet in length. The sector was first authorized with the implementation of FW 42 in November, 2006. Because of the late approval of this action, the first full year of operations for the sector was FY 2007. There were sixteen permits listed on the letter of authorization for this sector. The sector received 9.16 percent of the GB cod TAC for FY 2007, or 771.1 mt of cod. Catch of other groundfish was regulated through the use of DAS. For FY 2009, 23 vessels have committed to the sector and the preliminary allocation of GB cod is expected to be 11.64 percent of the TAC, or 408 mt.

As required by sector operating rules the Fixed Gear Sector submitted an annual report for FY 2007. Unless specifically stated, this section does not draw data from that report but uses available NMFS databases instead. There are often differences between the two data sources. For example, the sector's FY 2007 annual report identified cod landings of 896,988 pounds, whereas Table 114 below shows landings as 922,267 pounds, a difference of 3 percent. This section does not attempt to identify the reason for those differences.

6.2.4.2.1 Landings and Revenues

Species-specific landings and revenues for the sixteen permits in the sector in FY 2007 are shown in Table 114 and Table 115. These data are from the NMFS dealer database, not the annual sector reports. While a time series is shown, it should be understood that the permits may have had different owners in the years before FY 2007, and may not have used the same gear. Nevertheless, looking at the time series since the adoption of Amendment 13 in FY 2004 illustrates the effects of sector operations on each permit's landings and revenues in its first year of operation. 99 percent of the landings and revenues (both total and groundfish) were landed in Chatham, MA through the entire period.

From FY 2005 – FY 2006, between eight and ten of the permits in the sector in FY 2007 reported landings through the dealer database. In FY 2007, ten permits reported landings, indicating little change in participation in the fishery in the first year of operations. FY 2007 total landings were 1.4 times the average landings for FY 2004 – FY 2006, while nominal total revenues in FY 2007 were 1.5 times the average for the previous three fishing years. Groundfish landings were 1.7 times higher and groundfish revenues were 1.85 times higher in FY 2007 that the FY 2004 – FY 2006 average. Cod landings were about 418 mt, or 54 percent of the sector's allocation. The vessels nearly tripled their cod landings and revenues in FY 2007 compared to the average of the previous three years. The proportion of landings and revenues due to groundfish also increased. In FY 2007, groundfish landings accounted for 42 percent of landings by weight and 69 percent in value, while in earlier years groundfish were between 28 and 38 percent of landings and between 52 and 58 percent of revenues. 95 percent of groundfish landings were using sink gillnet gear and 4 percent were from handline, with the remainder attributed to various gears (note the dealer database can have errors in reported gear codes). Of the permits that reported landings in FY 2007, eight increased groundfish landings and two had reduced landings compared to the average of the previous three years.

Landings of non-groundfish species increased by fifteen percent in FY 2007 when compared to the previous three-year average. Most of the increase can be attributed to increased landings of skates in FY 2007. FY 2007 landings of skates (all species, live weight) were 380,000 pounds higher than the average of the previous three years. Much of the increase in skate landings occurred in FY 2006, before the sector was operating for a full year, so it is not clear that the skate increase can be attributed to shifting effort onto skates after joining the sector.

Cod landings by month are shown in Table 116, as a percentage of total cod landings. While one year of data as a sector cannot be viewed as definitive, it appears the largest change in fishing activity is that the sector landed more cod in October than in previous years. While the sector requested an exemption from the May seasonal closure on Georges Bank, FY 2007 activity does not appear to have focused on this month. The sector was authorized to operate beginning May 4, 2007.

Cod landings appear to have increased for two reasons. For the May through December period, the sector vessels had more days absent in FY 2007 than in FY 2006 (1,217 to 740). In addition, the landings of cod per day absent increased from 460 pounds/day absent during this period in FY 2006 compared to 740 pounds/day absent in FY 2007. This suggests that the vessels were able to operate more efficiently absent the effort control restrictions.

6.2.4.2.2 Discards

One of the arguments for forming the Fixed Gear Sector was that by removing trip limit restrictions the discards of cod by sink gillnet vessels would be reduced. Observer data was examined to determine if there is evidence that this did occur. The sixteen permits on the sector's LOA for FY 2007 were linked to 18 hull numbers. Observed trips for these 18 hull numbers were queried to determine landings and discards during the period FY 2004 through FY 2007. Only sink gillnet trips in statistical areas 521, 522, 525, 526, 561, and 562 were considered, and only those tows observed by a federal observer. Mesh size was not considered, since the question was whether discards would be reduced in total, not whether this just occurred on large mesh trips. No attempt was made to determine if vessel ownership was consistent through the period.

The number of trips observed ranged from 10 in FY 2006 to 40 in FY 2005 (Table 117). Coverage was limited in the second half of the fishing year in all years, but particularly in FY 2006. For this reason, the ratio of discards/kept were calculated for half-year periods. The ratios observed for vessels that were in the sector were also compared to the ratios observed for vessels that were not in the sector. Results are shown in

Figure 55. The ratios for vessels in the sector tend to be slightly lower than those for vessels not in the sector, even before sector formation. This makes it difficult to attribute the differences noted in FY 2007 solely to sector formation. The ratio for sector vessels shows a slight declining trend since FY 2005, and was at its lowest in the second half of FY 2007. The ratios for non-sector vessels do not show the same consistent declining trend, and in fact, it peaks in the first half of FY 2007. While this information suggests that the discard rates by vessels that chose to join

sectors may be lower than those for non-sector vessels, using these data there does not seem to be a dramatic change for sector vessels between the period before and after sector formation. Discard ratios for sector vessels have ranged between 4 and 8 percent since FY 2005. The rate in FY 2007 is slightly higher than that calculated by the sector itself - an annual rate of 0.029 in FY 2007. The sector's calculated rate does seem to provide stronger evidence that discard rates by sector vessels declined after sector formation.

Discard reasons are also reported by observers (Table 118). In FY 2007, the primary reason for discards was that the fish were below minimum size. While not surprising that the "quota filled" (i.e. trip limit reached) reason is absent after the sector began operating, it also appears that poor quality is also less of a cause for discards after the sector was formed.

If computed on an annual basis, the ratio of cod discarded to cod landed for the Fixed Gear Sector in FY 2007 was 0.0505. The CV (based on trips observed by federal observers) is about 1.02, higher than the desired CV of 0.30. If applied to the dealer landings, discards would be estimated at 46,574 pounds. Discards reported in the sector's annual report totaled 26,772 pounds, or 57 percent of the discards estimated here. Note that the sector report used additional data from trips observed by sector data collectors and video cameras to calculate discards monthly. These additional data may provide a more precise estimate of discards than that limited to the federal observers. The difference noted here amount to about two percent of the sector's landed catch and does not affect the determination that the sector remained within its TAC in FY 2007.

Table 114 – Landings (pounds, live weight) by permits in the Fixed Gear Sector in FY 2007

Species	FY 2004	FY 2005	FY 2006	FY 2007
COD	327,266	292,129	364,246	922,267
FLOUNDER, AM. PLAICE	264	252	110	226
FLOUNDER, SAND-DAB				6
FLOUNDER, WINTER	5,271	3,315	6,311	16,671
FLOUNDER, WITCH	192	309	252	373
FLOUNDER, YELLOWTAIL	426	274	469	659
HADDOCK	218,163	313,298	118,632	92,693
HAKE, WHITE	14,801	13,206	6,765	6,786
HALIBUT, ATLANTIC	193	237	97	163
POLLOCK	177,442	181,509	194,856	203,691
REDFISH	2,899	24,195	16,508	78,648
WOLFFISHES	15,352	1,201	2,404	6,137
ANGLER	264,698	460,007	335,888	284,481
BASS, STRIPED	998	495		
BLUEFISH	12,522	2,971	2,487	10,847
CATFISH, BLUE		7		
CUNNER	60	6	111	188
CUSK	6,688	4,657	1,176	928
DOGFISH SMOOTH			13,145	
DOGFISH SPINY	155,218	127,107	191,260	94,825
FLOUNDER, SUMMER	97	10	5	6
HAKE MIX RED & WHITE	68			17
HAKE, OFFSHORE	179			
HAKE, RED	27			
HAKE, SILVER	167	11	172	199
JOHN DORY		140		29
LOBSTER	4,472	7,080	15,576	14,802
MACKEREL, ATLANTIC	8,366	584	940	566
OTHER FISH	14			
SEA BASS, BLACK		94	5	1
SHAD, AMERICAN	10			44
SHARK, NK	61			
SKATE, BARNDOOR		2,915		
SKATE, SMOOTH	625,721			
SKATE, THORNY	18			
SKATE, WINTER(BIG)	96,044	714,643	783,339	1,180,034
SKATES	415,165	7,124	521,308	255,602
TILEFISH, GOLDEN	141	215	95	103
TUNA, BLUEFIN	21,179			
WHITING, KING	3		316	67
Total	2,374,185	2,157,991	2,576,473	3,171,059
Groundfish as % of total	32%	38%	28%	42%

Table 115 – Revenues (nominal dollars) for permits in the Fixed Gear Sector in FY 2007

Species	FY 2004	FY 2005	FY 2006	FY 2007
COD	452,529	439,314	581,046	1,372,267
FLOUNDER, AM. PLAICE	315	319	192	321
FLOUNDER, SAND-DAB				3
FLOUNDER, WINTER	5,406	4,533	12,204	30,409
FLOUNDER, WITCH	295	547	644	818
FLOUNDER, YELLOWTAIL	377	314	844	1,020
HADDOCK	265,171	499,712	191,107	150,282
HAKE, WHITE	6,439	12,277	7,251	6,627
HALIBUT, ATLANTIC	737	1,195	531	784
POLLOCK	71,769	98,588	91,927	89,214
REDFISH	1,189	17,878	12,825	62,539
WOLFFISHES	4,948	758	1,696	3,821
ANGLER	223,060	595,638	424,366	334,703
BASS, STRIPED	1,895	1,016		
BLUEFISH	3,383	1,891	1,146	4,127
CATFISH, BLUE		10		
CUNNER	98	12	51	106
CUSK	1,576	1,772	735	411
DOGFISH SMOOTH			3,135	
DOGFISH SPINY	30,775	29,944	51,563	20,153
FLOUNDER, SUMMER	153	11	6	18
HAKE MIX RED & WHITE	25			9
HAKE, OFFSHORE	31			
HAKE, RED	9			
HAKE, SILVER	59	8	80	115
JOHN DORY		163		50
LOBSTER	19,358	29,940	65,167	67,116
MACKEREL, ATLANTIC	2,136	298	654	392
OTHER FISH	28			
SEA BASS, BLACK		150	4	3
SHAD, AMERICAN	3			23
SHARK, NK	153			
SKATE, BARNDOOR		514		
SKATE, SMOOTH	87,589			
SKATE, THORNY	3			
SKATE, WINTER(BIG)	17,950	115,097	168,166	261,945
SKATES	62,396	1,411	110,361	69,951
TILEFISH, GOLDEN	240	400	174	255
TUNA, BLUEFIN	150,825			
WHITING, KING	5		527	61
Grand Total	1,410,925	1,853,710	1,726,402	2,477,543
Groundfish as % of total	57%	58%	52%	69%

Table 116 – Percent of cod landed by month for permits in the Fixed Gear Sector in FY 2007

MONTH	FY 2004	FY 2005	FY 2006	FY 2007
May	4.5%	3.6%	2.2%	0.4%
June	22.3%	13.6%	14.2%	8.3%
July	33.3%	29.1%	20.4%	31.9%
August	17.3%	27.7%	27.6%	28.1%
September	5.8%	8.3%	6.3%	8.6%
October	4.0%	2.9%	3.2%	12.6%
November	0.2%	3.4%	8.4%	5.2%
December	5.5%	1.5%	9.7%	2.6%
January	6.3%	8.3%	7.5%	1.9%
February	0.5%	1.3%	0.1%	0.3%
March	0.2%	0.2%	0.1%	0.0%
April	0.0%	0.3%	0.1%	0.1%

Table 117 – Observed sink gillnet trips on Georges Bank for vessels that were in the Fixed Gear Sector in FY 2007

	2004	2005	2006	2007
1. May – July	22	15	3	11
2. August – October	11	16	4	5
3. November – January	4	6	2	4
4. February - April	2	3	1	4
Total	39	40	10	24

Figure 55 – Discard/kept ratios for GB cod; vessels in Fixed Gear Sector in FY 2007

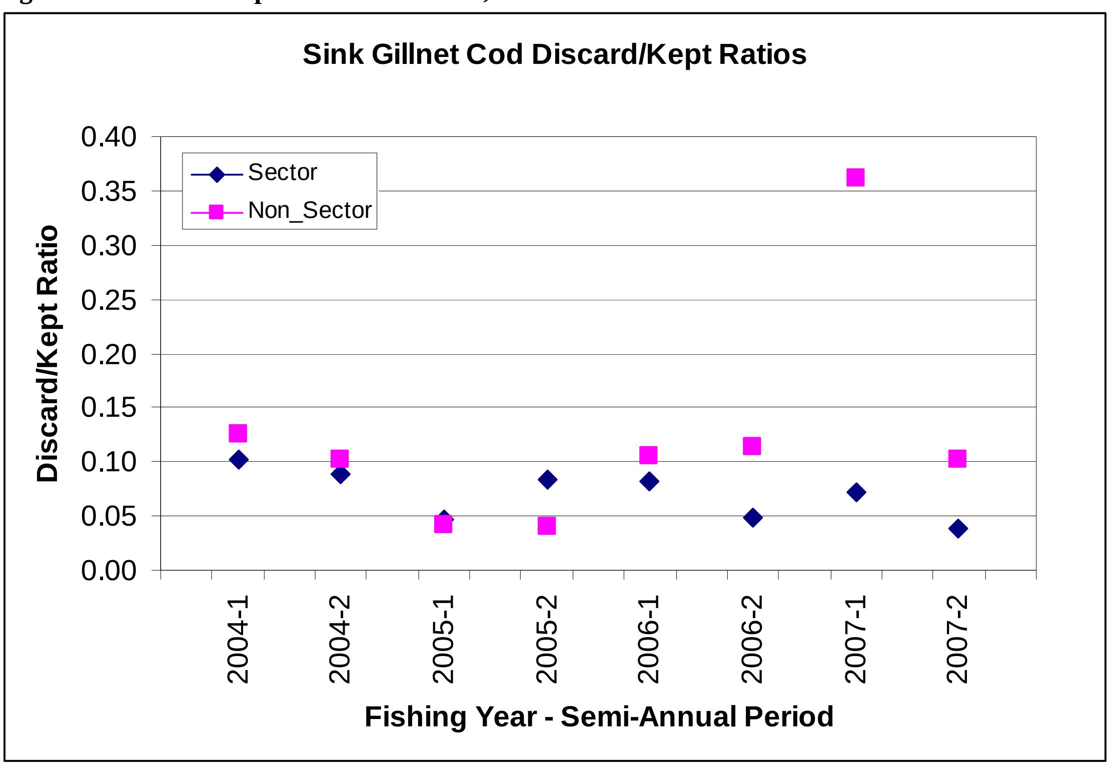


Table 118 – Cod discard reasons for vessels in the Fixed Gear Sector in FY 2007

Reason	FY 2004	FY 2005	FY 2006	FY 2007
Below legal size	7.9%	14.4%	34.4%	82.8%
Quota filled	12.9%	32.7%	0.0%	0.0%
Poor Quality	7.2%	19.3%	16.9%	1.6%
Poor Quality – Sand Fleas	38.3%	23.7%	11.4%	4.9%
Poor Quality – Seals	2.0%	0.0%	0.0%	0.0%
Poor Quality – Sharks	5.1%	0.6%	28.6%	0.0%
Poor Quality – Whales	0.0%	0.0%	0.0%	2.8%
Poor Quality – Hagfish	5.7%	9.2%	0.0%	7.9%
Poor Quality – Gear Damage	0.0%	0.0%	8.7%	0.0%
High Grading	21.1%	0.0%	0.0%	0.0%

6.2.4.3 Summary

The formation of sectors is widely viewed as an alternative to the inefficiencies of the effort control system. Increasingly stringent management measures have led to increased interest in sectors – an additional seventeen may be formed by this action. There is a widespread belief that sectors will reduce regulatory discards, will lead to harvesting a larger proportion of the TTAC or ACL, and will improve economic performance of the fishery. The limited experiences of the two existing sectors do not provide support for all of these expectations.

The GB cod hook sector has harvested only a fraction of its allocated TAC in spite of exemptions from trip limits, gear restrictions, and a seasonal closed area on GB. Clearly there are other factors at work that prevent this sector from achieving its catch goals: candidates include stock sizes lower than estimated, competition with dogfish or seals and other predators, or fish distribution. While it is not clear whether the sector members would have done better or worse fishing as non-sector vessels, the number of permits in this sector also declined significantly since its initial formation. There were 58 permits enrolled in the GB Cod Hook Sector in FY 2004 and the number had declined to 19 permits by FY 2008. This suggests that at least some members believe fishing as a non-sector vessel was preferable to sector membership, but perhaps it is more appropriate to consider total sector membership over this period. In FY 2007, membership in both sectors totaled 41 permits and the number of permits expected to be in both sectors in FY 2009 is 47. This is a 15 percent decline from the 58 permits that initially joined the hook sector in FY 2004.

The Fixed Gear Sector had operated for only one full year when this report was drafted. Again, they have not harvested their full allocation of GB cod. There is some evidence that economic performance of its members improved by forming a sector and sector formation allowed them to more effectively target GB cod. Discard rates may also have decreased though the one year of data available is not conclusive on this point.

These sectors have not been subject to the increased monitoring and enforcement costs that they will incur if proposed Amendment 16 measures are adopted. This makes it difficult to use these sectors to determine if sectors can be financially self-sustaining entities under the proposed management program.

6.2.5 Recreational Harvesting Component

The affected environment for recreational fisheries described in Framework 42 focuses primarily on Gulf of Maine cod. The Council is considering developing recreational allocations and accountability measures for additional groundfish species. These species include winter flounder, pollock, and haddock. This section updates information provide in Framework 42 for Gulf of Maine cod and provides baseline descriptions of recreational fisheries for winter flounder, pollock, and haddock.

Data to describe these recreational fisheries come from two sources; the Marine Recreational Information Program (MRIP, formerly the MRFSS) and recreational party/charter logbook data. The MRIP provides the primary source of data for catch statistics including harvested and released catch, distance from shore, size distribution of harvested catch, catch class (numbers of fish per angler trip), and seasonal distribution of harvested catch. For the party/charter mode logbook data are used to characterize numbers of participating vessels, trips, and passengers.

6.2.5.1 Winter Flounder

The recreational fishery for winter flounder takes place predominately in State waters with less than 2% of total catch coming from beyond the three mile limit (Table 119). Total catch of all winter flounder has declined from 1.6 million fish in 2001 to 364 thousand fish in 2007, a 77% reduction in catch.

Table 119 - Winter Flounder catch (A+B1+B2) by distance from shore (1,000's of fish)

Calendar Year	<= 3 mi.	> 3 Mi.	Inland	Total Catch	EEZ Proportion
2001	241	27	1326	1593	1.7%
2002	98	15	695	809	1.9%
2003	157	15	675	847	1.8%
2004	119	9	374	502	1.8%
2005	71	1	481	553	0.3%
2006	148	6	508	662	0.9%
2007	74	4	286	364	1.0%

Under the Multispecies plan winter flounder is comprised of three stocks, but given the characteristics of the recreational fishery only the Gulf of Maine and Southern New England/Mid-Atlantic winter flounder assessments include recreational data. According to GARM III about 87% of winter flounder catch came from the SNE/MA stock (Table 120). These data show substantial declines in catch although the decline in the SNE/MA stock (79.7%) was higher than the decline (57.2% in GOM winter flounder.

Winter flounder is harvested by party/charter, private boat and shore-based anglers. The majority of winter flounder are harvested by private boat anglers averaging 74.4% and 77.3% of GOM and SNE/MA harvested fish, respectively (Table 121). Note that the MRIP estimate of zero harvested GOM winter flounder in the party/charter mode during 2006 was due to the fact that winter flounder was not encountered through the creel survey in that year. While it is unlikely that no winter flounder at all were harvested by party/charter anglers in the Gulf of Maine, this result is a reflection of the low harvest rates of winter flounder in the party/charter mode.

Table 120 - Winter flounder catch disposition by stock (1,000's of fish)

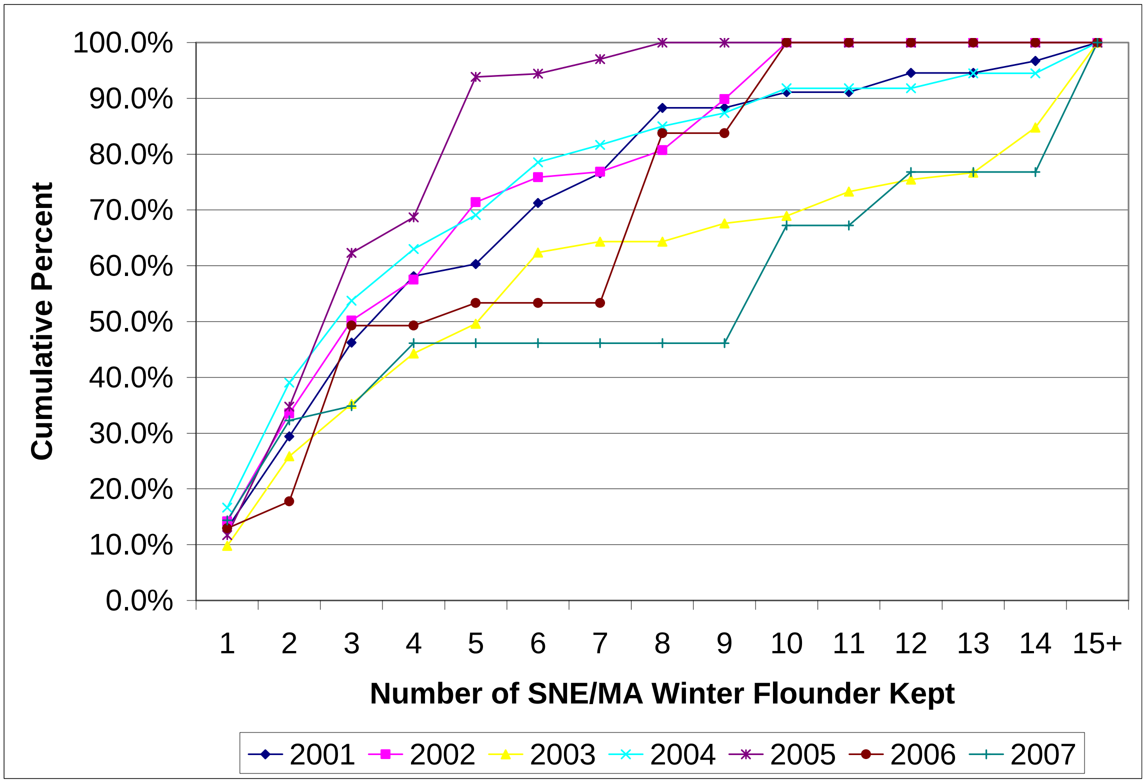
	Gulf of Maine Stock			SNE/MA Stock		
Calendar Year	Catch (A+B1+B2)	Harvested (A+B1)	Released Alive (B2)	Catch (A+B1+B2)	Harvested (A+B1)	Released Alive (B2)
2001	173	72	102	1421	892	528
2002	101	61	40	707	408	299
2003	86	52	34	761	572	189
2004	61	41	20	442	344	98
2005	79	40	39	484	215	269
2006	94	53	41	591	273	318
2007	74	48	26	289	215	74

Table 121 - Winter flounder harvest by stock area and mode (numbers of fish)

	Gulf of Maine Stock			SNE/MA Stock		
Year	Party/ Charter	Private Boat	Shore	Party/ Charter	Private Boat	Shore
2001	1,387	58,504	9,269	34,574	638,583	156,550
2002	441	48,502	10,273	28,772	268,754	98,786
2003	1,721	39,926	11,212	51,146	448,776	42,264
2004	312	25,951	12,568	47,526	221,769	75,718
2005	6,150	21,264	17,729	6,502	147,270	43,744
2006	0	46,931	5,102	2,214	191,811	51,009
2007	5,283	36,789	7,157	1,089	200,292	6,151

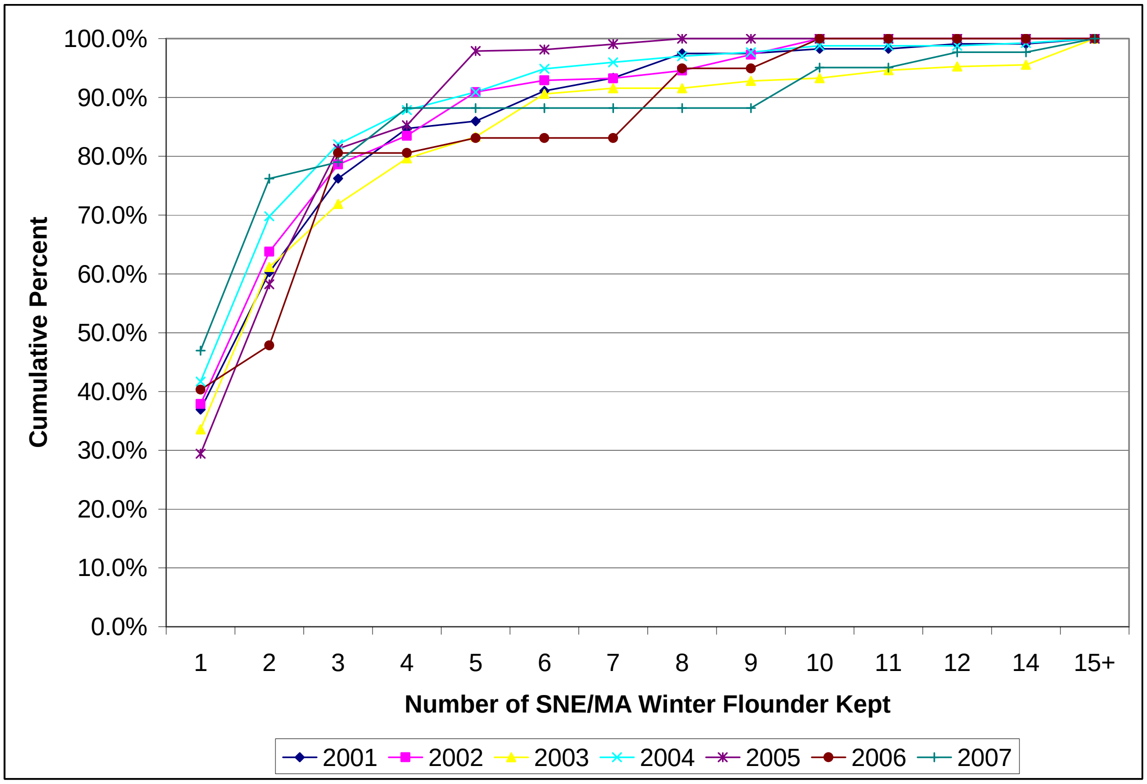
On a trip basis, recreational anglers may retain one or more fish. For example, during 2001 60% of SNE/MA winter flounder kept was caught on trips that harvested 5 or fewer fish and 90% of was kept on trips landing 10 or fewer fish (Figure 56). In both 2005 and 2006, all retained SNE/MA winter flounder were caught on trips were 10 or fewer fish were landed.

Figure 56 - Cumulative Percent of SNE/MA Winter Flounder Kept by Number of fish per Angler (all modes combined)



Even though trips that retained a small number of SNE/MA winter flounder represent a low proportion of the total number of winter flounder kept, these trips represent a comparatively larger proportion of total trips where winter flounder were kept. For example, trips where only one winter flounder were kept averaged 13% of total winter flounder kept, but averaged 38% of trips (Figure 57). Trips landing 5 fish accounted for 89% of total trips as compared to 60% of retained winter flounder.

Figure 57 - Cumulative Percent of SNE/MA Winter Flounder Trips by Keep Class (all modes combined)



In the Gulf of Maine, trips that kept one winter flounder accounted for an average of 16% of total retained fish during 2001 to 2007 (Figure 58). During these years, these trips accounted for an average of 41% of total trips where GOM winter flounder were kept (Figure 59). During 2001 two-thirds of harvested winter flounder were on trips that kept 5 or fewer fish. Since 2001 the proportion of total GOM winter flounder on trips landing 5 or fewer fish has ranged from a high of 90% during 2006 to 46% during 2004. In terms of trips, occasions where 5 or fewer GOM winter flounder were retained ranged from 82% of total trips during 2002 to 97% of trips during 2006. Since 2001, trips where 10 or fewer winter flounder accounted for less than 100% of harvested catch have only occurred in 2002 and 2006. Note that in each of these two years trips where more than 10 fish were harvested accounted for 3 to 6% of total harvest. Further, since 2002 harvested winter flounder in the GOM did not exceed 8 fish in any year except 2006.

Figure 58 - Cumulative Percent of GOM Winter flounder harvest by number of fish per angler (all modes combined)

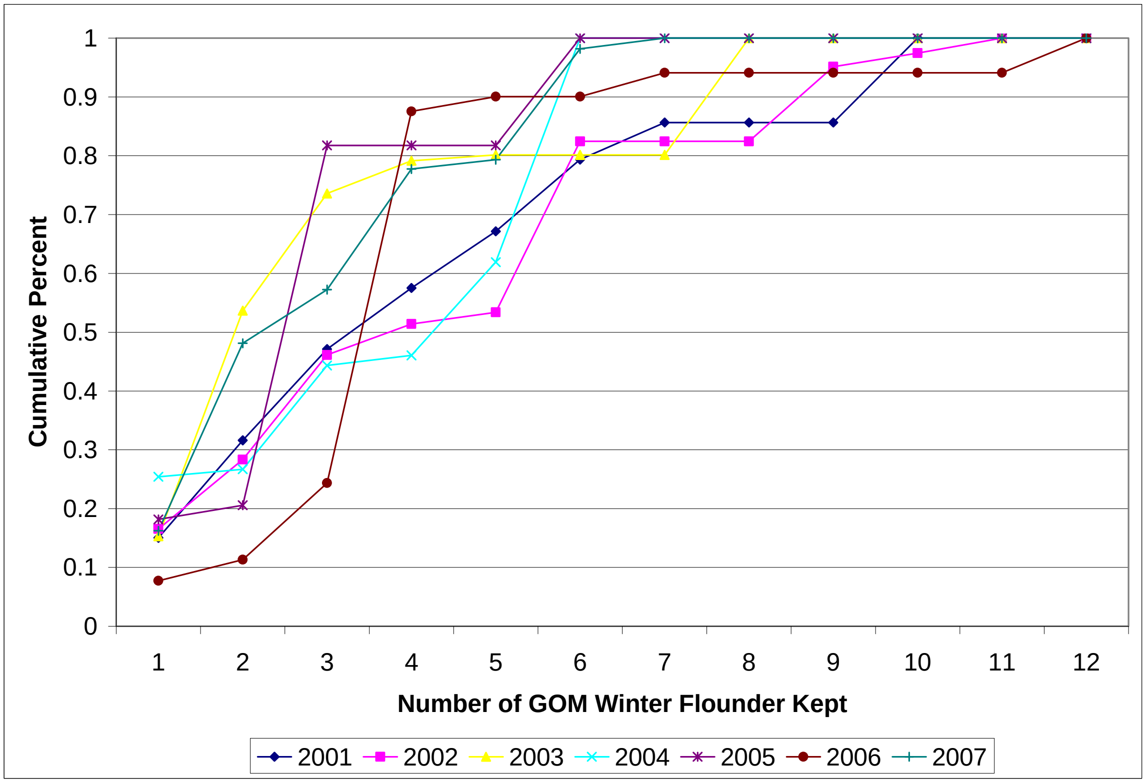
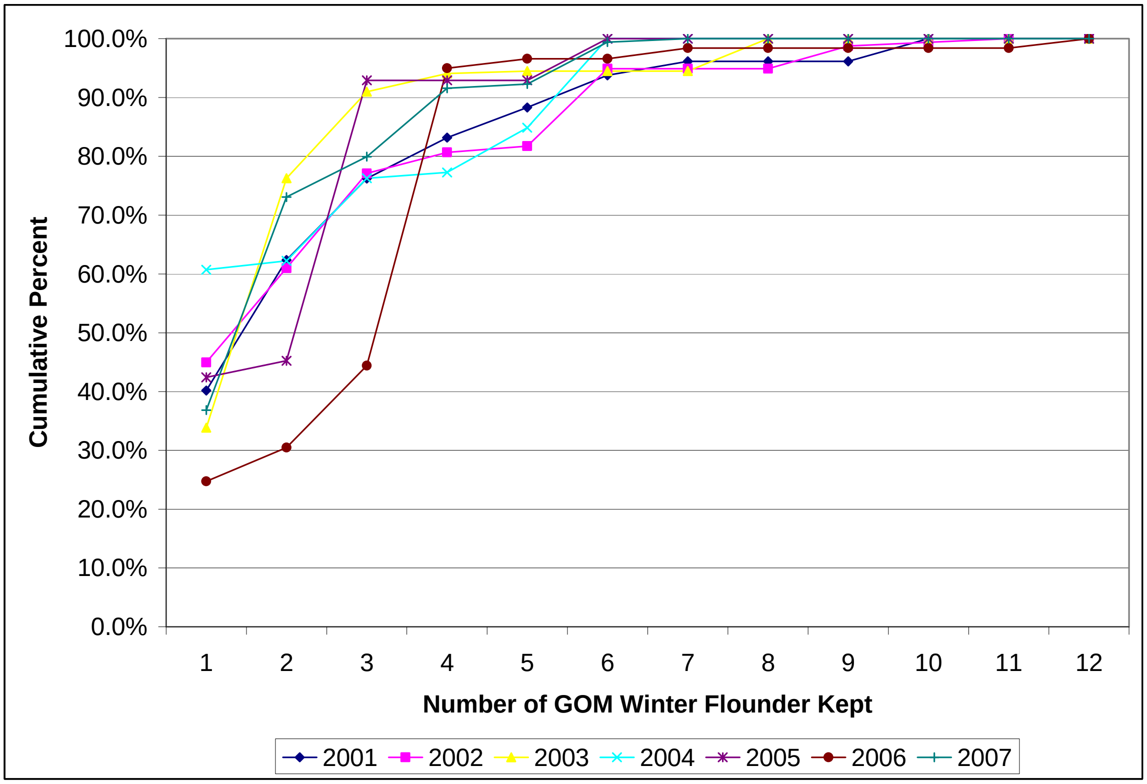


Figure 59 - Cumulative Percent of Trips Keeping GOM Winter Flounder (all modes combined)



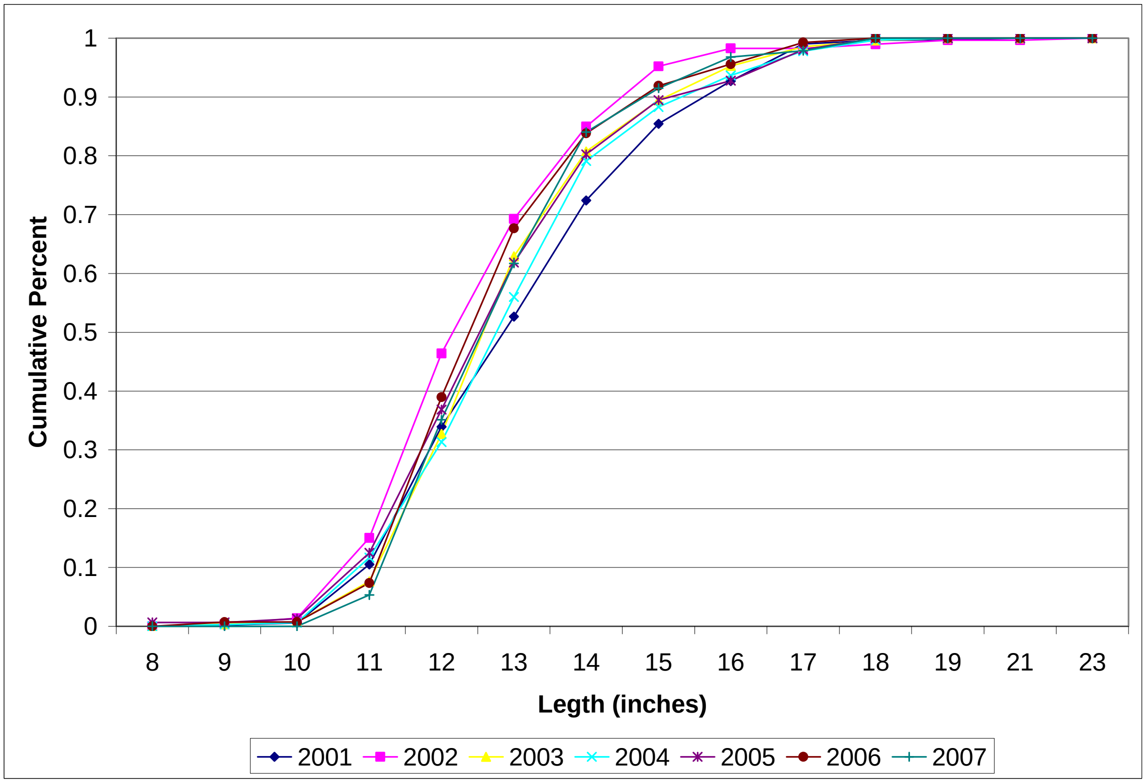
As part of the field intercept survey interviewers request to measure and weigh fish that are in the possession of each respondent. During 2001 522 winter flounder were measured as part of the intercept survey (Table 122). With a decline in harvested winter flounder the number of occasions where winter flounder were encountered by MRIP interviewers declined resulting in declining numbers of measured fish to fewer than 100 in 2007. For this reason, there available data were deemed insufficient to estimate a size distribution of harvested catch by stock area or by mode. For this reason, the size distribution of harvested winter flounder was estimated by pooling across all modes and stock areas.

Table 122 - Number of Measured Winter Flounder by Year

Year	Number of Measured Fish
2001	522
2002	293
2003	275
2004	316
2005	152
2006	136
2007	94

During 2001 to 2005 between 7% and 15% of the harvested winter flounder were less than 12-inches (Figure 60). In 2006 and 2007, 7% and 5% respectively, of the winter flounder harvest was less than 12-inches. Across all years nearly 98% of the winter flounder harvest was 17-inches or less. This means that between 80 and 90% of winter flounder harvest was between 12 and 17 inches in length.

Figure 60. Size Distribution of Winter Flounder Harvest



In the SNE/MA area winter flounder is predominately harvested during wave 2 (March and April) in the party/charter mode as except for 2006, 80 to 100% of all harvested fish were caught by the end of April (Table 123). The majority of winter flounder in the private boat and shore modes combined is also caught relatively early in the year although, the private boat/shore mode season extends into wave 3 (May and June).

During 2001 to 2004, at least 93% of the party/charter harvest occurred during waves 2 and 3 in the Gulf of Maine (Table 124). This pattern appears to have shifted to later waves as the majority of harvested GOM winter flounder were taken by party/charter anglers during wave 4 (August and September). Winter flounder harvested by private boat or shore mode anglers also tended to be taken somewhat later in the year during 2005 to 2007 compared to 2001 to 2004.

Table 123 - Proportion of SNE/MA Winter Flounder Harvested by Wave

	2001	2002	2003	2004	2005	2006	2007
Wave				**Party/Charter Mode**			
2	98.7%	97.6%	82.7%	85.1%	99.7%	43.2%	100.0%
3	1.3%	2.4%	17.3%	14.2%	0.0%	54.7%	0.0%
4	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
5	0.0%	0.0%	0.0%	0.6%	0.2%	0.0%	0.0%
6	0.0%	0.0%	0.0%	0.1%	0.2%	2.0%	0.0%
				Private Boat/Shore Mode			
2	60.9%	23.0%	54.8%	42.2%	47.3%	43.4%	92.3%
3	28.1%	7.0%	28.1%	33.8%	35.3%	56.4%	7.7%
4	0.3%	0.2%	0.3%	1.1%	0.0%	0.0%	0.0%
5	2.2%	12.1%	7.2%	14.3%	0.0%	0.2%	0.0%
6	8.5%	57.7%	9.6%	8.6%	17.5%	0.0%	0.0%
2	60.9%	23.0%	54.8%	42.2%	47.3%	43.4%	92.3%

Table 124 - Proportion of GOM Winter Flounder Harvested by Wave

	2001	2002	2003	2004	2005	2006	2007
Wave				Party/Charter Mode			
2	89.5%	94.7%	73.4%	79.4%	0.0%	0.0%	0.0%
3	6.3%	2.3%	18.7%	19.2%	26.0%	0.0%	0.0%
4	3.4%	0.0%	8.0%	0.0%	74.0%	0.0%	100.0%
5	0.0%	2.6%	0.0%	0.8%	0.0%	0.0%	0.0%
6	0.7%	0.4%	0.0%	0.6%	0.0%	0.0%	0.0%
				Private Boat/Shore Mode			
2	50.0%	18.7%	22.4%	30.5%	0.0%	0.0%	0.0%
3	33.6%	25.5%	40.1%	35.2%	33.2%	34.6%	7.4%
4	5.1%	8.3%	7.4%	23.7%	66.8%	48.4%	82.5%
5	2.4%	7.2%	13.6%	4.2%	0.0%	17.1%	10.1%
6	9.0%	40.3%	16.5%	6.5%	0.0%	0.0%	0.0%
2	50.0%	18.7%	22.4%	30.5%	0.0%	0.0%	0.0%

6.2.5.2 Haddock

Total recreational catches of haddock in have been increasing during 2001 to 2007 from 232.8 thousand fish to 507.8 thousand haddock; an increase of 118% (Table 125). The overwhelming majority of haddock are caught in the EEZ as during 2001 to 2006 over 98% of haddock were caught outside of state waters. In 2007 the number of haddock caught inside three miles from shore increased from no more than 13 thousand fish to 103 thousand.

Table 125 - Total Haddock Catch by Distance from Shore

Year	<= 3 mi.	> 3 Mi.	Total	EEZ Proportion
2001	4.6	228.2	232.8	98.0%
2002	8.4	247.2	255.6	96.7%
2003	6.9	373.7	380.6	98.2%
2004	1.5	400.4	402.0	99.6%
2005	9.1	565.0	574.1	98.4%
2006	12.5	445.7	458.2	97.3%
2007	103.2	404.6	507.8	79.7%

Haddock are known to be harvested by recreational anglers in both the Gulf of Maine and on Georges Bank. However, 99.7% of haddock were caught in the Gulf of Maine during 2001 to 2007. For this reason, harvest rates on Georges Bank haddock are too low to provide reliable estimates of recreational catch which is the reason recreational catch is not included in the Georges Bank haddock assessment. In the Gulf of Maine, haddock has been a recreational target of increased interest particularly as recreational measures implemented for cod have become more restrictive. Recreational catch increased in every year from 232.7 thousand fish during 2001 to 560.9 thousand fish during 2005 (Table 126). The number of haddock caught in 2006 dropped to 442.1 thousand fish but increased to 503.6 thousand haddock during 2007.

Table 126 - GOM Haddock Catch Disposition in Numbers (1,000's) (GARM III)

Year	Catch (A+B1+B2)	Harvested (A+B1)	Released Alive (B2)
2001	232.7	120.4	112.3
2002	255.3	83.3	172
2003	380.7	119.8	260.9
2004	420.9	278.5	142.4
2005	560.9	444.7	116.2
2006	442.1	277.9	164.2
2007	503.6	398.2	105.4

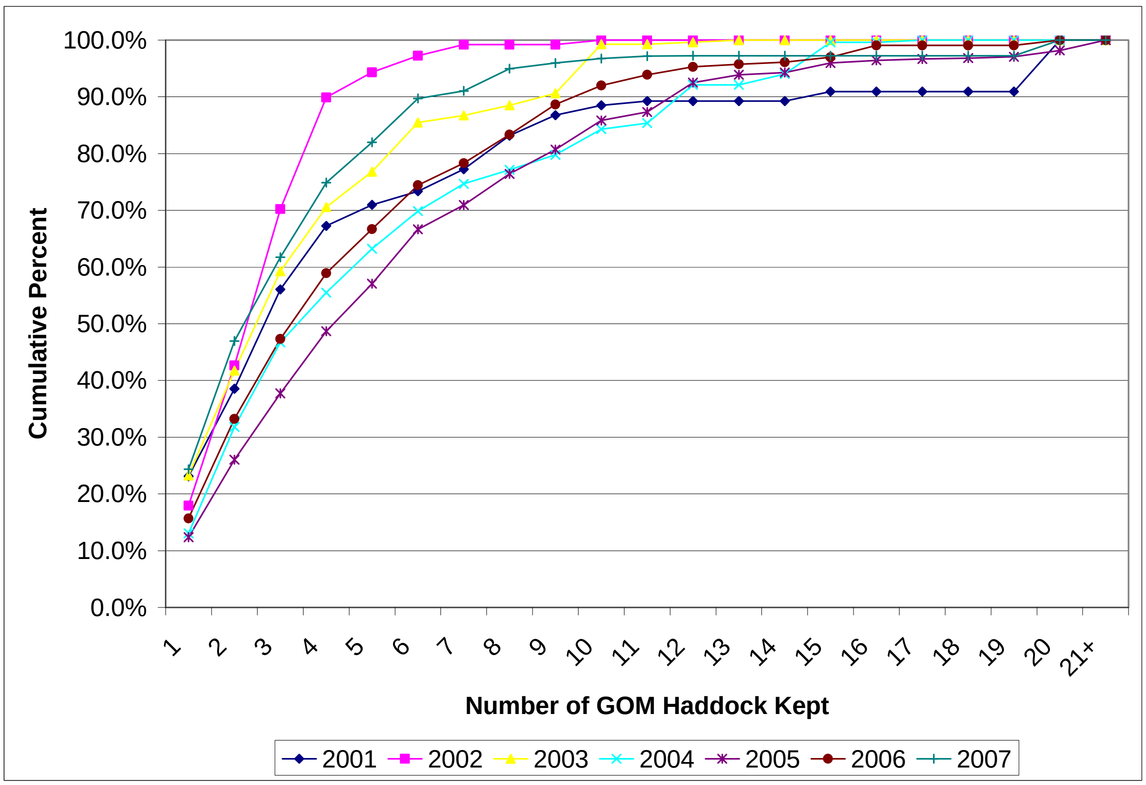
Haddock are harvested in the Gulf of Maine by both party/charter and private boat anglers. During 2001 to 2007 harvest by the two modes averaged 47% party/charter and 53% private boat (Table 127). Harvest by party/charter anglers more than doubled from 2003 to 2004 and doubled again from 2004 to 2005. Since 2005, party/charter harvest has been declining to 105 thousand fish in 2007. Private boat harvest also increased significantly from 2003 through 2005 but declined sharply to 88 thousand haddock in 2006 before rebounding to 236 thousand haddock during 2007. The reason for such a large one year change in private boat harvest is uncertain.

Table 127 - Gulf of Maine Haddock Harvested by Mode (numbers of fish)

Year	Party/Charter	Private Boat
2001	60,773	56,536
2002	31,249	47,832
2003	53,938	65,586
2004	118,368	147,133
2005	225,843	211,363
2006	177,921	87,683
2007	104,946	235,806

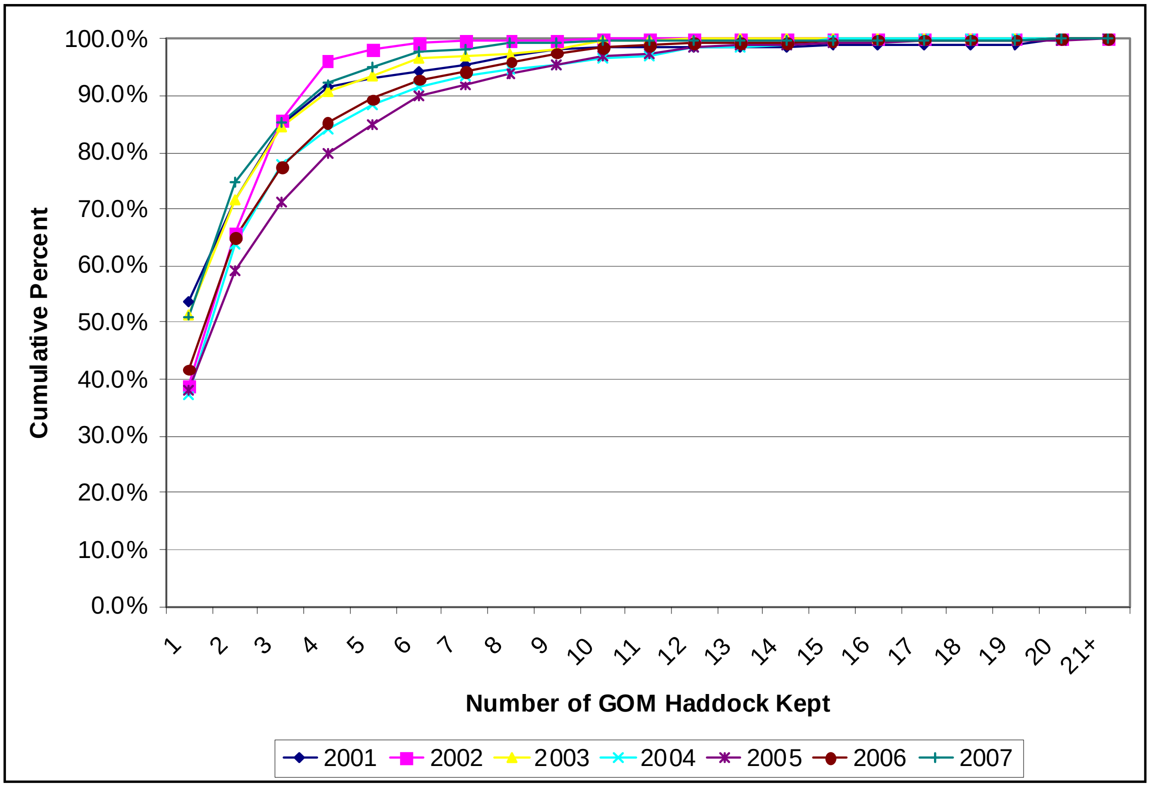
On average, 54% of GOM haddock harvested by party/charter anglers occurred on trips where 3 or fewer haddock were kept, while 92% of harvest occurred on trips that caught 10 or fewer fish were kept (Figure 61). The distribution of harvest by keep class during 2004 to 2006 is suggestive of a trend toward higher numbers of haddock kept by angler trip. That is, the cumulative distribution of harvest by keep class lies rightward of the cumulative distributions for prior years. For example, trips where 5 or fewer fish were kept accounted for 62% of harvested GOM haddock during 2004 to 2006 compared to 81% of total harvest during 2001 to 2003. Note that the distribution of harvest by keep class during 2007 was similar to that of the distributions estimated for 2001 to 2003.

Figure 61- Distribution of Kept Fish per Angler Trip for GOM Haddock Party/Charter Mode



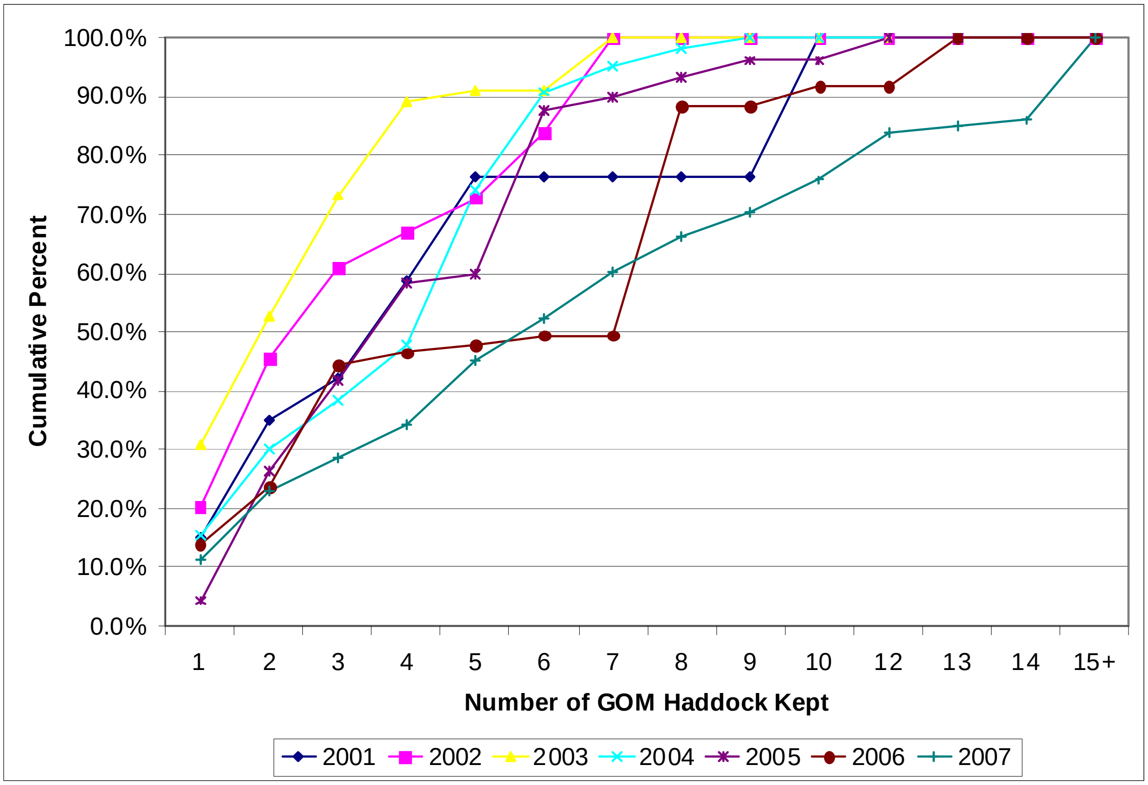
In the party/charter mode 45% of trips that landed GOM haddock kept only one fish (Figure 62). Trips where 3 or fewer GOM haddock were retained accounted for an average of 81% of occasions where GOM haddock were kept during 2001 to 2007. That is, trips on which 3 or fewer fish were kept accounted for 27% more of party/charter angler trips as compared to the number of haddock retained. However, as the number of kept haddock increases the difference between the cumulative distribution of retained fish and trips converges. For example, during 2001 to 2007 the cumulative percent of retained haddock and number of trips averaged 92% and 97% respectively when 10 or fewer fish were kept. In terms of management implications this means that at high potential bag limits for GOM haddock in the party/charter mode the biological impact on haddock and affected angler trips will be roughly proportional to one another. However, at lower potential bag limits the proportional impact on haddock will be larger than the proportional impact on affected trips and that this divergence between haddock and angler trips gets larger as the number of kept haddock gets lower.

Figure 62 - Cumulative Percent of Party/Charter Angler Trips that Retained GOM Haddock



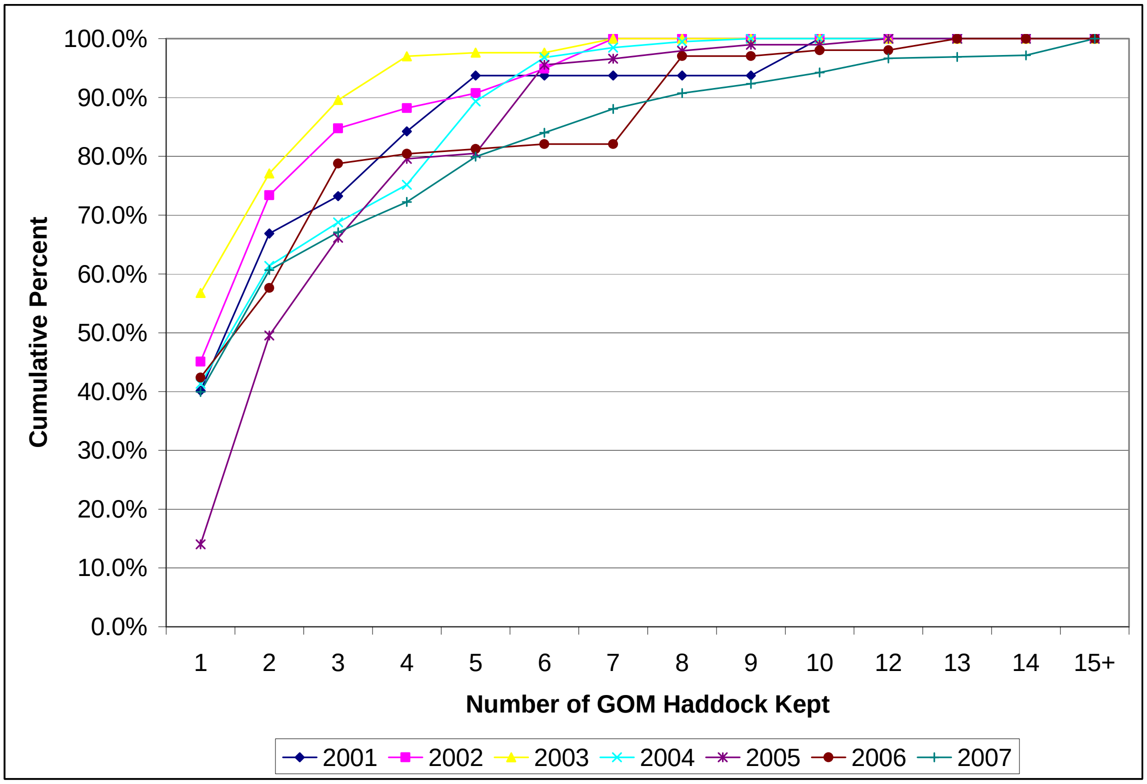
Compared to party/charter mode anglers the distribution of harvest by keep class by private boat anglers displays more inter-annual variability (Figure 62). However, the general shift toward higher numbers of fish kept on fishing trips evident in the party/charter mode is also evident in the private boat mode including calendar year 2007. During 2001 to 2004 private boat anglers did not harvest more than 10 fish per trip. However, during 2006 to 2007, 88% of harvested GOM haddock occurred on trips that kept 10 or fewer fish meaning that 12% of total harvest occurred on trips that landed more than 10 haddock.

Figure 63 - Distribution of Numbers of GOM Haddock Kept per Angler for Private Boat Mode



During 2001 to 2007 the proportion of private boat angler trips averaged 40% of all trips that kept GOM haddock (Figure 9). Occasions where three or fewer haddock were retained accounted for an average of 75% of during 2001 to 2007 compared to 47% of total numbers of GOM haddock kept.

Figure 64 - Cumulative Percent of Private Boat Mode Trips that Kept GOM Haddock by Keep Class



The number of measured haddock ranged from 5 to 42 fish in the private boat mode but was at least 100 fish in every year in the party/charter mode (Table 128). The MRIP changed its sampling methods for the party/charter mode beginning in 2004 in the North Atlantic region. As part of this change MRIP surveyors were placed on-board party boats to weigh and measure fish as they were harvested as well as fish that were released. This change increased the number of measured haddock to over 900 fish in 2004 and more than 1000 haddock in each year during 2005 to 2007. The sampling strategy also measured over 100 released haddock every year during 2005 to 2007. Given the low numbers of measured haddock in the private boat mode and in the party/charter mode during 2001 a reliable size distribution was not possible to estimate. Whether the size distribution of harvested haddock differs across fishing modes is uncertain.

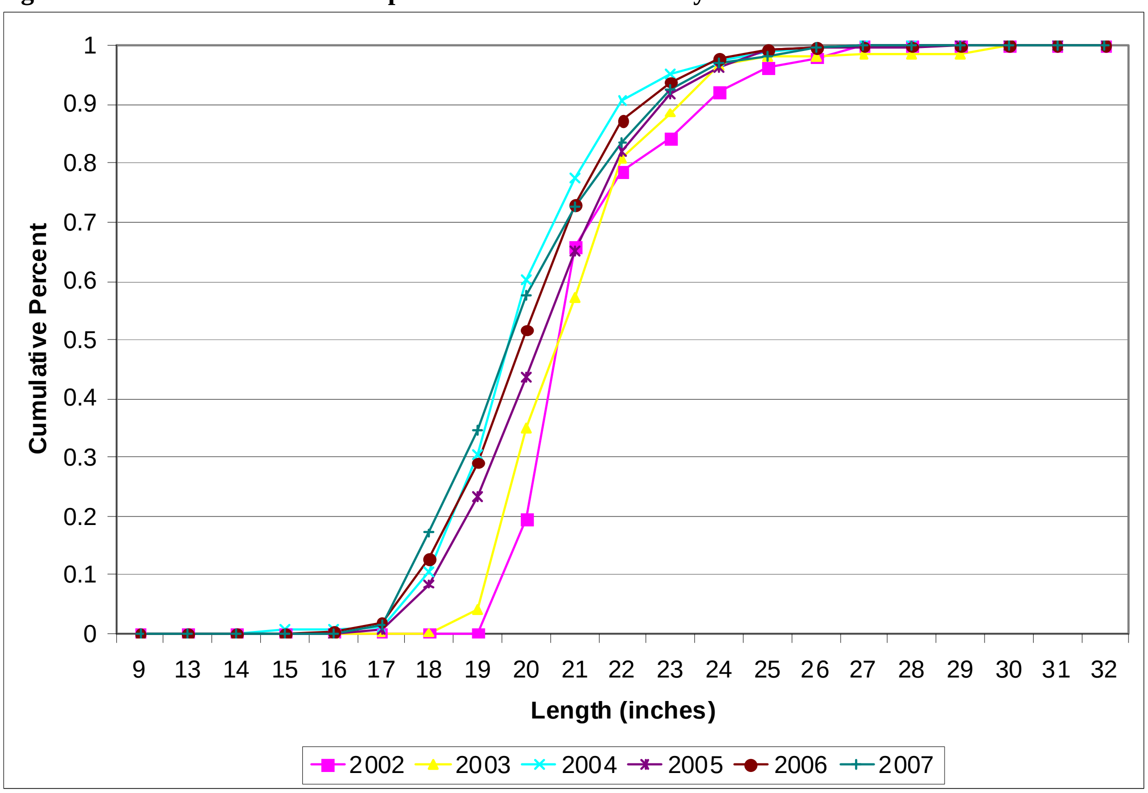
Table 128 - Number of Measured Gulf of Maine Haddock by Mode and Catch Disposition

Year	Party/Charter Kept	Private Boat Kept	Party Released
2001	20	5	
2002	111	8	
2003	194	16	
2004	923	7	
2005	1650	42	138
2006	1156	15	216
2007	1056	12	135

The number of measured haddock in the party/charter mode during 2004 to 2007 includes fish measured in both the party and charter modes. However, the large increase in sampling occurred only in the party mode since these vessels tend to be larger and can accommodate an MRIP surveyor. This means that the length data for these years will primarily reflect the size distribution in the party mode which may or may not be similar to that of charter boat anglers.

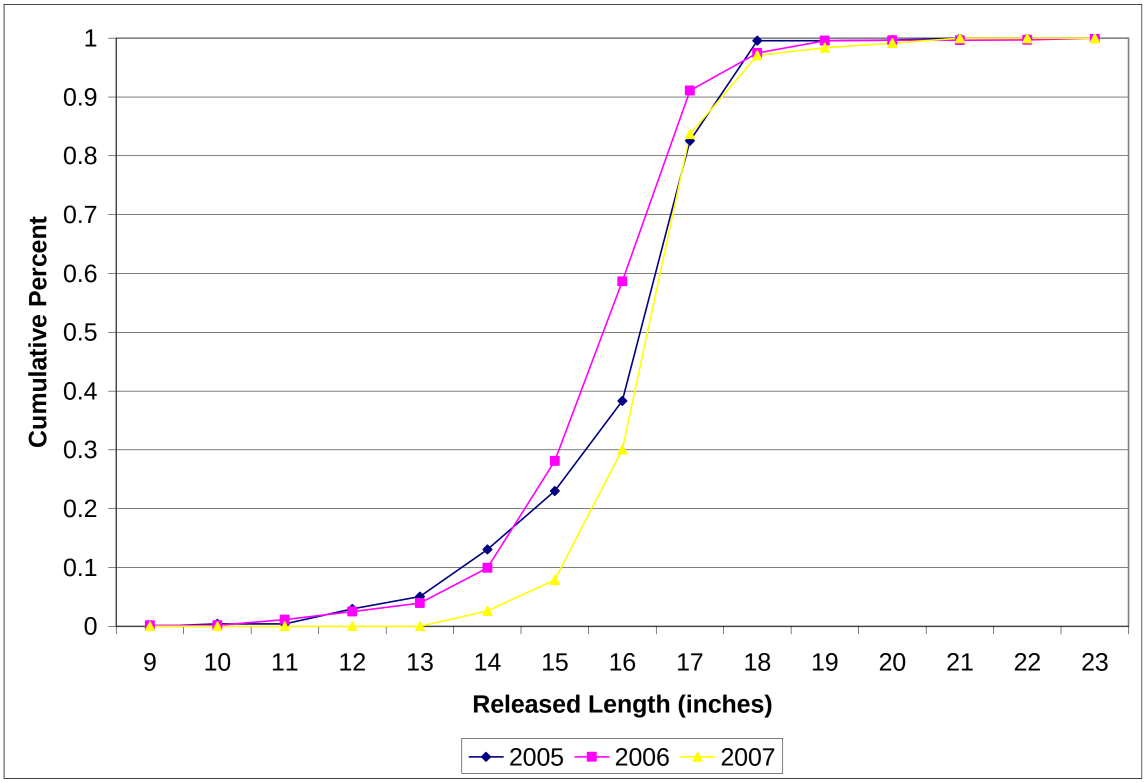
The minimum size for haddock changed several times between August 1, 2002 and May 1, 2004. From January to August the size limit was 19-inches then was raised to 23-inches until July, 2003 when the haddock size limit was lowered to 21-inches. Amendment 13, implemented May 1, 2004 returned the haddock size limit to 19-inches. The size distribution of harvested haddock reflects these changes as the distribution for 2002 and 2003 is truncated at 19-inches (Figure 65). Given the size limits that were in place during these two years one may have expected the size distribution to be even more truncated than they were. However, the MRIP data are annual which does not fully reflect size changes made either based on a fishing year or at some other date during a calendar year. Additionally, the size limit changes at the Federal level may not have been made the states. Since the majority of recreational fishery enforcement takes place dock-side enforcement of possession and size limits usually reflect state regulations. During 2004 to 2007 the size distribution of harvested GOM haddock has remained relatively stable. On average, for 2001 – 2007 12% of the party/charter harvest was 18-inches or less while the majority of harvest (88%) was at least 19-inches.

Figure 65 - Size Distribution of Kept GOM Haddock for Party/Charter Mode



In addition to measuring retained catch on-board party vessels MRIP surveyors measure fish that are released. During 2005 to 2007 less than 1% of released GOM haddock were 19-inches or greater (Figure 66). Thus, virtually all legal sized haddock are retained by party boat anglers. On average, 17" GOM haddock have accounted for the largest percentage (43%) of released fish while an 18" haddock accounted for 12% of released catch.

Figure 66 - Distribution of Released GOM Haddock by Party Mode Anglers



The seasonal pattern of GOM haddock harvest differs somewhat between party/charter and private boat anglers. Although inter-annual differences occur, on average the proportion of GOM haddock harvested in the party/charter mode was similar from May through September ranging between 15 and 18% during 2001 to 2007 (Table 129). The tendency for GOM haddock harvest in the party/charter mode to be roughly evenly spread from May to September was also evident during more recent years from 2005 to 2007. After September party/charter harvest of GOM haddock tapers off to less than 1% of total annual harvest in November and December before picking up again in March and April.

In the private boat mode GOM haddock harvest tended to spike during April or May and again in August. Relatively little GOM haddock private boat mode harvest occurred October through March. Harvest tended to pick up in April and May followed by a drop-off during the month of June.

Table 129 - Monthly Proportion of GOM Haddock Retained by Mode

Month	2001	2002	2003	2004	2005	2006	2007
				Party Charter Mode			
Mar	0.0%	0.0%	0.0%	1.6%	8.1%	4.4%	0.0%
Apr	2.8%	10.8%	10.8%	5.7%	18.0%	16.7%	3.5%
May	25.1%	21.9%	19.7%	13.7%	20.1%	18.7%	9.4%
Jun	4.5%	43.5%	8.9%	3.1%	14.7%	16.9%	18.5%
Jul	36.7%	4.7%	5.9%	10.0%	14.5%	11.1%	29.2%
Aug	9.5%	5.9%	9.8%	43.3%	12.9%	10.6%	9.2%
Sep	8.7%	5.7%	29.7%	11.6%	5.9%	16.6%	28.0%
Oct	12.3%	7.1%	12.0%	9.1%	5.2%	3.8%	2.2%
Nov	0.4%	0.0%	3.1%	0.0%	0.0%	1.1%	0.0%
Dec	0.0%	0.4%	0.0%	1.8%	0.6%	0.0%	0.0%
				Private Boat			
Mar	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Apr	0.8%	44.2%	5.7%	0.1%	43.7%	0.0%	13.3%
May	40.5%	11.5%	22.8%	37.2%	18.4%	19.5%	9.5%
Jun	18.5%	1.7%	4.7%	2.2%	6.7%	5.6%	10.7%
Jul	14.3%	7.6%	26.0%	5.8%	3.5%	40.7%	10.1%
Aug	10.9%	33.3%	10.5%	12.1%	21.6%	31.1%	26.0%
Sep	0.0%	1.8%	29.6%	38.0%	5.1%	1.3%	30.4%
Oct	14.9%	0.0%	0.7%	0.4%	0.9%	1.9%	0.0%
Nov	0.0%	0.0%	0.0%	2.9%	0.2%	0.0%	0.0%
Dec	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%

6.2.5.3 Pollock

Recreational catches of pollock were over one million fish in 2001 but have declined steadily to 239 thousand fish in 2007 (Table 130). During 2001 to 2007 the EEZ accounted for an average of 49% of total pollock catch. For reasons that are uncertain, the split between the EEZ and state waters has exceeded 50% in either state or EEZ waters in alternating years. In state waters the proportion of pollock caught inland as compared to other state waters has ranged from a high of 64% in 2003 to a time series low of just under 15% in 2004.

Table 130 - Pollock Catch in Numbers by Distance from Shore (1,000's)

Calendar Year	<= 3 mi.	> 3 Mi.	Inland	Total Catch	EEZ Proportion
2001	367.1	528.6	162.3	1,058.0	50.0%
2002	179.0	190.3	126.9	496.3	38.3%
2003	59.2	189.5	106.9	356.1	53.2%
2004	170.8	107.3	29.3	307.6	34.9%
2005	39.4	178.3	36.3	254.1	70.2%
2006	67.7	120.6	89.4	278.2	43.4%
2007	76.3	126.9	29.7	239.0	53.1%

As noted above, total recreational catch of pollock has declined by 77%. However, the number of pollock harvested has not declined by the same proportion. Harvested pollock has declined by nearly 55% as the proportion of pollock catch that was harvested increased from one-third of total catch during 2001 to two-thirds of total catch during 2007 (Table 131).

Table 131 - Pollock Catch by Disposition in Numbers (1,000's)

Year	Catch (A+B1+B2)	Harvested (A+B1)	Released Alive (B2)
2001	1058.0	355.7	702.3
2002	496.3	239.2	257.1
2003	356.1	158.5	197.6
2004	307.6	223.7	83.9
2005	254.1	156.8	97.3
2006	278.2	175.1	103.1
2007	239.0	161.2	77.8

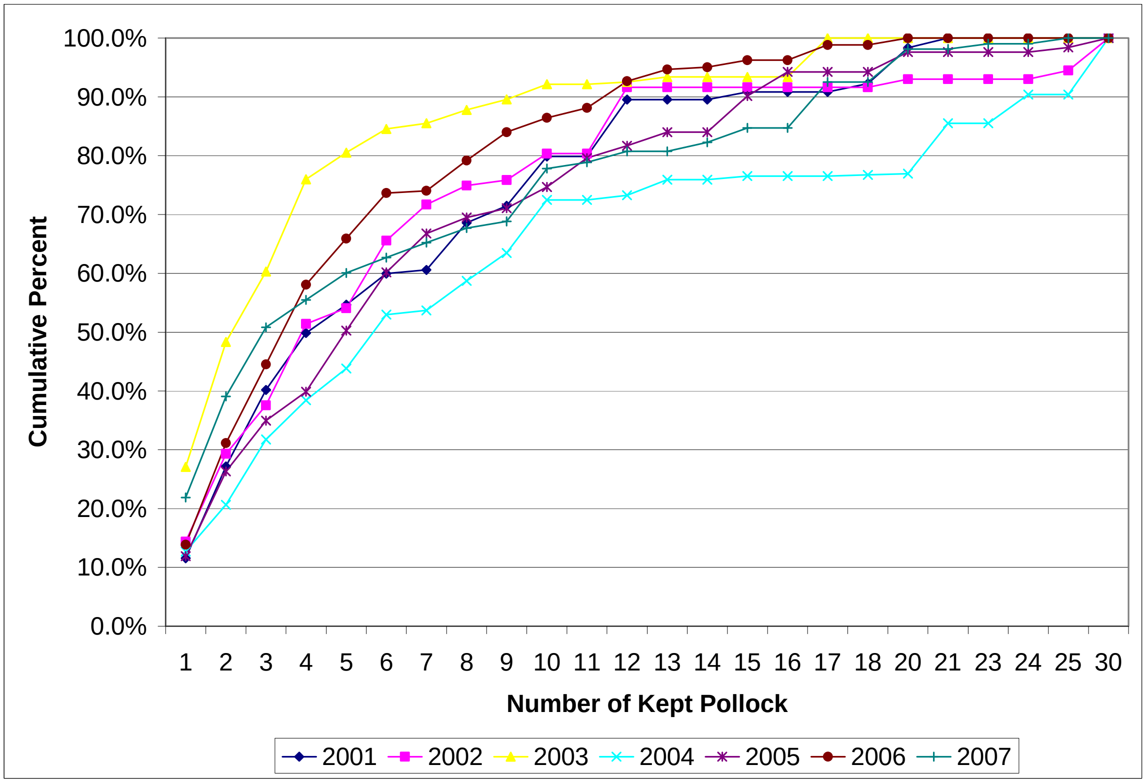
Pollock are harvested by anglers in a variety of different fishing modes. Although pollock are harvested by shore-based anglers, the majority of pollock are harvested by private boat anglers as the proportion of private boat harvest ranged from 56% during 2007 to 82% during 2003 (Table 132). The number of pollock harvested by party/charter anglers was as low as 23 thousand fish during both 2002 and 2003, but was at least twice as great in all other years.

Table 132 - Number of Harvested Pollock by Mode

Year	Party/Charter	Private Boat	Shore
2001	87,345	242,015	13,762
2002	22,846	183,603	33,988
2003	22,586	134,875	7,117
2004	71,638	144,873	8,703
2005	60,762	92,764	3,931
2006	56,993	121,686	0
2007	47,030	83,935	18,840

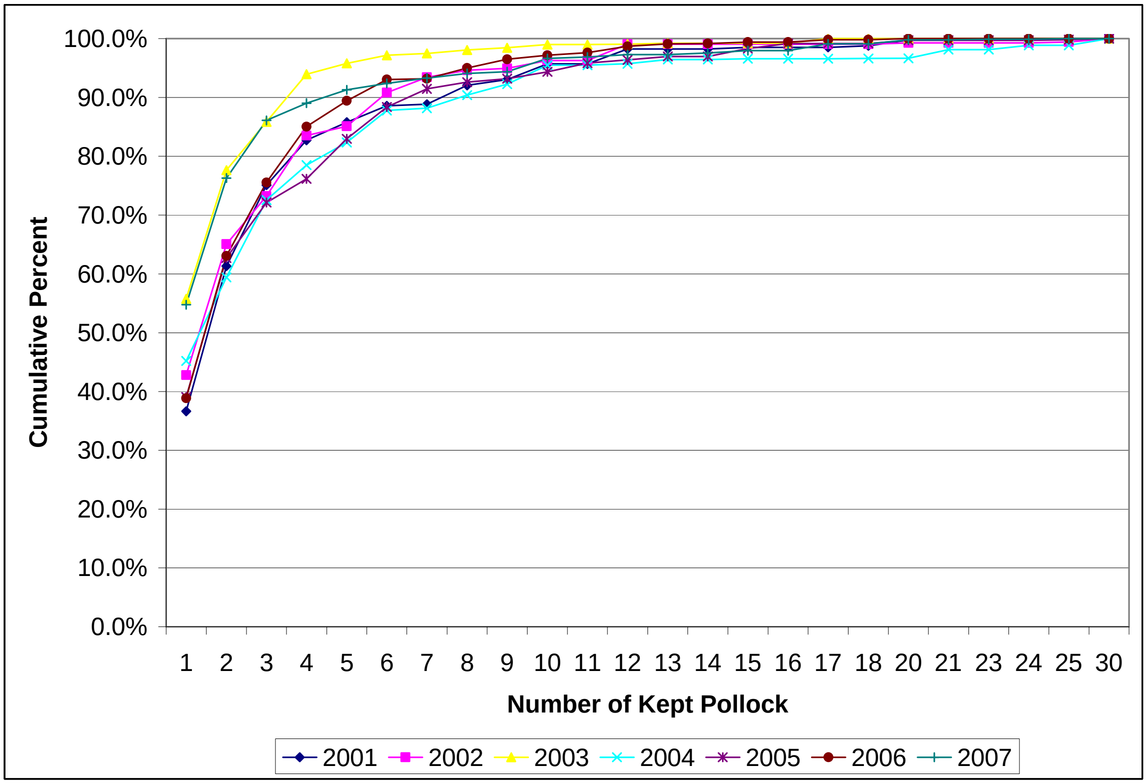
The distribution of numbers of pollock kept by party/charter anglers has been relatively stable. On average, just over half of pollock retained by party/charter anglers occurred on trips landing 4 or fewer fish (Figure 67). During 2001 to 2007 the number of fish accounting for at least half of kept pollock ranged between 3 or fewer to 6 or fewer pollock per angler trip. Although party/charter anglers were observed keeping up to 30 pollock on a trip, keep rates that exceeded 12 fish were not consistently observed in every year. However, keep rates above 12 pollock accounted for an average of 14% of total pollock retained by party/charter anglers, but ranged between 7% and 27%.

Figure 67 - Distribution of kept pollock by number of fish per angler in the party/charter mode



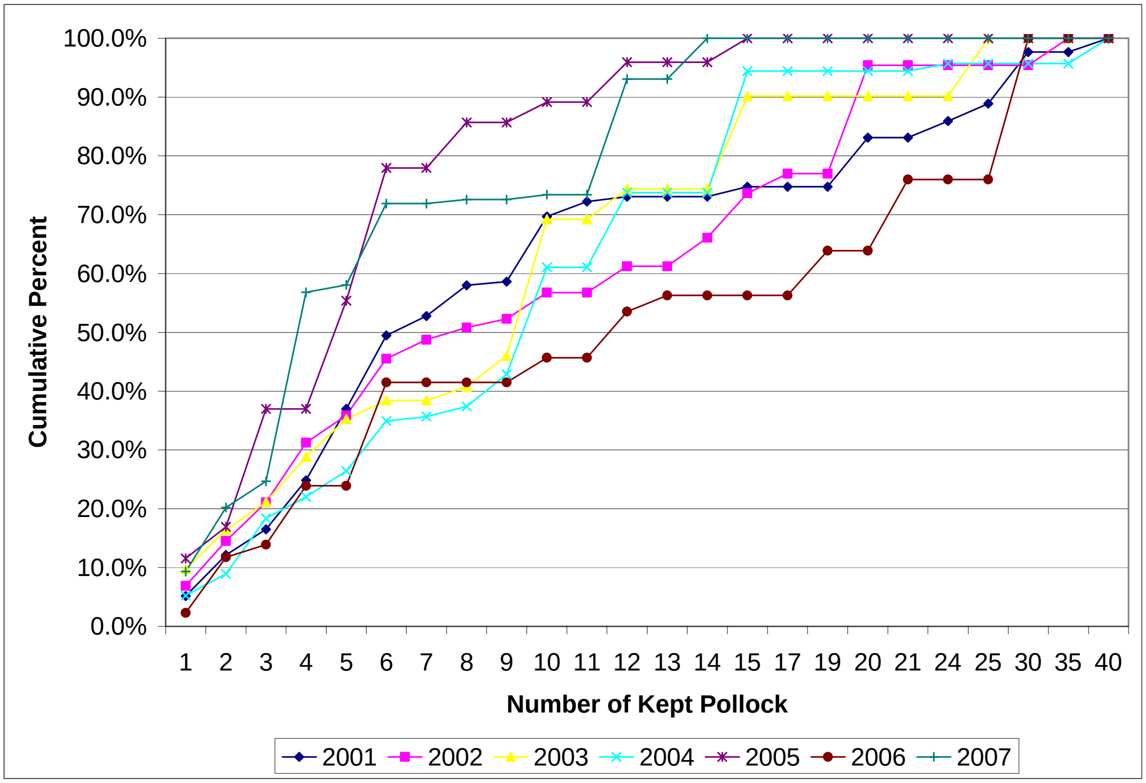
Trips that kept four or fewer pollock averaged 84% of total angler trips that retained pollock during 2001 to 2007 (Figure 68). Compared to the cumulative distribution of retained pollock, the cumulative distribution of trips is more steeply sloped asymptotically approaching 100% at lower keep levels. For example, the distribution of trips that kept pollock reaches 90% at trips that retained six or fewer pollock. This level of kept pollock accounted for an average of 66% of total pollock during 2001 to 2007. That is, the remaining 10% of party/charter trips that retained more than six pollock accounted for 34% of total retained fish.

Figure 68 - Cumulative Percent of Party/Charter Mode Trips Keeping Pollock by Number Kept per Angler Trip



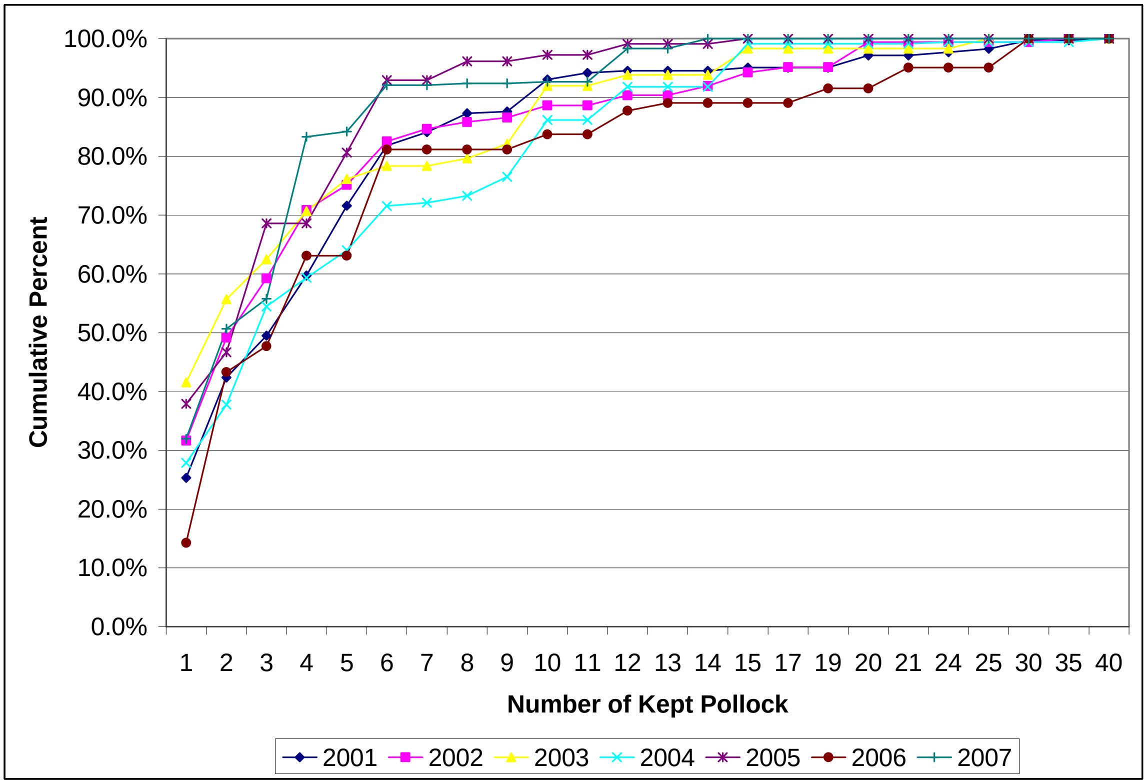
Compared to party/charter anglers the distribution of numbers of pollock kept by angler trip in the private boat/shore mode displayed considerably more variability (Figure 69). The number of pollock kept per angler that accounted for at least 50% of total kept catch ranged from 4 or fewer fish to as many as 12 or fewer pollock per trip.

Figure 69 - Cumulative Percent of kept pollock by numbers of pollock per angler trip in the private boat/shore mode.



As was the case for the party/charter mode the cumulative percent of trips approaches 100% more rapidly than the cumulative percent of retained pollock (Figure 70). That is, on average, two-thirds of private boat angler trips kept four or fewer pollock while these trips accounted for approximately one-third of all retained pollock. Similarly, 90% of trips keeping at least ten pollock accounted for only two-thirds of all retained pollock. Note that like the party/charter mode, this means that 10% of angler trips that landed more than 10 fish accounted for an average of one-third of recreational pollock kept. The management implication for pollock is that relatively high bag limits would have proportionally larger impacts on pollock as compared to its impact on the number of trips that keep pollock.

Figure 70 - Cumulative Percent of Private Boat Mode Trips Keeping Pollock by Number Kept per Angler Trip



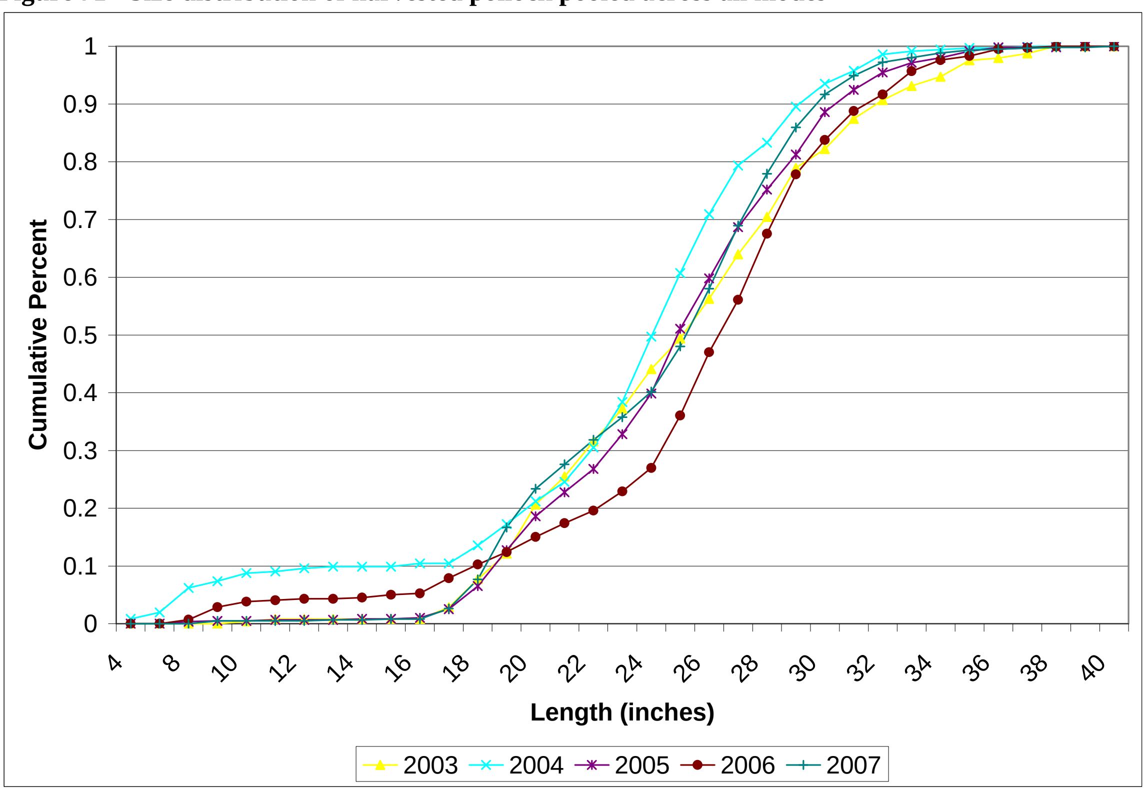
The number of pollock measured by MRIP interviewers ranged from more than 600 pollock during 2007 to less than 70 fish during both 2001 and 2002 (Table 133). Due to small sample size a size distribution for calendar years 2001 and 2002 were not estimated. Further, sample sizes by fishing mode were not sufficient to estimate a length distribution by fishing mode so the size distribution of harvested pollock was estimated by pooling all data across modes.

Table 133 - Total number of measured pollock in all fishing modes

Year	Measured Pollock
2001	66
2002	37
2003	247
2004	354
2005	597
2006	419
2007	612

Measured pollock during 2003 to 2007 ranged from as small as 4-inches to 40-inches (Figure 71). Note that this range represents the limit of observed pollock harvested during 2001 to 2007. At the lower end of the size distribution pollock under 19-inches accounted for about 10% of total recreational harvest while at the upper end of the size distribution pollock measuring 30-inches or more accounted for another 10% of the recreational harvest. This means that 80% of the recreational harvest of pollock was between 19 and 30-inches in length.

Figure 71 - Size distribution of harvested pollock pooled across all modes



Pollock harvest occurs somewhat earlier in the year in the private boat/shore mode compared to the party/charter mode (Table 134). In most years nearly 90% of pollock in the private boat/shore mode was harvested during waves 3 and 4 (March – June). By contrast about 80% of the party/charter harvest of pollock occurred during waves 4 and 5 (May – August). Thus, wave 4 is an important season for all fishing modes whereas, wave 3 was more important for private boat and shore mode anglers and wave 5 tended to be more important for party/charter anglers.

Table 134 - Proportion of Pollock Harvested by Wave and Mode

Wave	2001	2002	2003	2004	2005	2006	2007
			Party/Charter Mode				
2	0.0%	0.4%	6.2%	0.4%	0.0%	0.6%	0.4%
3	10.8%	16.2%	5.6%	11.2%	8.0%	20.8%	21.1%
4	44.2%	45.0%	57.0%	40.7%	42.4%	44.6%	48.5%
5	44.1%	36.8%	29.2%	44.4%	37.7%	23.4%	29.7%
6	0.8%	1.6%	2.1%	3.2%	11.9%	10.5%	0.3%
			Private Boat/Shore Mode				
2	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%
3	28.2%	50.2%	21.6%	17.4%	19.4%	71.1%	39.5%
4	47.3%	44.1%	64.3%	71.0%	71.5%	28.9%	43.9%
5	23.8%	4.0%	9.6%	11.3%	9.1%	0.0%	16.7%
6	0.6%	0.5%	4.5%	0.3%	0.0%	0.0%	0.0%

6.2.5.4 Cod

During 2001 to 2007 the total number of cod caught in the Northeast region has ranged from a high of 2.5 million fish during 2001 to just over one million fish during 2006 (Table 135). Although cod are caught by recreational anglers in both the EEZ and in state waters, the majority are caught in the EEZ averaging 80% of all cod caught. In the EEZ total recreational catch peaked during 2005 at 1.9 million fish, but declined to less than one million fish during 2006 before rebounding to 1.2 million cod during 2007. In state waters the split between inland and other state waters varied significantly ranging from 2% of cod from inland waters during 2003 to almost 90% during 2007.

Table 135 - Number of Cod Caught by Distance from Shore (1,000's)

Year	<= 3 Mi	> 3 mi	Inland	Total	EEZ Proportion
2001	507.1	1612.5	361.9	2481.5	65.0%
2002	418.9	1316.4	51.6	1786.9	73.7%
2003	202.0	1674.5	4.0	1880.6	89.0%
2004	172.7	1284.4	95.8	1552.9	82.7%
2005	269.7	1853.4	54.9	2178.0	85.1%
2006	151.4	879.6	34.4	1065.4	82.6%
2007	32.7	1184.8	279.1	1496.6	79.2%

Although cod are caught in Gulf of Maine and Georges Bank stock areas, the proportion caught in the Gulf of Maine exceeded 90% in all years except 2004 and 2005 (Table 136). Catches of Georges Bank cod averaged about 160 thousand fish during 2001 to 2003 before increasing in consecutive years to 511 thousand cod in 2005. However, during 2005 less than 30% of cod caught on Georges Bank were harvested; down from an average of 58% during 2001 to 2004.

During 2006 recreational catch of Georges Bank cod fell to 79 thousand fish and fell again during 2007 to less than 25 thousand fish. The number of harvested Georges Bank cod during 2007 was less than four thousand. The low value for 2007 cannot be readily explained.

Over two million cod were caught in the Gulf of Maine by recreational anglers during 2001. The number of Gulf of Maine cod caught has been below this level since 2001, but averaged 1.7 million fish during 2002 to 2005. During 2006 the number of Gulf of Maine cod caught was a recent time series low of 932 thousand before increasing to 1.3 million fish during 2007; an increase of 43%. The percentage of harvested Golf of Maine cod averaged about 38% of total catch (recreational harvest, commercial landings and discards) from 2001 to 2004. However, the percentage of harvested Gulf of Maine cod has been declining in consecutive years since 2004 to 23% of the catch during 2007.

Table 136 - Number of Cod by Catch Disposition and Stock Area

	Gulf of Maine			Georges Bank		
Year	Catch (A+B1+B2	Harvested (A+B1)	Released Alive (B2)	Catch (A+B1+B2	Harvested (A+B1)	Released Alive (B2)
2001	2,330.3	1,018.3	1,312.0	168.6	99.3	69.3
2002	1,640.6	551.4	1,089.2	146.5	93.1	53.4
2003	1,721.0	613.0	1,108.0	162.4	94.2	68.2
2004	1,427.6	531.9	895.7	245.2	130.1	115.1
2005	1,859.0	584.2	1,274.8	511.2	141.8	369.4
2006	932.4	249.7	682.7	79.4	39.6	39.8
2007	1,337.1	307.0	1,030.1	24.8	3.9	20.9

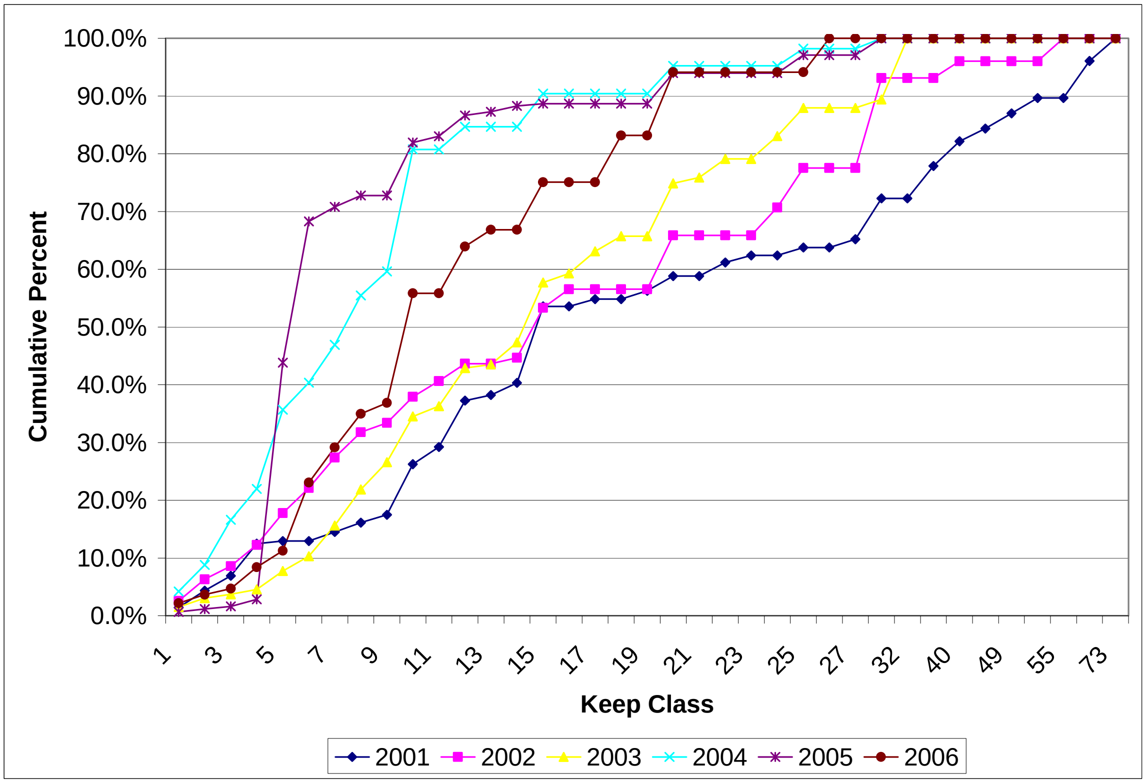
Compared to the Gulf of Maine, the overwhelming majority of Georges Bank cod were harvested by party/charter anglers (Table 137). Party/charter anglers accounted for more than 90% of harvested Georges Bank, whereas party/charter anglers averaged 25% of harvested Gulf of Maine cod in during 2001 to 2007 except for 2006 where 55% of harvested were caught by party/charter anglers.

Table 137 - Number of Harvested Cod by Stock and Mode

	Gulf of Maine		Georges Bank	
Year	Party/Charter	Private Boat	Party/Charter	Private Boat
2001	252.6	741.7	78.9	17.9
2002	92.7	437.2	56.1	34.5
2003	139.4	449.5	92.1	0.9
2004	129.5	404.0	93.7	8.2
2005	162.3	420.8	127.3	14.2
2006	121.3	100.2	38.8	0.0
2007	77.2	173.6	2.1	0.9

The distribution of number of Georges Bank cod kept per angler trip differed during 2001 to 2003 compared to 2004 to 2006 (Figure 72). Note that due to very low numbers of Georges Bank cod caught during 2007 it was not possible to estimate the distribution of numbers of kept cod per angler trip. Also, for the same reason, the distribution of Georges Bank kept by private boat anglers could not be estimated for any year. During 2001 to 2003 only about one-third of Georges Bank cod were kept on trips where 10 or fewer cod were kept. By contrast, 73% of Georges Bank cod were kept on trips landing 10 or fewer cod during 2004 to 2006.

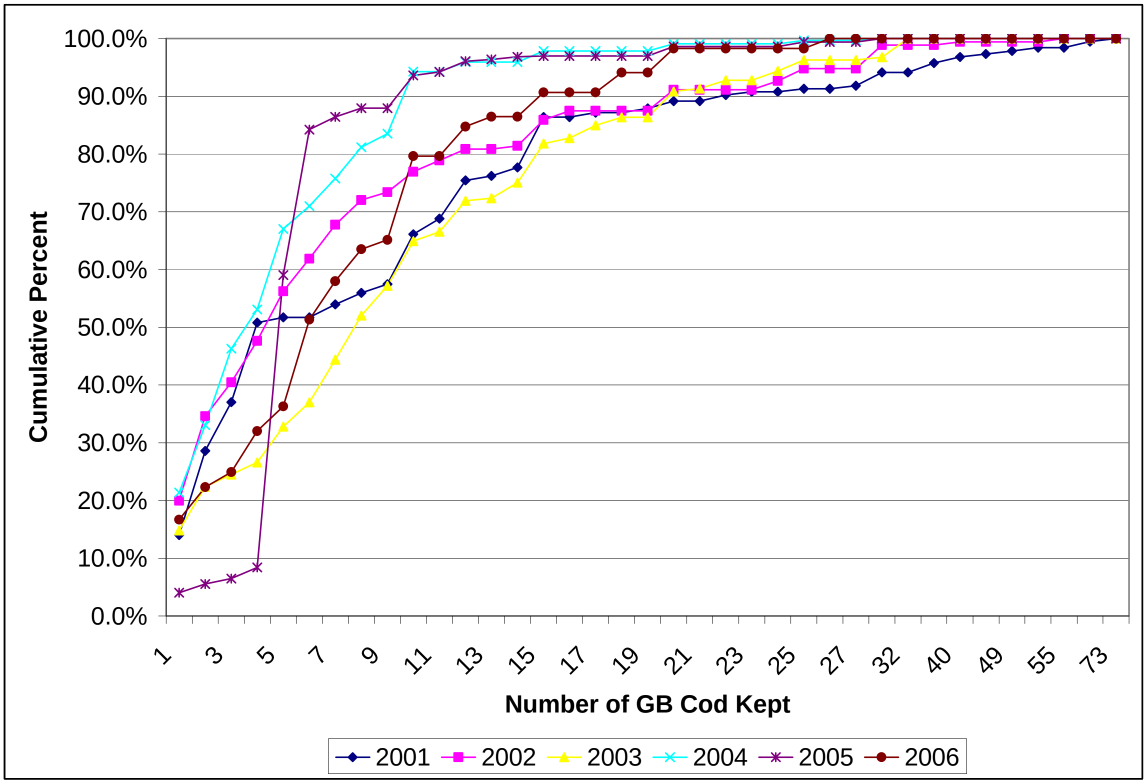
Figure 72 - Cumulative Percent of Georges Bank Cod Kept by Party/Charter Anglers by Number of Fish Kept per Angler Trip



The reason for the change in the distribution of kept Georges Bank cod is uncertain. While the MRIP data collection program during 2004 to 2006 was changed for the party/charter mode, the difference between these years and prior years in the distribution of retained Georges Bank cod was not evident for other species, and as will be seen later, was not evident for Gulf of Maine cod.

The cumulative distribution of party/charter angler trips that kept Georges Bank cod also exhibited differences between calendar years 2001 to 2003 and 2004 to 2006 although the difference was not as pronounced (Figure 73). During 2001 to 2003 50% of angler trips kept six or fewer Georges Bank cod even though these trips accounted for only about 15% of total keep. During 2004 to 2006 there was closer correspondence between the distribution of angler trips and kept Georges Bank cod as 54% of trips retained five or fewer fish which accounted for 30% of kept cod.

Figure 73 - Cumulative Percent of Party/Charter Angler Trips that Kept Georges Bank Cod



On average, 57% of total Gulf of Maine cod kept by party/charter anglers were caught on trips where four or fewer cod were landed (Figure 74). Note that these trips accounted for 87% of total angler trips that kept Gulf of Maine cod (Figure 75). This also means that 13% of party/charter angler trips accounted for 43% of total kept Gulf of Maine cod in the party/charter mode. At least since 2004 the possession limit on Gulf of Maine cod has been 10 cod per person. During 2004 to 2007 about 94% of Gulf of Maine cod were caught on trips that retained 10 or fewer fish. This indicates that about 6% of the cod kept on party/charter angler trips may not have been in compliance with the Federal possession limit. Note that these occasions represent a small percent (about 1%) of total trips that retained Gulf of Maine cod and may be associated with over night trips. If the latter, then possessing up to 20 cod would be legal since the bag limit is a daily limit.

Figure 74 - Cumulative Percent of Gulf of Maine Cod Kept in the Party/Charter Mode

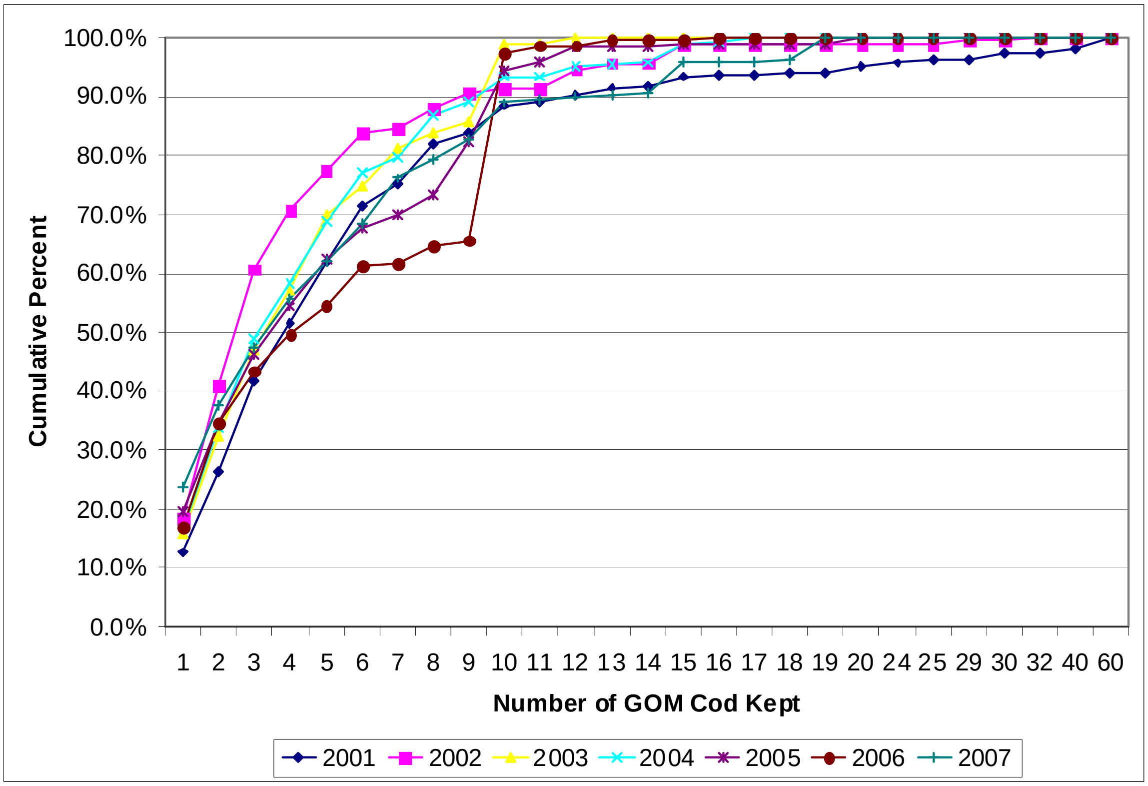
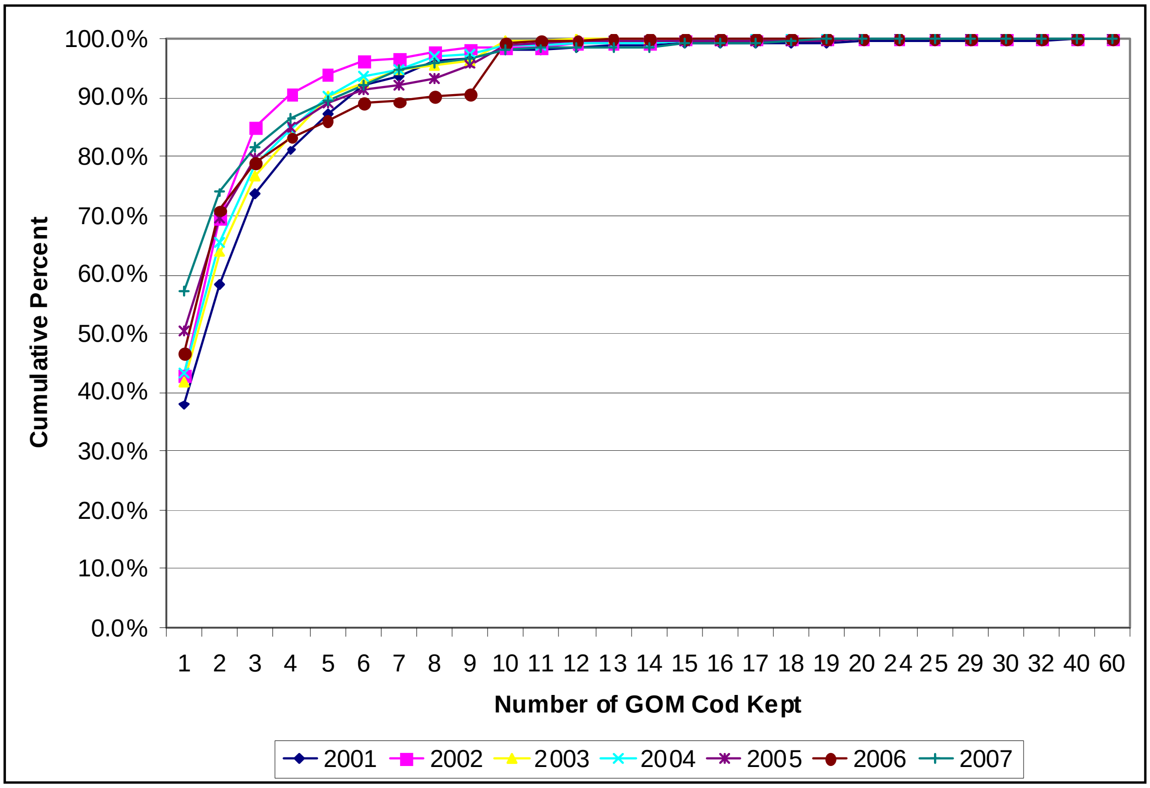
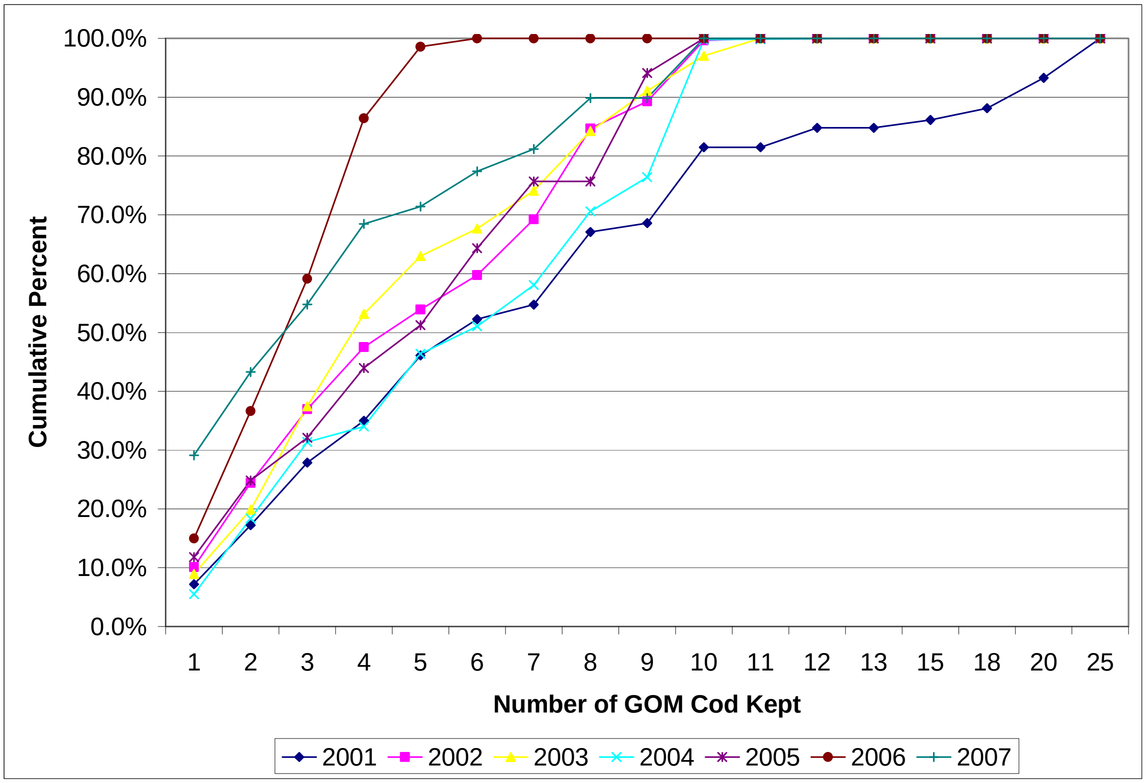


Figure 75 - Cumulative Percent of Party/Charter Angler Trips that Retained Gulf of Maine Cod



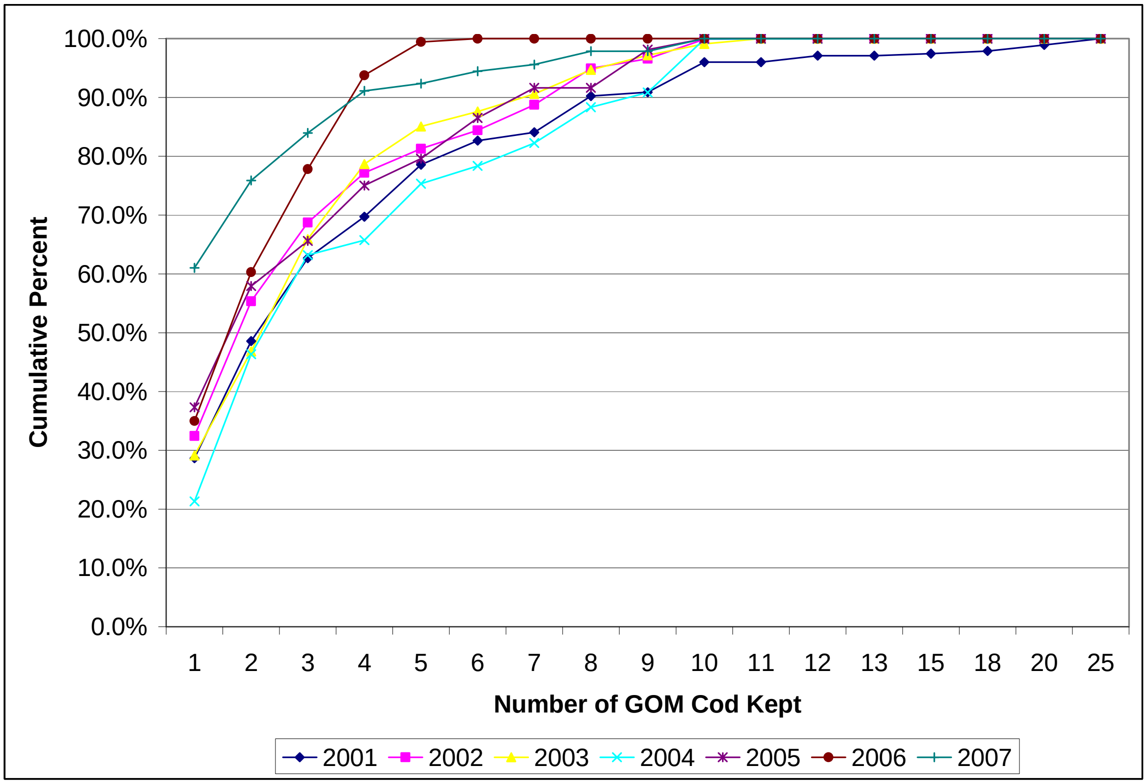
Compared to the party/charter mode, the range of retained cod by number kept per angler trip in the private boat mode was more compact, but there was substantially greater inter-annual variability in the cumulative distribution of retained Gulf of Maine cod (Figure 76). For example, during 2001 to 2007 private boat angler trips that kept five of fewer Gulf of Maine cod ranged from 46% to 98% whereas the percentage kept by party/charter anglers ranged between 55% and 77%. Also, since 2002 the number of Gulf of Maine kept by private boat anglers has been truncated at 11 cod in all but one year, and during 2005 to 2007 has been truncated at the 10 cod possession limit.

Figure 76 - Cumulative Percent of Kept Gulf of Maine Cod Private Boat Mode by Number Kept per Angler Trip



On average, more than half of all private boat angler trips that retained Gulf of Maine cod kept either one or two fish per trip during 2001 to 2007 (Figure 77). The cumulative distribution of private boat angler trips during 2006 and 2007 were more truncated than in other years as 92% of trips kept four or fewer cod as compared to 73% in all other years. This difference may be due to the November to March closed season implemented in 2006.

Figure 77 – Cumulative Percent of Private Boat Angler Trips that Retained Gulf of Maine Cod



During 2001 to 2007 the number of measured cod increased from 141 during 2001 to more than 600 cod during 2003 to 2007 (Table 138). Additionally, more than 1,000 released cod were measured during 2005 to 2007 in the party mode. By contrast, the number of measured cod was just over 100 in the private boat mode during 2001 to 2003 but has dwindled to only 20 cod during 2007. For this reason the size distribution of harvested cod in the private boat mode could not be estimated. Note also that the majority of measured cod were from the Gulf of Maine a size distribution for Georges Bank cod could not be estimated.

Table 138 - Numbers of Measured Atlantic Cod by Year and Mode

YEAR	Party/Charter Kept	Private Boat Kept	Party Released
2001	141	104	
2002	343	119	
2003	647	104	
2004	901	81	
2005	774	28	1364
2006	817	20	1608
2007	681	19	1606

During 2001 to 2007 the Gulf of Maine cod size limit changed from 21-inches during 2001 to 23-inches during 2002 to 2005, and was raised again to 24-inches as part of Framework 42 during 2006. During 2001, when the size limit for Gulf of Maine cod was 21-inches, 17% of harvested cod was 20-inches or less (Figure 78). During the full calendar years over which the size limit was 23-inches (2003 to 2005) the percentage of Gulf of Maine cod below the legal size averaged

30% of total harvest. During 2006 and 2007 the percentage of cod harvested by Gulf of Maine party/charter anglers that was less than 24-inches averaged 22%.

Nearly all Gulf of Maine legal-sized cod caught by party-boat anglers are kept, as less than 1% of the released catch was above the minimum size (Figure 81). The size distribution for 2007 is suggestive of a shift toward proportionally more released cod at higher sizes. For example, about 35% of the released Gulf of Maine cod were less than 15-inches during 2005 and 2006. This also means that 65% of the released catch was greater than 15-inches. During 2007, more than 80% of the released Gulf of Maine cod were more than 15-inches. Similarly, about 10% of the released Gulf of Maine cod harvest was above 20-inches during 2005 and 2006 but was 22% of the released catch during 2007.

Figure 78- Cumulative Distribution of Gulf of Maine Cod Party/Charter Mode Harvest by Length

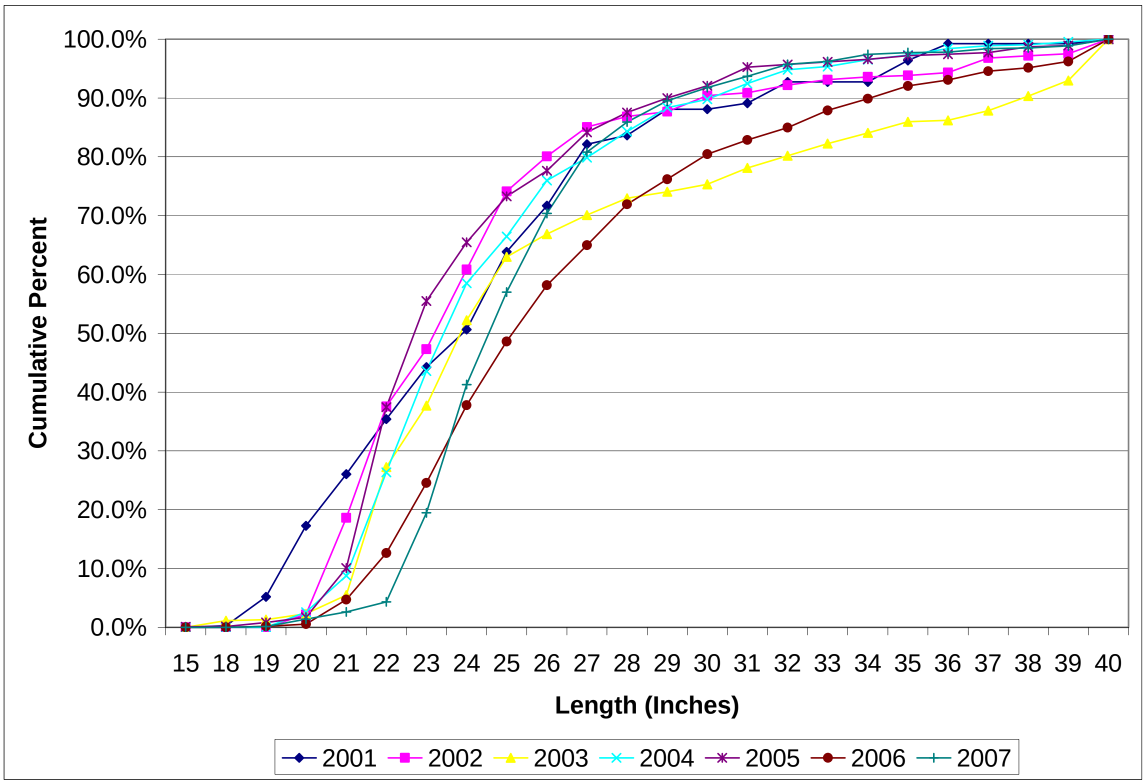
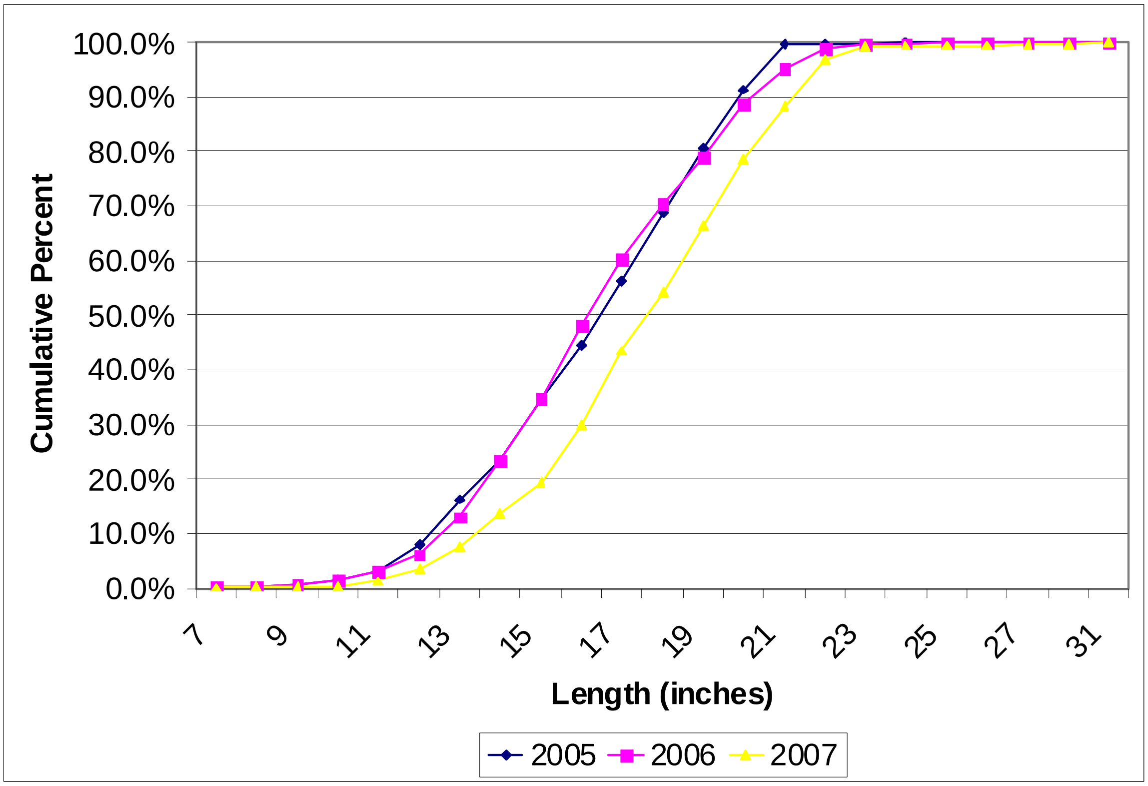


Figure 79 - Cumulative Distribution of Gulf of Maine Cod Party Mode Released Catch by Length



The seasonal distribution of the party/charter harvest of Gulf of Maine cod differs somewhat between party/charter anglers and private boat anglers. The party/charter season begins in April peaks in May or June, but remains reasonably steady through the summer months before tapering off in October and November. Party/charter harvest averaged less than 2% of total harvest in November and less than 1% of harvest during December. Note that during November of 2006 and March 2007, party/charter harvest of Gulf of Maine cod was zero as these months have been closed to possession of cod since implementation of Framework 42.

The seasonal distribution of private boat mode harvest varied more than that of the party/charter mode (Table 139). In some years harvest peaked during spring and early summer while in others, harvest peaked during the fall. This results in somewhat of a bimodal season with highs during the spring and fall with lulls occurring during summer and winter.

Table 139 - Monthly Distribution of Gulf of Maine Cod Harvest by Mode

	2001	2002	2003	2004	2005	2006	2007
				Private Boat Mode			
Mar	0.5%	2.1%	0.0%	0.0%	0.0%	2.9%	0.0%
Apr	11.4%	21.3%	19.0%	0.3%	40.7%	5.6%	23.4%
May	21.7%	14.4%	34.4%	18.7%	21.0%	29.3%	12.0%
Jun	12.2%	4.1%	6.2%	11.8%	8.0%	4.9%	3.4%
Jul	21.1%	11.4%	15.7%	2.2%	5.7%	16.1%	6.2%
Aug	4.5%	10.1%	5.6%	2.4%	12.9%	14.6%	10.8%
Sep	5.8%	4.8%	14.8%	37.0%	3.5%	0.8%	28.7%
Oct	9.7%	8.6%	0.4%	4.7%	0.5%	25.8%	2.1%
Nov	11.4%	19.9%	2.7%	17.4%	7.9%	0.0%	13.5%
Dec	1.8%	3.4%	1.1%	5.6%	0.0%	0.0%	0.0%
				Party/Charter Mode			
Mar	0.0%	6.1%	0.0%	0.8%	1.9%	12.4%	0.0%
Apr	0.8%	7.5%	4.6%	8.4%	28.4%	26.1%	15.4%
May	19.6%	16.5%	37.1%	25.5%	17.6%	9.2%	29.0%
Jun	4.7%	17.7%	11.6%	14.1%	16.3%	27.7%	14.1%
Jul	34.8%	7.7%	8.4%	7.7%	11.2%	9.0%	17.5%
Aug	6.1%	11.3%	6.8%	17.3%	11.6%	7.9%	6.4%
Sep	16.3%	18.7%	17.8%	14.9%	5.2%	6.0%	15.3%
Oct	16.4%	11.5%	9.5%	5.8%	5.8%	1.7%	2.4%
Nov	1.4%	1.4%	4.4%	4.5%	1.7%	0.0%	0.0%
Dec	0.0%	1.7%	0.0%	0.9%	0.3%	0.0%	0.0%

6.2.5.5 Party/Charter Permits

Federal party/charter permits are currently issued by the NERO under the Summer Flounder/Scup/Black Sea Bass, Squid/Mackerel/Butterfish, Multispecies, and Bluefish, FMPs. Federal party/charter permits for American lobster fishery are also issued under the provisions of ACFCMA. Each of these permits is open access and with the exception of multispecies any vessel operator must possess a federal permit when fishing in the EEZ while carrying passengers for hire. The multispecies plan is unique in that the FMP prohibits any limited access permit holder from also possessing any open access permit but allows limited access permit holders to carry passengers for hire. The number of multispecies party/charter permits issued has been increasing since 2001 from 652 permits to 762 permits in 2007 (Table 140). Almost all multispecies party/charter permit holders held at least one other party/charter permit with bluefish and fluke being the most commonly held permit. Only a small number of multispecies permit holders held a party/charter lobster permit during FY 2001-2007.

Table 140 - Summary of Northeast region party/charter permits held by Multispecies Part/Charter Permit Holders FY 2001-2007.

Permit Type	2001	2002	2003	2004	2005	2006	2007
Multispecies	652	687	687	692	741	738	762
Bluefish	553	590	609	626	674	674	699
Fluke	508	537	548	537	618	631	672
Lobster	12	16	17	23	22	22	23
Scup	438	469	470	491	560	568	610
Black Sea Bass	469	507	518	534	597	608	645
Squid/Mackerel/Butterfish	466	491	506	525	579	588	627

Although the number of unique party/charter permit combinations that would be possible to obtain is much larger, there were only 34 unique permit combinations issued to multispecies party/charter permit holders during FY 2001 – 2007. Of these combinations nine accounted for more than 80% of multispecies permit holders. More than half of all multispecies party/charter permit holders also held every other federal party/charter permit except lobster (Table 141). Most of the other common permit combinations at least included bluefish and summer flounder. Less than 50 multispecies party/charter permit holders only held a multispecies permit.

Table 141 - Summary of Unique party/charter permit combinations held by multispecies party/charter permit holders FY 2001-2007

Permit Combinations	2001	2002	2003	2004	2005	2006	2007
Mult/Bluefish/Fluke/Scup/BSB/SMB	304	340	362	379	449	469	511
Mult/Bluefish/Fluke/Scup/BSB	40	46	40	48	48	46	42
Multispecies-only	39	44	47	32	34	30	25
Mults/Bluefish	39	44	47	32	34	30	25
Mult/Bluefish/Fluke/BSB/SMB	23	27	32	28	20	25	22
Mult/Bluefish/SMB	24	29	28	36	28	23	19
Mult/Bluefish/Fluke/SMB	19	20	19	16	14	15	17
Mults/Bluefish/Fluke/Scup	24	18	18	16	15	14	14
Mult/Fluke/Scup/BSB/SMB	25	22	15	8	13	12	13
Percent of Total Permits	83%	86%	87%	87%	88%	91%	91%

Party/Charter Activity

The number of vessels reporting retaining any groundfish through the VTR ranged from 251 to 299 during FY 2001-2007 (Table 142). These vessels include individuals that hold an open access multispecies party/charter permit as well as limited access vessels that carry passengers for hire. The number of participating vessels declined in consecutive years from 283 operators during FY 2003 to 259 operators during FY2006 before increasing to 269 vessels during FY 2007. The number of trips retaining groundfish and number of passengers carried on those trips were highest during FY 2001. However, even as the number of trips and passengers fluctuated over time the number of trips taken per vessel was nearly constant at about 20 trips. Likewise the number of passengers per trip did not vary very much.

Table 142 - Summary of Party/Charter Operations

Fishing Year	Number of Reporting Vessels	Number of Groundfish Trips	Number of Anglers	Anglers per Trip	Trips per Vessel
2001	299	5,898	136,748	23.2	19.7
2002	251	5,106	108,034	21.2	20.3
2003	283	5,475	119,520	21.8	19.3
2004	277	5,710	119,612	20.9	20.6
2005	265	5,768	115,737	20.1	21.8
2006	259	5,133	102,759	20.0	19.8
2007	269	5,622	109,734	19.5	20.9

The number of party/charter operators taking passengers for hire on groundfish trips dropped by 48 permits from FY 2001 to FY 2002, but increased by 38 permit holders from FY 2002 to FY 2003. During FY 2004 – FY 2007 the annual change in number of operating units ranged between +10 to -6. Embedded in these changes is a mixture of vessels that have operated continuously for multiple years and others that have operated on an intermittent basis.

To get a better understanding of entry and exit patterns in the groundfish party/charter fishery two types of continuous operators were tracked from FY 2001 to FY 2007. Entering vessels were defined as being vessels that operated continuously from 2002 to 2007, from 2003 to 2007, 2004 to 2007 and so on. Exiting vessels were defined as vessels that operated from 2001 to 2002, from 2001 to 2003, from 2001 to 2004 and so on. An exiting vessel only means that it did not report taking passengers for hire where groundfish were retained. This does not necessarily mean that the vessel ceased altogether from carrying passengers for hire. For entering vessels the first fishing year denotes the fishing year in which they entered the party/charter groundfish fishery whereas the last fishing year for exiting vessels denotes the final year in which these vessels reported taking groundfish passengers. Note that any vessel that operated continuously from 2001 to 2007 was defined as neither an exiting nor an entering vessel. However, for purposes of reporting these vessels were included in both tallies.

A total of 87 party/charter vessels carried passengers for hire where groundfish were retained in every fishing year from FY 2001 – FY 2007 (Table 143). During 2002-2007 there were 100 party/charter operators that took trips where groundfish were landed. Note that these 100 vessels include the 87 that had also operated during FY 2001. During FY 2003-2007 there were 120 vessels carried passengers on one or more trips in every year where groundfish were landed. As was previously the case for the 120 vessels includes the 100 vessels operating during 2002 – 2007 as well as the 87 vessels that operated in every year during 2001 – 2007, and so on. There were 22 vessels that operated during 2001 – 2002 but did not report taking groundfish passengers for hire in any other fishing year. Similarly, there were 18 groundfish party/charter vessels that operated in every year during FY 2001 – FY 2003 but reported no groundfish trips in any other fishing year.

Table 143 - Summary of Groundfish Party/Charter Operators by Years of Continuous Operation

Years of Operation Enter Year – FY 2007	Number of Operating Vessels	Years of Operation FY 2001 – Last Year	Number of Operating Vessels
2001-2007	87	2001-2002	22
2002-2007	100	2001-2003	18
2003-2007	120	2001-2004	13
2004-2007	135	2001-2005	8
2005-2007	157	2001-2006	10
2006-2007	192	2001-2007	87

The net change in party/charter operators as either entering or exiting following more multiple years of continuous operation is reported in Table 144. Fishing year denotes the year in which new entrants first operated and the year in which exiting party/charter groundfish vessels stopped taking groundfish passengers for hire. The net change represented the difference between entering and exiting vessels. For example, 20 party/charter vessels started operating in FY 2003 that had not carried groundfish passengers in any prior year include in the analysis, while 22 operators that had carried passengers during FY 2001-FY 2002 left the fishery leaving a net reduction of 2 party/charter operators during FY 2003. The net change in entry and exit was also negative during FY 2004 but was positive in both FY 2005 and FY2006. During FY 2007 10 party/charter operators left the groundfish fishery, however, the net change will not be known until FY2008 since some operators may have begun carrying groundfish passengers for hire during FY 2007.

Table 144 - Summary of Entry and Exit of Groundfish Party/Charter Operators

Fishing Year	Entering Operators	Exiting Operators	Net Change
2002	13		13
2003	20	22	-2
2004	15	18	-3
2005	22	13	9
2006	35	8	27
2007		10	

The increase in new entrants to the party/charter fleet engaged in the groundfish fishery has resulted in greater competition for passengers. During FY 2001 the 87 vessels that operated in every year took two-thirds of the trips where groundfish were landed and carried 77% of all passengers (Table 145). These vessels maintained their share of both trips and passengers during FY 2002 – FY 2003. Since FY 2003 the share of trips and passengers has declined to 59% and 63% respectively.

Table 145 - Passenger and Trip Shares for the 87 Vessels Active in Every Year

Fishing Year	Number of Groundfish Trips	Number of Anglers	Share of Groundfish Trips	Share of Passengers
2001	3907	104944	66%	77%
2002	3442	83854	67%	78%
2003	3715	92228	68%	77%
2004	3622	83603	63%	70%
2005	3714	78997	64%	68%
2006	3176	67946	62%	66%
2007	3339	69610	59%	63%

Because of safety regulations the party/charter sector is segmented into operations that may only carry six or fewer passengers on a trip and operations that may carry more than six passengers. Thus there are operators that exclusively carry fewer than six passengers, operators that exclusively carry more than six passengers, and operators that sometimes carry six or fewer passengers and sometimes carry more than six. During FY 2001-FY 2007 there were between 163 and 195 party/charter operators that exclusively carried six or fewer passengers on all trips where groundfish were kept (Table 146). These operating units accounted for more than 60% of all operating units reporting groundfish trips (Table 147). These so-called “six-pack” vessels took about 2,000 trips during FY 2007 and carried more than 11,000 passengers. These trips represented just over one-third of total groundfish trips and 10% of total passengers. Thus while six-pack vessels represented the majority of party/charter operations they carried a small proportion of total party/charter passengers.

Table 146 - Summary of Operating Units, Trips and Passengers by type of Operation

Fishing Year	Only Six Passengers or Fewer: Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Only More than Six Passengers: Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Both Six and More than Six Passengers: Number of Operating Units	Number of Groundfish Trips	Number of Anglers
2001	195	1,941	10,156	76	1,968	73,574	28	1,989	53,018
2002	163	1,802	9,570	67	2,537	85,942	21	767	12,522
2003	177	1,539	7,990	70	1,845	64,766	36	2,091	46,764
2004	172	1,807	9,600	66	1,828	64,990	39	2,075	45,022
2005	173	1,930	10,449	53	1,670	60,038	39	2,168	45,250
2006	166	1,947	10,500	71	2,171	75,415	22	1,015	16,844
2007	169	2,079	11,162	78	2,368	79,020	22	1,175	19,552

Table 147 - Summary of Shares of Operating Units, Groundfish Trips, and Passengers by Type of Operation

Fishing Year	Only Six Passengers or Fewer: Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Only More than Six Passengers: Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Both Six and More than Six Passengers: Number of Operating Units	Number of Groundfish Trips	Number of Anglers
2001	65%	33%	7%	25%	33%	54%	9%	34%	39%
2002	65%	35%	9%	27%	50%	80%	8%	15%	12%
2003	63%	28%	7%	25%	34%	54%	13%	38%	39%
2004	62%	32%	8%	24%	32%	54%	14%	36%	38%
2005	65%	33%	9%	20%	29%	52%	15%	38%	39%
2006	64%	38%	10%	27%	42%	73%	8%	20%	16%
2007	63%	37%	10%	29%	42%	72%	8%	21%	18%

Party/charter operators that exclusively carried more than six passengers represented approximately one-quarter of the party/charter fleet engaged in the recreational groundfish fishery during FY 2001-FY 2007. In most years the share of groundfish trips taken by these vessels was similar to that of the number of the six-pack fleet but has increased during FY2006-FY 2007 to 42% of total trips. The share of passengers carried by party/charter vessels that only carry more than six passengers was as high as 80% during FY 2002, was just over 50% during FY 2001 and FY 2003-FY 2005, but more recently has increased to more than 70% during FY2006-FY 2007.

Party/charter vessels that offer both trips taking fewer than six passengers and trips taking more than six passengers represented the smallest number of operators ranging from 39 to 21 during FY 2001 – FY 2007. While these vessels do offer both types of trips one more than 80% of the occasions where groundfish were retained there were more than more than six passengers on board. These vessels represented 13-15% of total operating units during FY 2003-FY 2005, but have declined to 8% of operating units during FY2006-FY 2007. Similarly, the share of groundfish trips and passengers has also declined to about 20% and 17% during FY2006-FY 2007.

Party/charter operators offer trips of different duration. For purposes of analysis these trips were delineated between trips departing and returning on the same calendar day and trips that sailed and returned on different calendar days. The former were subdivided into half-day (6 hours or less), full-day (more than 6 and less than or equal to 12 hours), and extended (more than 12 hours), while the latter only included overnight trips regardless of actual trip duration. For both six-pack and trips carrying more than six passengers the number of full-day trips (6-12 hours) represented the majority of trips, at least 83% for the former and 73% for the latter (Table 148). Since 2003 there appears to have been a modest shift in emphasis away from half-day trips (6 hours or less) to a larger proportion of trips greater than 12 hours. However, there does not appear to be any notable change in the proportion of trips spanning more than one calendar day. Note that the proportion of passengers carried by trip duration was quite similar to trip proportions (Table 149).

Table 148 - Summary of Number of Trips by Trip Duration and Number of Passengers per Trip

	More than Six Passengers				Six or Fewer Passengers			
Fishing Year	Half-Day	Full-Day	Extended	Overnight	Half-Day	Full-Day	Extended	Overnight
2001	714	3075	166	53	141	1892	68	17
2002	564	2593	156	63	152	1722	58	9
2003	743	2739	217	77	145	1753	141	4
2004	576	2957	281	72	139	1924	262	6
2005	358	3007	361	65	52	2240	279	7
2006	343	2642	289	49	93	1965	248	6
2007	595	2707	362	48	105	2101	205	11
				Shares				
2001	17.8%	76.7%	4.1%	1.3%	6.7%	89.3%	3.2%	0.8%
2002	16.7%	76.8%	4.6%	1.9%	7.8%	88.7%	3.0%	0.5%
2003	19.7%	72.5%	5.7%	2.0%	7.1%	85.8%	6.9%	0.2%
2004	14.8%	76.1%	7.2%	1.9%	6.0%	82.5%	11.2%	0.3%
2005	9.4%	79.3%	9.5%	1.7%	2.0%	86.9%	10.8%	0.3%
2006	10.3%	79.5%	8.7%	1.5%	4.0%	85.0%	10.7%	0.3%
2007	16.0%	72.9%	9.8%	1.3%	4.3%	86.7%	8.5%	0.5%

Table 149 - Summary of Number of Passengers by Trip Duration and Number of Passengers per Trip

	More than Six Passengers				Six or Fewer Passengers			
Fishing Year	Half-Day	Full-Day	Extended	Overnight	Half-Day	Full-Day	Extended	Overnight
2001	25145	99161	5005	1539	617	10032	323	64
2002	17494	78223	4090	2235	694	9237	294	50
2003	22761	83586	6745	2900	608	9372	747	19
2004	16375	89008	8193	2529	612	10339	1382	23
2005	9941	90365	11079	2172	248	12096	1491	31
2006	10493	78804	8375	1708	428	10683	1363	25
2007	17953	77650	10392	1450	470	11358	1113	59
				Shares				
2001	19.2%	75.8%	3.8%	1.2%	5.6%	90.9%	2.9%	0.6%
2002	17.1%	76.7%	4.0%	2.2%	6.8%	89.9%	2.9%	0.5%
2003	19.6%	72.1%	5.8%	2.5%	5.7%	87.2%	7.0%	0.2%
2004	14.1%	76.7%	7.1%	2.2%	5.0%	83.7%	11.2%	0.2%
2005	8.8%	79.6%	9.8%	1.9%	1.8%	87.2%	10.8%	0.2%
2006	10.6%	79.3%	8.4%	1.7%	3.4%	85.5%	10.9%	0.2%
2007	16.7%	72.3%	9.7%	1.3%	3.6%	87.4%	8.6%	0.5%

Party/charter vessels may offer a mix of recreational trips that target groundfish and trips that do not. Since party/charter revenues are directly linked to passengers, dependence on groundfish was based on the proportion of passengers carried when groundfish were retained to total passengers carried. Of the party/charter operators that took at least one groundfish trip, the distribution of dependence exhibits a bimodal pattern where approximately three quarters of all vessels either relied on groundfish for more than 90% of passengers or relied on groundfish for 20% or less (Table 150). That is, about 35% of party/charter vessels taking at least one groundfish trip relied on groundfish for over 90% of total passengers. Approximately 40% of party/charter operators relied on groundfish for 20% of less of total passenger load.

Table 150 - Dependence on Groundfish Trips

	2001	2002	2003	2004	2005	2006	2007
<= 10%	102	81	95	90	70	75	76
> 10% <= 20%	22	25	22	24	24	22	31
> 20% <= 30%	11	8	14	10	9	5	13
> 30% <= 40%	13	6	9	12	13	11	14
> 40% <= 50%	10	8	6	9	11	11	9
> 50% <= 60%	10	6	6	8	13	14	11
> 60% <= 70%	10	9	8	13	11	11	6
> 70% <= 80%	10	6	6	8	11	2	6
> 80% <= 90%	7	11	8	11	7	9	8
> 90%	104	91	109	92	96	99	95
<= 10%	34.1%	32.3%	33.6%	32.5%	26.4%	29.0%	28.3%
> 10% <= 20%	7.4%	10.0%	7.8%	8.7%	9.1%	8.5%	11.5%
> 20% <= 30%	3.7%	3.2%	4.9%	3.6%	3.4%	1.9%	4.8%
> 30% <= 40%	4.3%	2.4%	3.2%	4.3%	4.9%	4.2%	5.2%
> 40% <= 50%	3.3%	3.2%	2.1%	3.2%	4.2%	4.2%	3.3%
> 50% <= 60%	3.3%	2.4%	2.1%	2.9%	4.9%	5.4%	4.1%
> 60% <= 70%	3.3%	3.6%	2.8%	4.7%	4.2%	4.2%	2.2%
> 70% <= 80%	3.3%	2.4%	2.1%	2.9%	4.2%	0.8%	2.2%
> 80% <= 90%	2.3%	4.4%	2.8%	4.0%	2.6%	3.5%	3.0%
> 90%	34.8%	36.3%	38.5%	33.2%	36.2%	38.2%	35.3%

The bimodal distribution of groundfish dependence is at least in part explained by area fished. On average, 82% of party/charter vessels took passengers for hire exclusively in the Gulf of Maine (48%) or in the Southern New England/Mid-Atlantic (34%) (Table 151). Of the vessels fishing exclusively in the Gulf of Maine more than 60% relied on groundfish for more than 90% of passengers (Table 152). By contrast, 87% of party/charter vessels fishing exclusively in the SNEMA area relied on groundfish for 20% or less of total passengers carried during the fishing year.

Table 151 - Stock Area Combinations Fished by Party/Charter Vessels by Fishing Year

Fishing Year	GOM Only	GB Only	SNEMA Only	GOM & GB	GB & SNEMA	GOM & SNEMA	All Areas
2001	131	10	121	10	8	11	8
2002	123	4	85	12	11	12	4
2003	132	1	104	13	12	16	5
2004	126	4	87	15	11	27	7
2005	137	2	81	13	7	16	9
2006	134	2	76	11	8	20	8
2007	133	0	103	4	6	16	7

Table 152 - Dependence on Groundfish for Vessels Fishing Exclusively in GOM or SNEMA

	GOM Only			SNEMA Only		
Fishing Year	GF Depend <= 20%	GF Depend > 20% < 90%	GF Depend >= 90%	GF Depend <= 20%	GF Depend > 20% < 90%	GF Depend >= 90%
2001	4.6%	29.8%	65.6%	85%	14.0%	0.8%
2002	8.1%	29.3%	62.6%	91%	9.4%	0.0%
2003	5.3%	25.8%	68.9%	88%	6.7%	4.8%
2004	9.5%	30.2%	60.3%	92%	6.9%	1.1%
2005	6.6%	33.6%	59.9%	84%	13.6%	2.5%
2006	9.0%	30.6%	60.4%	86%	10.5%	3.9%
2007	8.3%	28.6%	63.2%	83%	12.6%	4.9%
Average	7%	30%	63%	87%	11%	3%

The majority (approximately 85%) of party/charter groundfish trips took place in the Gulf of Maine (Table 153). These trips also accounted for about 86% of passengers on board party/charter trips that landed groundfish. The number of trips and passengers on groundfish trips in the Gulf of Maine fell during FY2006 compared to FY 2003-FY 2005. This reduction may have been associated with Framework 42 measures that implemented a closed season and raised the cod size limit. During FY2006 the number of Gulf of Maine groundfish trips was down 5.4% compared to the FY 2003-FY 2005 average and the number of passengers was down 10.2%. Both trips and number of passengers rose in FY 2007 compared to FY2006 and while the number of Gulf of Maine groundfish trips was 1.1% higher compared to the FY 2003-FY 2005 average, the number of passengers was still down by 7.8%.

Table 153 - Summary of Party/Charter Vessels Groundfish Trips and Passengers by Fishing Year and Stock Area

Fishing Year	Number of Reporting Vessels	Number of Groundfish Trips	Number of Anglers	Anglers per Trip	Trips per Vessel
Gulf of Maine					
2001	153	4,786	11,4081	23.8	31.3
2002	146	4,456	9,6261	21.6	30.5
2003	164	4,534	10,1104	22.3	27.6
2004	165	4,823	10,3361	21.4	29.2
2005	171	4,861	9,673	19.9	28.4
2006	168	4,484	9,020	20.1	26.7
2007	157	4,792	9,256	19.3	30.5
Georges Bank					
2001	32	103	1,273	12.4	3.2
2002	30	82	1,022	12.5	2.7
2003	23	104	1,811	17.4	4.5
2004	26	108	1,955	18.1	4.2
2005	25	110	1,805	16.4	4.4
2006	21	113	2,415	21.4	5.4
2007	14	37	808	21.8	2.6
Southern New England/Mid-Atlantic					
2001	134	1,009	21,394	21.2	7.5
2002	97	568	10,751	18.9	5.9
2003	112	837	16,605	19.8	7.5
2004	117	779	14,296	18.4	6.7
2005	98	807	17,202	21.3	8.2
2006	98	536	10,142	18.9	5.5
2007	120	793	16,267	20.5	6.6

The number of party/charter groundfish trips to Georges Bank represented no more than 2.2% of trips and 2.4% of passengers in any fishing year from FY 2001- FY 2007. The number of passengers per trip was highest during FY2006-FY 2007 which may be the result of some switching between Gulf of Maine and Georges Bank, but given the low number of trips and passengers this is unlikely to account for the changes in Gulf of Maine trips.

Party/charter groundfish trips taken in the SNE/MA stock area averaged 14% and 13% of total groundfish trips and passengers respectively. Both the number of trips and passengers was highest during FY 2001 at 1,009 and 21,394 respectively. In most years trips were around 800 and the number of passengers ranged between 16,000 – 17,000 anglers. However, during FY 2002 and FY2006 trips were down to between 500 and 600 and passengers were between 10,000 and 11,000 anglers. The reason for theses low trip and passenger numbers are uncertain.

6.2.6 Wholesale Trade and Processing Component

6.2.6.1 Seafood Dealers

All Federally permitted groundfish vessels are required to sell to a federally permitted dealer. Further, federally permitted dealers are required to report all purchases of seafood regardless of whether the vessels held a Federal or state-waters only permit. Note that since Federal dealer permits are issued on a calendar year basis all reported data contained in this section are on a calendar year basis. Additionally, all reported data refer purchased of seafood from commercial fishing vessels. Dealers may obtain product from many other sources so the activity levels included herein are likely to capture only a portion of business activity by seafood wholesalers.

Given dealer reporting requirements, dealer records account for 99% of reported sales of groundfish in the Northeast region. Issued on a calendar year basis, the number of groundfish permitted dealers has declined by about 10% averaging 366 permits during 2005 to 2007 compared to an average of 408 permits issued during 2001 to 2004 (Table 154).

Based on the mailing address state for each dealer permit, the majority of groundfish permits were issued to dealers located in Massachusetts, followed by New York, .New Jersey, Rhode Island, and Maine. Note that the number of permits reported in Table 1 includes dealer permits issued to seafood auctions (Portland Fish Exchange, Whaling City Display Auction, Gloucester Fish Exchange, and New England Fish Exchange). These auctions function as clearinghouses where member dealers purchase seafood, but do not necessarily possess a Federal dealer permit since the auction itself is the dealer of record. This means that the total number of entities involved in seafood wholesale trade is likely to be larger than what official dealer records may suggest.

Table 154 – Number of federally permitted groundfish dealers (calendar year)

State	2001	2002	2003	2004	2005	2006	2007
CT	6	7	6	6	4	4	5
DE	2	2	2	1	2	2	2
MA	134	131	125	117	111	118	112
MD	4	3	6	5	4	7	8
ME	56	56	54	51	35	30	33
NC	24	22	23	24	21	22	22
NH	9	9	8	8	7	8	7
NJ	42	41	36	31	35	43	52
NY	77	75	77	77	74	68	73
RI	39	38	43	41	39	40	38
VA	17	20	23	23	23	22	18
Other	10	7	8	6	5	3	2
Total	420	411	411	390	360	367	372

Overall, only about 40% of dealers issued a Federal groundfish permit actually report any purchases of groundfish (Table 155). The total number of reporting dealers with purchases of groundfish has been declining over time from 170 during 2001 to 133 in 2007.

Table 155 – Number of federally permitted groundfish dealers reporting buying groundfish

State	2001	2002	2003	2004	2005	2006	2007
CT	2	0	2	1	0	1	1
DE	0	0	0	0	1	1	1
MA	68	64	63	55	54	53	48
MD	1	1	1	1	2	2	1
ME	10	9	8	7	8	6	9
NC	2	7	5	7	8	6	7
NH	2	3	2	1	2	1	2
NJ	10	10	8	9	8	9	9
NY	37	36	46	43	39	38	34
RI	33	21	26	21	21	20	19
VA	5	3	4	8	4	0	2
Other	0	0	0	0	0	0	0
Total	170	154	165	153	147	137	133

Including auction markets, seafood dealers in Massachusetts alone accounted for more than 70% of the value of groundfish purchased and the combined purchases by Maine and Massachusetts dealers accounted for over 90% of total groundfish purchased (Table 156). A substantial proportion of groundfish have been purchased through the four auctions located in New England averaging 54% of total groundfish purchased. However, the share of groundfish purchased through auctions has declined in both 2006 and 2007 to 50% and 46% of total purchases respectively.

Table 156 – Share of groundfish purchased by federally permitted dealers including auctions

State	2001	2002	2003	2004	2005	2006	2007
CT	0%		0%	0%		0%	0%
DE					0%	0%	0%
MA	71%	73%	74%	76%	76%	75%	77%
MD	0%	0%	0%	0%	0%	0%	0%
ME	20%	18%	17%	18%	18%	16%	13%
NC	0%	0%	0%	0%	0%	0%	0%
NH	4%	4%	3%	2%	2%	2%	3%
NJ	1%	0%	1%	1%	1%	1%	1%
NY	2%	1%	1%	1%	1%	1%	1%
RI	3%	4%	3%	3%	3%	5%	5%
VA	0%	0%	0%	0%	0%		0%
Auctions	57%	57%	57%	56%	55%	50%	46%
MA	38%	39%	40%	39%	38%	35%	34%
ME	20%	18%	17%	17%	17%	15%	11%

Three of the four auction markets are located in Massachusetts while the Portland Fish Exchange in located in Maine. The Portland Fish Exchange accounts for nearly all of the groundfish purchased in Maine while the auction markets in Massachusetts account for less than 40% of reported purchases. Omitting auctions, Massachusetts based dealers accounted for nearly 80% of the value of groundfish purchased during 2001 to 2007. Permitted dealers from New Hampshire and Rhode Island averaged 6% and 8% of dealer purchases of groundfish respectively.

Table 157 – Share of groundfish purchased by federally permitted dealers excluding auctions

State	2001	2002	2003	2004	2005	2006	2007
CT	0%		0%	0%		0%	0%
DE					0%	0%	0%
MA	78%	80%	80%	84%	85%	79%	78%
MD	0%	0%	0%	0%	0%	0%	0%
ME	0%	0%	0%	1%	2%	2%	3%
NC	0%	0%	0%	0%	0%	0%	0%
NH	8%	9%	7%	5%	5%	5%	5%
NJ	2%	1%	2%	2%	1%	2%	2%
NY	4%	2%	2%	2%	1%	2%	2%
RI	8%	9%	8%	7%	6%	10%	10%
VA	0%	0%	0%	0%	0%		0%

In most states the number of dealers reporting purchases of groundfish is too small to report detailed statistics due to confidentiality concerns. The states with sufficient numbers of participating dealers include Massachusetts, New York, New Jersey, and Rhode Island. Compared to all purchases of seafood from commercial fishing vessels the median proportion of groundfish has declined from more than 19% during 2001 and 2002 to less than 4% during 2005 to 2007 (Table 158). Similarly, the share of groundfish value at the 80th percentile also declined for Massachusetts dealers from an average of 78% during 2001 to 2004 to 55% during 2005 to 2007. The decline in relative share of groundfish of total seafood purchased from fishing vessels was partially due to a decline in the total value of groundfish available to seafood dealers (13% comparing the 2001-2004 to 2005-2007 average), but was also do to an 80% increase in the value of seafood purchases comprised of species other than groundfish. Thus, reductions in groundfish supplies were more than offset by purchases of other seafood products.

Table 158 – Relative dependence on groundfish

	2001	2002	2003	2004	2005	2006	2007
				Massachusetts Dealers			
20th Percentile	0.2%	0.2%	0.7%	0.3%	0.0%	0.2%	0.2%
Median	19.2%	19.3%	16.3%	11.4%	4.0%	2.4%	3.2%
80th Percentile	79.1%	77.6%	82.0%	73.0%	50.0%	51.6%	64.4%
				New Jersey Dealers			
20th Percentile	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Median	0.0%	0.0%	0.3%	0.0%	0.7%	0.8%	0.3%
80th Percentile	3.3%	2.6%	7.9%	8.3%	4.7%	8.5%	9.3%
				New York Dealers			
20th Percentile	1.7%	0.7%	0.5%	0.4%	0.2%	0.2%	0.5%
Median	10.0%	2.7%	4.4%	1.9%	1.5%	3.5%	3.1%
80th Percentile	48.2%	27.0%	21.5%	9.9%	6.6%	15.1%	10.9%
				Rhode Island Dealers			
20th Percentile	0.2%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%
Median	0.9%	5.4%	1.2%	4.0%	0.3%	5.6%	5.2%
80th Percentile	15.9%	19.1%	8.7%	13.0%	8.4%	13.3%	17.3%

6.2.6.2 Seafood Processing

Available data make it difficult to characterize the seafood processing industry particularly as it relates to the groundfish fishery. Studies of the processing industry suggest that it is relatively less susceptible to fluctuations in the availability of domestic sources of wild-caught fish as processors are able to find alternative sources of supply or use substitute species to maintain product lines (Jin, Hoagland, and Thunberg, 2005; Dirham and Georgianna, 1994). Note that this does not necessarily mean that all segments of the processing industry are readily able to find alternatives as some processors may be more reliant on local sources of seafood to meet customer demand.

The processing sector was characterized by using County Business Patterns (CBP) data. County Business Patterns is an annual survey of establishments to ascertain numbers of employees and wages paid. Although the survey is conducted annually, the data are not released until about two calendar years afterward. This means that the most recent data include calendar year 2006.The survey is conducted by the U.S. Bureau of the Census where the unit of observation is an establishment, which is defined as being a single physical location or place of business. In cases where multiple activities are carried out under the same ownership, all activities are classified under a single establishment. The industrial classification for that multi-activity establishment is based on its major activity. This means that the reported number of establishments may underestimate the total number of establishments that may be engaged in a particular kind of activity. For example, seafood businesses may process fish or shellfish and may also act as wholesale distributors or buyers/sellers of unprocessed seafood. Any such establishment would be assigned to a single industrial classification (either processing or wholesale trade) depending on which activity was the larger source of revenue. For this reason, the CBP data will underestimate the total number of establishments that may be engaged in some level of processing activity. Nevertheless, the survey should reflect establishments that specialize in seafood processing.

Region-wide, the number of processing establishments has been declining in consecutive years from 224 during 2003 to 197 in 2006. Since availability of groundfish is most likely to affect states in New England the focus will be on these states. The number of processing establishments has not changed in Rhode Island (Table 159) since 2003 and in Connecticut has increased from 2 to 4 processors between 2003 and 2006. In New Hampshire the number of processing establishments was constant at 10 during 2004 to 2006. By contrast, the number of processing establishments has declined in both Maine and Massachusetts. The number of processing establishments in Massachusetts was 47 during 2006; down from a high of 55 processors in 2003. In Maine the number of processors did not change from 2005 to 2006, but was down from 35 establishments in 2003.

Table 159 – Number of seafood processing establishments

Year	CT	DE	MA	MD	ME	NC	NH	NJ	NY	RI	VA	NER Total
2001	2	1	41	26	36	27	8	18	21	6	42	228
2002	2	1	45	24	33	21	9	17	16	9	39	216
2003	2	1	55	23	35	18	11	16	18	7	38	224
2004	3	1	53	23	28	18	10	15	17	7	42	217
2005	3	1	50	23	27	17	10	17	18	7	39	212
2006	4	1	47	19	27	18	10	16	15	7	33	197

Although the number of processors declined in Maine employment has not declined at the same rate (Table 160). That is, employment per establishment was 18.7 in 2003 but had risen to 22.8 in 2006. This suggests that at least some of the processing employment associated with a decline in establishments has been absorbed by the establishments that remain. This was also the case for Massachusetts as employment per establishment increased to 55.5 in 2006 compared to 49.4 in 2003. By contrast, processing employment declined in both New Hampshire and Rhode Island during 2004 to 2006 even as the number of establishments remained the same. Connecticut was the only New England state where processing employment increased in 2006 compared to prior years. However, the number of employees per establishment declined from 37.7 during 2005 to 29.8 during 2006.

Table 160 – Seafood processing mid-March employment (2001-2006)

Year	**CT**	**DE**	**MA**	**MD**	**ME**	**NC**	**NH**	**NJ**	**NY**	**RI**	**VA**	**NER Total**
2001	103	357	2164	889	1007	381	296	1100	370	240	1259	8165
2002	109	333	2231	807	639	280	368	928	352	184	1035	7267
2003	112	172	2717	762	656	427	322	846	271	355	1256	7896
2004	108	312	2743	895	576	610	448	749	323	355	1231	8350
2005	113	312	2671	1141	614	439	418	969	324	270	1336	8607
2006	119	191	2607	1053	616	475	369	667	298	231	871	7496

6.2.7 Bycatch

The M-S Act defines bycatch as fish which are harvested in a fishery, but which are not sold or kept for personal use, including economic discards and regulatory discards. Fish released alive under a recreational catch and release fishery management program are not included. Further, the M-S Act requires that, to the extent practicable, bycatch should be minimized and the mortality of bycatch that cannot be avoided should be minimized. In order to consider whether these objectives are being met, bycatch must be reported and assessed. To this end, the M-S Act requires that a standardized reporting methodology assess the amount and type of bycatch occurring in a fishery. The primary tools used to report bycatch in the multispecies fishery are the Vessel Trip Report system (VTR) and the seas sampling/observer program. Each permitted vessel is required to report discards and landings in VTRs submitted on a periodic basis. The sea sampling/observer program places personnel on boats to observe and estimate the amount of discards on a haul-by-haul basis. A federal judge ruled that the NMFS acted arbitrarily, capriciously, and contrary to law when it did not adopt new measures to report and assess bycatch after passage of the Sustainable Fisheries Act (*Conservation Law Foundation et al. v. Donald Evans*). This court ruling was addressed by the implementation of the Standardized Bycatch Reporting Amendment (SBRM) in 2007.

The SBRM, however, does not address bycatch on a fishery or stock basis. For this reason, the discard estimates of all groundfish stocks are summarized here to facilitate monitoring whether the management plan minimizes discards to the extent practicable.

The amount of bycatch in Northeast Region fisheries is routinely estimated on a stock-by stock and calendar year basis in the assessments conducted as part of the stock assessment workshops (SAW) reviewed by the stock assessment review committee (SARC). Bycatch was also estimated in the Groundfish Assessment Review Meeting process (GARM III). The discard estimates presented in this section largely consist of summaries of the information presented in GARM III. More detailed information for each stock can be found in the NMFS' full GARM III report. Generally, the estimates of discards can be divided into three broad categories: stocks for which no estimates are possible, stocks for which estimates are possible but are not included in the catch-at-age matrix (for a variety of reasons), and stocks for which estimates are available and are included in the catch-at-age matrix. These broad categories are not unchanging, in that the precisions of discard estimates for any given stock may change over time. This can be due to many reasons, such as changes in sampling or in the level of observer coverage.

Most discard estimates are categorized according to gear, as opposed to other criteria such as target species. There are exceptions to this general rule, however, as estimates are generated for specific small mesh fisheries (northern shrimp is the primary example). Estimates for recreational fisheries are also included in assessments for some stocks. Information on discard mortality varies on a stock-to stock basis. For most stocks managed in the multispecies fishery, reliable estimates of discard mortality are not available and the assumption used in the assessment is that all discards are dead, with the exception of the winter flounder stocks which assume ea 50% mortality rate for discards.

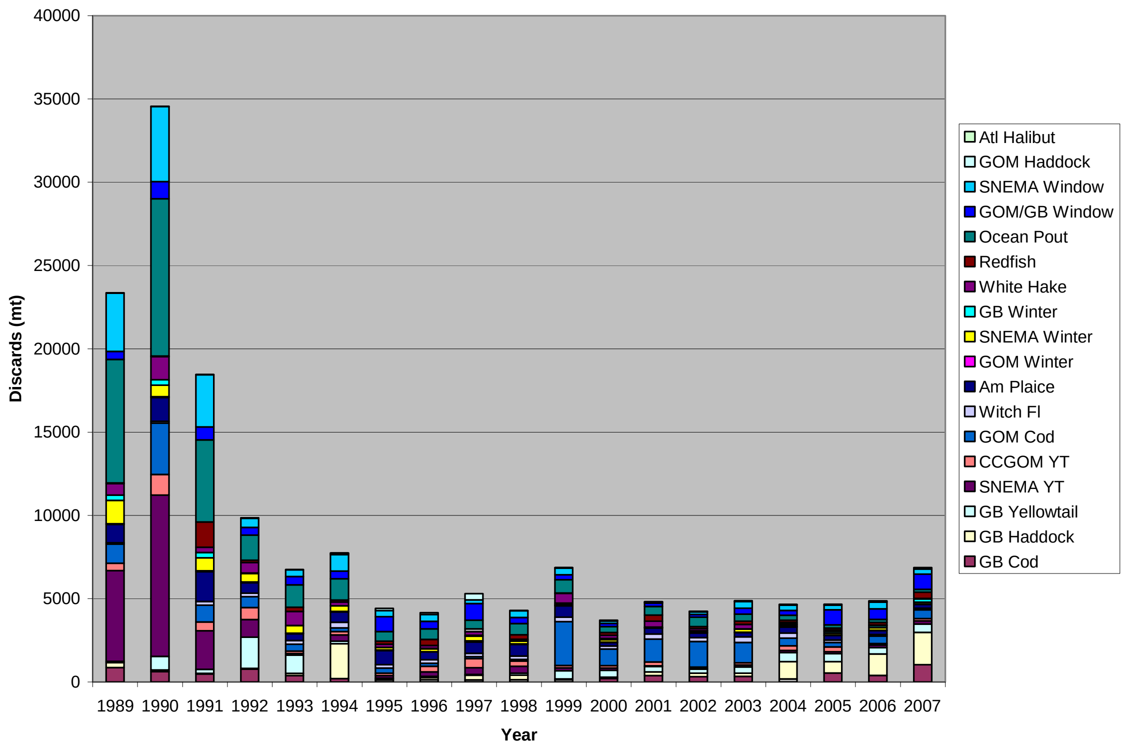
While the primary sources of data for commercial fishery discard estimates are VTRs and the sea sampling/observer program, a variety of statistical methods convert the information from these systems into discard estimates. In addition, some discard estimates are generated through a statistical examination of survey data, fishing effort, and fishery selectivity patterns. These methods are described in detail in the pertinent assessment documents and various technical memoranda.

There are nineteen groundfish stocks identified as regulated groundfish managed through this action. Commercial discard estimates are available for eighteen of these stocks from their most recent assessments. Only U.S. discards are included in this summary, although Canadian discards are listed for some stocks in the GARM III. Total discard estimates in this section are provided in metric tons, while discards-at-age are presented in numbers (in thousands). For some stocks, discard estimates are available for over thirty years. The summary below, however, focuses on discard estimates since 1989 (where available). As suggested earlier, the precision of the estimates varies from stock to stock, as does the level of detail. More information about precision estimates and further details can be found in the GARM III report. For some stocks, discard estimates are available by gear and age, while for others only total commercial discards are presented in the technical documents. Recreational estimates of discards are included in the assessments of only five stocks, and are based on Marine Recreational Fishery Statistical Sampling (MRFSS) data. While MRFSS may allow calculation of discards for other stocks, only those stocks where the information was included in the GARM are presented in this summary. The most recent estimate of discards is summarized in Figure 80 and described further below.

Prior to GARM III, there were occasionally stocks where discard estimates were available but were not used as input data for the assessments. This is no longer the case – where discard estimates were made they were included as input data in the assessment. For some stocks only the total weight of discards is available and discards at age are not.

Figure 80 summarizes groundfish discards for CY 1989 – 2007. Discards have declined dramatically since 1990 but showed s slight increase in 2007 that appears due primarily to increased discards of the large GB haddock 2003 year class. GB cod discards also increased in 2007. Examination of the stock specific summaries reveals that in most instances the discards of younger fish have been dramatically reduced through changes in gear since 1994. While discards have declined significantly regulatory discards (induced primarily by the use of trip limits) remain a concern in this fishery.

Figure 80 – Groundfish Discards (mt), 1989-2007



Oceana Report

In July 2005, a report on bycatch and discards in U.S. fisheries was commissioned by the nonprofit group Oceana. In that paper, discards for the 2002 fishing year were calculated for species in the northeast multispecies FMP. The results where significantly different (and generally higher) than the numbers in the GARM III estimations (Table 161). They were calculated using the ratio-estimator method for individual fishing years, and focused on target species by gear type. The methods used in the Oceana report are believed to be less accurate than those used in GARM III. The full report can be found on Oceana's website at http://www.oceana.org/fileadmin/oceana/uploads/Big_Fish_Report/PDF_Bycatch_July28.pdf.

Table 161 – Estimates of 2002 discards for the major target species in the northeast groundfish FMP from the 2005 Oceana report

Species	Gear Type	2002 Target landings (mt)	d/l ratios	Total estimated 2002 discards (mt)
Cod	gillnet	2,724.9	0.44	1,190.8
Yellowtail flounder	gillnet	126.9	0.01	1.5
White hake	gillnet	776.1	0.04	28.3
Winter flounder	gillnet	144.9	0.04	5.9
Witch flounder	gillnet	60.5	0.03	1.6
Silver hake	gillnet	49.8	0.23	11.3
Haddock	gillnet	447.5	0.35	156.2
American plaice	gillnet	41.6	0.12	5
Windowpane flounder	gillnet	0.4	0.02	0.009
Acadian redfish	gillnet	48.0	0.23	10.9
Red hake	gillnet	5.4	0.10	0.53
Pollock	gillnet	1,615.1	0.10	158.3
Total	**gillnet**	**6,041.1**	**0.14**	**1,570.3**
Cod	trawl	8,613.4	0.17	1,481.5
Yellowtail flounder	trawl	4,989.8	0.16	813.3
White hake	trawl	2,445.3	0.15	371.7
Winter flounder	trawl	5,671.3	0.03	170.1
Witch flounder	trawl	3,089.6	0.09	278.1
Silver hake	trawl	7,871.3	0.55	4,329.2
Haddock	trawl	6,976.4	0.11	781.4
American plaice	trawl	3,348.2	0.12	398.4
Windowpane flounder	trawl	95.1	0.01	1.05
Acadian redfish	trawl	317.9	0.43	135.4
Red hake	trawl	893.7	0.10	87.6
Pollock	trawl	1,899.8	0.10	186.2
Total	**trawl**	**46,211.8**	**0.17**	**9,034.0**

6.2.7.1 Commercial Fishery Discards

6.2.7.1.1 Discard estimates included in a catch-at-age matrix

GB Cod

Atlantic cod discarded in the USA Georges Bank otter trawl, gillnet, and scallop fisheries were estimated using the NEFSC Observer data. A ratio of discarded cod to total kept of all species was estimated on a trip basis. Total discards (mt) were estimated by applying that ratio to commercial landings (Figure 81). In 2007, the fishery discarded a series high of 1,040 mt, or 22% of total catch. In contrast, discards in 1999 only accounted for 2% of total catch.

Discards at age were estimated annually by applying combined survey and commercial age-length keys to observer length frequency data (Table 162). The majority of discards occurred among age 1 to 3 fish until 1999, and ages 2 to 3 or 4 after that year.

Figure 81 – GB Cod Landings and Discards (mt), 1989-2007

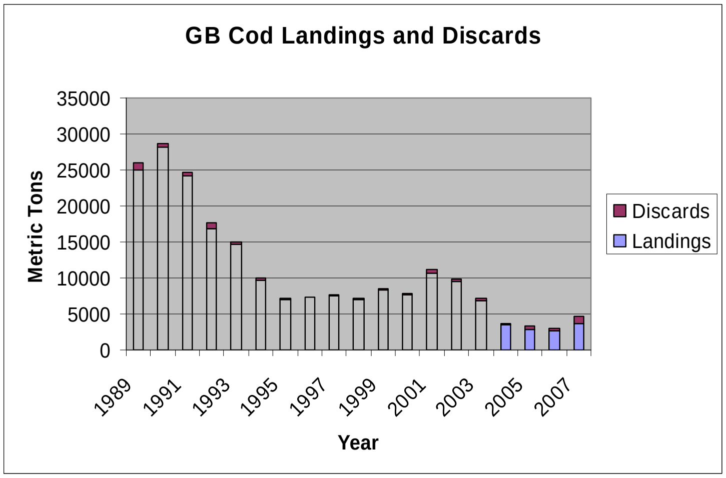


Table 162 – GB Cod Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10+	Total
1989	715	521	89	5	0	0	0	0	0	0	1331
1990	43	444	119	12	4	0	0	0	0	0	623
1991	89	247	52	18	4	3	0	1	0	0	414
1992	91	607	23	8	7	2	2	0	0	0	740
1993	18	273	65	2	2	2	0	1	0	0	363
1994	46.6	135	30	6	1	0	0	0	0	0	219
1995	11.7	70	33	3	1	0	0	0	0	0	119
1996	34.7	29	19	10	2	1	0	0	0	0	96
1997	57.1	54	13	6	4	0	0	0	0	0	134
1998	15.9	25	16	6	3	1	0	0	0	0	69
1999	37.3	45	32	5	0	0	0	0	0	0	120
2000	13	67	22	17	3	1	0	0	0	0	123
2001	7	179	103	9	7	2	0	0	0	0	307
2002	25	66	116	25	5	0	0	0	0	0	237
2003	10	92	38	36	14	2	1	0	0	0	193
2004	20	30	70	4	4	2	0	0	0	0	129
2005	8	241	61	49	5	3	2	0	0	0	370
2006	19	36	195	10	12	1	0	0	0	0	273
2007	10	364	184	119	5	7	0	0	0	0	689

GOM Cod

Commercial discards were estimated for the 1989-2007 period on a gear-quarter basis from NEFSC Observer Program data using SBRM methods incorporating cod discard/cod kept ratios (Figure 82). The revised estimates indicate a substantial increase in the discard/kept ratio in 1999, at 190%, compared to previous years, which saw a high of 20% in 1990. Ratios calculated for years after 1999 were lower, but still remain substantially greater than the 1989-1998 ratios. Discards estimated from the Observer Program data have ranged from 97 mt in 1998 to 3,092 mt in 1990.

The discard estimates were used to generate the discards at age from 1999 to present (Table 163). In general, the discards at age and total catch at age in numbers were dominated by age 3 and 4 fish through 2001, with ages 4-6 predominating during the past 6 years.

Figure 82 – GOM Cod Landings and Discards (mt), 1989-2007

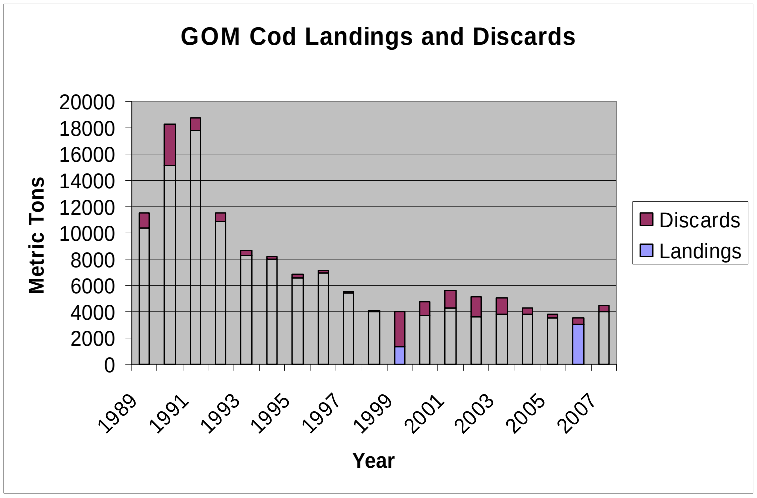


Table 163 – GOM Cod Discards-at-Age (thousands of fish), 1999-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11+	Total
1999	0	6	350	335	155	31	43	4	0	3	0	925
2000	0	27	69	134	33	19	3	1	0	0	0	286
2001	0	15	155	104	68	22	12	2	3	0	0	382
2002	0	1	49	187	74	45	18	5	2	2	0	383
2003	0	2	15	65	125	39	17	7	3	2	1	277
2004	0	0	19	17	28	22	7	3	2	1	0	99
2005	0	0	3	33	5	14	6	2	1	0	0	65
2006	0	0	18	29	46	3	10	5	2	1	1	114
2007	0	1	13	83	13	24	1	2	1	1	1	139

GB Haddock

Discards of Georges Bank haddock were estimated using at-sea observer sampling data and the discard methodology using a ratio of kept haddock to discarded of all species. Most of the discards are estimated to be from trawl gear, with a small amount coming from hook/line gear, and negligible amounts from gillnet and scallop dredge. While the discarded fraction of catch has typically been low, it has increased in recent years to 33% in 2006 and 40% in 2007. Much of the discarding is estimated to be on western Georges Bank, although the number of observed trips on eastern Georges Bank was rather low in the 1990s. On eastern Georges Bank, estimated discards in years 2004-2007 averaged 231 mt, while they were 1004 mt on western Georges Bank. The average discarding for the period 2004-2007 is about seven times larger than the average for 2000-2003.

Age data shows high variability in the ages of fish discarded. Most discards occurred on fish ages 2 through 4 or 5, but in some years discards were much heavier on age zero or 1 fish, and fish 5 years and older.

Figure 83 – GB Haddock Landings and Discards (mt), 1989-2007

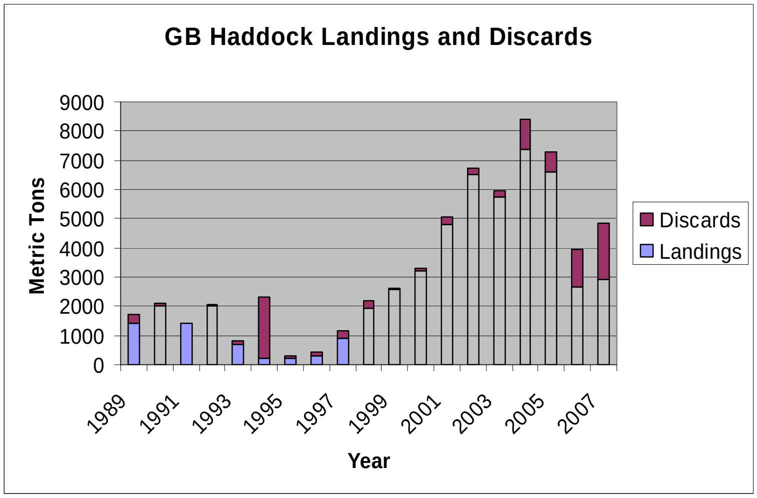


Table 164 – GB Haddock Discards-at-Age (thousands of fish), 1989-2007

Year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Total
1989	0	2	140	26	22	2	12	2	1	1	208
1990	0	61	1	49	5	5	1	1	0	0	123
1991	0	1	22	3	4	0	1	0	1	0	32
1992	0	77	15	3	1	8	0	0	0	0	104
1993	0	26	68	63	2	2	2	0	0	0	163
1994	0	26	291	399	80	81	18	173	25	70	1163
1995	8	15	24	22	12	2	1	2	3	1	90
1996	21	6	17	16	20	15	1	0	0	5	101
1997	0	12	51	54	50	27	11	1	2	6	214
1998	19	5	45	16	31	29	16	2	0	5	168
1999	0	2	7	22	5	4	4	2	3	2	51
2000	5	2	16	18	8	5	3	3	2	2	64
2001	0	12	15	74	27	15	7	5	3	3	161
2002	0	2	109	46	40	11	4	5	2	2	221
2003	13	3	10	94	15	42	8	8	2	4	199
2004	1	468	30	55	439	58	74	12	17	9	1163
2005	35	18	498	8	20	132	15	28	4	2	760
2006	0	158	14	959	28	34	185	26	40	13	1457
2007	1	12	143	48	2843	40	119	810	64	253	4333

GOM Haddock

Estimates of commercial discards were calculated using the combined-ratio method. Discards were estimated for five commercial fleets: the large mesh bottom otter trawl (≥ 5.5”), small mesh bottom otter trawl (< 5.5”), benthic longline, sink gillnet, midwater-paired otter trawl, and midwater otter trawl fleets. These five fleets constitute the majority of total Gulf of Maine haddock discards. Discards constitute a minor fraction of total fishery removals with the exception of the 1994 to 1997 period, when restrictive trip limits were in place. Discards accounted for 44% of the total catch in 1994, and more than 30% in the other years between 1994-1997. Outside of that time period, the most discards as a percentage of catch occurred at 13% in 1993, and the least was in 1990 at less than 1%.

Because of the relative sparseness of discard sampling by the Northeast Fisheries Observer Program, a non-fleet specific annual discard length frequency was used to characterize the length distribution of the discarded catch. Age-length keys were supplemented with survey age data, and discards at age were estimated using the BioStat software. In very general terms, discards primarily occurred at ages zero through 3 until 1996, and at ages 1 through 4 after 1997. An exception was 1998, which saw high discards of age zero fish, and subsequent years saw high discards of fish from that year class.

Figure 84 – GOM Haddock Landings and Discards (mt), 1989-2007

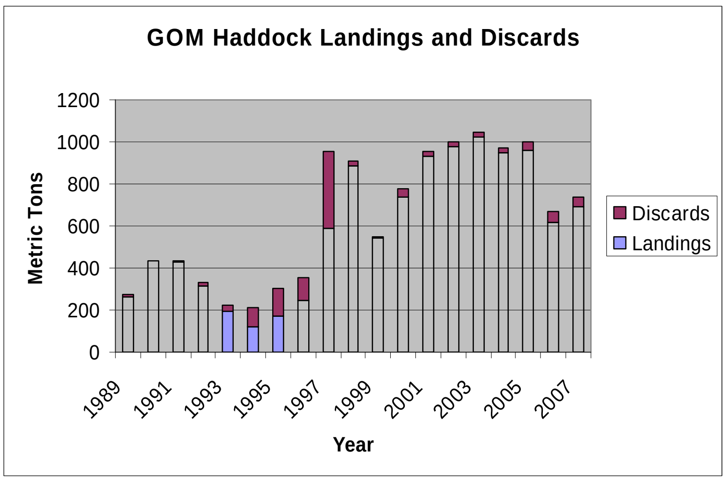


Table 165 – GOM Haddock Discards-at-Age (thousands of fish), 1989-2007

Year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9+	Total
1989	0	3.4	7.1	0.8	1.7	0	0	0	0	0	13
1990	4.5	4.5	0	1.8	0	0	0	0	0	0	10.8
1991	9.2	7.9	2.2	0.4	0	0	0	0	0	0	19.8
1992	4.8	20.4	11	4.8	0.1	0	0	0	0	0	41
1993	15.7	12.4	17.8	3.1	1.8	0.2	0.6	0.1	0.4	0.6	52.7
1994	60.4	89.9	17.8	21.4	3.9	1.5	3.2	2	0.3	0.4	200.8
1995	0.9	50.1	58.5	42	14.5	1.6	0.9	0.6	0	0	169.1
1996	47.7	9.9	32.4	85.8	10.3	1.7	0.4	0.4	0.2	0	189
1997	0.2	2.9	5.7	87.4	123.1	23.9	4.4	1.5	0.5	0.2	249.8
1998	107.6	13.3	13.8	1.5	4.7	5	0	0	0	0	145.9
1999	1.1	8.4	0.7	0.2	0.1	0.1	0.1	0	0	0	10.8
2000	1.1	5.4	47	14.2	1.7	0.2	0.4	0.1	0	0	70.1
2001	1.2	1.6	11.2	21.1	2.3	0.4	0.4	0.3	0	0	38.6
2002	0	2.1	1.3	6.6	17.3	1.8	0.3	0	0.1	0.1	29.5
2003	0	0.1	3.9	1	3.6	14.3	1.5	0.3	0.2	0.1	25
2004	0.3	7.8	0.4	4.9	1.1	2.9	12.1	1	0.4	0.5	31.4
2005	0	0.3	15.6	1	5.1	4.3	4.1	10.1	0.6	0.5	41.5
2006	5.2	9.4	1.6	35.9	3.8	3.7	1.6	2.8	9.2	0.4	73.6
2007	0	1.7	12.7	4.1	27.8	0.3	1.8	0.5	1.4	4.8	55.1

GB Yellowtail Flounder
US discarded catch for years 1994-2007 was estimated using the SBRM recommended in the GARM III Data meeting. Observed ratios of discards of yellowtail flounder to kept of all species for large mesh otter trawl, small mesh otter trawl, and scallop dredge were applied to the total landings by these gears by half-year. Discards varied from approximately 66% (in 1992) to 7% (in 1997) of the US catch in years 1989-2007 (Figure 85).

Discards at age and associated mean weights at age were estimated from sea sampled lengths and pooled observer and survey age-length keys. Fish were discarded across all age classes, but in general there were fewer age one fish discarded after approximately 1993 and more age six-plus fish discarded after approximately 1998.

Figure 85 – GB Yellowtail Flounder Landings and Discards (mt), 1989-2007

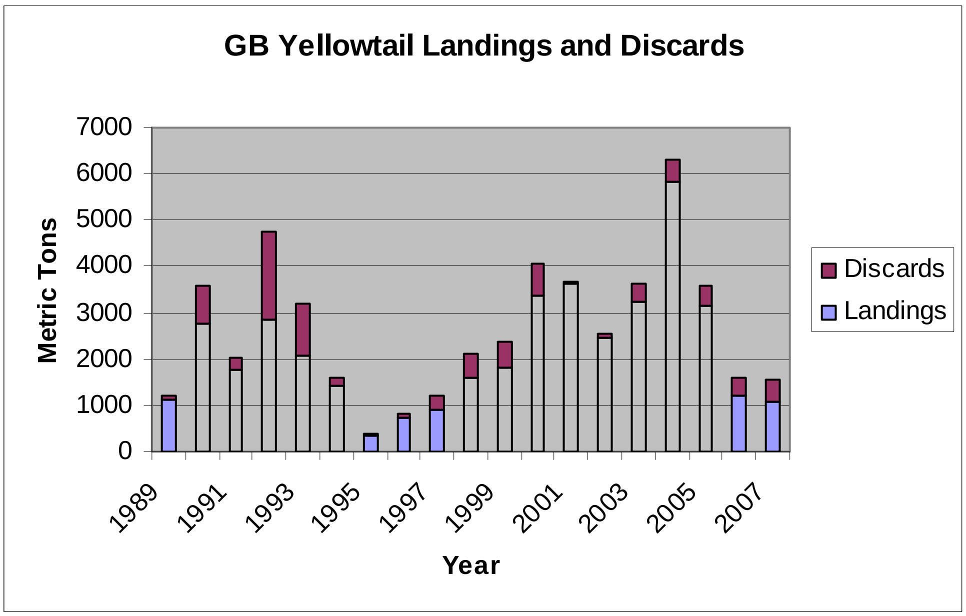


Table 166 – GB Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6+	Total
1989	190	791	433	157	40	11	1622
1990	231	1373	2372	234	34	6	4250
1991	663	119	585	653	81	8	2109
1992	2414	5912	1037	270	90	14	9737
1993	5229	731	928	436	69	11	7404
1994	27	401	331	104	41	7	911
1995	41	130	416	232	51	11	881
1996	99	313	551	281	68	9	1321
1997	47	733	645	400	111	20	1956
1998	146	1207	986	433	183	79	3034
1999	43	1191	848	266	149	72	2569
2000	68	650	762	470	130	141	2221
2001	65	449	863	306	109	67	1859
2002	42	324	406	188	79	55	1094
2003	75	1022	1072	370	123	86	2748

2004	64	821	697	349	128	95	2154
2005	60	597	767	211	76	20	1731
2006	154	965	902	375	96	45	2537
2007	50	1131	622	135	22	8	1968

SNE/MA Yellowtail Flounder

Discarded catch for years 1994-2007 was estimated using the SBRM recommended in the GARM III data meeting. Three commercial fleets (large mesh otter trawl, ≥ 5.5"; small mesh otter trawl, < 5.5"; and scallop dredge) were considered to estimate discards as these fleets constituted the majority of the total discards of this stock. Observed ratios of discards of yellowtail flounder to kept of all species for large mesh otter trawl, small mesh otter trawl, and scallop dredge were applied to the total landings by half-year. In the years 1989-2007, discards ranged from approximately 65% (in 1989) to 2% (in 2001) of the total catch (Figure 86). Discards contributed to almost 50% of the total catch in 2007.

Discards at age were estimated from sea sampled lengths and pooled observer and survey age-length keys. The age-length key was supplemented significantly by the industry-based survey (IBS) in years 2003-2005. Discards occurred primarily at ages one through four from 1989-1994, ages two through four through 2003, and two through five through 2007 (Table 167).

Figure 86 – SNE/MA Yellowtail Flounder Landings and Discards (mt), 1989-2007

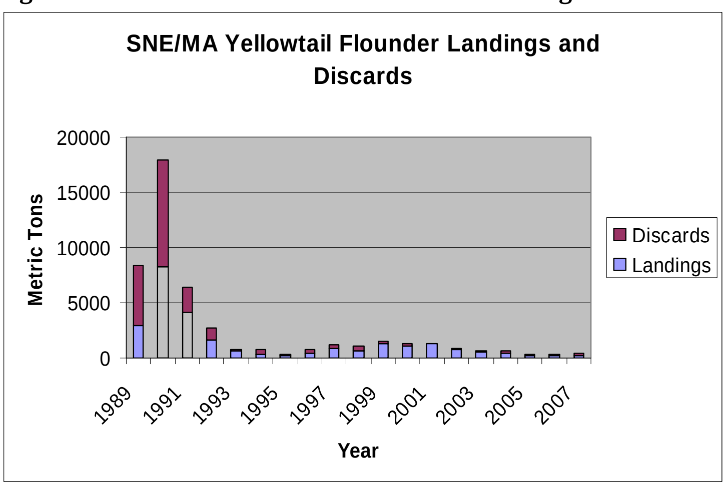


Table 167 – SNE/MA Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6+	Total
1989	24	14002	1834	131	6	0	15997
1990	192	1634	23721	673	11	0	26231
1991	446	1357	2826	2889	12	0	7530
1992	477	1152	1086	659	33	0	3407
1993	13	212	15	9	0	0	249
1994	362	836	126	183	85	8	1600
1995	1	373	114	37	4	7	536
1996	3	227	497	58	11	7	803
1997	22	446	565	142	25	2	1202
1998	19	968	364	60	3	25	1439
1999	10	214	164	24	15	1	428
2000	2	217	101	49	2	6	377
2001	0	13	57	9	1	0	80
2002	1	26	20	11	2	1	61
2003	2	60	131	41	10	5	249
2004	4	80	56	60	51	25	276
2005	66	144	68	40	31	15	364
2006	19	224	190	42	6	12	493
2007	6	206	261	47	22	0	542

CC/GOM Yellowtail Flounder
Discarded catch for years 1994-2007 was estimated using the Standardized Bycatch Reporting Methodology recommended in the GARM III Data meeting. Observed ratios of discards of yellowtail flounder to kept of all species for large mesh otter trawl, small mesh otter trawl, scallop dredge, and gillnet were applied to the total landings by these gears by half-year. Discards were approximately 15% of the catch in years 1994-2006.

Discards at age were estimated from sea sampled lengths and pooled observer and survey age-length keys. Discarded fish were primarily age one through four from 1989-1993, and age two through four from 1994 through 2007. Increased discards on age five fish also occurred from 1994 on, as well as occasional small amounts of age six discards.

Figure 87 – CC/GOM Yellowtail Flounder Landings and Discards (mt), 1989-2007

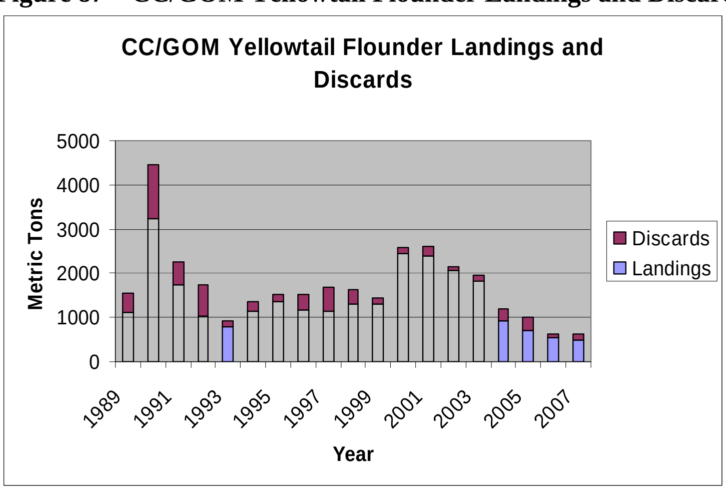


Table 168 – CC/GOM Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6+	Total
1989	118	1459	528	11	0	0	2116
1990	84	2180	2738	21	0	0	5023
1991	465	1011	700	234	7	0	2417
1992	1709	3569	930	87	3	0	6298
1993	159	391	206	72	0	0	828
1994	19	710	332	47	11	1	1120
1995	37	147	335	52	3	0	574
1996	26	339	516	219	55	0	1155
1997	8	850	831	215	61	7	1972
1998	38	443	616	75	18	3	1193
1999	9	231	265	18	6	0	529
2000	2	189	209	52	6	5	463
2001	20	400	404	27	0	0	851
2002	37	207	111	21	1	0	377
2003	10	245	193	49	4	0	501
2004	13	389	412	118	15	9	956
2005	15	394	502	63	2	3	979
2006	7	84	156	39	7	0	293
2007	14	158	221	69	18	0	480

American Plaice

The NEFSC Observer Database was used to estimate discard to kept ratios (d:k) of discarded American plaice to total kept of all species, on a trip basis. Total mt of American plaice discards were then estimated by applying the d:k to commercial landings. Discards of American plaice were estimated for both the large mesh fisheries in the GOM and GB and for the northern shrimp fishery in the GOM. Discarding of small fish historically occurred in the northern shrimp fishery during the 1st and 4th calendar quarter, however, in recent years the discards are minimal. Discards in the large mesh fishery occur year-round. Discards as a percentage of total catch have been generally decreasing throughout the time period. Total discards accounted for about 18% of the total catch during 2005-2007.

Observer length frequencies, and both research survey and commercial age-length keys were applied to estimate discards at age. Small mesh fishery discards are not included in the catch at age matrix. Discarded fish are primarily age two through six, although some years saw increased discarding of age one fish and more recent years seem to have a higher proportion of age seven through eleven plus fish discarded compared to the past.

Figure 88 – American Plaice Landings and Discards (mt), 1989-2007

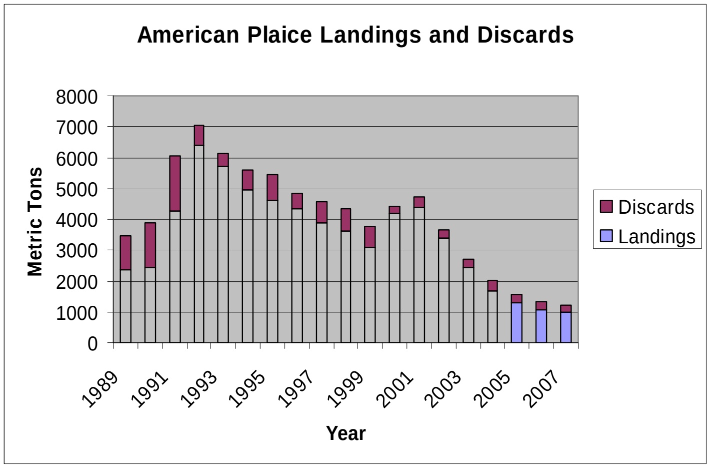


Table 169 – American Plaice Discards-at-Age (thousands of fish), 1989-2007

Year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11+	Total
1989	0	15.5	2275	2530.1	2066	836.2	323.7	86.9	65	2.8	0.7	2.3	8204
1990	0	0	1094.4	4523.6	2761	923.1	195.8	76.9	55	0.2	0	0	9630.1
1991	0	0.4	255.2	1007.9	4147.2	2047.6	155.6	7.2	1.4	0.7	0	0	7623
1992	0	9.6	244.5	815.7	865.5	939.3	86.5	36.3	0	0	0	0	2997.3
1993	0	21.8	280.6	299	745.8	345.1	126.3	2	0	0	0	0	1821
1994	0.7	58.2	862.6	211.1	814.4	974.7	79.6	3.3	0.2	0.2	0	0	3004.4
1995	1.1	45.3	2433.7	1432.7	1648.5	440.5	125	14	11.4	0.5	0	0	6152.6
1996	0	12.5	1049.5	1083.9	1238.7	337.4	106.4	37.4	3.3	2.7	2	4.8	3878.6
1997	0	14.7	636.1	335	1058.1	1033.1	177.9	21.5	0.3	0	0	0	3276.3
1998	0	37.2	85.4	343	692.1	1366	714.6	74.8	0.4	0	0	0	3313.3
1999	0	4.2	216.3	167.4	912.4	689.2	688.9	231.7	46.7	2.4	0.4	0	2959.6
2000	0	2.7	303	329.2	380.6	220.2	106.2	41.9	1.6	0	0	0	1385.8
2001	0	0	91.7	413.8	567.7	396	206.9	65.2	18	6	0.1	5.9	1771.2
2002	0	1.1	12.8	106.1	444.1	377.8	147.1	36.3	15.7	9.8	4.2	1.3	1155.9
2003	0	11.9	689.1	45.5	167.7	456.1	177	30	34.2	11.5	0.6	10.3	1633.8
2004	0	6.2	140	219.6	317.2	466.5	358.5	70.6	14.7	4.8	1.6	1.2	1601.3
2005	0	34.3	283.5	103.8	246.5	407.7	192.7	57	10.6	0.7	0.4	0.8	1337.7
2006	0	28.4	83.3	112.2	309.6	276.1	134	60	14.3	2.5	4.6	0.8	1025.6
2007	0	160	237.7	203.4	341.4	220.4	89.5	14.7	3.7	0.8	2.8	0	1274.3

Witch Flounder

Discards have been estimated for three fleets: northern shrimp trawl, large-mesh (>=5.5 inch) otter trawl, and small-mesh (<5.5 inch) otter trawl. Discards from the northern shrimp fishery were estimated using two methods: when no observer data were available (1998-2002), a regression of age 3 fish in the autumn NEFSC survey and observed discard rates was used to estimate ratios of discard weight to days fished (d/df) ratios. When observer data were available (1989-1997, 2003-2007), d/df ratios were calculated by fishing zone (a surrogate for depth). To estimate discard weight, the mean discard ratio (weighted by days fished in each fishing zone) was expanded by the days fished in the northern shrimp fishery. The estimation of large-mesh otter trawl discards is based upon two methods. For 1982 to 1988, a method which filters survey length frequency data through a commercial gear retention ogive and a culling ogive was used and then a semi-annual ratio estimator of survey-filtered 'kept' index to semi-annual numbers landed was used to expand the estimated ‘discard’ survey index to numbers of fish discarded at length. For 1989 to 2007, an annual combined ratio of witch flounder discard weight to kept weight of all species ratios (d/kall) was calculated from observer data. Total discard weight was derived by multiplying the d/kall ratio by the commercial large-mesh otter trawl landings. Observed discard length frequencies are used to estimate discarded fish at length. Semi-annual numbers of fish discarded were apportioned to age using the corresponding seasonal NEFSC survey age/length key. Witch flounder discards from the small-mesh otter trawl fisheries were also estimated using an annual combined ratio for this fleet and expanded to total discards by commercial landings of small-mesh otter trawls. Given the possession regulations for this fleet, the commercial catch at age was used to apportion the small mesh otter trawl discard weight to discards at age. For 2003 to 2005, witch flounder discards in the northern shrimp fishery were estimated to be near zero. For 2006 and 2007, discards were estimated to be very small and are associated primarily with the 2004 year class. Discards from the large mesh otter trawl fishery account for the majority of total discards.

Witch flounder discarded in the northern shrimp fishery range in age from 0 to 6, with the majority at ages 1-3. The estimated discard weight of witch flounder from the shrimp fishery is small compared to the other trawl fleets. Witch flounder discarded in the large-mesh otter trawl fishery range in age from 0 to 6, with the majority at ages 4 to 5. The majority of discards for the small-mesh otter trawl fleet occur between ages 1 to 6, and the discards are a small component of total catch.

Figure 89 – Witch Flounder Landings and Discards (mt), 1989-2007

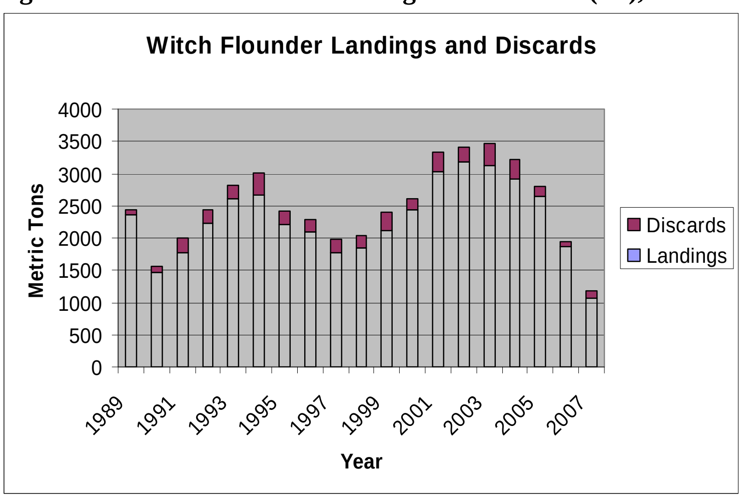


Table 170 – Witch Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11+	Total
1989	0.7	11.1	52.6	89.7	303.5	104.1	0	0	0.4	0	0	0	562.1
1990	1.2	5.2	117.0	303.2	200.7	200.6	0	0	0	0	0	0	827.9
1991	3.0	17.8	79.0	496.3	451.0	348.9	129.8	0	0	0	0	0	1525.7
1992	2.7	43.4	137.0	161.9	460.1	273.9	130.0	12.0	0	0	0	0	1221.0
1993	112.1	78.8	108.2	86.5	584.2	395.4	5.9	2.2	0	0	0	0	1373.3
1994	8.1	1368.5	498.5	67.2	439.2	629.9	59.4	119.2	2.3	2.8	0	7.9	3202.9
1995	2.7	49.9	658.6	640.9	354.4	278.3	108.1	2.4	1.0	0.3	0	0	2096.5
1996	5.2	32.7	51.5	141.8	327.2	418.0	61.4	0	0	0	0	0	1037.9
1997	8.7	74.9	106.8	124.3	485.9	366.8	155.8	5.4	1.4	0.8	0	0.2	1330.9
1998	49.8	392.3	278.5	221.0	283.5	241.0	71.0	10.2	0.3	0.2	0	0	1547.7
1999	32.1	253.0	188.9	146.5	275.9	340.6	51.8	15.5	1.9	0.8	0	0	1306.9
2000	21.6	170.0	121.2	122.2	291.2	297.9	74.7	17.5	2.9	0	0	0	1119.1
2001	12.3	97.0	66.3	65.1	310.5	645.8	176.7	43.1	0.1	0.1	0	0	1417.0
2002	2.3	19.1	15.8	32.5	407.0	471.2	125.1	34.9	5.9	2.8	1.1	1.1	1118.8
2003	0	1.4	6.7	32.0	226.2	585.7	379.4	120.4	23.7	6.4	1.3	1.4	1384.8
2004	0	0.1	9.6	33.0	169.1	476.8	383.7	116.8	31.7	15.1	13.5	8.0	1257.4
2005	0	5.9	14.6	15.3	109.1	196.1	159.0	53.8	9.4	4.6	1.3	0.9	570.0
2006	0	2.6	20.4	47.2	36.2	61.1	136.8	36.6	9.8	3.7	2.1	1.8	358.4
2007	0	2.1	19.1	69.7	69.8	52.9	37.4	18.1	2.0	1.9	0	0.5	273.4

GB Winter Flounder

Initial estimates of GB winter flounder discards were calculated for the large mesh bottom trawl fleet, small mesh groundfish fleet, and the sea scallop dredge fleet ("limited permits" only). Discards (mt) were estimated based on fisheries observer data and the landings data using the combined ratio method described in Wigley et al. The discard ratio estimator consisted of discards of GB winter flounder divided by the sum of all species kept by a particular fleet. Due to a lack of fisheries observer data, discard estimates for the scallop fleet prior to 1992 were hindcast back to 1964 based on an equation using the average d:k ratio from 1992-1998. During 1989-2007, discards were primarily attributable to the scallop dredge fleet during most years, ranging between 66% and 100%. Discards ranged from <1% to 25 % of the total landings during 1989-2007 and were higher during 1989-1991 than during 1992-2007 (Figure 90). Discards reached a peak of 314 mt in 1991 then declined sharply to their lowest level (1 mt) in 1995. During 1999-2003, discards declined from 85 mt in 1999 to 9 mt in 2003, but have increased since then. Discards nearly doubled between 2006 (110 mt) and 2007 (193 mt) and predominately came from the scallop dredge fleet.

The annual number of lengths sampled from winter flounder discards in the bottom trawl and scallop dredge fisheries was inadequate to characterize discard length compositions during most years. As a result, discards at age were characterized based on the assumption that fish smaller than the minimum regulatory size limits were discarded. Examination of length-at-age data indicates that fish of this size are one year old in the NEFSC fall surveys and two years old in the spring surveys. Therefore, discards at age for the bottom trawl fleet, during 1989-2001, were estimated by dividing the estimated weight of discarded winter flounder from the bottom trawl fleet, during January-June, by the annual mean weights of age 2 fish from the NEFSC spring surveys. Likewise, winter flounder discard weights for July-December were divided by the annual mean weights of age 1 fish from the NEFSC fall surveys. Discards at age for the bottom trawl fleet, during 2002-2007, were estimated by using the discard numbers at length, binned as

January-June and July-December, to characterize the proportion discarded at length and ages were determined by applying the NEFSC spring and fall survey age-length keys and length-weight relationships, respectively. Length compositions of discarded fish in the bottom trawl fishery indicate that for most years during 2002-2007, discarding of all sizes of winter flounder occurred (Table 171), particularly since the establishment of Georges Bank winter flounder trip limits in May of 2006. Discards at age for the scallop dredge fishery were estimated by scaling up the length at age by the ratio of scallop dredge discards to total landings. Discards occur across all age categories, but primarily ages 2-4 during 1989-1997 and ages 3-5 during 1998-2003. Total discards were lower after 2004 than before and discards of age 1 fish were much higher prior to the 1994 when the minimum codend mesh size (5.5 in) and minimum fish retention size (28 cm) was smaller.

Figure 90 – GB Winter Flounder Landings and Discards (mt), 1989-2007

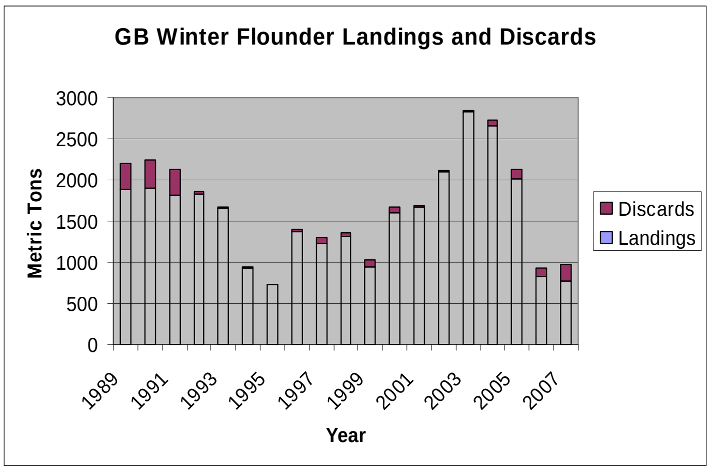


Table 171 – GB Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	Total
1989	34	1,556	1,340	559	161	117	66	3,833
1990	36	370	2,248	739	204	50	18	3,667
1991	2	656	1,389	1,040	149	41	66	3,343
1992	23	764	704	678	436	86	57	2,748
1993	39	285	1,062	419	297	152	44	2,296
1994	8	353	598	339	92	47	43	1,478
1995	365	688	168	138	103	31	40	1,534
1996	35	1,336	424	185	95	98	88	2,261
1997	2	52	27	12	2	1	1	96
1998	0	10	1,445	837	132	44	12	2,480
1999	70	395	808	536	151	20	21	2,001
2000	52	676	1,100	366	253	185	159	2,791
2001	15	376	1,276	799	584	157	99	3,306
2002	0	117	890	728	427	227	182	2,571
2003	0	257	689	918	452	251	398	2,968
2004	3	25	15	17	5	4	8	76
2005	4	41	18	19	11	18	12	123
2006	4	12	23	24	24	6	9	102
2007	11	34	32	35	47	13	14	186

GOM Winter Flounder

Discards were estimated for the large mesh trawl, gillnet, and northern shrimp fishery. Observer discard to landings of all species ratios were applied to corresponding commercial fishery landings to estimate discards in weight for the large mesh trawl fishery. The observer sum discarded to landing of all species ratios were used for estimating gillnet discard rates. Observer sum discarded to days fished ratios were used for the northern shrimp fishery since landing of winter flounder in the shrimp fishery is prohibited. The observer length frequency data for gillnet and the northern shrimp fishery were used to characterize the proportion discarded at length. The sample proportion at length, converted to weight, was used to convert the discard estimate in weight to numbers at length. As in the southern New England stock, a 50% mortality rate was applied to all commercial discard data. Discards were generally low compared to overall catch. Discards accounted for a high of 9.5% of total removals in 1997 and a low of only two percent in 1989 and 2003.

Numbers at ages were determined using NEFSC/MDMF spring and NEFSC fall survey age-length keys. In general, most discards were comprised of age one to four fish, although later years included fewer age one fish.

Figure 91 – GOM Winter Flounder Landings and Discards (mt), 1989-2007

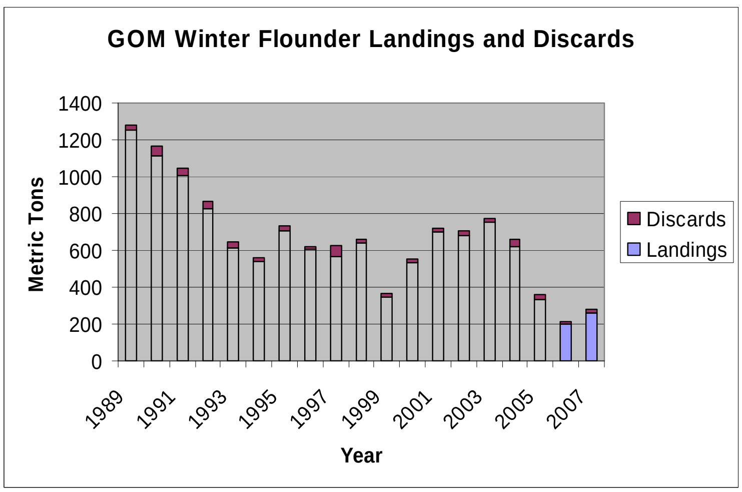


Table 172 – GOM Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+	Total
1989	24	77	43	16	3	1	0	0	164
1990	9	47	114	58	8	0	0	0	236
1991	18	117	82	30	2	0	0	0	249
1992	44	182	77	15	1	0	0	0	319
1993	28	64	70	25	4	0	0	0	191
1994	18	73	37	15	3	0	0	0	146
1995	27	62	44	22	5	2	1	0	163
1996	16	41	27	14	2	0	0	0	100
1997	19	136	93	66	26	0	0	0	340
1998	20	38	32	16	4	0	1	0	111
1999	7	13	18	11	3	2	1	1	56
2000	17	24	30	19	9	2	0	0	101
2001	13	21	32	26	7	3	0	0	102
2002	4	28	32	20	6	2	0	0	92
2003	9	36	28	11	4	1	0	1	90
2004	10	57	77	17	2	2	1	0	166
2005	15	42	46	20	4	2	0	0	129
2006	7	12	25	11	2	0	0	0	57
2007	7	11	34	16	4	0	0	0	72

SNE/MA Winter Flounder

Prior to 1994, NEFSC trawl survey length frequencies and commercial trawl fishery mesh selection data were used to estimate the magnitude and characterize the length frequency of the commercial fishery discard. For 1994-2007, NEFSC Fishery Observer trawl and scallop fishery discards to landings ratio estimates were applied to corresponding commercial fishery landings to estimate discards in weight. The NEFSC Fishery Observer length frequency samples were used to characterize the proportion discarded at length for 1994-2007. Commercial fishery discard length samples were applied on a semi- annual basis and ages were determined using NEFSC survey spring and fall age-length keys. A discard mortality rate of 50% (Howell et al., 1992) was applied to commercial fishery live discards. Discards were generally higher in earlier years, both in weight and as a proportion of landings, than in later years. In 1989, discards accounted for a series high of 28 percent of total removals, and 2001 saw a low of less than one percent discards.

Discards-at-age showed high variability and no clear trend. In general, in 1989 and from 1993-1995 fish were primarily discarded at ages one through four. From 1990-1992, ages two through four were most commonly discarded. From 1996 on, discards occurred at ages one or two through five or six.

Figure 92 – SNE/MA Winter Flounder Landings and Discards (mt), 1989-2007

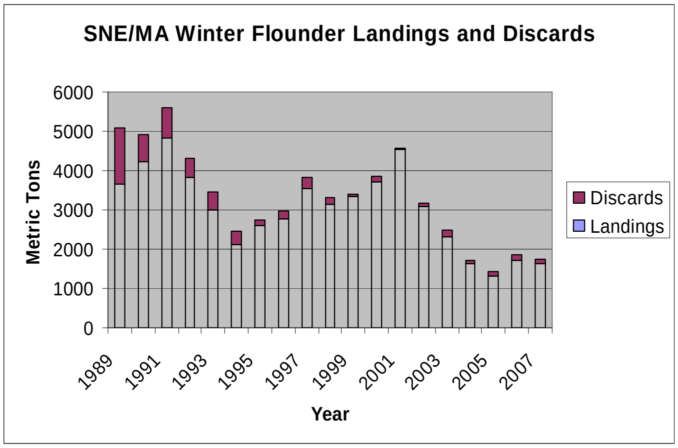


Table 173 – SNE/MA Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	Total
1989	315	2724	2,131	555	33	2	1	5,761
1990	16	781	1433	322	14	0	1	2,567
1991	17	1,238	1,205	227	12	1	0	2,700
1992	15	845	787	150	14	1	0	1,812
1993	201	849	467	57	6	0	0	1,580
1994	233	914	186	28	1	0	0	1,362
1995	86	254	193	25	3	0	0	561
1996	16	117	181	82	21	1	0	418
1997	73	205	256	102	16	0	0	651
1998	10	257	153	37	5	0	0	462
1999	2	30	57	45	16	7	2	158
2000	42	113	111	41	32	9	5	354
2001	12	44	35	11	1	0	0	102
2002	10	74	58	36	25	11	6	221
2003	8	47	68	26	16	35	19	219
2004	31	76	45	37	12	7	5	214
2005	22	107	47	30	17	12	8	243
2006	36	131	102	37	21	9	6	342
2007	9	60	100	57	15	8	4	254

Acadian Redfish

Discards were estimated using the d/k ratio (ratio of sums) method. The discard estimates are generally low (< 400mt) (Figure 93), but are sometimes a substantial proportion of total removals during this period (Figure 94). There was a large amount of discards in 1991 (1514 mt), which was roughly three times the corresponding landed biomass. However, on average discards accounted for approximately 34 percent of total removals during the 1989-2007 time period.

Figure 93 – Acadian Redfish Discards (mt), 1989-2007

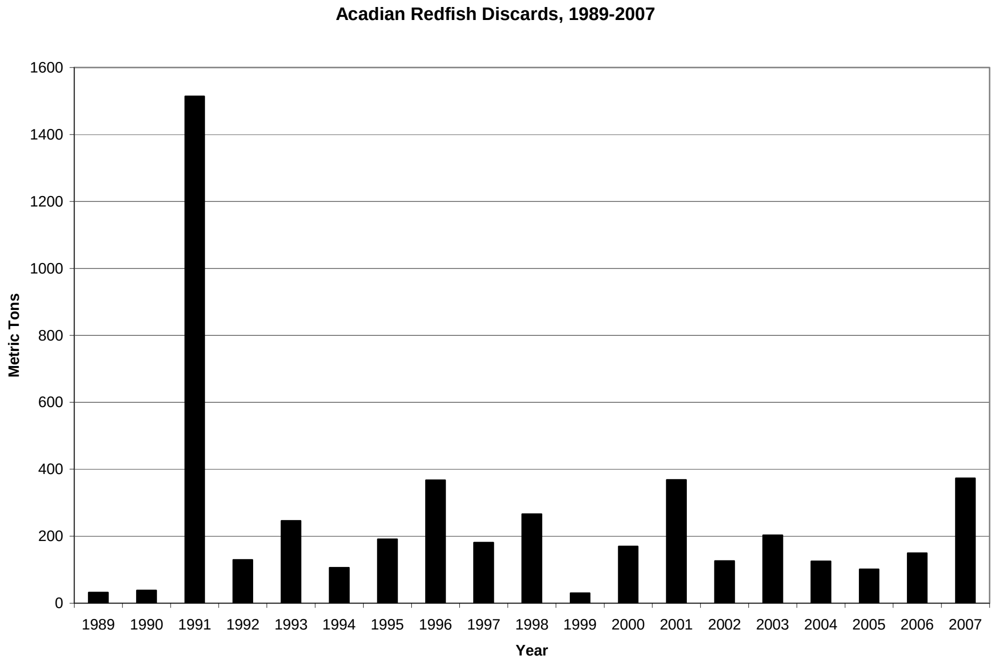
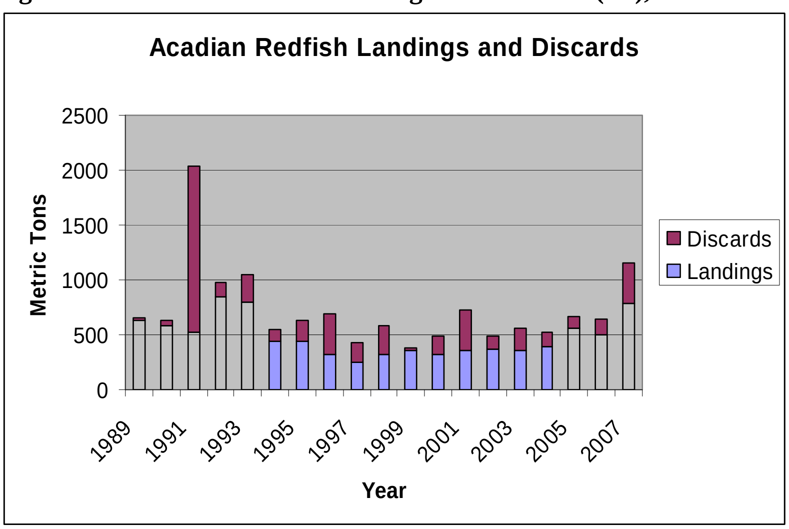


Figure 94 – Acadian Redfish Landings and Discards (mt), 1989-2007



White Hake

Commercial discards were estimated for white hake for 1989-2007 using the SBRM method of white hake discard/all kept (Figure 95). In recent years, discards in both the otter trawl and the sink gill net fisheries have been very low, and discards have been a small proportion of total removals (Figure 96). The highest proportion of discards to total removals occurred in 1990 at twenty-two percent. That year also had the series high of discards in metric tons, with 1384. In 2007, 29 mt of discards accounted for less than two percent of total catch.

Figure 95 – White Hake Commercial Discards (mt), 1989-2007

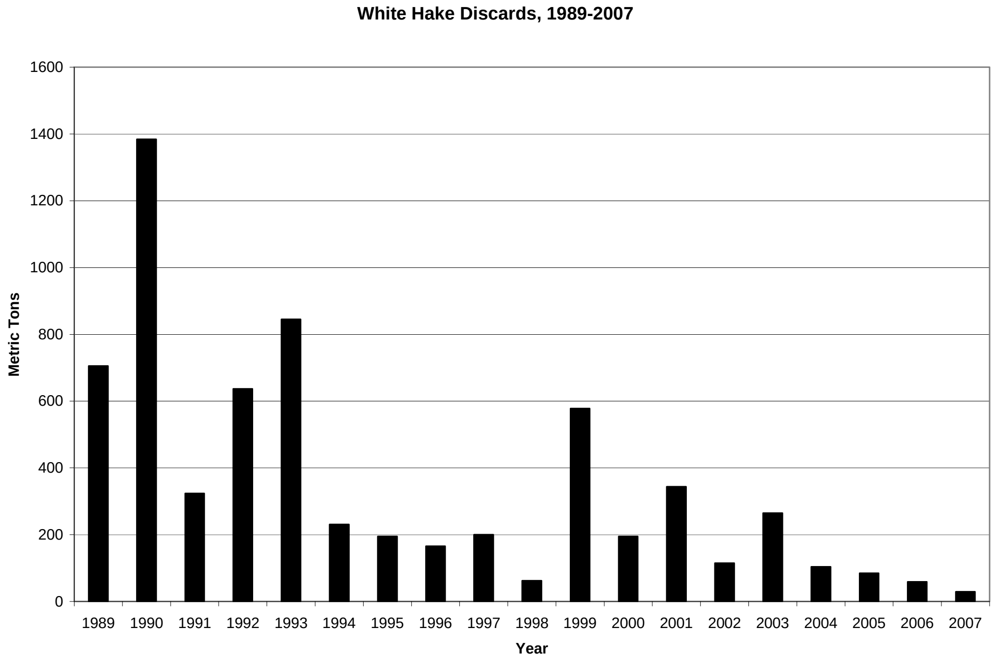
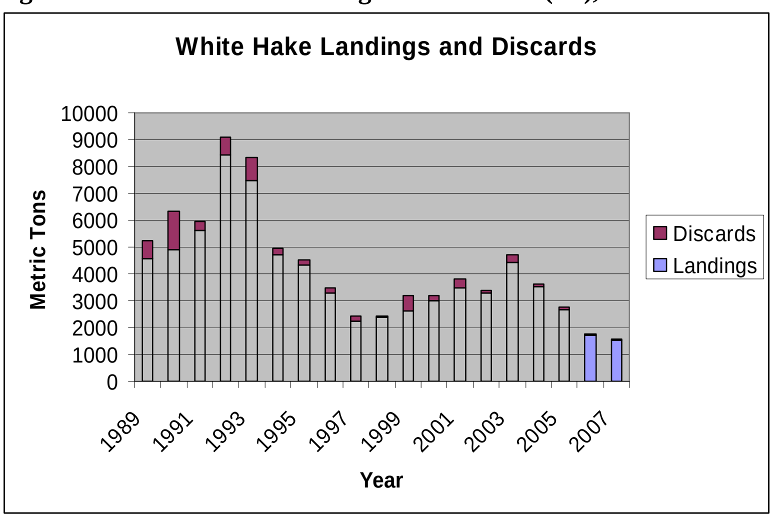


Figure 96 – White Hake Landings and Discards (mt), 1989-2007



GOM/GB Windowpane Flounder

Discard estimates (mt) for 1989-2007 were calculated using NEFOP data and the combined ratio method for the large mesh bottom trawl fleet, small mesh groundfish fleet, and the sea scallop fleets in Figure 97. Due to a lack of fisheries observer data prior to 1992 for the scallop fleet, discard estimates were hindcast back to 1989 based on an equation using the average d:k ratio from 1992-1998. During most years, discards are primarily (70%-80%) from the large mesh bottom trawl fleet, although the scallop dredge fleet also contributed a substantial percentage (30%-60%) of the total discards before 1993. The small mesh bottom trawl fleet comprised a low percentage of the total discards, generally ≤ 5%, during most years. The amount of discards declined during 1997-2002, but has been increasing since then and reached the third highest level on record in 2007 (913 mt) (Figure 97). Discards more than tripled between 2004 (288 mt) and 2005 (806 mt). Discards represented a smaller percentage of the total catch from 1989-1993 (averaging 27%), but have since comprised a majority of the catch (82% to 96%) (Figure 98). A directed fishery occurred from 1989-1993, but is no longer in effect. During the directed fishery period, windowpane flounder catches filled the market void left by depleted yellowtail flounder stocks. NEFOP data indicate the primary reason for discarding since 1994 is the lack of a market for windowpane.

Figure 97 – GOM/GB Windowpane Flounder Discards (mt), 1989-2007

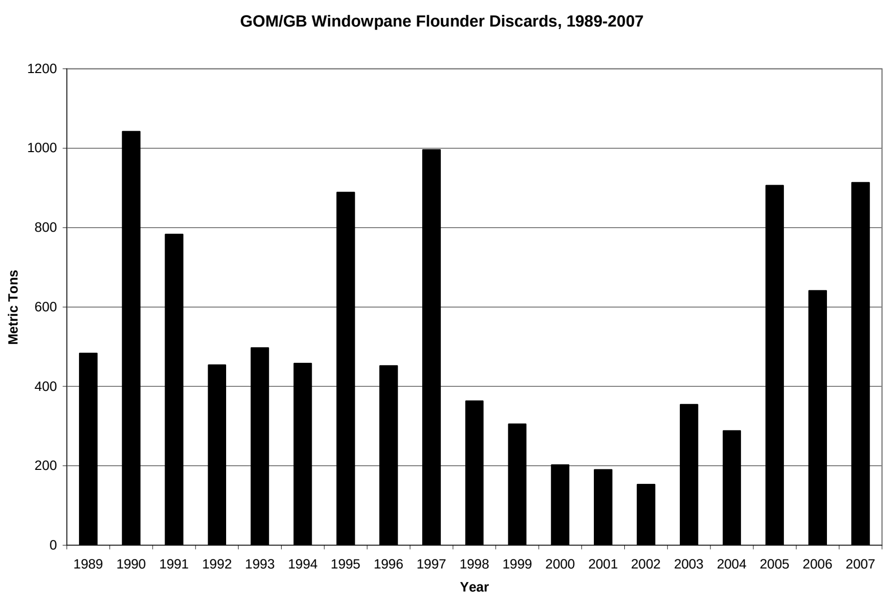
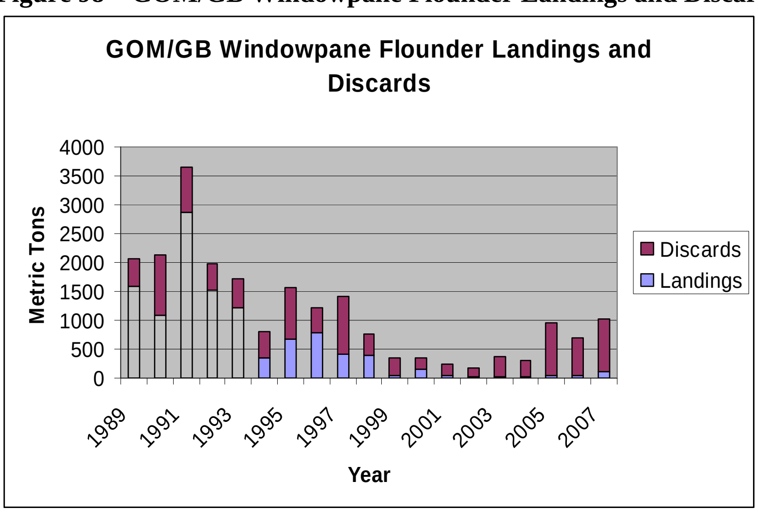


Figure 98 – GOM/GB Windowpane Flounder Landings and Discards (mt), 1989-2007



SNE/MA Windowpane Flounder

Initial estimates of SNE/MA windowpane flounder discards during 1989-2007 were calculated using the same method as those for the GOM/GB stock. During most years since 1989, windowpane discards were primarily from the large mesh bottom trawl fleet. However, a majority of the total discards occurred in the scallop dredge/trawl fleet during 1993 and 1996-1999, ranging between 30% and 67%, and in the small mesh groundfish trawl fleet during 1989, 1992, 1994 and 2001-2002 and ranged between 46% and 69%. Even during the period of the directed fishery, the landings were dwarfed by the high level of discards that occurred; generally 2-5 times the landings (Figure 100). During 1989-1991, total discards ranged between 3,133 mt and 4,510 mt (Figure 99). Since 1992, total discards have been much lower. However, during 2003-2007, discards from the large mesh trawl fleet have increased to 200-300 mt per year. The NEFOP database indicates that since 1994, the primary reason for discarding windowpane flounder is the lack of a market for this thin-bodied flatfish. However, trip limits of 1,000 lbs (100 lbs per day) when conducting a "B day" fishing trip were implemented beginning in November 2004.

Figure 99 – SNE/MA Windowpane Flounder Discards (mt), 1989-2007

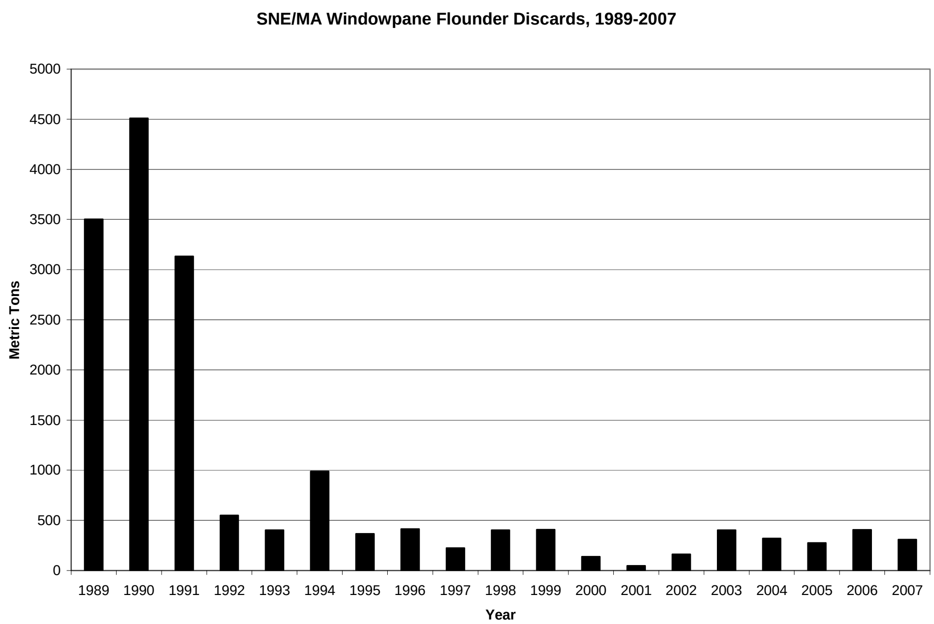
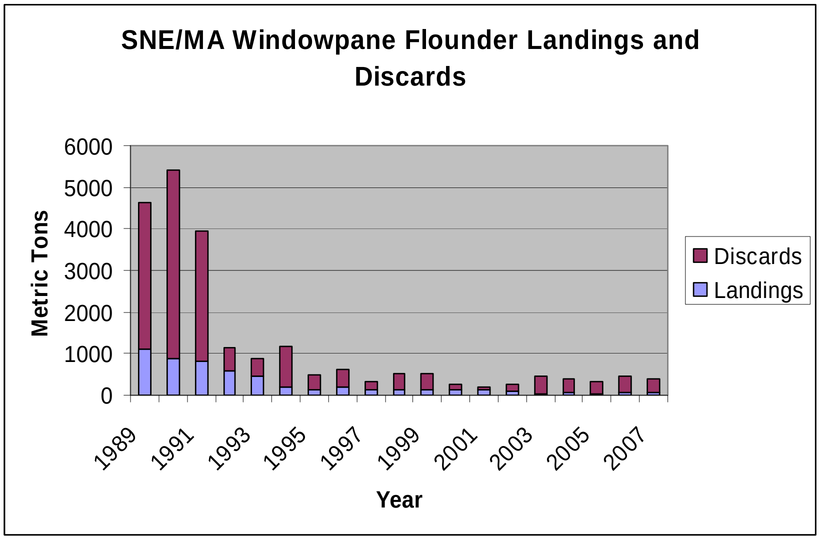


Figure 100 – SNE/MA Windowpane Flounder Landings and Discards (mt), 1989-2007



Ocean Pout

A combined ratio estimator, discard weight of ocean pout to kept weight of all species, was used to estimate ocean pout discards in the otter trawl fishery by large (>=5.5 inch) and small (<5.5 inch) mesh groups, gillnet, and scallop dredge using the NEFOP data from the Cape Cod Bay, Georges Bank and Southern New England and Mid-Atlantic regions. Limited NEFOP data are available for gear types other than otter trawl, gillnet and scallop dredge gear. Total discards were derived by expanding the discard ratios by the kept weight of all species, by gear type and mesh group, using the dealer weighout data for 1989–2007. The majority of ocean pout discards occur in the large-mesh and small-mesh otter trawl fisheries. Total discards range between 175 mt in 2007 to 9,434 mt in 1990 (
Figure 101). Discards far exceed landings in all years, accounting for up to 98% of total removals (Figure 102). The primary reason reported in the NEFOP for ocean pout discards is "no market".

Figure 101 – Ocean Pout Discards (mt), 1989-2007

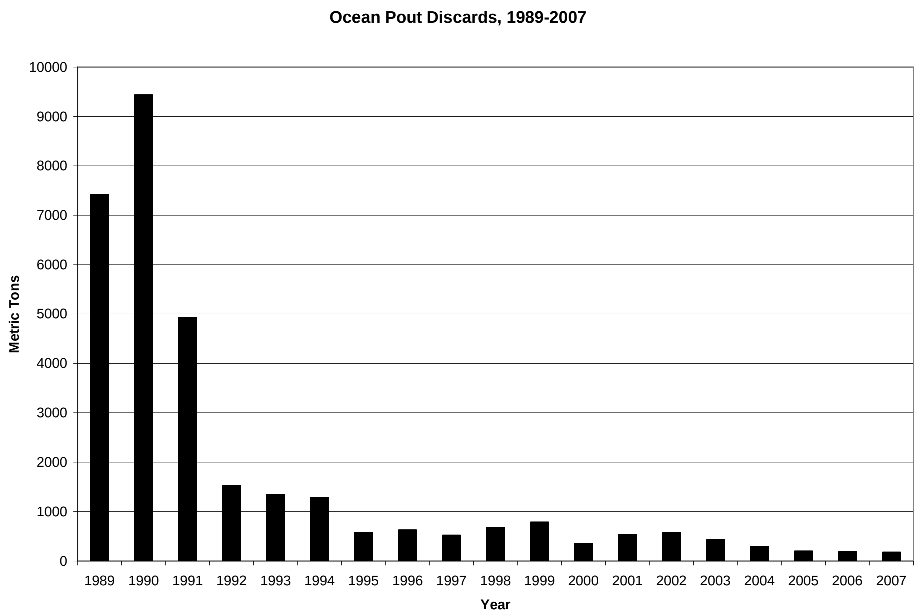
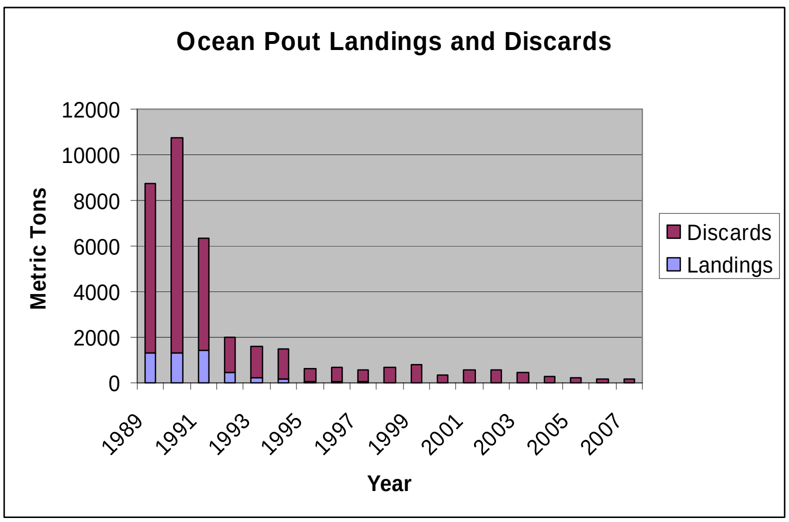


Figure 102 – Ocean Pout Landings and Discards (mt), 1989-2007



Atlantic Halibut

Discards from the NEFOP database were estimated based on the Standardized Bycatch Reporting Methodology combined ratio estimation. Due to the low occurrence of Atlantic halibut in the observer database, the 1989-1998 average discards were applied to the landings from 1893 to 1998 and the 1999-2007 average discards were applied to landings in those years. The amount of discarded fish increased after 1999 (Figure 103), as well as the discard-to-kept ratio. The amount of discarded fish was, on average, 17% that of kept fish from 1989-1998, and 147% from 1999-2007 (Figure 104). A trip limit of one halibut per trip and a 91 cm minimum retention size were implemented in 1999.

Figure 103 – Atlantic Halibut Discards (mt), 1989-2007

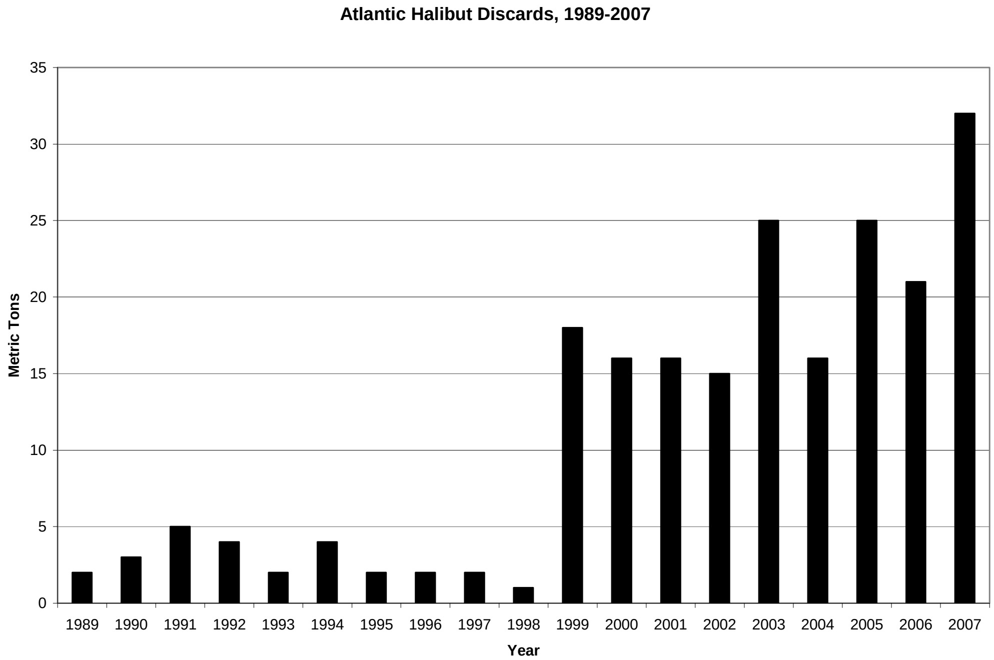
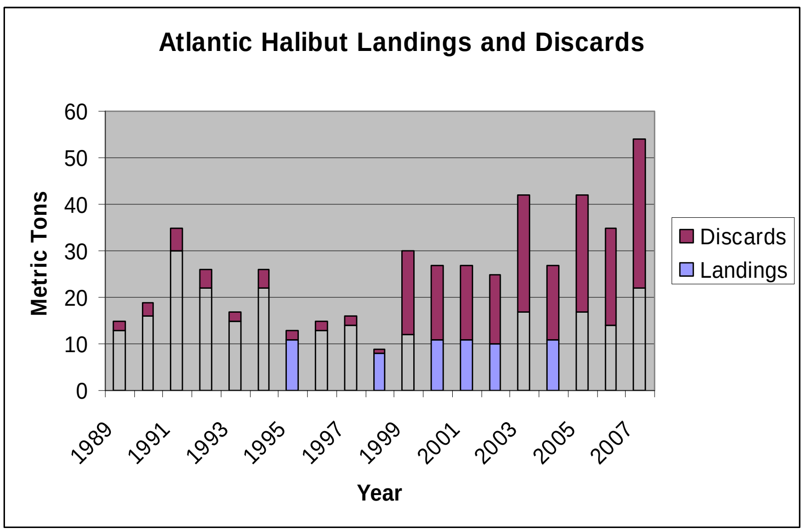


Figure 104 – Atlantic Halibut Landings and Discards (mt), 1989-2007



Atlantic Wolffish

Commercial fishery discards from U.S statistical areas were gathered from the Northeast Fisheries Observer Program database for the period 1989-2007. Numbers were based on the Standardized Bycatch Reporting Methodology combined ratio estimation. Discards appear to be a small component of the overall catch of Atlantic wolffish. The maximum estimated discards in any one year were 26.98 mt in 1989. Otter trawls accounted for 98.3% of the total discarded wolffish from all years. Discards appear to be increasing in the gillnet sector, which reported approximately 17% of the total wolffish discarded for 2007.

Figure 105 – Atlantic wolffish discards, 1989 - 2007

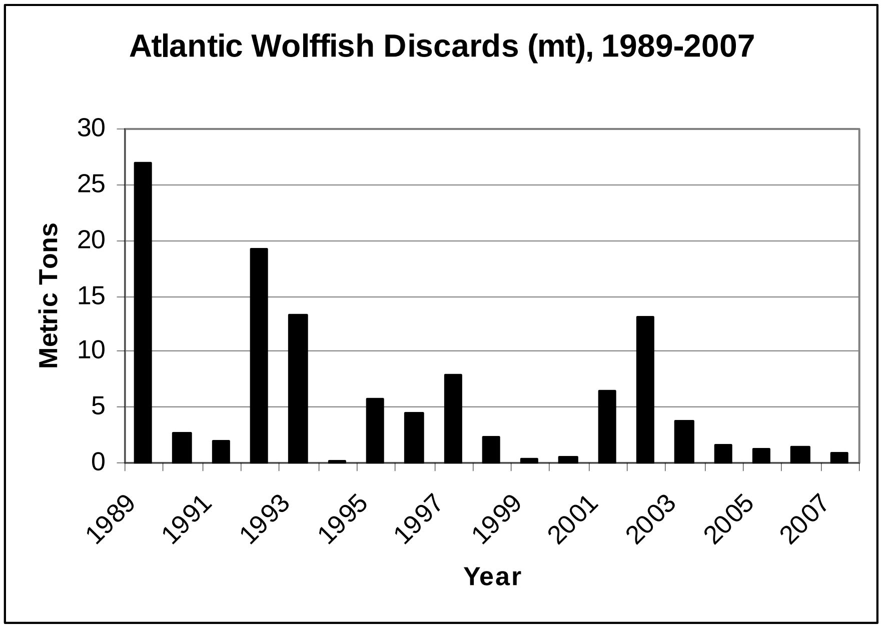
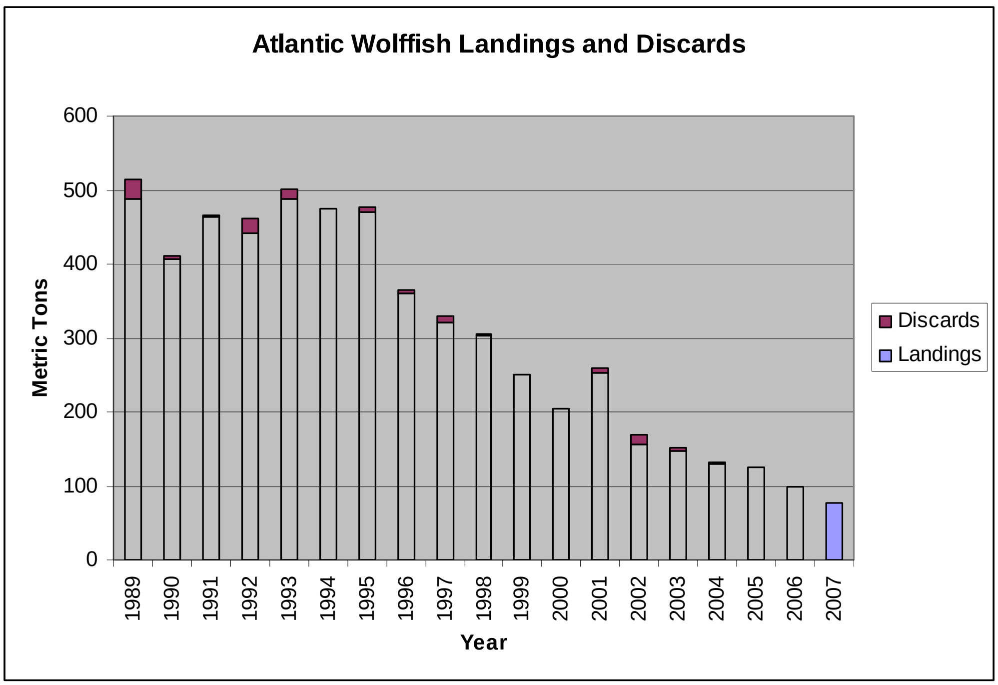


Figure 106 – Atlantic wolffish landings and discards, 1989 -2007



6.2.7.1.2 Stocks for Which No Estimates Are Provided

Recent discard estimates are not available for pollock from GARM III.

6.2.7.2 Recreational Fishery Discards

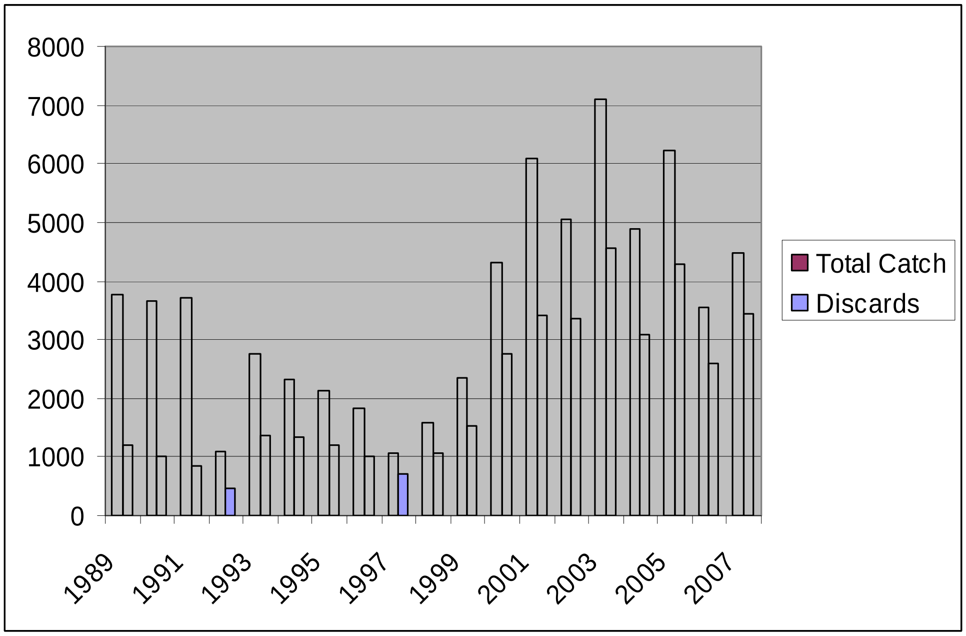
Information for recreational discards is collected through the MRFSS/MRIP system.

Estimates below were taken from the GARM III report. The estimates shown here reflect the difference between MRFSS categories A+B1+B2 and A+B1.

GOM Cod

The survival of released recreational cod is assumed to be 100%. This number is a source of uncertainty and it was recommended in the GARM III that it receive confirmation in future assessments. Recreational discards in the time series ranged from 468 mt in 1992 to 4568 in 2003, and generally accounted for a greater percentage of total catch in later years.

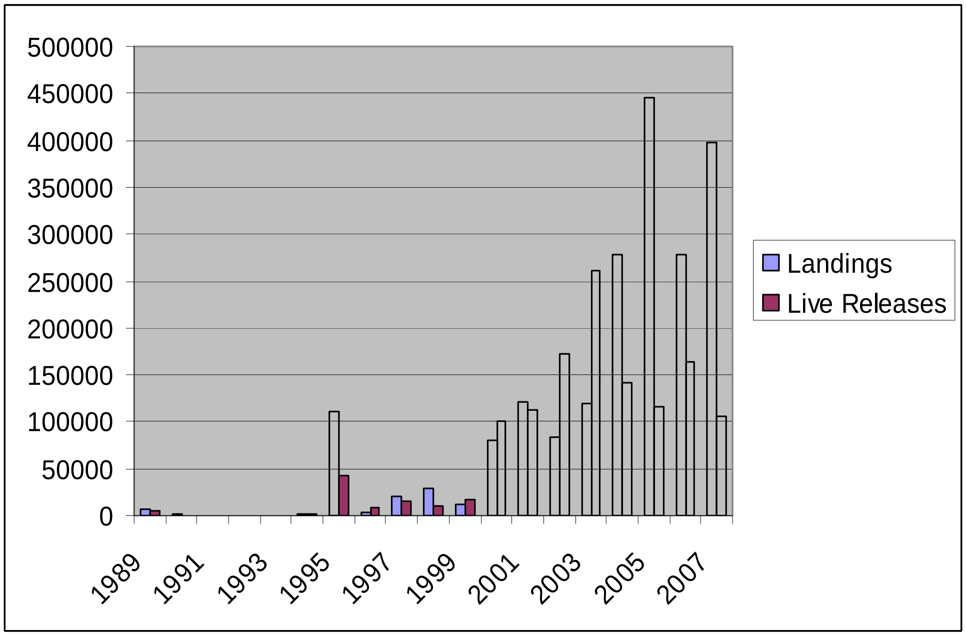
Figure 107 – GOM Cod Recreational Catch and Recreational Discards (mt), 1989-2007



GOM Haddock

Gulf of Maine haddock recreational landings were obtained from the Marine Recreational Fisheries Statistics Survey (MRFSS), and are presented in numbers of fish. There was assumed 100% survival of recreational live releases. MRFSS data are available from 1981 onward. Historically, recreational landings have been a minor component of overall fishery removals, though over the past five years recreational landings have averaged less than 500 mt. In the past four years, landings were significantly greater than live releases.

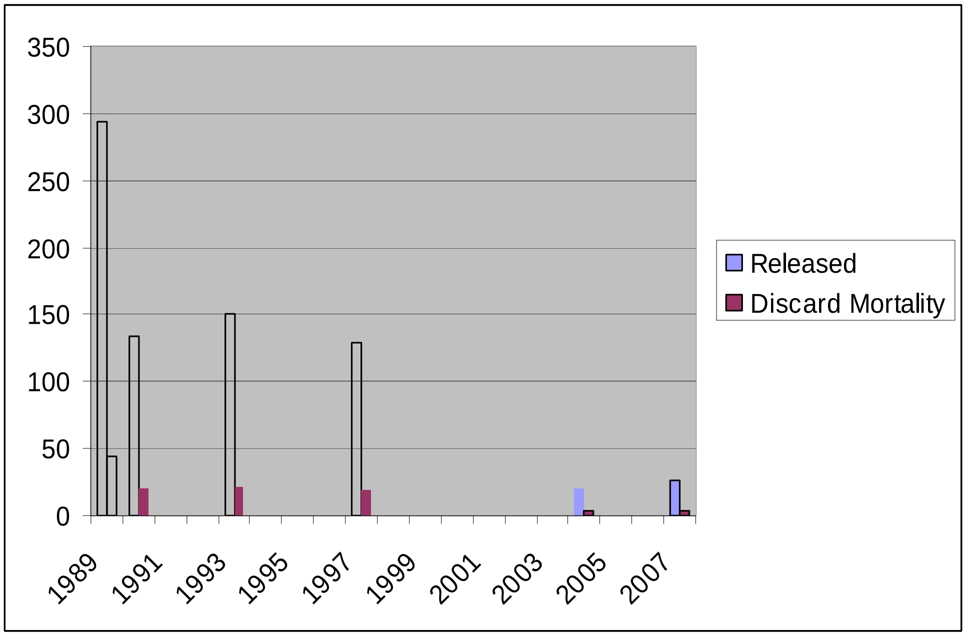
Figure 108 – GOM Haddock Recreational Landings and Live Releases (mt), 1989-2007 in numbers of fish



GOM Winter Flounder

Discards are presented in numbers of fish, and a discard mortality of 15% was assumed for recreational discards. Discard losses peaked in 1982 at 140,000 fish. Discards have since declined to 4,000 fish in 2007. Since 1997, irregular sampling of the recreational fisheries by state fisheries agencies has indicated that the discard is usually of fish below the minimum landing size of 12 inches (30 cm). For 1989-2007, the recreational discard has been assumed to have the same length frequency as the catch in the MDMF survey below the legal size and above an assumed hookable fish size (13 cm).

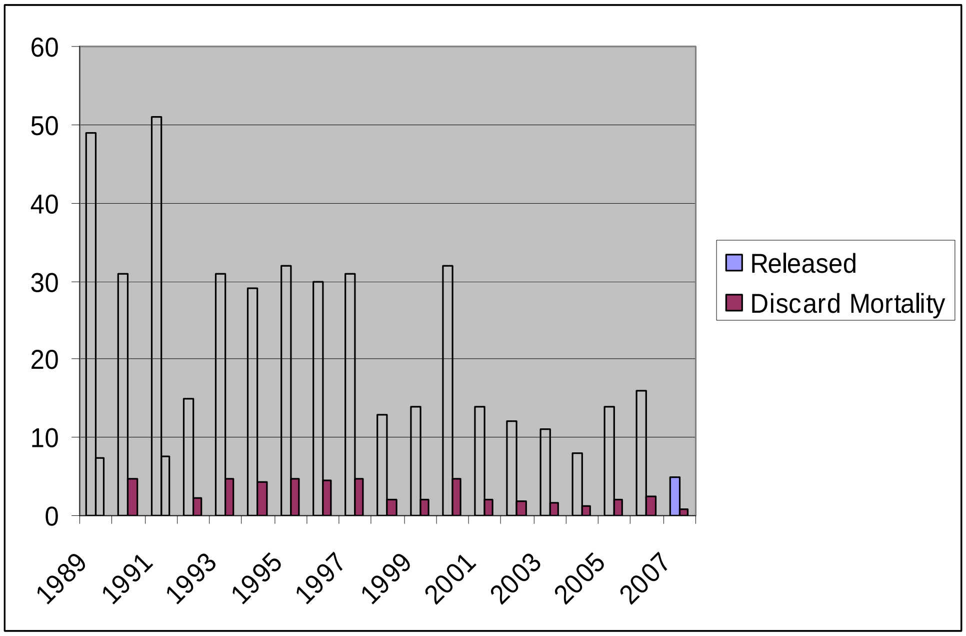
Figure 109 – GOM Winter Flounder Recreational Discards and Recreational Discard Mortality (thousands of fish), 1989-2007



SNEMA Winter Flounder

Discards are presented in numbers of fish. Discards have generally declined throughout the time series and reached a low in 2007 of 11,000 fish. Since 1997, irregular sampling of the recreational fisheries by state fisheries agencies has indicated that the discard is usually of fish below the minimum landing size of 12 inches (30 cm). For 2002-2007, discard length samples from the NYDEC sampling of the recreational party-boat fishery and from the CTDEP Volunteer Angling Survey (VAS) have been used to better characterize the recreational fishery discard. A discard mortality rate of 15% was applied to recreational live discard estimates.

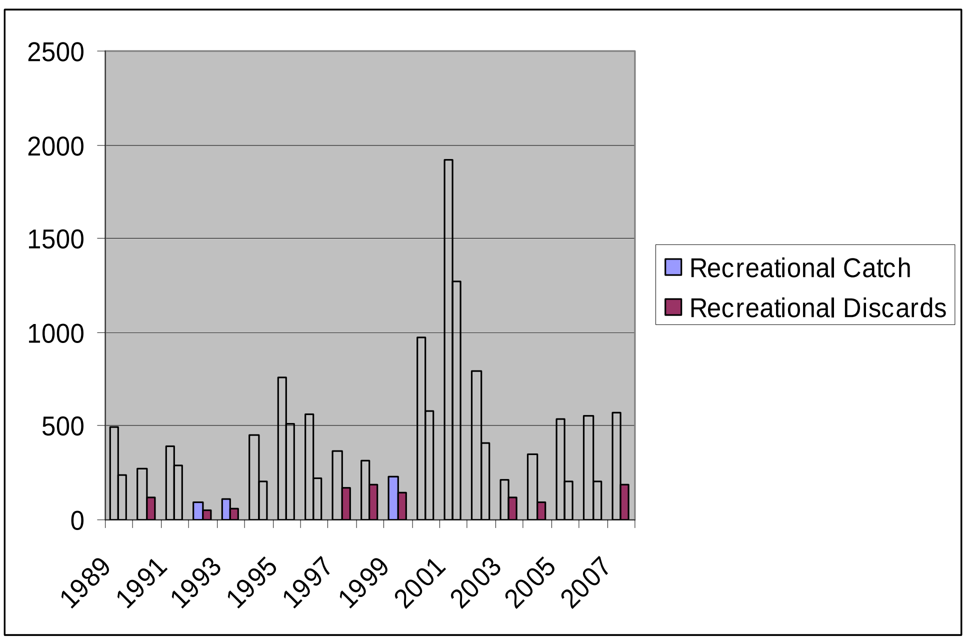
Figure 110 – SNE/MA Winter Flounder Recreational Discards and Recreational Discard Mortality (thousands of fish), 1989-2007



Pollock

Recreational catch and recreational discards of pollock from Statistical Areas 5 and 6 are presented in metric tons. Discards generally comprised roughly half of the total catch, with a high of 1275 mt discarded in 2001 and a low of 47 in 1992.

Figure 111 – Recreational Pollock Catch and Discards (mt), 1989-2007



6.2.8 Communities

6.2.8.1 Overview

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is “a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.” Current guidance on National Standard 8 specifies that communities are place-based: geographic units such as towns and cities that might fit the Census Bureau's definition of a “place.” But actual methodological guidelines are still in the process of refinement and resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. For example, the weigh-out data and the permit files document landing and home ports, but these are not necessarily the same places where people live, where specific styles of and knowledge about fishing are practiced, or where the impacts of management are most strongly felt. It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other communities in the region.

In terms of the keywords “substantially dependent” and “substantially engaged,” some have suggested, for example, that "substantial dependence" be measured in terms similar to the U.S. Department of Agriculture’s criteria for determining whether rural communities are dependent on agriculture or logging. The Economic Research Service of the USDA, for example, classifies counties as farming dependent given a certain percentage of economic activity, in this case labor and proprietor income. Some of the sources of data to consider in making determinations of fishing dependence are thus supplied in current guidance, such as landings information or numbers of participants, and the socio-cultural importance of the fishery. With respect to determining whether a community is "substantially engaged" in the harvesting or processing of a fishery, existing guidance does not provide clear criteria. While the application of a percentage of economic income activity may be an appropriate way to determine "substantial dependence", there may be other valid criteria for determining "substantial dependence." For example, it could be based on some minimum absolute level of activity (such as landings, number of vessels, etc.), or the presence of particular type of infrastructure (auctions, co-ops, state fish piers), or level of fishing activity (revenues, landings in weight, time spent fishing) that indicate a community is "substantially engaged" in fishing. This approach was used in Amendment 13 to identify fishing communities that are "substantially engaged" in fishing.

The Amendment 13 Affected Human Environment and the SIA also discuss ports and groups based on gear or other characteristics in order to meet the requirements of the fishery impact statements to examine the impacts to all the individuals, communities, and other groups that participate in the fishery. However, assessment of the impacts of the measures proposed in this action includes not only those communities that meet the strict interpretation of fishing communities, but also other ports or port groups that will certainly experience impacts from the alternatives beings considered Not all of these port groups necessarily meet the legal definition of a fishing community as promulgated through National Standard 8, which can be considered a subset of the broader ports and groups involved in the groundfish fishery. The Northeast Region has begun to make some headway in collecting the kinds of information and performing the kinds of analyses to support National Standard 8 determinations, most notably the Marine Fisheries

Initiative (MARFIN) project on fishing communities and fishing dependency in New England (Hall-Arber, *et. al* 2001) and an updated port-profiles report for the Mid-Atlantic (McCay and Cieri, 2000). While some of these efforts include discussions of communities at larger levels than a "place," they still usefully provide context and background for understanding the impacts that fishing communities defined by National Standard 8 might experience. However, they do not identify all the fishing dependent communities that may require action under National Standard 8, an exercise that is still in progress.

In Amendment 13, coastal communities throughout the Northeast region were organized into primary and secondary *port groups* based on participation in the groundfish fishery since the 1994 fishing year. The port groups were assembled in such a way that additional information about them can be obtained by cross-referencing information about the sub-regions in the MARFIN Report. The port groups identified in Amendment 13 are essentially subsets of the sub-regions identified in the MARFIN Report. Since social and demographic statistics are often compiled at the county level, the port groups are divided by county or adjacent counties, depending on how the MARFIN sub-regions are structured, so that county-level data may be used to characterize changes in these communities and ports.

The port groups are separated into primary and secondary groups. ***Primary groups*** are those communities that are substantially engaged in the groundfish fishery, as explained above, and which are likely to be the most impacted by groundfish management measures. ***Secondary groups*** are those communities that may not be substantially dependent or engaged in the groundfish fishery, but have demonstrated some participation in the groundfish fishery since the 1994 fishing year (FY94). Because of the size and diversity of the groundfish fishery, it is not practical to examine each secondary port individually, which is why most secondary ports are grouped with others in the same county or in geographically adjacent counties.

To identify primary and secondary port groups, groundfish landings by port were examined for the time period 1994-1999 from the dealer weighout database. Primary port groups represent the most active ports (currently) in the groundfish fishery and were selected based on groundfish landings greater than one million pounds annually since 1994 and/or the presence of significant groundfish infrastructure (auctions and co-ops, for example). In Amendment 13 and in the absence of specific guidance, these ports are considered <u>fishing communities</u> (as defined by the MSFCMA) because they have demonstrated a continued substantial engagement in fishing, here in particular the groundfish fishery. Secondary port groups consist of groups of ports in which some level of groundfish activity has been observed since 1994. This approach provides a way to consider the impacts of management measures on every port in which some amount of groundfish has been landed since 1994, and identifies some as fishing communities (as defined by NS8) based on substantial engagement. Though the analysis does not identify those fishing communities that meet the "substantial dependence" criteria, it is unlikely that the analysis misses any port which may be a fishing community based on the substantial dependence criteria because the impacts of the amendment are considered on nearly every port that has groundfish activity,

It is important to remember that because significant geographical shifts in the distribution of groundfish fishing activity have occurred the characterization of some ports as primary or secondary ports may not reflect their historical participation in and dependence on the groundfish fishery. A good example is Rockland, Maine. Historically, Rockland would have been considered a primary groundfish port, landing large quantities of redfish, flounders, and other groundfish, and serving as an important groundfish processing port, and would have met the test for "substantial engagement." In recent years, however (since the establishment of the Hague Line in 1984 and the decline of groundfish stocks in the early 1990s), fishing activity in Rockland has shifted from groundfish to other species like lobster and herring. This also reflects the apparent concentration of the groundfish fishery around Portland, Maine and the loss of the fishery to many coastal communities in northern Maine. Since FW 42, shifts have continued and groundfish fishing activity has become increasingly concentrated in fewer ports.

The outline below lists the Amendment 13 primary and secondary port groups. Additional information about each of these groups appears in Amendment 13, with a brief discussion repeated following the outline. Primary multispecies ports are considered fishing communities under NS8.

I. DOWNEAST MAINE – WASHINGTON COUNTY

A. Primary Multispecies Port

1. None

B. Secondary Multispecies Ports

1. Downeast Maine: Jonesport, West Jonesport, Beals Island, Milbridge, Machias, Eastport, and Dyers Bay

II. UPPER MID-COAST MAINE – HANCOCK, WALDO, AND KNOX COUNTIES

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Communities

1. Upper Mid-Coast 1: Rockland, Port Clyde, Sprucehead, Owls Head, Friendship, Friendship Harbor, Camden, and Vinalhaven

2. Upper Mid-Coast 2: Stonington and Sunshine/Deer Isle

3. Upper Mid-Coast 3: Winter Harbor, Southwest Harbor, Bar Harbor, Northeast Harbor, and Northwest Harbor

III. LOWER MID-COAST MAINE – LINCOLN, SAGADAHOC, AND CUMBERLAND COUNTIES

A. Primary Multispecies Ports

1. Portland

B. Secondary Multispecies Ports

1. Lower Mid-Coast 1: New Harbor, Bristol, South Bristol, Boothbay Harbor, East Boothbay, Medomak, Southport, and Westport

2. Lower Mid-Coast 2: Cundys Harbor, Orrs Island, Yarmouth, Harpswell, East Harpswell, South Harpswell, Bailey Island, and Cape Elizabeth

3. Lower Mid-Coast 3: Sebasco Estates, Small Point, West Point, Five Islands, and Phippsburg

IV. SOUTHERN MAINE – YORK COUNTY

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Southern Maine: York, York Harbor, Camp Ellis, Kennebunkport, Kittery, Cape Porpoise, Ogunquit, Saco, and Wells

V. OTHER MAINE – all other coastal Ports in Maine

VI. STATE OF NEW HAMPSHIRE – ROCKINGHAM AND STRAFFORD COUNTIES

A. Primary Multispecies Ports

1. Portsmouth

B. Secondary Multispecies Ports

1. NH Seacoast: Rye, Hampton/Seabrook, Hampton, and Seabrook

VII. OTHER NEW HAMPSHIRE – all other coastal Ports in New Hampshire

VIII. GLOUCESTER AND NORTH SHORE – ESSEX COUNTY

A. Primary Multispecies Ports

1. Gloucester

B. Secondary Multispecies Ports

1. The North Shore: Rockport, Newburyport, Beverly/Salem, Beverly, Salem, Marblehead, Manchester, and Swampscott

IX. BOSTON AND SOUTH SHORE – MIDDLESEX, SUFFOLK, NORFOLK, AND PLYMOUTH COUNTIES

A. Primary Multispecies Ports

1. Boston

B. Secondary Multispecies Ports

1. The South Shore: Scituate, Plymouth, and Marshfield (Green Harbor)

X. CAPE AND ISLANDS – BARNSTABLE, DUKES, AND NANTUCKET COUNTIES

A. Primary Multispecies Ports

1. Chatham/Harwichport

B. Secondary Multispecies Ports

1. Provincetown
2. Other Cape Cod: Sandwich, Barnstable, Wellfleet, Woods Hole, Yarmouth, Orleans, and Eastham
3. The Islands: Nantucket, Oak Bluffs, Tisbury, and Edgartown

XI. NEW BEDFORD COAST – BRISTOL COUNTY

A. Primary Multispecies Ports

1. New Bedford/Fairhaven

B. Secondary Multispecies Ports

1. Other Bristol County: Dartmouth, and Westport

XII. OTHER MASSACHUSETTS – all other coastal Ports in Massachusetts

XIII. STATE OF RHODE ISLAND – WASHINGTON AND NEWPORT COUNTIES

A. Primary Multispecies Ports

1. Point Judith

B. Secondary Multispecies Ports

1. Western RI: Charlestown, Westerly, South Kingstown (Wakefield), and North Kingstown (Wickford)
2. Eastern RI: Newport, Tiverton, Portsmouth, Jamestown, Middletown, and Little Compton

XIV. OTHER RHODE ISLAND – all other coastal Ports in Rhode Island

XV. STATE OF CONNECTICUT – NEW LONDON, MIDDLESEX, NEW HAVEN, AND FAIRFIELD COUNTIES

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Coastal CT: Stonington, New London, Noank, Lyme, Old Lyme, East Lyme, Groton, and Waterford

XVI. OTHER CONNECTICUT – all other coastal Ports in Connecticut

XVII. LONG ISLAND, NEW YORK – SUFFOLK, NASSAU, QUEENS, AND KINGS COUNTIES

A. Primary Multispecies Ports

1. Eastern Long Island: Montauk, Hampton Bay, Shinnecock, and Greenport

B. Secondary Multispecies Ports

1. Other Long Island: Mattituck, Islip, Freeport, Brooklyn, Other Nassau County, and Other Suffolk County

XVIII. OTHER NEW YORK – all other coastal Ports in New York

XIX. NORTHERN COASTAL NEW JERSEY – MONMOUTH AND OCEAN COUNTIES

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Northern Coastal NJ: Point Pleasant, Belford, Long Beach/Barnegat Light, Barnegat, Highlands, Belmar, Sea Bright, and Manasquan

XX. SOUTHERN COASTAL NEW JERSEY – ATLANTIC AND CAPE MAY COUNTIES

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Southern Coastal NJ: Cape May, Wildwood, Burleigh, Sea Isle City, Ocean City, Stone Harbor, and Avalon

XXI. OTHER NEW JERSEY – all other coastal Ports in New Jersey

XXII. DELAWARE

XXIII. MARYLAND

XXIV. VIRGINIA

XXV. NORTH CAROLINA

6.2.8.2 Port Group Characterizations

Information in this section is largely based on recent fishing data, "Community Profiles for the Northeast U.S. Fisheries from the Northeast Fisheries Science Center" (available at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/), and Amendment 13 social impact community information meetings. Similar meetings were not convened for this Amendment, but issues identified for the previous Amendment are likely to remain applicable. For additional information and references, refer to the NEFSC document and Amendment 13.

Portland, Maine: According to Census 2000 data, Portland has a population 64,249, which is a 0.2% decrease from the year 1990. In FY07, 75 vessels landed 7,022,856 lbs. of groundfish in Portland, down from 111 vessels that landed 17,127,475 lbs. in FY04. The total value of groundfish caught in FY07 was approximately $6.5 million. Although the numbers have been diminishing, Portland is still an important port of landing for groundfish vessels and a primary port for the multispecies fishery. The community of Portland is also substantially dependent on groundfish for a significant portion of its total fisheries revenues. More than 64% of Portland's total fisheries revenues from federally-permitted vessels came from groundfish in FY07. While these data reflect the community's relative dependence on the groundfish fishery, it is important to remember that at least some of the individual groundfish vessels in Portland are even more than 64% dependent on the multispecies fishery. Vessel-level impacts of the Amendment 16 measures, therefore, will vary.

Media attention has focused on the impacts of Amendment 13 and FW 42 on the fishermen of Portland and surrounding fishing communities. Amendment 13 limited fishermen's Days at Sea throughout the Northeast, but Maine fishermen feel they were put at more of a disadvantage than Southern New England because Maine is farther from George's Bank, which requires fishermen to use more of their allowed Days at Sea for travel rather than fishing. Another issue in newspapers during this same time period is the question of how Portland's land-based fishing industry infrastructure will remain in business if landings become more sporadic. For example, if the Portland Fish Exchange were to go out of business, fishermen would have to travel to other large ports to sell their landings. To avoid this disaster, the federal government implemented a program to keep the Fish Exchange afloat during the current strict groundfish regulations. The main issue of worry for the fishing community in Portland and other towns in Maine is whether the fishing infrastructure can be maintained as Days at Sea and catches are limited. Most recently, there has been concern that herring fishing is threatening groundfish stocks.

At the Amendment 13 social impact informational meeting in Portland, residents of Portland reported having experienced the most significant social impacts from DAS reductions in earlier Amendments. Many of Portland's active groundfish vessels possess Individual DAS permits and had experienced a 50% reduction in their Individual DAS. Moreover, most Individual DAS vessels use the majority of their allocated DAS. The measures proposed in Amendment 16 that are likely to impact this community the most are those that modify or further reduce DAS allocations. However, because Portland is such a large and important groundfish port, and because of its location, it is likely that most measures proposed in Amendment 16 will affect this community.

Portsmouth, New Hampshire: Portsmouth had a population of 20,784 at the time of the 2000 U.S. Census, which was a decrease from 25,925 in the previous 1990 Census. Nineteen vessels landed groundfish in Portsmouth in 2007, down from 41 in 2004. In FY04, Portsmouth had 1,604,137 pounds of groundfish landings and $1,372,199 in groundfish revenues. In FY07, those numbers decreased to 539,957 lbs. and $363,121 in revenues. The community of Portsmouth is dependent on the groundfish fishery for a significant portion of its total fisheries revenues. In FY99 and FY00, Portsmouth's dependence on groundfish for its total fisheries revenues from federally-permitted vessels averaged about 23%, but in previous years the dependence was higher (36% in FY06). While these data reflect the community's relative dependence on the groundfish fishery, it is important to remember that at least some of the individual groundfish vessels in Portsmouth are even more than 23% dependent on the multispecies fishery. Vessel-level impacts of the Amendment 16 measures, therefore, will vary.

Not unlike most fishing communities, Portsmouth fishermen are concerned that their livelihood is dependent on regulations that they believe are overly stringent. In September of 2007, the Portsmouth Co-op closed its doors. According to the President of the New Hampshire Commercial Fishermen's Association, "The current groundfish management regulations of Amendment 13 and more recently Framework 42 overwhelmed its ability to function as it had for over 30 years." Many residents stated their frustration with high property taxes in the town and high real estate prices. Some residents say the town is losing its small town atmosphere and parking has become a big issue in the downtown area. Some residents are also concerned that new buildings and development is engulfing the historic buildings along the main streets in downtown. The city recognizes these issues, and has developed a master plan aimed at revitalizing the city in a comprehensive manner.

At the Amendment 13 social impact informational meeting in Portsmouth, residents of Portsmouth and the NH Seacoast reported that they have experienced the most significant social impacts from the Gulf of Maine inshore area closures and the low Gulf of Maine cod trip limits. The measures proposed in Amendment 16 that are likely to impact this community the most, either positively or negatively, are those that modify inshore Gulf of Maine area closures, the Gulf of Maine cod trip limit, and differential DAS counting in the Gulf of Maine. However, depending on the alternative selected, other measures have the potential to significantly affect this community (for example, large-scale DAS reductions).

Gloucester, Massachusetts: Gloucester had a population of 30,273 according to the U.S. Census 2000, which was an increase of 5.4% from 1990. In FY04, Gloucester saw 13,755,265 pounds of groundfish landings and $14,306,231in groundfish revenues. In 2007, those numbers increased to 18,852,948 pounds and $18,159,498 in revenues. The significant amount of landings and revenues as well as the importance of the Gloucester Seafood Display Auction and other shoreside facilities indicate that Gloucester is an important port of landing for multispecies vessels and a primary port for the multispecies fishery. In FY07, 166 vessels homeported in Gloucester caught groundfish, down from 202 in FY04. Vessel-level impacts of the Amendment 16 measures will vary.

As regulations tighten, fishermen have been concerned that they will go out of business. It is interesting, however, that Gloucester has gained some business from Maine vessels which land here due to tightening restrictions at the statewide level in Maine. Fishermen and environmentalists in the Gloucester area have been heavily opposed to the development of two offshore LNG facilities near Gloucester. The facilities require fishermen to avoid a large area for security reasons, restricting some important fishing grounds and causing vessels to have to steam longer to get around the closed areas. Environmentalists have been concerned about the effect the ship traffic may have on endangered right whales inhabiting the area. In December 2006, $6.3 million was provided to the Gloucester Fishing Community Preservation Fund as part of a $12.6 million mitigation package for the LNG terminal being built off the coastline. These funds will be used to buy fishing permits from local fishermen who wish to leave the industry, and lease the DAS on those permits to others.

At the Amendment 13 social impact informational meeting in Gloucester, residents of Gloucester reported that they have experienced the most significant social impacts from the Gulf of Maine area closures, both year-round and seasonal. Therefore, the measures proposed in Amendment 16 that are likely to impact this community the most, either positively or negatively, are those that modify access to the Gulf of Maine, including differential days at sea counting. However, because Gloucester is such an important groundfish port and because of its location, it is likely that most measures in Amendment 16 will impact this community. Large-scale DAS reductions will undoubtedly have significant impacts on this port.

Boston, Massachusetts: Boston had a population of 589,141 in 2000, which was a 2.6% increase from the 1990 U.S. Census. The number of federally-permitted vessels landing groundfish in Boston is actually increasing slightly, from 24 in FY04 to 30 in FY07. In FY04, Boston experienced 3,846,639 pounds of groundfish landings and $3,947,175 in groundfish revenues. In FY07, these numbers increased to 6,876,819 pounds of landings and $6,363,534 in revenues. These landings as well as the historical importance of Boston as a provider of fishing-related support services for smaller communities indicate that Boston is an important primary community. In FY07, 72% of total revenues from multispecies vessels landing in Boston came from groundfish. While these data reflect the community's relative dependence on the groundfish fishery, it is important to remember that at least some of the individual groundfish vessels in Boston are even more than 72% dependent on the multispecies fishery. Vessel-level impacts of the Amendment 16 measures, therefore, will vary.

The high cost of real estate in Boston means that fishermen and other maritime users of waterfront areas are face displacement issues. Groups such as the Boston Harbor Association are working to prevent this from happening. There are now only two areas for commercial fishermen to tie-up and unload their catch – Boston Fish Pier and the Cardinal Medeiros docks (Medeiros dock is used almost exclusively by lobstermen) – and limited options for containers and bulk cargo handling. Due to redevelopment, much of the working waterfront has been lost to the construction of condos, office buildings, hotels, and other non-marine related businesses. The Conservation Law Foundation (CLF) filed suit against the Massachusetts Port Authority (Massport) in 2004, for failing to maintain the Boston Fish Pier (which they had recently purchased) as a working commercial pier. The Pier is in need of repair and the businesses relying on the pier have not been issued long-term leases. The pier recently underwent a massive construction project, including replacing its barrier walls. Also, the Massachusetts Division of Marine Fisheries (MADMF) proposed in 2004 to shut down a section of Massachusetts Bay extending from Boston north to Marblehead to cod fishing, in order to protect prime spawning ground. This proposal caused much concern for fishermen in the area, already severely limited by restrictions on cod fishing. The MADMF not only proposed the Cod Closure Zone, but it has been enacted each subsequent year to protect spawning cod. The MADMF conducts directed research on these activities and there are indicators that this area may help support the largest remaining aggregation of spawning cod in the Gulf of Maine.

At the Amendment 13 social impact informational meeting in Boston, participants reported that they had experienced the most significant social impacts from the Amendment 5/7 DAS reductions. Many of Boston's active groundfish vessels possess Individual DAS permits and had experienced a 50% reduction in their Individual DAS from those measures. Moreover, most Individual DAS vessels use the majority of their allocated DAS. The measures proposed in Amendment 16 that are likely to impact this community the most are those that modify or reduce DAS allocations and those that change the ways that DAS are counted.

Chatham/Harwichport, Massachusetts: According to Census 2000 data, Chatham had a total population of 1,667, down 12.9% from the reported population of 1,916 in 1990. Harwichport had a 2000 population of 1,809, up 3.8% from a reported population of 1,742 in 1990. In FY07, Chatham and Harwichport had 1,950,982 pounds of groundfish landings and $2,583,334 in groundfish revenues, establishing it as an important port of landing for groundfish vessels and a primary port for the multispecies fishery. Those numbers had decreased from 2,742,502 pounds of groundfish and $3,422,921 in revenues in FY04. Chatham and Harwichport also serve as homeports for a significant number of multispecies vessels. In FY04, 126 multispecies vessels landed groundfish in Chatham/Harwichport, although that number declined to 57 in FY07. Groundfish revenues accounted from 31% of total revenues by multispecies vessels in FY07. It is likely that at least some of the active groundfish vessels in Chatham and Harwichport are even more than 71% dependent on the multispecies fishery.

Information gathered during a visit to the Cape Cod Commercial Hook Fishermen's Association (CCCHFA) in 2004 revealed that the fishing industry in Chatham faces similar challenges to other fishing port communities in the Northeast. With tourism and the increase of gentrification, the fishing industry is threatened by a lack of mooring space and the threat of land-based fishing infrastructure closing down. At the same time many believe that the history of fishing has been a large part of the allure that draws tourists to Chatham, so it could lose its cultural appeal if the fisheries really did fade away. With a group such as the CCCHFA, the fishermen appear to be fighting the challenges of stricter catch regulations and decreased catches by finding alternative ways to keep their fishing industry alive. There are a significant number of people directly involved in small-boat fishing in Harwichport. In addition to the fishermen, the local fleet supports baiters, boatyards, shopkeepers, gear suppliers and repairers, fuel suppliers, fish markets, consumers, marine insurance agents, etc. Restrictions on the local fleet affect all of Harwich, either directly or indirectly. Harwich is an area without many other identifiable industries operating all year. There is little besides tourism and fishing to support the local economy. Unemployment has continued to be a problem during Cape Cod winters, and strict regulations exacerbate this in addition to social distress. Despite an external appearance of wealth, some residents of Harwich experience economic and social suffering due to stringent fishing regulations. The Cape Cod Regional Economic Development Council (CCREDC) has not recognized the importance of commercial fishing on Cape Cod, however; they rely on census data which hides fishermen's incomes in the self employment and agricultural categories. Melissa Weidman of CCCHFA estimated that there are 10,000 fishermen on Cape Cod, while the CCREDC reported only 50 fishermen. One example of an important business to fishing in Chatham is Cape Fish Supply. It is the biggest supplier for the entire Cape. People come here from Provincetown with the next biggest supplier in New Bedford. The CCCHFA recently initiated a project to purchase groundfish permits to preserve community access sot the fishery.

At the Amendment 13 social impact informational meeting in Chatham, a few residents of Chatham and Harwichport submitted comments reporting that they have experienced the most significant social impacts from the May closure on Georges Bank to protect cod. The majority of multispecies vessels from Chatham/Harwichport fish for Georges Bank cod and not Gulf of Maine cod. Some of the measures proposed in Amendment 13 that are likely to impact this community group the most are those that modify or add nearshore area closures on Georges Bank and those that modify the Georges Bank cod trip limit.

New Bedford/Fairhaven, Massachusetts: In 2000, New Bedford had a population of 93,768 (a 6.2% decrease from the population of 99,922 in 1990), and Fairhaven had a population of 16,159 (a 0.2% increase from the population of 16,132 in 1990). In FY04, New Bedford and Fairhaven averaged 31,339,886 pounds of groundfish landings and $25,722,137 in groundfish revenues, establishing it as an important port of landing for groundfish vessels and a primary port for the multispecies fishery. However, in FY07 those numbers decreased to 15,150,104 pounds and $19,828,362 in revenues. New Bedford/Fairhaven is also an important port of landing for scallop vessels, and its dependence on the scallop fishery for revenues reduces its overall dependence on the multispecies fishery, although many individual vessels may be more dependent on groundfish. In FY07, 156 vessels landed groundfish in the port, down from 211 in FY04. Despite these high numbers, New Bedford/Fairhaven's community dependence on groundfish is relatively low compared to other communities of interest, averaging 9% for FY07. It is likely, however, that at least some of the active groundfish vessels in New Bedford and Fairhaven are more than 9% dependent on the multispecies fishery.

The data suggest that from a community-impact perspective, impacts from the measures in Amendment 16 may be less significant in New Bedford/Fairhaven because the community is less dependent on groundfish for its overall fisheries revenues and because some impacted vessels may have the ability to offset losses in groundfish revenues with revenues from other fisheries. In addition, the multispecies vessels in New Bedford/Fairhaven are significantly larger than multispecies vessels in many other communities, so they may be more suited to adapt to some measures (for example, area closures or differential DAS areas) by shifting to different fishing areas or changing their fishing practices. However, because they tend to fish offshore on multi-day trips, they could be more impacted by trip limits and DAS reductions. The vessel level impacts of the Amendment 16 measures will vary. However, the measures that are likely to impact this community the most are those that modify or further reduce DAS allocations and those that change the ways that DAS are counted.

Another issue in New Bedford is in regard to fishing crew members. According to a 2002 newspaper article, fishing vessel owners complain of a shortage of crewmen. They attribute this scarcity to low unemployment rates that have kept laborers from the docks. Many choose to bypass work that government statistics place among the most dangerous jobs in the country. Many crewmembers are either inexperienced or come from foreign countries. Both present safety issues, according to one fisherman, because inexperienced crew get hurt more often and foreign crew have significant language barriers that impede communication. Additionally, the article noted, those willing to work sometimes struggle with alcohol and drug dependency. However, a community member and former fisherman commented that this is not normal procedure; most of the drug problems in the city come from crew members on out-of-town boats. He also noted that with a decrease in days at sea vessels are allowed to fish, crew members have been more steady, most working on more than one vessel owned by a single owner.

Point Judith, Rhode Island: Point Judith is considered a village in the town of Narragansett and does not have any census data as it is not incorporated on its own. It is also not a residential town, and fishermen working out of the port live in surrounding communities and all across Rhode Island. Narragansett had a population of 16,361 in 2000, up 9.2% from a reported population of 14,985 in 1990. In FY07, Point Judith had 1,988,119 pounds of groundfish landings and $2,890,548 in groundfish revenues. This represented about 14% of Point Judith's total revenues from multispecies vessels. Groundfish landings and revenues in this community have increased considerably since the 1994 fishing year, suggesting that Point Judith is becoming a more important port of landing for multispecies vessels. In FY04, the port had 1,685,393 pounds of groundfish landings and $1,425,630 in revenues. In FY07, 75 vessels landed groundfish in Point Judith, which was only a slight decrease from the 81 vessels that landed there in FY04. Similar to New Bedford, the data suggest that from a community-impact perspective, the impacts of the measures in Amendment 16 may be less significant in Point Judith because the community is less dependent on groundfish for its overall fisheries revenues and because impacted vessels may have the ability to offset losses in groundfish revenues with revenues from other fisheries. Many of Point Judith's vessels are actively involved in fisheries in the Mid-Atlantic region (squid, fluke, etc.). However, increasing reliance on groundfish in recent years suggests that vessels may have more difficulty shifting effort as restrictions in these other fisheries increase and opportunities decrease. In addition, on an individual-vessel basis, impacts may be more severe. It is likely that at least some of the active groundfish vessels in Point Judith are more than 14% dependent on the multispecies fishery.

Not unlike many fishing communities in the Northeast, increasingly stringent state and federal fishing regulations could jeopardize the viability of Point Judith as a fishing port, affecting both commercial and recreational fishermen. In addition to affecting the fishermen directly, Point Judith processing companies have difficulty handling drastic variations in landings, commonly due to the lifting or expanding of quotas, as well as sudden changes in what species are landed. It is also important to note that Point Judith fishermen harvest species managed by both the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council, which increases the level of management measures they must follow. Additionally, the boom in tourism at Point Judith has had an adverse effect on the commercial fishing industry. Not only do fishermen battle parking issues but shore front rents for fish processing companies and the cost of dockage and wharfage for vessels have increased.

At the Amendment 13 social impact informational meeting in Point Judith, residents reported that they have experienced the most significant social impacts from gear restrictions and DAS reductions. Gear restrictions were cited compromising the ability to plan a business and ultimately costing everyone affected by the regulation more money. The measures proposed in Amendment 16 that are likely to impact this community the most are gear restrictions and modifications to and/or further reductions in DAS. DAS reductions may affect Point Judith vessels the most by compromising their ability to fish for groundfish as an alternative for other fisheries.

Eastern Long Island, New York: This region is made up of several communities. Among them, in the year 2000 the Township of Southold had a population of 20,599, Hampton Bays had 12,236, Mattituck had a population of 4,198, and Montauk had 3,851. The populations in each area had generally increased since the 1990 Census, including a 55% increase in Hampton Bays. In FY07, Eastern Long Island experienced 456,849 pounds of groundfish landings and $657,784 in groundfish revenues. Groundfish landings and revenues in this community group had increased considerably since the 2004 fishing year (which had 337,261 pounds of groundfish landings and $363,029 in revenue) suggesting that Eastern Long Island communities are becoming more important ports of landing for multispecies vessels. However, the amount of landings and revenues are highly variable each year, so it is difficult to determine an absolute trend. The number of permitted vessels landing groundfish in the area is decreasing, from 87 permits in FY04 to 74 in FY07. Eastern Long Island's dependence on multispecies revenues for its total fisheries revenues from federally-permitted vessels is also variable, with 4.7% in 2007. It is likely that at least some of the active groundfish vessels in Eastern Long Island are more than 4.7% dependent on the multispecies fishery. Similar to New Bedford and Point Judith, however, from a community-impact perspective, impacts from the measures in Amendment 16 may be less significant in Eastern Long Island than in other communities because this area is less dependent on groundfish for its total fisheries revenues and because impacted vessels may have the ability to offset losses in groundfish revenues with revenues from other fisheries. Also, most of the multispecies vessels homeported in Eastern Long Island are not using all of their DAS. However, increasing reliance on groundfish in recent years suggests that vessels in Eastern Long Island may have more difficulty shifting effort as restrictions in other fisheries increase and opportunities decrease.

The population of Eastern Long Island has been growing steadily, and a number of seasonal home owners are choosing to live here year round. This is changing the population structure and dynamics of the region, and is likely to cause house prices to increase in an area where affordability is already a problem. The area around Shinnecock Inlet is one where much growth is expected to occur. As in many other coastal communities with a fishing industry, the soaring costs of waterfront property make it very difficult for fishermen and others in the industry to afford or retain necessary waterfront property for water access. Most of the infrastructure at Shinnecock has disappeared in the last few years; where there were at one time three docks for commercial fishermen to pack out at, now only one remains. Many commercial fishermen from Greenport have gone out of business entirely in recent years, and have difficulty finding decent jobs after they leave, because of a lack of other marketable skills. Few children of fishermen are choosing to pursue this career. The town of Southold has instituted a program to assist its residents with rising housing costs. It is estimated that the Hispanic population in Greenport (and elsewhere on Long Island) is much greater than what census data indicate, due to the likely presence of illegal immigrants. In recent years some vessels have been repossessed, which signifies a great change in a fishery where there was always money to be made at one time. The rest of the fleet is aging badly, but fishermen cannot afford new vessels.

At the A13 social impact informational meeting in Riverhead, residents of Eastern Long Island communities reported that they have experienced the most significant social impacts from increased restrictions in fisheries other than groundfish. DAS were cited as providing flexibility and opportunities for groundfish fishing when quotas for other fisheries closed or became too restrictive. This is apparent in the increased landings for this community group as well as its increased reliance on groundfish for its total fisheries revenues. Therefore, the measures proposed in Amendment 16 that are likely to impact this community group the most are those that modify or further reduce DAS allocations and those that change the ways that DAS are counted. In addition, the alternatives to address capacity have the potential to significantly impact this community group. The impacts of Amendment 16 will be significant to the extent that DAS changes constrain vessels in Eastern Long Island from shifting effort onto groundfish and increasing their DAS usage in response to regulations in other fisheries.

Upper Mid-Coast 1, Maine: This community group includes Rockland, Port Clyde, and surrounding communities. According to Census 2000 data, Rockland City had a total population of 7,609, down 4.6% from the reported population of 7,972 in 1990. Census data is not available for Port Clyde, which is a village in the town of St. George. According to Census 2000 data, St. George had a total population of 2,580, up 1.2% from the reported population of 2,261 in 1990.

Port Clyde is the primary groundfish fishing port of the region. Despite having 120 miles of coastline, access to the waterfront is an ongoing issue throughout the town of St. George. There are only five private and public facilities within the town dedicated to fishing, meaning that the remaining 92% of access points are on private residences. Parking in Port Clyde and Tenants Harbor by waterfront access areas is also very limited. Other fisheries such as herring and lobster have played a larger role in Rockland's economy than groundfish. However, the Rockland Fish Pier provides open, public water access for participants in several fisheries. In 2006, the State of

Maine passed the Working Waterfront Tax Law, to address the problem of working waterfront property being heavily taxed based on its projected market value. The goal of this tax is "to encourage the preservation of working waterfront land and to prevent the conversion of working waterfront land to other uses as the result of economic pressures caused by the assessment of that land for purposes of property taxation." The law requires the tax assessor to value the property based on what it is worth as working waterfront land, rather than what its market value would be if it were sold and converted to residential or other uses. Fishermen in Port Clyde have recently become active in developing a marketing niche and have expressed interest in forming a sector.

During the social impact informational meetings, some comments were received from Upper Mid-Coast 1 community residents suggesting that DAS reductions since Amendment 5 have had the most significant social impacts on them and their communities. It is difficult to predict which Amendment 16 measures will most significantly impact this community group. Because of its location and multispecies activity, it is likely to experience impacts from most of the Amendment 16 measures that address Gulf of Maine cod, including gear restrictions, modifications to area closures, and particularly differential DAS counting in the Gulf of Maine. The alternatives to address capacity are also likely to significantly impact this community group.

Lower Mid-Coast 1, Maine: This community group includes Bristol, Boothbay, and surrounding communities. According to Census 2000 data, Boothbay Harbor had a total population of 2,334, down 0.5% from the reported population of 2,365 in 1990. South Bristol had a total year 2000 population of 897, up 8.7% from the reported population of 825 in 1990.

This region faces similar issues to the Upper Mid-Coast Maine area: namely, the rising cost of real estate and lack of access to coastal property. According to the Island Institute, out of over 5,000 miles of coastline in the state, only 20 miles are open to commercial fishermen. Also, most of the access areas fishermen use are privately owned, meaning at any time those properties can be sold and access denied to fishermen. While fishing in Maine brings over $700 million in revenues, the competition from second home buyers and retired New Englanders may squeeze out the state's fishing culture and identity. The Working Waterfront Access Pilot Program and Working Waterfront Tax Law established by Maine voters are implementing initiatives to combat these problems. The unbalanced age structure in Boothbay Harbor is another concern. Gentrification has resulted in higher priced houses, increased taxes, and fewer opportunities for young people to make a living in the town. In 2005, the Boothbay Region Land Trust acquired a 1.9 acre parcel on Barters Island used by fishermen and lobstermen to store their gear. The dock and pier located here need to be rebuilt, but this purchase assures waterfront access to the town's lobstermen and to other residents in the future. The Boothbay Region Land Trust also has purchased Damariscove Island which it maintains for both the public and commercial fishing access.

It is difficult to predict which Amendment 13 measures will substantially impact this community group. Because of its location and multispecies activity, it is likely to experience impacts from most of the Amendment 16 measures that address Gulf of Maine cod, including gear restrictions, modifications to area closures, and particularly differential DAS counting in the Gulf of Maine. The alternatives to address capacity are also likely to significantly impact this community group.

NH Seacoast: This community group includes Hampton, Rye, and Seabrook NH. According to the Census 2000 data, Hampton had a population of 14,937, down 21.7% from the reported population of 12,278 in 1990. Seabrook had a population of 7,934, up 22.0% from the reported population of 6,503 in 1990. Rye had a total population of 5,182, down 0.1% from the reported population of 5,188 in 1990.

With the ever increasing need for Hampton to accommodate its growing tourism, the city has proposed a new master plan that will change zoning. Currently, the commercial fishing industry is in direct competition for waterfront access with residential and tourist uses. This has put a significant restraint on commercial fishing operations from basic waterfront access needs to parking and congestion. One current problem with regards to use by the commercial fishing industry is increased crowding in the harbor with recreational vessels and jet skis, resulting in conflicts and turning this into a safety issue.

At the Amendment 13 social impact informational meeting in Portsmouth, residents of Portsmouth and the NH Seacoast reported that they have experienced the most significant social impacts from the Gulf of Maine inshore area closures and the low Gulf of Maine cod trip limits. The measures proposed in Amendment 16 that are likely to impact this community the most, either positively or negatively, are those that modify inshore Gulf of Maine area closures, the Gulf of Maine cod trip limit, and differential DAS counting in the Gulf of Maine. However, depending on the alternative selected, other measures will significantly affect this community group (for example, large-scale DAS reductions). Also, the Amendment 13 cod restrictions pushed struggling fishermen to go after other species, like tuna, scallops or lobster. Fishermen wondered if those species would be the next to be restricted. In addition, there was concern that these restrictions may permanently destroy small local operations like the Yankee Fisherman's Cooperative.

South Shore, Massachusetts: This community group includes Scituate, Plymouth, and Marshfield, Massachusetts. According to Census 2000 data, Plymouth had a total population of 51,701, up 13.4% from the reported population of 45,608 in 1990. Marshfield had a total population of 24,324, up 12.5% from the reported population of 21,621 in 1990. Scituate had a total population of 17,863, up 6.4% from the reported population of 16,786 in 1990.

As noted above, the population of the town of Plymouth has grown by 145% over the last two decades, encouraged by its proximity to Boston. This puts numerous demands on the municipality to meet this growth with schools and other infrastructure. Plymouth’s Town Wharf, where the commercial fishing fleet is stationed, was described in 2002 as in very poor condition and badly in need of repair. It was temporarily closed in the winter of 2004, after having been found to be structurally unsound; plans for a new wharf were being developed. The new plans involved implementing a user fee for commercial fishermen and anyone else using the wharf to pay for the proposed improvements; currently fishermen tying up to the dock to unload or get fuel and ice pay no fee. Fishermen argue that the proposed fee structure could drive some of them out of business. As of 2007, the pier has been repaired and has reopened. A 2004 report noted that the Town Pier in Scituate, which is the only deep-water facility in town, was also run-down, and the groundfish fishing fleet and lobstermen were competing for the same limited space. In 2005 some immediate improvements were made to the pier to improve the working conditions, but it is still aging. Discussions on closing all or part of the Stellwagen Bank National Marine Sanctuary off the coast of Scituate to fishing also have many fishermen worried. Also, Cape Cod Bay, where many South Shore fishermen work, is critical North Atlantic right whale habitat, and parts of the bay are frequently closed to fixed fishing gear or require gear modifications at times when the whale are present, which impacts fishermen from the region.

At the Amendment 13 social impact informational meeting in Scituate, residents of South Shore communities reported that they had experienced the most significant social impacts from the Gulf of Maine inshore rolling closures. The closures significantly precluded fishing opportunities and reduced flexibility for the relatively small-sized multispecies vessels in this area. The measures proposed in Amendment 16 that are likely to impact this community group the most, either positively or negatively, are those that modify inshore Gulf of Maine area closures, the Gulf of Maine cod trip limit, and differential DAS counting. However, depending on the alternative selected, other measures will significantly affect this community group (for example, large-scale DAS reductions).

Provincetown, Massachusetts: According to the year 2000 U.S. Census, Provincetown CDP had a total population of 3,192, down 5.4% from the reported population of 3,374 in 1990.

One of the biggest controversies in Provincetown in the past few years has been the reconstruction of the MacMillan Wharf. The community disagreed on the plans in 2000, but the construction began in 2001. Floating docks added to the wharf were damaged in the first Nor'easter after installation due to design flaws and have since been replaced with a better design. After the wharf was reconstructed, the town created the Provincetown Public Pier Corporation (PPPC). The first several years after the Town seated the PPPC Directors were contentious. The PPPC increased dock rates; excursion businesses sued PPPC over rate increases and lost in court. The fishers did not trust the PPPC to protect their interests and used the political climate to try to dissolve the corporation. The outcome of three-way negotiations between the fishers' organization ProFish, PPPC and the Board of Selectmen resulted in a reduced or protected rate for the fishers of about half ($2000 per average boat in 2005) the market rate with an annual consumer price index modifier. PPPC also completed a long stalled ice plant and delivery system for the fishing fleet undercutting New Bedford delivered ice prices.

Although no social impact informational meeting was held in Provincetown for Amendment 13, it can be assumed that impacts in Provincetown have been somewhat similar to those experienced by residents of South Shore communities. The measures proposed in Amendment 13 that are likely to impact this community the most, either positively or negatively, are those that modify inshore Gulf of Maine area closures, the Gulf of Maine cod trip limit, and differential DAS counting. However, depending on the alternative selected, other measures will significantly affect this community (for example, large-scale DAS reductions).

Eastern Rhode Island: This community group includes Newport, Tiverton, Portsmouth, and surrounding communities. According to Census 2000 data, Newport had a total population of 26,475, down 6.2% from the reported population of 28,227 in 1990. Portsmouth had a total population of 17,149, up 2.0% from the reported population of 16,817 in 1990. Tiverton had a total population of 15,260, up 110.2% from the reported population of 7,259 in 1990

Like many coastal communities in the area, Eastern Rhode Island towns have a problem with loss of waterfront access. In Tiverton, a property known as Manchester's, which has been in the past leased to fishing companies for use as a wholesale and retail market, and where a number of fishing vessels were docked, was sold in 2005 to a couple who intend to develop this area for retail and tourism. In Newport, an increase in tourism, increasing property values, and competition with recreational vessel for limited wharf space restrict fishing industry infrastructure and are contributing to the decline of Newport's fleet. Portsmouth's waterfront is underutilized, and there are a number of future development plans for it, including a large marina and luxury condominiums. An additional highly controversial proposal in this area is one to bring liquid natural gas (LNG) tankers into Fall River, which borders Tiverton. These tankers would have to pass close to a segment of Tiverton's shore. In addition to the safety concerns over having LNG tankers in the area, this would possibly present an access problem for fishermen in Narragansett Bay, as security regulations surrounding the tanker would restrict the use of part of the bay as the tankers are passing through. This would also require dredging parts of the bay to allow the tanker to pass through, a plan that Save the Bay, an organization dedicated to the protection of Narragansett Bay, claims would hurt the area's already sensitive fisheries.

It is difficult to predict which Amendment 16 measures will most significantly impact this community group. Because of its location and multispecies activity, it is likely to experience impacts from most of the Amendment 13 measures that address Southern New England stocks, including gear restrictions, trip limits, and further DAS reductions. The alternatives to address capacity are also likely to significantly impact this community group.

Northern Coastal New Jersey: This community group includes Point Pleasant, Belford, Barnegat Light, and surrounding communities. According to Census 2000 data, Point Pleasant had a total population of 19,306, up 6.2% from the reported population of 18,177 in 1990. Belford had a total population of 13,404 in 2000; 1990 population data was unavailable for Belford for comparison. Long Beach township (which encompasses all of Long Beach Island with the exception of the five independent boroughs) had a total population of 3,329 in 2000, down 3.6% from 3,452 in 1990.

One emerging trend (as of 2006) on Long Beach Island and in other similar summer resort areas is that as real estate prices soar, many year-round residents are selling their homes for bigger homes on the mainland, tempted by the large price they can get. These homes are bought up by those using them as summer homes. The results are dwindling year-round populations on places like Long Beach Island, and a resulting loss in year-round businesses and students in local schools. Like many other coastal communities, Barnegat Light must deal with the forces of rapidly increasing home prices and the resulting gentrification. Because the community is physically so small, there is very little land area for development, and the development of condominiums or other properties generally involves land in existing use. The high housing costs are encouraging many families to move to the mainland, and many of those employed in the commercial fishing industry now do not reside in Barnegat Light. As Belford becomes more accessible to commuters to New York City and elsewhere, and as housing is increasingly scarce around the city, many people are moving to Belford and forcing up the price of homes. The resulting increase in property taxes may force some residents who have lived in Belford their entire lives to relocate. Belford represents some of the last untouched waterfront real estate in New Jersey within commuting distance to New Jersey, and development pressures here are increasing. The promised clam depuration plant and renovation of the cooperative and other fishing infrastructure in Belford, which may be of great benefit to the fishing community here, have been continuously postponed, and fishermen are concerned that condominiums will be built on the property instead. The project was being headed by the Bayshore Economic Development Corporation, which later became surrounded with controversy and had some of its state funding cut off.

It is difficult to predict which Amendment 16 measures will most significantly impact this community group. Because of its location and multispecies activity, it is likely to experience impacts from most of the Amendment 16 measures that address Southern New England stocks, including gear restrictions, trip limits, and further DAS reductions. Its low dependence on groundfish suggests that there is a substantial amount of latent effort in the area, so the alternatives to address capacity are likely to significantly impact this community group. There is also a great deal of recreational fishing in the region, so recreational fishery users will also be affected by measures that address capacity, the method of ACL allocation to that fishery, and gear and area restrictions.

7.0 Environmental Impacts of the Management Alternatives

The impacts of the proposed management alternatives are described in this section. Expected impacts are considered in four broad categories:

Biological impacts: the effect on fishing mortality, bycatch and bycatch mortality

Protected and threatened species

Economic impacts: the effects of the proposed measures on revenues and costs in the fishery, and the impacts of those changes on other entities in coastal communities

Social impacts: the effects of the proposed measures on fishing communities and participants in the fisheries affected by the FMP

Habitat impacts: the effects of the proposed measures and the extent to which they will minimize the adverse effects of fishing on essential fish habitat

7.1 Analytic Approach and Limitations

The Council is proposing changes to address several broad issues: rebuilding overfished stocks, ending overfishing, modifications to existing sector policies, addressing requirements to minimize bycatch and/or bycatch mortality, and numerous administrative measures. Analyses are grouped in the same manner, but the emphasis is on analysis of the measures designed to control fishing mortality. In the case of measures designed to control fishing mortality, the impacts of measures are analyzed by combining the measures as much as possible. This is because many of the proposed measures interact with each other and analyzing the measures individually does not capture the true impact of adopting a suite of measures. Where possible, quantitative impacts are estimated, but the Council has limited ability to quantify the impacts of some of the indirect management measures proposed in this framework. As a result, most alternatives are a combination of quantitative and qualitative analysis. Some management measures are included in several alternatives. Where this occurs, the detailed analysis is only described the first time the measure appears in an alternative. In later alternatives, the measure is referenced and its effects summarized.

7.1.1 Uncertainty About Sector Participation

The major cause of uncertainty in analyzing the biological, economic, and social impacts of the proposed management measures is the uncertainty over the number of vessels that will choose to participate in groundfish sectors.

In many respects, this management action will adopt two management systems at the same time: an effort control system that has been used to manage the fishery since FY 1994, and an output control system that is the underlying basis for self-selecting, voluntary sectors. While self-selecting sectors were first adopted in FY 2004 through Amendment 13, it is possible that with the adoption of Amendment 16 the scale of participation will increase nearly ten-fold. Indeed, if preliminary estimates of the number of sector participants proves correct, nearly two-thirds of the fishery may choose to join sectors and be subject to hard TACs. Even so, a substantial portion of the fishery will remain subject to effort controls, either by choice or because they are unable to join a voluntary sector.

As the measures are being developed, the Council is not certain which vessels will choose to join sectors and which vessels will remain subject to effort controls. The effectiveness of effort controls could be compromised if they are designed for one group of vessels and a very different set of vessels are subject to their application. In a simplistic example, if effort controls are designed assuming that a variety if vessels will fish in different management areas for a variety if stocks, and instead a small group of similar vessels fishes on only a few stocks, the measures may not be effective: they could be too stringent or not stringent enough, they may sacrifice yield unnecessarily or may allow excessive harvests on a few stocks.

Similarly, it is difficult to anticipate the impacts of sectors without definitive information on which vessels will participate. Sectors will be subject to stringent monitoring requirements and the attendant costs. If there are a large number of participants, economies of scale may be realized that reduce the cost for individual vessels, whereas a small number of participants may have difficulty absorbing these costs.

While it would facilitate the design of effort controls and analysis of sector impacts if definitive information was available on sector participation prior to developing the management program, there are good reasons why this information is not available. As long as sector participation is voluntary, fishing vessel owners need to be provided sufficient information to make an informed business decision prior to committing to a sector. This decision cannot be made without knowing what the alternative to sectors will be, as well as what the requirements will be for sectors (with respect to monitoring, reporting, costs, etc.). To require fishermen to commit to either sectors or the effort control system without this information in hand is unreasonable. Under the current timeline, at least vessel owners will know what choices the Council makes on these issues before they are required to commit to a sector in fall 2009. While they will not know if the Council's recommendations will be approved by NMFS, at least some information on selected alternatives will be available.

As a result of this uncertainty over sector participation, there is more uncertainty over the impacts of the proposed measures than in the previous actions. Effort control measures were designed and evaluated under the assumption that none of the vessels join sectors. Sector measures are evaluated under the assumption that participation is similar to that indicated by sector rosters developed in early CY 2008. These two assumptions are not consistent with each other. An analytic approach was considered that would have used the preliminary sector participation estimates to design effort controls. This was rejected on the basis that these early estimates were based on non-binding expressions of interest and there was concern that this would under-estimate the number of vessels that would remain subject to effort controls.

7.1.2 Closed Area/Effort Control Analysis

One of the primary analytic tools used to analyze both the biological and economic impacts of the effort control alternatives (section 5.3.2) is the closed area model. Changes in mortality brought about by area closures and revised trip limits were projected through a non-linear programming model using the General Algebraic Modeling System (GAMS). The model has been previously described in Amendment 13 (NEFMC 2003) and FW 42 (NEFMC 2006). This model attempts to estimate fishery responses to management measures based on economic factors. The results an also be used to estimate changes in exploitation, which can be converted to changes in fishing mortality. Over time, the model has been modified in response to suggests from reviewers. The current formulation of the model used for these analyses incorporates non-groundfish species into the model, attempts to account for exchanges of DAS through leasing activity, and allows vessels the potential to fish in more areas and time periods. More information on the current model structure can be found in Appendix II.

To use the model, an initial model run was made based on the no action management regime. Additional model runs are then made based on proposed changes in seasonal and year round area closures, changes in trip limits, and changes in days at sea under each management option. The estimated catch stream from each option is then compared to the no action catch stream, and the percentage change in landings is calculated. These numbers should be interpreted as the percent change in exploitation brought about by the proposed management action using the conditions which existed during the 1998-2001 time period. Changes in the exploitation rate can then be interpreted as equivalent changes in mortality. However, results should be interpreted cautiously because some conditions may have changed which are not reflected in the base year data.

Additionally, there is variability around the estimates which is not fully captured by the model. One weakness of the model is the uncertainty about catch rates that result from opening areas that have been closed for a lengthy period of time. This is most problematic when changing the boundaries of year round closed areas. Because there is limited trip information in the closed area, the closed area model may under-estimate the catch rates that will result when an area closed to year round fishing is re-opened. This is less of a problem for seasonal closures, since the model incorporates recent trip information that reflects the catch rates that result immediately after opening an area. An advantage of the model is that unlike the "no displacement" analysis of closed areas (that is, assuming that effort in a newly closed area does not fish in another location), it assumes fishing effort moves out of a closed area into an open area based on rational decisions to maximize revenue. A second advantage is that the model output can include predicted impacts on revenues, and this can be broken down by gear sector and tonnage class of vessel. *The model is a simulation of behavioral responses to changes in fishery regulations. It should not be interpreted as a precise calculation of future fishing mortality. While the model output results in apparently precise numerical estimates, it is better to interpret these as broad indicators of relative changes, rather than as precise predictions of mortality impacts. Small percentage changes, for example, should be viewed as less likely relative outcomes than large percentage changes. For stocks where the Council is implementing measures to make large reductions in fishing mortality, it should be clear that the results of the measures will have to be carefully monitored to make sure the objectives are achieved. The model may not capture the exact response of fishermen to the regulations and as a result may over or under estimate the realized impacts.*

As noted earlier, the percentage results should be interpreted as indicators of the relative change in exploitation between options, and not as precise predictions of the result. Changes in exploitation must be converted to a change in fishing mortality in order to determine if mortality objectives are being met. When large reductions in mortality are needed, the PDT uses the criteria that if the estimated reduction is within ten percent of the needed reduction, the proposed measures are successful. The closed area output includes information on the revenues of individual vessels, and this is used in the analysis of economic impacts of the alternatives (section 7.5).

The use of this model to evaluate effort controls for previous management actions has been challenged. Most recently, a lawsuit was filed in 2007 challenging the model's use to develop FW

42 management measures. On January 26, 2009 the court rejected the complaint that use of the CAM did not constitute the best available science. As noted earlier, changes have been made to the model since its use in FW 42. As management measures become increasingly complex, it becomes more difficult to adapt the model to capture the interactions between measures and the model results become more uncertain. The PDT explored the development of different models for this action, but there was not sufficient time or resources to develop and vet an alternative prior to submitting this document.

7.1.3 Combination of Quantitative Results

While the closed area model is the primary analytic tool used to estimate impacts of management measures, other models are used as well. The closed area model results show changes in exploitation, while the model used for estimating the impacts of mesh change shows reduction in fishing mortality. Prior to combining the results from these two models, the changes in exploitation are converted to percentage reductions in fishing mortality.

When quantitative impacts are calculated for more than one measure, they are not additive because the measures interact with each other. They are combined by first calculating a multiplier value for each, then by multiplying those values together. The multiplier is determined from the following formula:

$$\text{Multiplier} = 1 - (\text{Estimated F reduction})$$

Both of these issues are considered in the summary of biological impacts at the end of each alternative. The summary tables show impacts on fishing mortality for GOM cod and GB cod.

7.1.4 Definition of the No Action Alternative

NEPA requires that the No Action alternative be defined and the impacts of the action should be compared to this alternative. The M-S Act requires that management measures be based on the best available science. These two requirements create a subtle conflict that complicates definition of the No Action alternative.

The management plan defines mortality targets based on current assessments of stock status. These new mortality targets determine the strategy that specific measures are designed to achieve. Until these new targets are adopted they are not in effect. Thus it could be argued that the No Action alternative should be based on existing mortality targets, and new measures should be based on new mortality targets. If this is done, comparisons between the impacts of the No Action alternative and the proposed measures become meaningless as the two are not attempting to achieve the same goals. It makes little sense to evaluate that one or the other provides greater economic returns if they do not accomplish the same biological objectives.

An additional nuance is that in many cases the current understanding of stock status does not support the earlier mortality objectives. In these instances, using the old mortality targets as the basis for analyses means that they would be based on faulty scientific information. This could lead to misinterpretation of the impact analyses.

As a result, a two-step approach is taken in the impacts analyses. First, with respect to mortality targets, the No Action alternative is based on the mortality targets and biological reference points adopted by Amendment 13. It is compared to the revised mortality targets and status determination criteria – our new understanding of the best available science. This demonstrates whether the No Action alternative for mortality targets would meet rebuilding goals. All other measures are then evaluated against the revised mortality targets and status determination criteria.

7.1.5 Limitations

Analysis of the impacts of the proposed management alternatives is complicated by the following factors.

- The range of proposals and the interaction between management measures precludes analysis of the components on both large and small scales.
- Many of the management measures interact with each other. Whenever possible, the impacts of each alternative are analyzed as a combination of measures, usually by using the closed area model. When estimates of fishing mortality reductions are obtained from different analytic techniques, they cannot be summed to obtain an estimate of the overall impacts. This is partly because the measures interact with each other, even if analyzed separately.
- The impacts of some measures in the alternatives cannot be quantified. When possible, impacts are expressed in a combination of quantitative and qualitative terms.
- There is limited ability to model long-range economic impacts. Any attempt to model economic impacts into the future assumes no changes in the structure of the economy in the interim. This is an unrealistic assumption over the time periods associated with the rebuilding plans.
- There is limited ability to estimate the economic impacts of changes to the recreational fishing measures. There is both a lack of available data and lack of an ability to predict how recreational fishermen will react to changes. The motivations for recreational fishing are many and varied, and predicting changes in recreational fishermen's behavior is nothing more than guesswork.

7.2 Biological Impacts of the Alternatives

7.2.1 Biological Impacts of the Proposed Action

7.2.1.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

7.2.1.1.1 Revised Status Determination Criteria

The specification of status determination criteria (SDC) is required by the guidelines for interpretation of the National Standards (NSGs). The SDC are the biological underpinnings of the management program. Comparison of current stock status (fishing mortality and stock biomass, or proxies for those values) to the SDC determines whether the management plan is meeting biological objectives and complies with legal requirements.

Under the Proposed Action, the SDCs are revised to adopt the best available science as determined through GARM III and the DPWG. The differences between the proposed action and the No Action alternative are highlighted in Table 174.

In addition to differences in values, in some instances the No Action/Amendment 13 SDCs are a different parameter than what is proposed. Continuing to use a parameter that is not consistent with the currently used assessment model would make it difficult to accurately determine stock status. Selecting the No Action alternative is also not consistent with using the best available science for management actions.

Table 174 – Comparison of No Action and Proposed Status Determination Criteria

Species	Stock	Bmsy or proxy (mt)		Fmsy or proxy	
		No Action	Proposed	No Action	Proposed
Cod	GB	216,800	148,084	0.18	0.25
Cod	GOM	82,800	58,248	0.23	0.24
Haddock (1)	GB	250,300	153,329	0.26	0.35
Haddock	GOM	22.17 kg/tow	5,900	0.23 C/I	0.43
Yellowtail Flounder	GB	58,800	43,200	0.25	0.25
Yellowtail Flounder	SNE/MA	69,500	27,400	0.26	0.25
Yellowtail Flounder	CC/GOM	12,600	7,790	0.17	0.24
American Plaice	GB/GOM	28,600	21,940	0.17	0.19
Witch Flounder		25,240	11,447	0.23	0.20
Winter Flounder	GB	9,400	16,000	0.32	0.26
Winter Flounder	GOM	4,100	3,792	0.43	0.28
Winter Flounder	SNE/MA	30,100	38,761	0.32	0.25
Redfish		236,700	271,000	0.04	0.04
White Hake	GB/GOM	14,700	56,254	0.29	0.13
Pollock	GB/GOM	3.0 kg/tow	2.00 kg/tow	5.88 C/I	5.66 c/i
Windowpane Flounder	GOM/GB	0.94 kg/tow	1.40 kg/tow	1.11 C/I	0.50 c/i
Windowpane Flounder	SNE/MA	0.92 kg/tow	0.34 kg/tow	0.98 C/I	1.47 c/i
Ocean Pout		4.9 kg/tow	4.94 kg/tow	0.31 C/I	0.76 c/i
Atlantic Halibut		5,400	49,000	0.31 C/I	0.07
Atlantic Wolffish		NA	,1847 – 2,202 mt	NA	< 0.35

7.2.1.1.2 ABC Control Rules

The Proposed Action replaces the MSY control rules adopted by Amendment 9 and modified in Amendment 13 with ABC control rules recommended by the SSC. These control rules are intended to guide the SSC when setting ABCs. They were recommended because of the difficulty in quantifying scientific uncertainty for groundfish stocks.

The fundamental idea of the Proposed Action is that fishing mortality should not exceed 75 percent of F_{MSY}, or $75F_{MSY}$, at any time, regardless of stock size. This creates a consistent difference between the overfishing level (fishing at F_{MSY}) and the ABC. This fishing mortality rate is not adjusted for stock size. As a result, it differs from the MSY control rules adopted in Amendment 9 and Amendment 13, which reduced the limit fishing mortality rate as stock size declined below SSB_{MSY} and called for the target fishing mortality to be set at 75 percent of this limit. As a result, the proposed ABC control rule, in most cases, produces a fishing mortality rate that is less than that based on the earlier MSY control rule, but is higher than the target fishing mortality called for by earlier amendments.

In the case of stocks in rebuilding plans, the proposed control rule calls for using an Frebuild if $75F_{MSY}$ will not rebuild in the time period chosen. For some stocks, this can create an unusual situation. For stocks in poor condition - such as GB cod – Frebuild is needed and the ABC is set at the median catch associated with Frebuild. There are other stocks, such as GOM cod, where Frebuild is actually higher than $75F_{MSY}$, so the default control rule applies and the lower fishing mortality is used (in the absence of additional information about uncertainty). This creates a paradox: in the case of GOM cod, the ABC control rule produces an ABC that is lower than that needed for rebuilding, but in the case of GB cod – a stock in worse condition – the ABC that results is the median catch associated with the rebuilding mortality. In essence, a more conservative ABC is set for a stock in better condition. The SSC's rationale is that the proposed approach places more emphasis on avoiding overfishing than on the rebuilding mortality rates. By using $75F_{MSY}$ for GOM cod, and Frebuild for GB cod, the ABC is set using a fishing mortality that is more likely to avoid overfishing in each instance when additional information is not available to estimate uncertainty more accurately.

Setting aside the issue of the ABC calculated for stocks with an Frebuild, in the long-term the proposed ABC control rule approach should lead to stock sizes larger than SSB_{MSY}. Restrepo et al (1998) conducted simulations of this approach that indicated stock sizes on the order of 130 percent of SSB_{MSY} would result. When compared to the No Action alternative, these results are similar to what could be expected if the target fishing mortality was maintained.

7.2.1.1.3 Revised Mortality Targets for Formal Rebuilding Programs

7.2.1.1.3.1 Revised Rebuilding Mortality Targets

This proposal modifies fishing mortality rates for rebuilding programs and adopts rebuilding programs for stocks that have been recently determined to be overfished. Projections were used to predict the fishing mortality rates necessary for these rebuilding programs. The projection output includes estimates of future stock size. If the assumptions used in the projections are correct, and fishing mortality targets are achieved, stocks are expected to rebuild as shown in

Table 175. The following figures illustrate predicted stock growth given the fishing mortality rates are achieved for all stocks with reliable projections, and projection assumptions are observed. The charts include recent stock size for comparison to future predictions, as well as the proposed SSB_{MSY} level. In each chart the solid SSB line reflects the rebuilding strategy.

For GB yellowtail flounder, the GARM III assessment results were used to develop the management measures and projections from that assessment are shown in Figure 116. Subsequent to approval of the amendment by the Council, the stock was assessed by the Transboundary Resource Assessment Committee (June, 2009). The results of that assessment will be used to set ABCs and ACLs for FY 2010 – FY 2012 in a subsequent management action and the projected SSB changes will be updated at that time.

Two charts are shown for SNE/MA winter flounder. The first chart (Figure 122) reflects rebuilding in the absence of any fishing mortality. The next two charts reflect rebuilding under two different interpretations of a fishing mortality "as close to 0 as possible." The second chart (Figure 123) reflects rebuilding if fishing mortality is reduced to F=0.09. This is slightly higher than the mortality expected to result from the revised effort controls (F=0.08) but is used for the projection to account for some level of discards in other fisheries. This chart reflects an increase in discards as a result of management measures since possession is prohibited. As can be seen, there is little difference in when the rebuilding target is achieved. The first chart shows rebuilding achieved by spawning season in 2015, the second chart also shows rebuilding achieved some time in 2015, and the third chart shows rebuilding achieved in 2016.

Charts are not shown for GOM winter flounder, Northern and Southern windowpane flounder, ocean pout, or Atlantic wolffish. The GARM III review panel and Northern Demersal Working Group advised against using the assessment results to calculate projections for those stocks. It would not be consistent with the best scientific information available to present those projection results. This makes it difficult to directly compare this option to the No Action option.

Selecting this option will not have direct impacts on non-groundfish stocks.

Table 175 – Expected dates for achieving rebuilding targets should mortality targets be achieved
1. There are two assessment runs for GB yellowtail flounder that give different results.
2. Projections are unreliable.

Species	Stock	Expected Rebuilding Date (Probability)
Cod	GB	2026/50%
Cod	GOM	2010
Haddock	GB	NA (rebuilt)
Haddock	GOM	NA (rebuilt)
Yellowtail Flounder	GB	2012(75%)/2015(77%)[1]
Yellowtail Flounder	SNE/MA	2014/50%
Yellowtail Flounder	CC/GOM	2014/61%
American Plaice	GB/GOM	2011/73%
Witch Flounder		2015/75%
Winter Flounder	GB	2016/76%
Winter Flounder	GOM	NA (status unknown)[2]
Winter Flounder	SNE/MA	2017/85%
Redfish		2012/50%
White Hake		2014/50%
Pollock		2017[2]
Windowpane	GOM/GB	Unk[2]
Windowpane	SNE/MA	Unk[2]
Ocean Pout		Unk[2]
Atlantic Halibut		2055/50%
Atlantic Wolffish		Unk[2]

Figure 112 – GB cod predicted SSB, Proposed Action

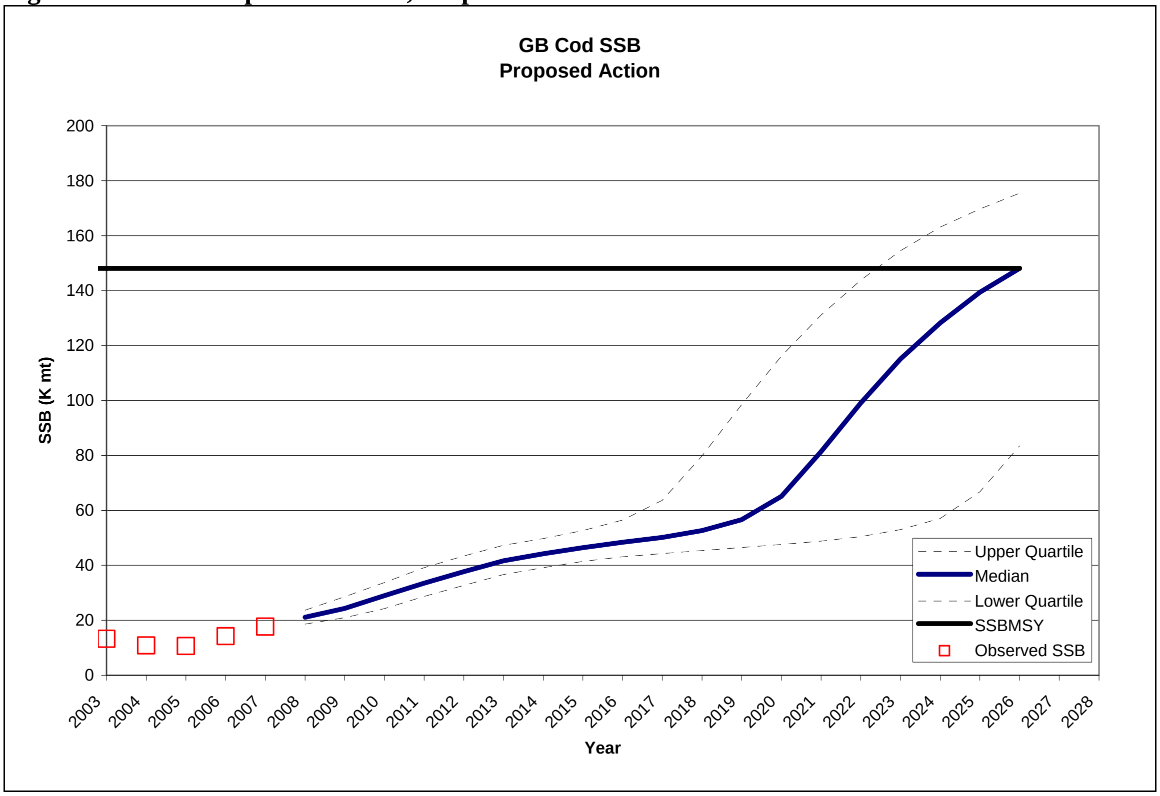


Figure 113 - GOM cod predicted SSB, Proposed Action

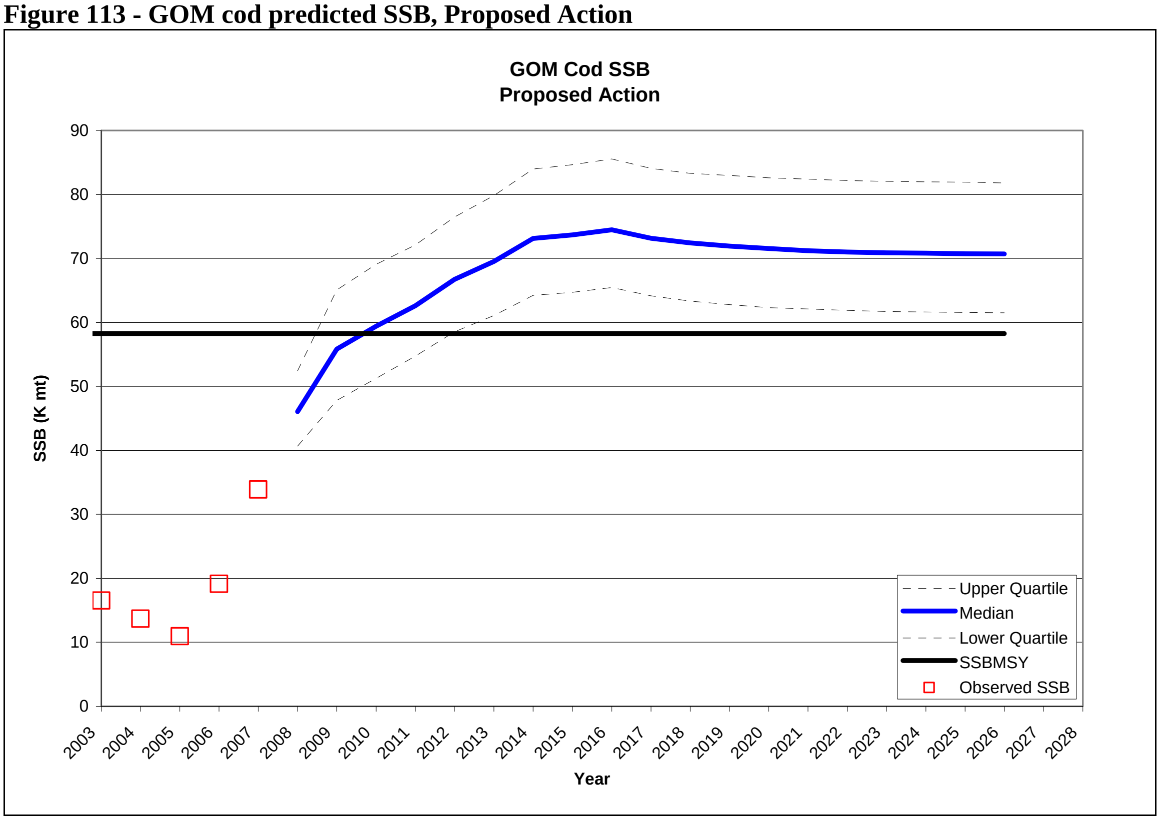


Figure 114 - GB haddock predicted SSB, Proposed Action

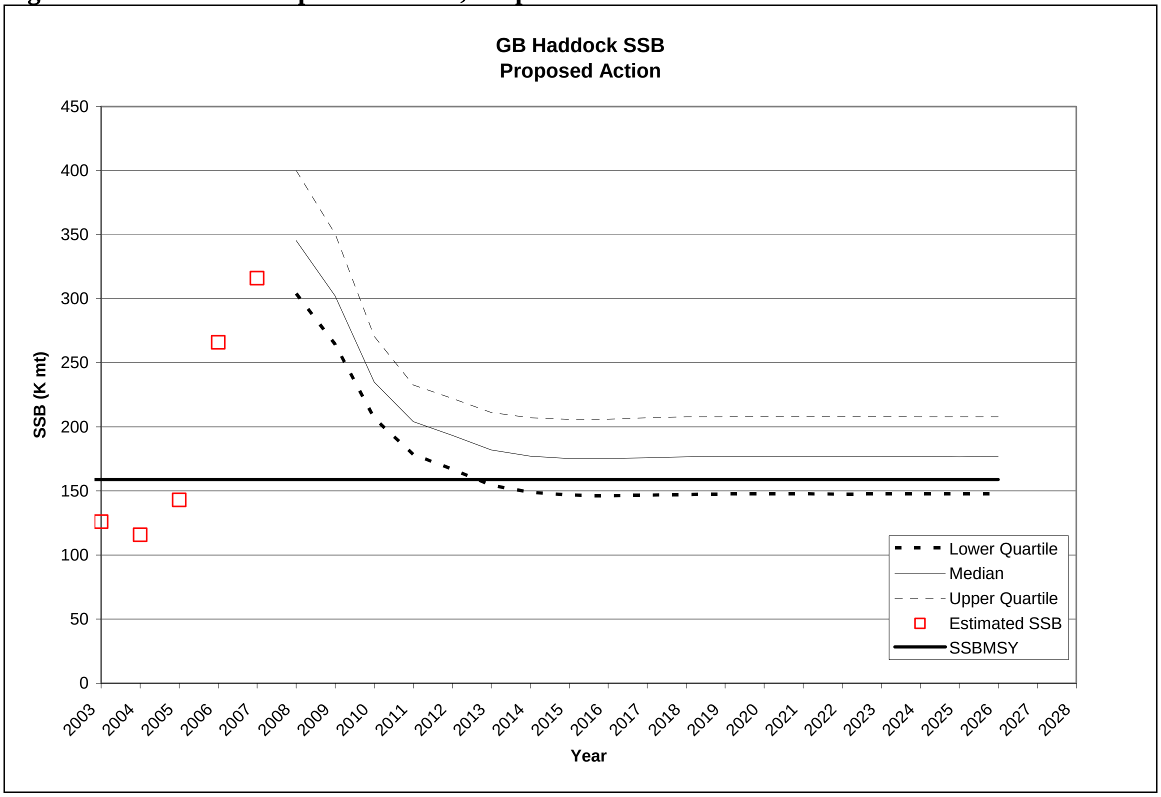


Figure 115 – GOM haddock predicted SSB, Proposed Action

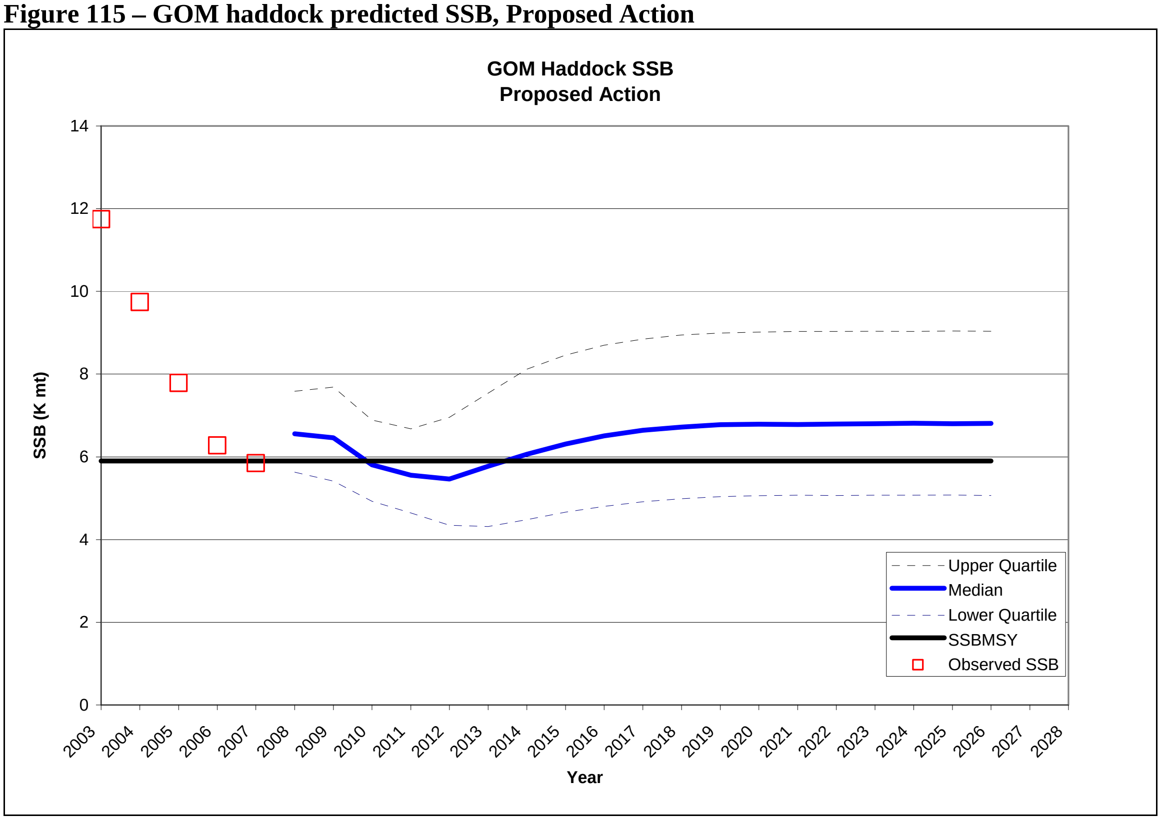


Figure 116 - GB yellowtail flounder predicted SSB, (based on GARM III)

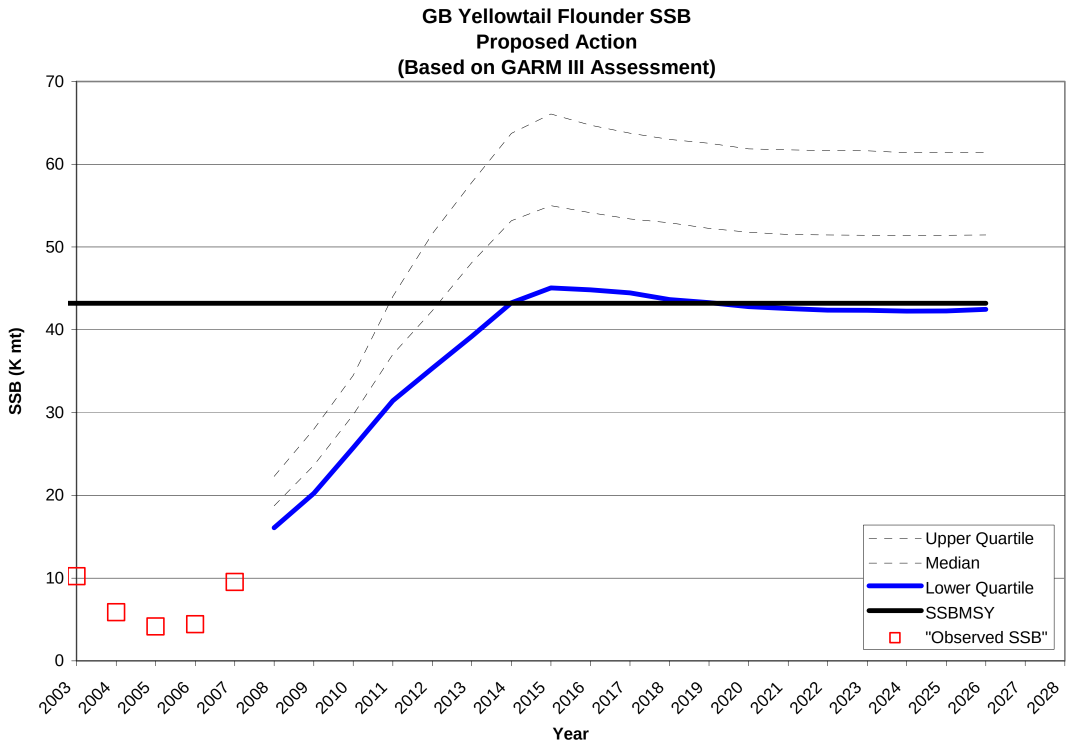


Figure 117 – SNE/MA yellowtail flounder predicted SSB, Proposed Action

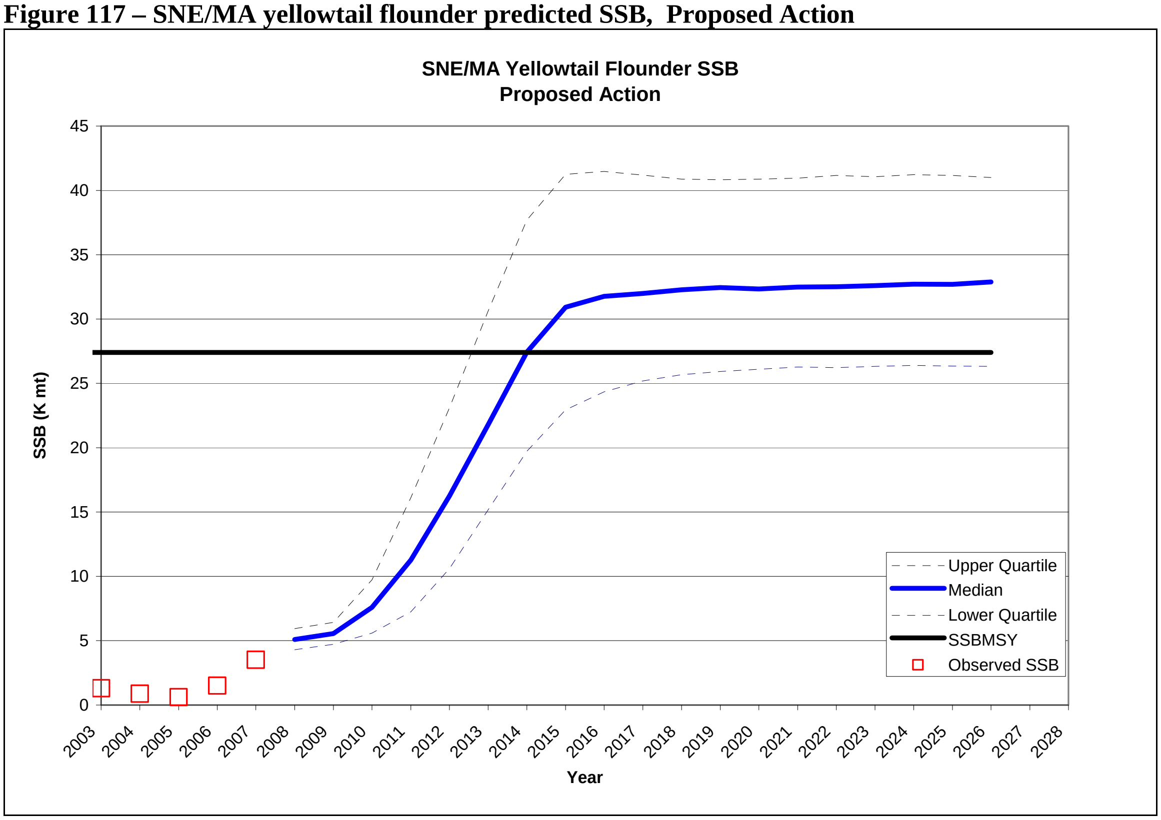


Figure 118 – CC/GOM yellowtail flounder predicted SSB, Proposed Action

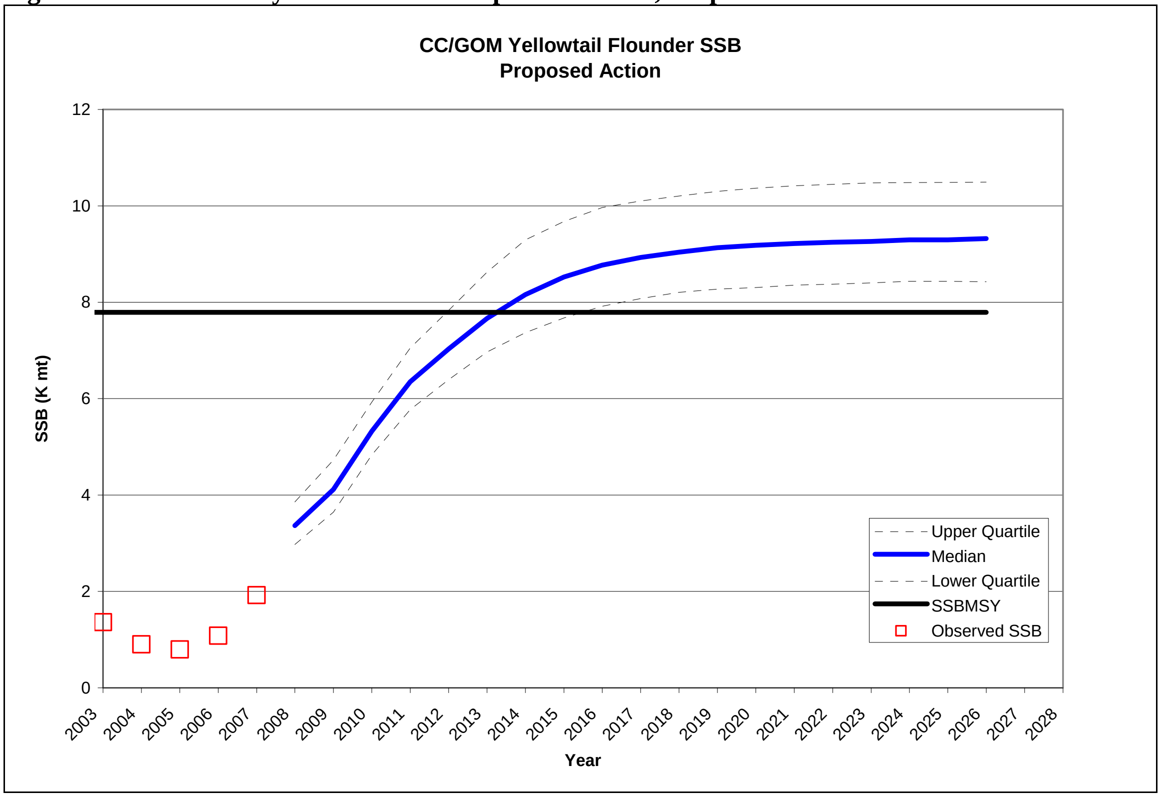


Figure 119 – American plaice predicted SSB, Proposed Action

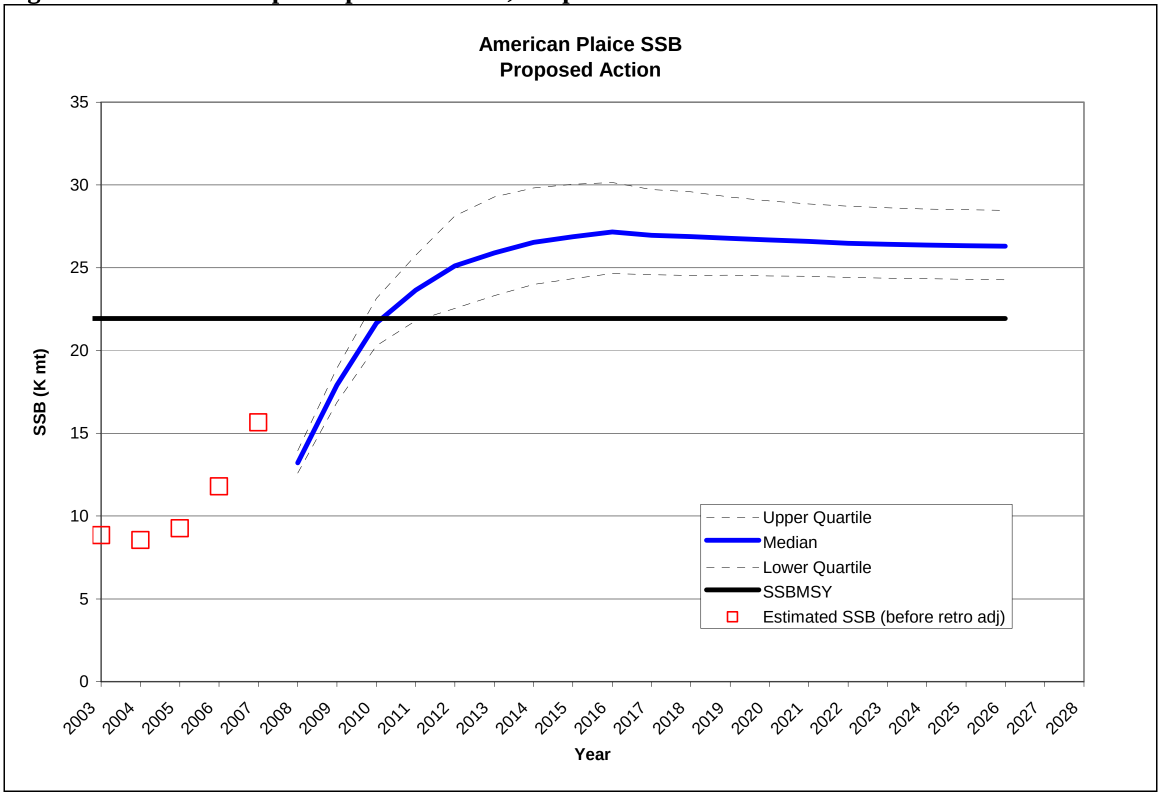


Figure 120 – Witch flounder predicted SSB, Proposed Action

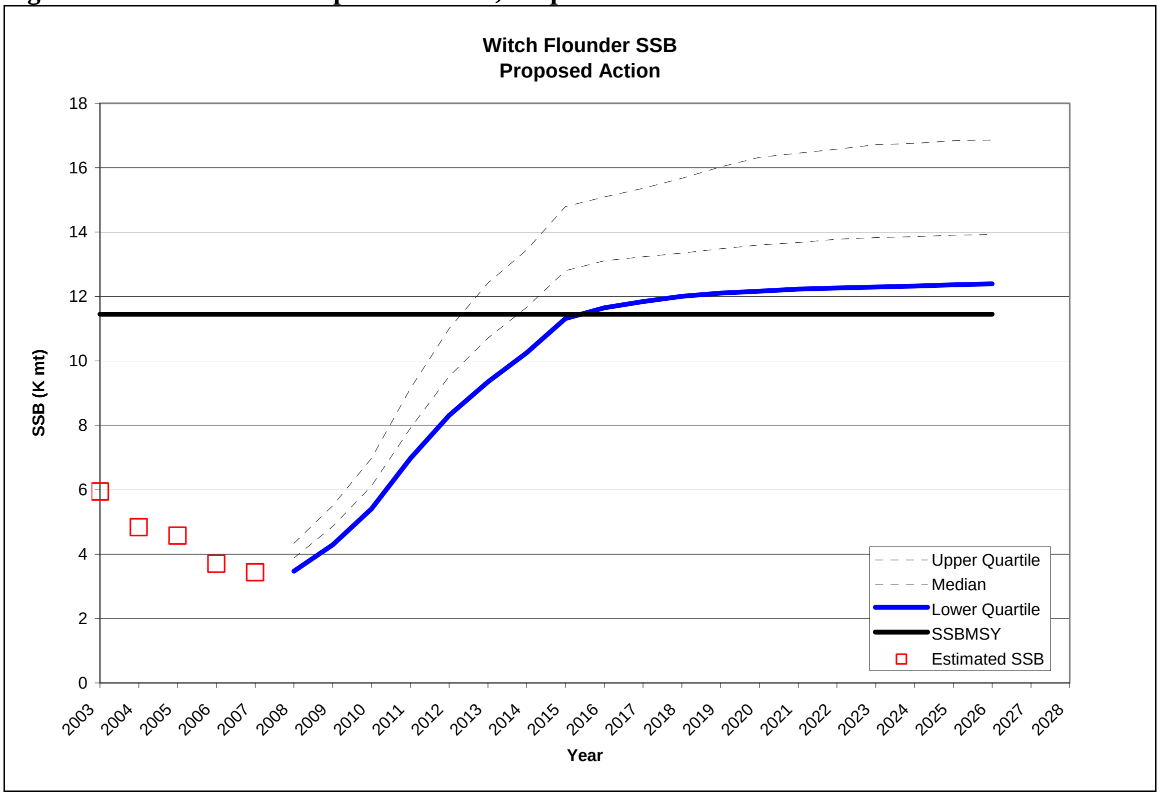


Figure 121 – GB winter flounder predicted SSB, Proposed Action

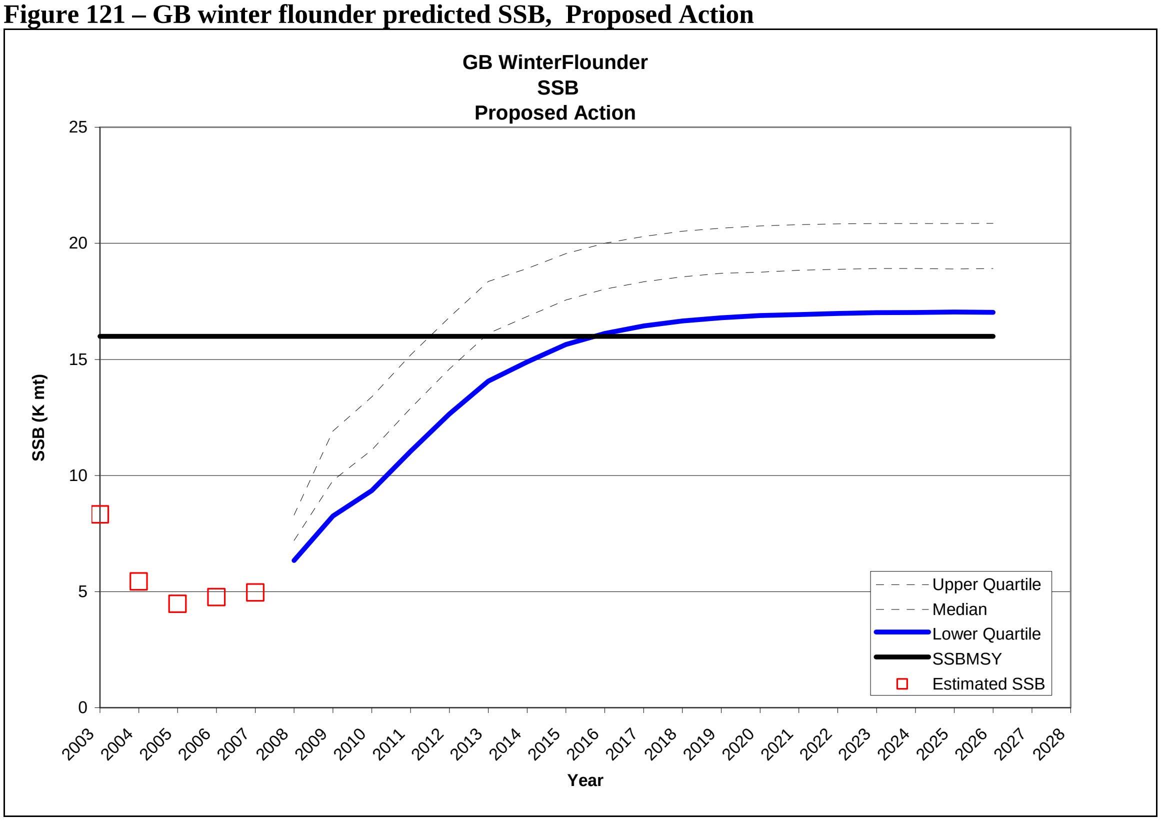


Figure 122 – SNE/MA winter flounder predicted SSB, F=0

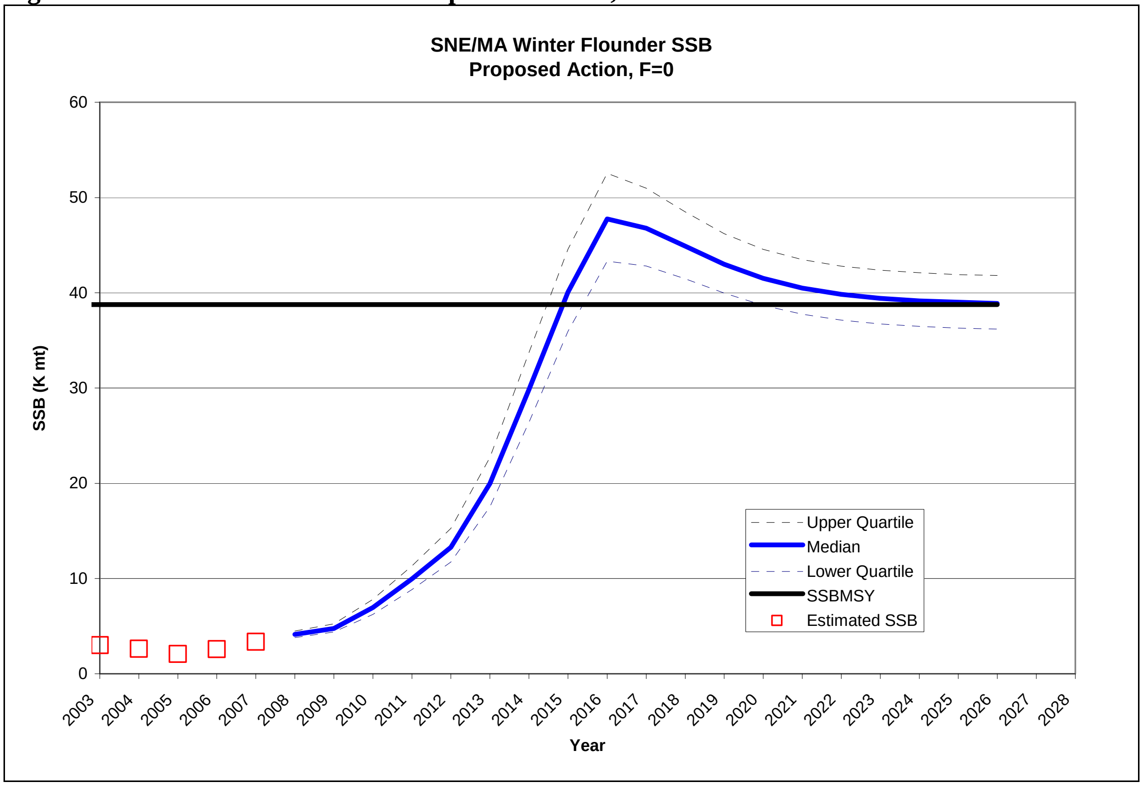


Figure 123 – SNE/MA winter flounder predicted SSB, Proposed Action (F=0.098)

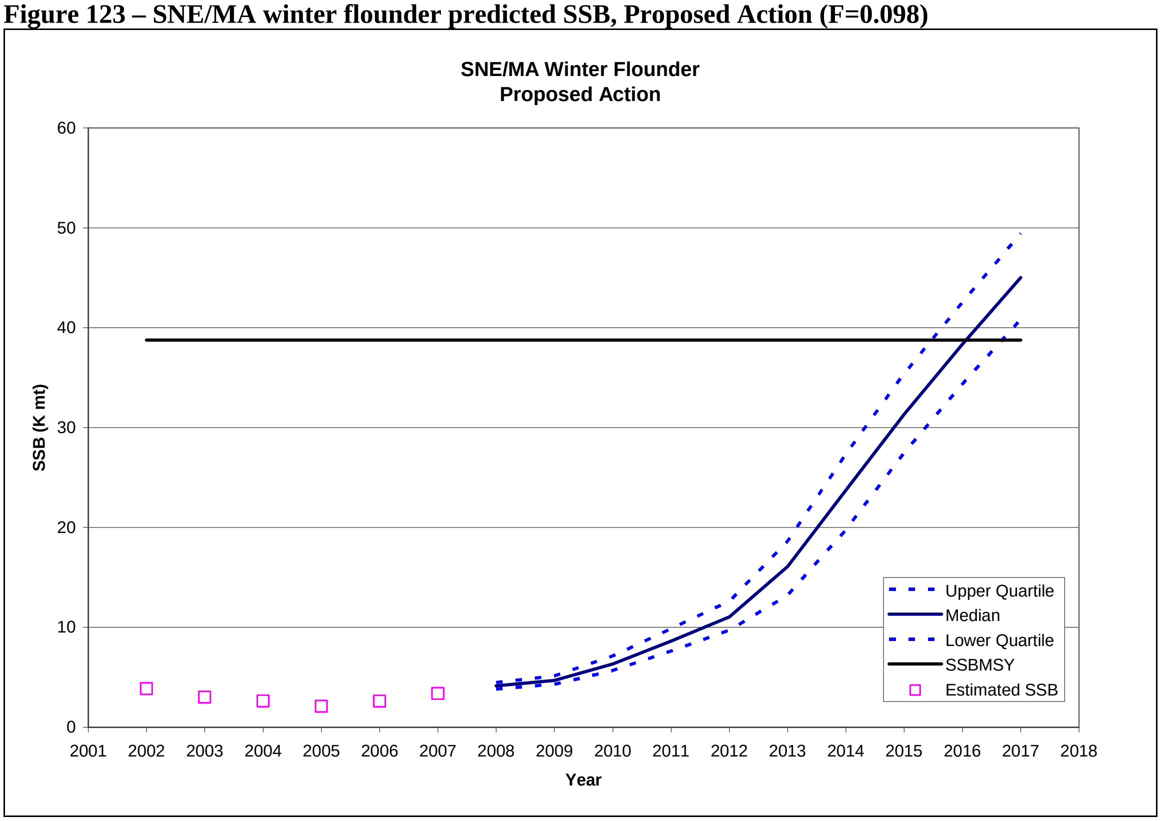


Figure 124 - Redfish predicted SSB, Proposed Action

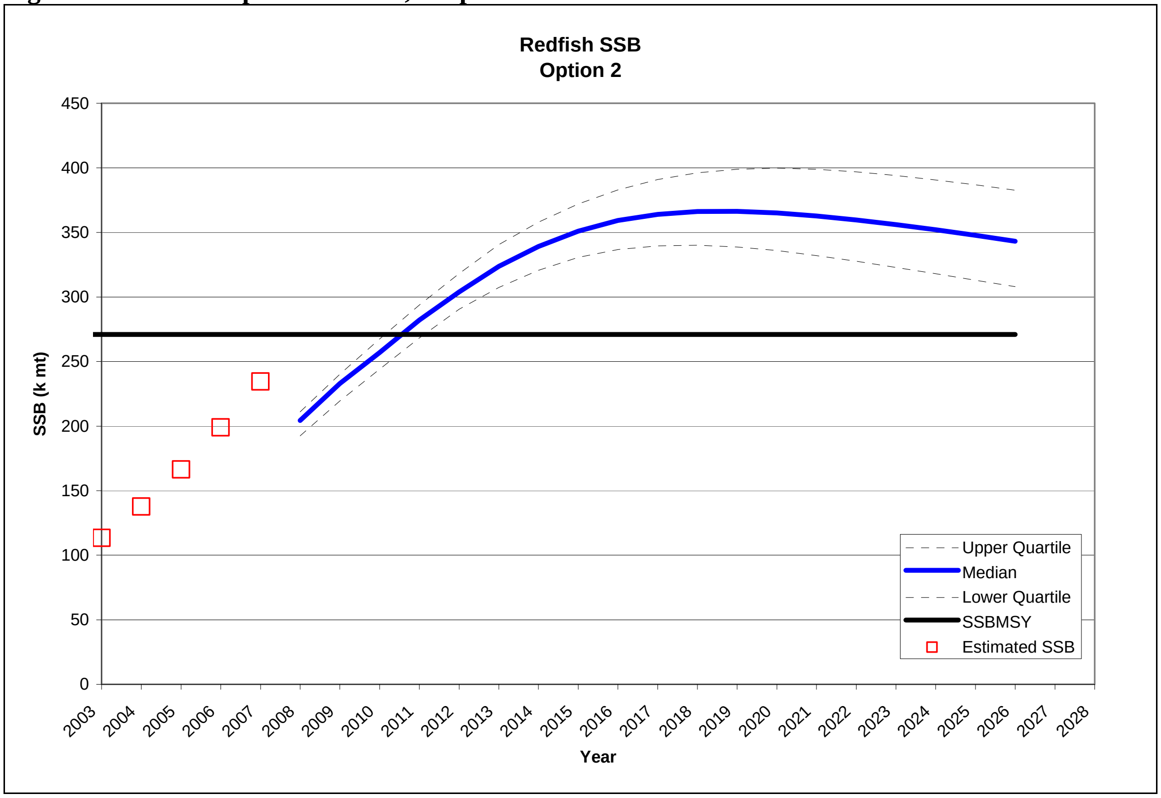


Figure 125 – Atlantic halibut predicted SSB, Proposed Action

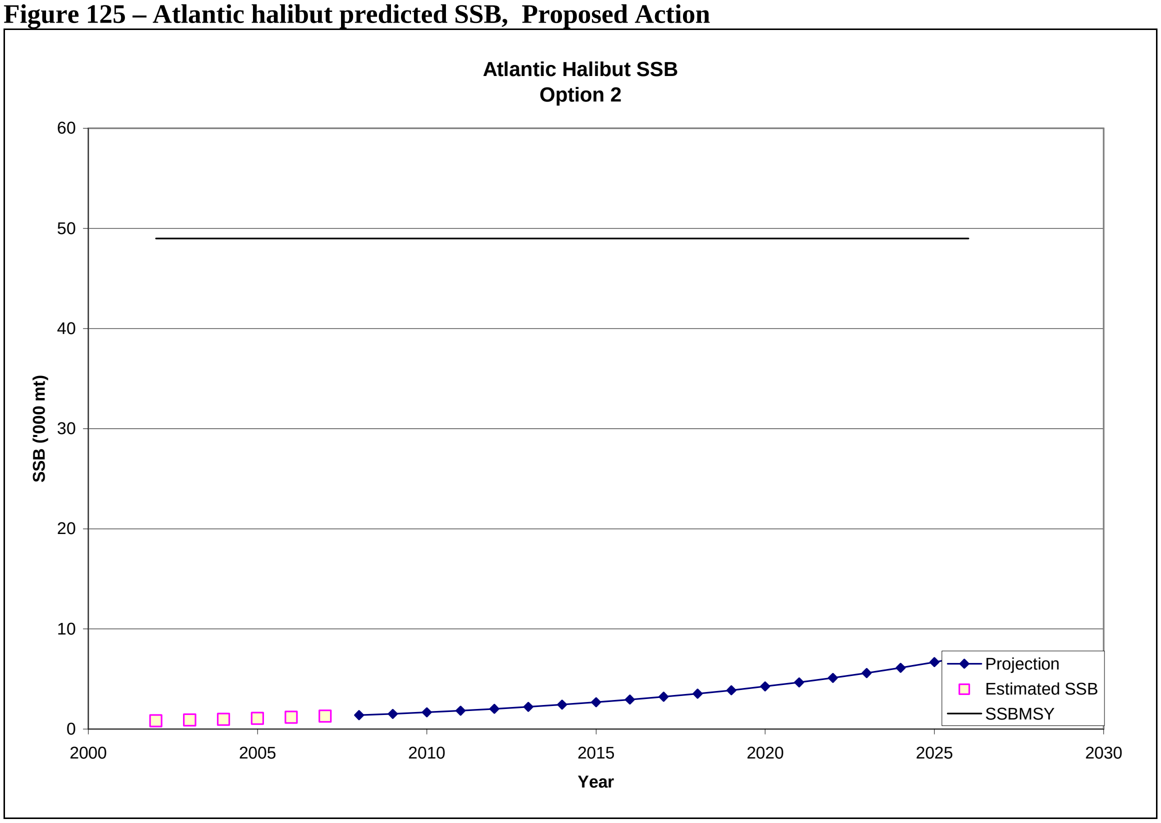
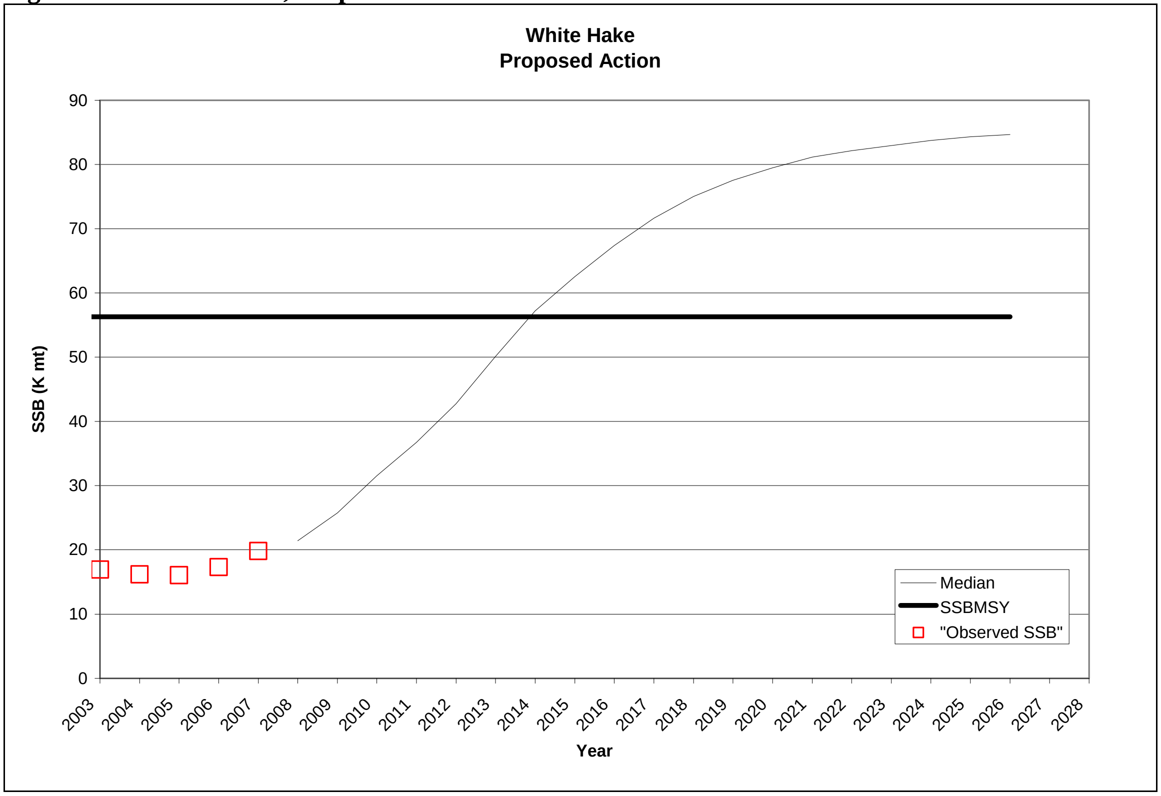


Figure 126 – White hake, Proposed Action



7.2.1.1.3.2 Mortality Reductions to Achieve Rebuilding Targets

Option 2 proposes to alter the fishing mortality targets in order to rebuild groundfish stocks. In order to design effort controls to achieve these targets fishing mortality was estimated for CY 2008 and the needed change was calculated. This section documents the calculation of these changes.

The PDT's approach to determine the rebuilding mortality targets and needed mortality reductions for Amendment 16 is similar to that used for FW 42. Catch in 2008 was estimated using six months of preliminary landings statistics provided by NERO, the ratio of discards to landings in 2007 from the GARM, Canadian quotas for GB cod, haddock, and yellowtail flounder, 2008 Canadian catch for pollock, and 2007 recreational catches for GB cod, GOM cod, GOM haddock, pollock, SNE/MA winter flounder, and GB winter flounder. Estimates were not made for the four stocks with very low landings. While the method used to estimate 2008 catch has performed adequately in the past, it is not without uncertainty. Changes in discard rates, recreational catch, and commercial fishing patterns could result in actual catches that differ from these estimates. Table 176 summarizes the derivation and the results for 2008. In several instances, the 2008 catch differs from that assumed for projections included in GARM III. PDT analyses suggest that rebuilding mortality targets are not very sensitive to the 2008 catch assumption, but it does have larger implications when estimating the necessary mortality reductions to get from the current mortality (that is, 2008 as estimated using a catch estimate and GARM III results) to the target fishing mortality. The necessary changes are shown in Table 16 and are not repeated here.

Subsequent to developing these estimates and prior to the final decision on the amendment, the PDT obtained preliminary landings information for calendar year 2008 and compared the earlier estimates of catch to estimates derived with the new data. Substantial differences were noted for pollock and GB winter flounder. The revised estimated 2008 catches for both of these stocks increased: to 10,675 mt for pollock, and to 1,017 mt for GB winter flounder. The revised estimates are used to determine the necessary mortality reductions shown in Table 16.

Projections were run to determine rebuilding mortality targets. The following assumptions were used:

- Beginning projection stock size, age structure, partial recruitment, weights-at-age, and future recruitment assumptions were as approved by the GARM III for each stock.
- The PDT's estimate of catch was used for 2008.
- For stocks that are currently in rebuilding programs, the probability of achieving stock size at the end of the period is as specified in the plan: 75 percent for GB yellowtail flounder, and 50 percent for all other stocks.
- Fishing mortality in 2009 was assumed to be the rebuilding fishing mortality for stocks currently in rebuilding plans, and F_{MSY} for stocks that will begin a formal rebuilding program at the implementation of Amendment 16 (May 1, 2010). These assumptions were consistent with the mortality objectives and management measures in a proposed interim groundfish action that was published January 16, 2009 (*74 FR 2959*).

Subsequent to approval of the draft amendment, NMFS published the final rule for the interim groundfish action effective May 1, 2009 (*74 FR 17030).* While that action kept the same mortality objectives as the proposed interim action, the measures were modified and analyses showed that the proposed measures were not likely to meet the stated objectives for several stocks: GB cod, witch flounder, SNE/MA winter flounder, pollock, and northern and southern windowpane flounder. Since these objectives were used as the assumptions for 2009 fishing mortality when developing the targeted fishing mortality rates for Amendment 16, the possibility exists that not meeting the assumed mortality rates in 2009 would mean lower fishing mortality rates would be needed beginning in FY 2010 than those shown in Table 16. This possibility was examined in more detail.

The management process takes a considerable amount of time to identify issues, develop alternatives, seek public input, and prepare, submit, review, and implement management measures. As a result, new information is often received as this process continues. Whenever possible, new information is incorporated into the design and analyses of measures. But the time necessary to prepare documents means that at some point it is impossible to incorporate new information into the process if required analyses and decisions are to be completed on time.

For both the draft document and the interim action, needed mortality objectives were determined based on available information. A key factor in the design of effort controls for this amendment and the interim action was the estimate of fishing mortality in 2008. Both the draft amendment and the interim action used estimates of 2008 catch to determine the 2008 fishing mortality and the reductions from 2008 needed to meet mortality objectives. For the interim action, the reduction from 2008 was that needed to achieve the fishing mortality target for 2009. For this amendment, the reduction from 2008 was that needed to meet the rebuilding mortality objectives for 2010. These rebuilding mortality objectives depend in part on what is assumed for the 2009 mortality, though PDT analyses show that in general the mortality assumption for one year generally has only small impacts on the needed rebuilding fishing mortality.

As already noted, two of the original 2008 catch estimates were low (pollock and GB winter flounder) and the catches were corrected when evaluating the change sin mortality needed for this action. No adjustments were made in those instances where the revised estimate of 2008 catch was lower than the original estimate. This was the case for GB cod and witch flounder. This means that the interim action - based on a higher estimate of 2008 catch – may have over-estimated the mortality reduction needed for these two stocks by some amount.

Subsequent to approval of the final document by the Council, additional catch information became available for 2008. Using these data, the 2008 fishing mortality for GB cod is estimated to be 0.304 and not the original estimate of 0.41. As a result, if the interim action achieves its estimated reduction of 28 percent from 2008, then 2009 fishing mortality for this stock will be just below F_{MSY} . This means the Amendment 16 targets remain appropriate for this stock.

Similarly, the witch flounder fishing mortality in 2008 is estimated as 0.276 rather than the original estimate of 0.296. The mortality reduction needed to achieve the 2009 target is reduced to 27.5 percent rather than 32 percent. If the interim action achieves its estimate reduction of 17 percent from 2008, the 2009 fishing mortality will be about 0.23, higher than the F_{MSY} of 0.20. This small difference is not expected to affect the needed rebuilding target. Note also that the adopted ABC control rule targets a mortality rate less than Frebuild for this stock.

For SNE/MA winter flounder, the targeted fishing mortality rate is as close to 0 as possible. The 2009 assumption does not change this objective, though it may affect when the target biomass is achieved.

For the three index-based stocks where the interim action is not expected to achieve its objectives – pollock, northern windowpane, and southern windowpane flounder - there is no projection methodology that is used to estimate the required fishing mortality rate. As a result, the 2009 fishing mortality has no affect on the targeted fishing mortality rates for this amendment. Recent catch and survey data also show that the exploitation rates for the two windowpane flounder stocks in 2008 are lower than assumed for preparation of the interim action EA. In the case of northern windowpane flounder, the 2008 exploitation index is only 40 percent of the 2007 value used when preparing the interim action. As a result, the interim action impacts

Other provisions of the FMP will allow adjustments in the future should these targeted fishing mortality rates prove incorrect. Rebuilding progress is monitored and management measures can be changed through a framework or amendment. ACLs established very two years will consider the most recent data and estimates of fishing mortality. These adjustment mechanisms provide a process for ensuring that stock rebuilding continues.

Selecting this option will not have direct impacts on non-groundfish stocks.

Table 176 – Derivation of 2008 estimated catch for rebuilding projections. See text for revisions for pollock and GB winter flounder.

	Prelim. Landings, Jan – Jun			Jan-Jun Prelim. Landings, Percent of Total		Estimated Commercial Catch		Maximum Estimated Comm. Catch				
Stock	2007	2008	GARM III Discards as % of Landings	CY 2007	Average, CY 2005-CY 2007	Based on 2007	Based on 05-07	2008	2007 Rec Harvest	Canada	Total Est. 2008 Catch	GARM III Assumed 2008 Catch
GB Cod	1,829	1,878	0.282	0.48	0.55	5,016	4,378	5,016	8	1,633	6,657	5,957
GOM Cod	1,468	2,356	0.129	0.38	0.39	7,002	6,822	7,002	1,026		8,028	5,268
GB Haddock	1,373	2,986	0.660	0.46	0.59	10,776	8,401	10,776		14,950	25,726	21,929
GOM Haddock		217	0.066	0.74	0.70	313	330	330	630		960	1,368
GB Yellowtail	804	483	0.474	0.70	0.60	1,017	1,187	1,187		550	1,737	2,500
SNE/MA Yellowtail	61	122	0.895	0.44	0.49	525	472	525			525	396
CC/GOM Yellowtail	215	300	0.298	0.48	0.52	811	749	811			811	627
Plaice	419	426	0.241	0.42	0.47	1,258	1,124	1,258			1,258	1,126
Witch Flounder	599	581	0.090	0.56	0.58	1,131	1,092	1,131			1,131	1,172
GB Winter Flounder	384	261	0.245	0.45	0.46	722	707	722			722	980
GOM Winter Flounder	109	132	0.065	0.46	0.48	306	293	306	28		334	305
SNE/MA Winter Flounder	546	312	0.070	0.36	0.32	928	1,044	1,044	121		1,165	1,857
Redfish	438	617	0.474	0.56	0.56	1,624	1,624	1,624			1,624	1,160
White Hake	673	469	0.371	0.44	0.50	1,461	1,286	1,461			1,461	2,200
Pollock	3,539	3,765		0.42	0.42	8,964	8,964	8,964	383	417	9,764	7,756

7.2.1.2 Fishery Program Administration

7.2.1.2.1 Annual Catch Limits

The Proposed Action adopts ACLs. By themselves, ACLs will not have any direct effect on fishing mortality. They define the catch that should be taken from the fishery to reduce the likelihood of overfishing. If used to help design management measures, and as the basis for AMs, ACLs are expected to reduce the risk that fishing mortality targets will be exceeded. They allow for a more explicit incorporation of uncertainty and risk when determining catch levels. It is important to note that ACLs are designed to prevent overfishing – that is, to prevent exceeding the maximum fishing mortality threshold.

The proposed measure defines the process for setting ACLs for regulated groundfish. Included are definitions for determining an overfishing level (OFL) and an Acceptable biological Catch (ABC). The ABC is defined in such a way that it is based on the fishing mortality rate associated wit the rebuilding plan (for overfished stocks) or the control rule. These fishing mortality rates will always be less than the maximum fishing mortality threshold when the stock is less than BMSY or its proxy. This provides a measure of caution even before the ACL is determined. The ACL cannot exceed the ABC, which further reduces the risk the overfishing threshold will be exceeded. By specifying an ACL, such uncertainties as management uncertainty and risk can be considered. In order to monitor ACLs and adopt the appropriate AMs, sub-components of each ACL are identified. These sub-components allocate a portion of each stock to different fisheries. While this can be viewed as an allocation decision with only social and economic implications, in reality by promoting a more accurate accounting of how groundfish are caught it may lead to less risk that mortality targets will be exceeded.

Determining the correct amount to allocate to various sub-components is difficult because for the most part there is not a ready estimate of groundfish caught in other "fisheries" as the management system uses the term. For example, the SBRM is designed around "fishing modes": a particular gear, mesh size, access category, and port of departure. Where the SBRM refers to large mesh otter trawl vessels leaving from New England ports, managers think of the groundfish or fluke fisheries. In addition, in the past assessments have not included all catch. Some stocks do not include discards, or do not consider discards from fisheries with low observer coverage or low discard rates.

The PDT considered several sources of information to construct the proposed option. Since groundfish are only supposed to be landed by vessels with a groundfish permit, the primary source of catch in other fisheries should be discards. First, the PDT used discard estimates from an NEFSC reference document that estimates discards for 2005 by fishing mode using the SBRM methodology. The species where discards by gear not typically considered groundfish gear (scallop dredges, mid-water trawls, pelagic longlines, etc.) exceeded five percent of landings were identified. These were ocean pout, windowpane flounder, winter flounder, and yellowtail flounder. Preliminary 2005 and 2006 catch (landings and discards) estimates for these species were further examined by stock to see if there were stock specific differences. Second, in the case of SNE/MA yellowtail flounder, an attempt (not entirely successful) was made to determine if discards were primarily caused by non-groundfish activity by looking at the target species on tows where yellowtail flounder was discarded. This does not seem to be the case. Third, a NMFS report to Congress was reviewed to determine the catch within state waters fisheries. Finally, observer data for exempted fisheries was reviewed to see if any exempted fisheries exceeded the overall five percent standard. While in most cases there are significant numbers of observed trips where groundfish exceeds the five percent standard and these fisheries may need to be more closely examined, in no case did the overall total on all observed trips exceed five percent of the total catch.

These analyses suggest that for most stocks the amount allowed for "other non-specified fisheries" should be five percent. For windowpane flounders this amount should be 30 percent. A specific sub-component should be allocated to the scallop fishery for all yellowtail flounder stocks and possibly windowpane flounder stocks. Determining the appropriate amount for the scallop fishery is difficult. It is probably unwise to attempt to set a fixed percentage. The "right" amount may depend on the rotational management program, stock status, and other factors. The Council believes it may be better to leave the specific amount undefined, but establish a process to determine the amount through the periodic adjustment process. Existing regulations suggest that this amount would be at least 10 percent for those areas that have closed area access programs in effect. The proposal shows that ACLs are only specified for the commercial groundfish, recreational groundfish, and the herring mid-water trawl fishery. In part this is due to the impracticality of developing AMs for other sub-components in the time available for this amendment. In essence, it means that the groundfish fishery is accountable for overages by any other group. This decision will need to be re-evaluated in the future after monitoring the performance of these sub-components.

Selecting this option will not have direct impacts on non-groundfish stocks, but may have indirect impacts on such stocks. This is particularly important in the setting of sub-ACLs for fisheries that catch groundfish as bycatch when targeting other stocks. For example, the Atlantic Herring fishery is allocated a sub-ACL of haddock. Specification of the haddock ACL could have indirect biological impacts on the herring fishery, particularly if the haddock sub-ACL for the herring fishery is small. If the haddock sub-ACL is caught by herring vessels, current regulations reduce the herring possession limit and, therefore, herring catch within the GB/GOM Herring Exemption Area. In addition, if the ACLs specified for the directed groundfish fishery are caught or exceeded, the resulting AMs triggered by catching such ACLs (e.g., differential DAS counting, trip limit changes, area closures, etc.) could cause groundfish vessels to redirect fishing effort into other fisheries. The precise impacts of such responses are impossible to predict and quantify and would be based upon the specific AM triggered. Proposed effort controls for the groundfish fishery may be able to minimize the impact of such potential effort shifts by reducing the likelihood that catch will exceed the specified ACLs and trigger the associated AMs.

7.2.1.2.2 Addition of Atlantic Wolffish to the Management Unit

Atlantic wolffish was recently assessed through a Data Poor Working Group (DPWG 2009). Several measures of abundance show that this stock has declined in abundance since roughly the mid-1980s and it has been determined it is overfished. This species is caught by vessels fishing for groundfish in the Gulf of Maine and Georges Bank areas. While adding Atlantic wolffish to the management unit is merely an administrative first step, it facilitates the implementation of management measures to protect this stock under the provisions of the M-S Act. A specific measure is also included that is expected to reduce wolffish fishing mortality (see section 4.3.5).

There could potentially be differential indirect impacts of the wolffish EFH designation alternatives on stocks of fish that are included in the multispecies FMU if larger designated areas lead to a greater number or increased effectiveness of EFH consultations on fishing and non-fishing activities in the Gulf of Maine-Georges Bank-southern New England region, and if those consultations succeed in reducing adverse habitat impacts, thereby increasing the productivity of exploited fishery resources. However, adding wolffish to the existing array of federally-managed species would not improve the current level of habitat protection because none of the EFH designation alternatives for wolffish would add any new geographic area or habitat features that aren't already included by some of the 27 species (and four life stages) managed by the NEFMC. Thus, there would be no impact of any of the EFH designation alternatives on exploited biological resources in federal waters.

7.2.1.2.3 Sector Administration Provisions

This action proposes numerous changes to the administration of voluntary, self-selecting sectors. All of these changes are designed to improve the effectiveness of sectors as a management option. Some of the proposed changes are primarily administrative in nature. Many of these administrative measures provide more detail on the information sector organizers should submit when applying for a sector or in annual reports. These are unlikely to have any direct biological impacts. The proposed measures that fall into this category are:

- Sector formation proposal and operations plan revisions
- Sector annual reports

This action also changes the method used to determine the potential sector contribution (permit history) for limited access permit holders eligible to join sectors. While this action determines the annual catch entitlement (ACE) for each sector, which limits the sector's catch, the allocations themselves do not have direct biological impacts. It is possible that the Proposed Action may have indirect biological impacts. For example, if it results in allocating more groundfish to a sector that because of its fishing practices has more interaction with a non-groundfish stock that is over-fished, including the use of less selective fishing gear that results in increased bycatch of non-targeted species, that option could increase fishing mortality on that stock and slow rebuilding progress. These types of indirect impacts are impossible to predict without knowing sector membership and fishing practices. Because the Proposed Action allocates resources based on recent landings history, any indirect impacts will be due primarily to the transfer of ACE between sectors, or other exchanges of fishing privileges (such as through combining permits under the DAS transfer program).

7.2.1.2.3.1 Allocation of Resources

This action proposes to change how resources are allocated to sectors. The option proposed requires that sector fishing be limited by a hard TAC for all regulated groundfish stocks, except for ocean pout, the two windowpane flounder stocks, SNE/MA winter flounder, Atlantic wolffish, and halibut. Limiting sectors to TACs for more stocks should provide more certainty that fishing mortality targets will be met. For the six stocks not limited by a hard TAC, measures will be adopted to reduce the likelihood that these stocks are targeted and to control catches (halibut is already limited to one fish per trip).

The Proposed Action changes how ACE is allocated to sectors, except the allocation of GB cod for permits committed to one of the two existing sectors as of a specific date. By selecting these two options, sector TAC allocations will represent the recent fishing histories of participating vessels and would not result in a redistribution of fishing effort.

This action also provides that when the sectors are issued their ACE at the beginning of the fishing year, twenty percent will be withheld for up to forty-five days. This provides an opportunity for NFMS to verify that sectors did not exceed their ACE in the previous year and to adjust allocations of ACE in the current year if that occurred. This measure provide positive biological benefits because it makes it more likely that fishing mortality targets (that is, the portion subject to fishing by sectors) will not be exceeded over successive fishing years.

The Proposed Action will not have direct impacts on non-groundfish stocks, but could have some indirect impacts on such stocks. Sectors may not be allocated stocks in all stock areas. If a sector is not allocated ACE for all groundfish stocks within a particular stock area, participating vessels cannot fish for groundfish in that particular stock area. This would reduce the catch and, therefore, mortality of non-groundfish stocks. Such impacts may be mitigated at least in part by other provisions proposed in this action, including ACE transfers and the requirement for sectors to cease fishing operations in a particular stock area once sector ACEs for relevant stocks in that area have been caught. If sector ACEs are small and caught early in the fishing year, there is the potential that sector operations may shift to targeting other fisheries in other areas. If this were to occur, catch and, therefore, mortality on those non-groundfish stocks would increase.

7.2.1.2.3.2 U.S./Canada Area

This action proposes to make a specific allocation of cod and haddock on eastern GB that is subject to management under the terms of an understanding between the U.S. and Canada. This is not expected to have any direct biological impacts, as it is primarily an allocation issue. It may have some benefits in controlling fishing mortality and reducing discards of non-target species as it allows sectors to operate in a rationale manner in this area rather than compete in a derby with non-sectors vessels in this area.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.3.3 Monitoring and Enforcement

Sector fishing activity is controlled by limits on how much the sector can catch – ACE. These are "hard" limits- sectors must stop fishing before they exceed these limits. There are two components to catch – landings and discards. In order to ensure that sector catches are actually limited to the ACE, both landings and discards must be accurately monitored. The proposed measures in this section are designed to increase confidence that sector catches are accurate.

The requirement that sectors land all legal-sized fish is meant to discourage sectors from discarding catches to avoid exceeding ACE. While admittedly difficult to monitor or enforce, this measure does encourage sectors to land all catch of legal-size. If adhered to, this measure may reduce discards of legal fish. Sectors are also required to prove they can attribute landings to a specific stock area, in order to reduce the likelihood sector catches will be applied to the wrong stock. This could lead to indirect benefits as improved attribution of catch to stock areas may lead to better management and assessment of the stocks. Finally, the requirement that sectors implement an improved dockside monitoring system, and limit landings to specific ports, will improve confidence in landed amounts.

With respect to accounting for sector discards, two approaches were considered in this amendment. The proposed approach applies an estimated discard rate to sector landings on a trip-by-trip basis if there is insufficient data to determine an in-season rate. This discard rate will be determined based on past observed trips on sector vessels. With the initiation of additional sectors, this discard rate will be based on fishing activity prior to implementation of the new sectors. Many of the discards during this period are caused by regulations (trip limits, quotas, etc.) that sectors will not be required to adhere to. As a result, it is likely that these discard rates will be higher than those experienced by the sector and using this rate will over-estimate sector catches. Support for this assumption can be found in the experience of the Fixed Gear Sector in FY 2007, where it appears that discard rates for permits in the sector may have been lower than when those permits were not in the sector (see section 6.2.4.2.2). This could help reduce fishing mortality, since the catches that are applied against ACE are likely to be higher than actual catches, and sectors may have to stop fishing earlier as a result.

Another possibility, however, is that while this may hold true while sectors have sufficient ACE available to continue fishing, as they approach an ACE that could result in stopping fishing, discard rates might increase above those used in the estimated discard rate. For this reason, the use of an estimated discard rate is intended to be a temporary measure. Sectors will be required to develop a monitoring system that meets NMFS standards that will adequately monitor discards by sector vessels. Standards will be developed and published to facilitate the development of such systems. Once the system is developed, a sector will be required to use it, which should improve discard estimation for sectors.

The proposal requires that monitoring systems developed by the sector include an at-sea component through the use of observers or electronic monitoring systems. This at-sea component must be in place by year three of the sector's operations. Some sectors may choose to adopt such a system earlier than year three if they believe their discard rates are lower than the assumed discard rates; proving this is the case will allow them to land more of the assigned ACE, increasing revenues. The monitoring standards require that the at-sea program allow the estimation of discards with a CV of at least 30 percent (the standard adopted by the SBRM (2007)), but the actual coverage levels will be determined by NMFS and will consider other factors, such as the requirement to ensure the estimates are not biased. Public comment on the SBRM reflected concerns that this CV standard was too high (that is, discards were not being estimated with a sufficient degree of precision) and a lower value should be established. In reply, NMFS noted that discards are a relatively small proportion of the total catch for most species and the CV of landings estimates contributes more to the precision of total catch estimates. Nevertheless, the standard proposed here is that at a minimum sector at-sea monitoring must meet this standard and the program must be approved by NMFS. Because the SBRM approach is not specifically designed for quota monitoring, NMFS may impose additional requirements. Should a higher standard be deemed necessary for a particular sector or all sectors it can be easily implemented through the review of the sector Operations Plan by NMFS. Actual discard rates will be used whenever NMFS determines data is sufficient to to do, regardless of the source.

One concern is that sector participants may alter behavior when an observer is on board. As a result, a CV standard may be met but discard estimates may be biased. Setting a particular CV standard does not resolve this issue; the only real solution is to require higher levels of observer coverage to reduce the effect of this behavior on catch estimates. Again, the Proposed Action allows NMFS to require a higher coverage level to address these concerns.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.3.4 Transfer of Annual Catch Entitlements

This action adopts Option 2, allowing sectors to transfer ACE between sectors. Allowing transfer of ACE should not result in increased fishing mortality. It does not change the allocations to the sectors and so at worse should be neutral – that is, this option should not increase or decrease fishing mortality. ACE trading may actually prove to help control fishing mortality. Since sectors must stop fishing on all groundfish stocks in an area if an ACE for one stock is exceeded, there is the possibility that if a sector unexpectedly approaches the limit for one stock, members may have an incentive to illegally discard additional catches in order to avoid sacrificing yields on other stocks. Allowing the trading of ACE helps to reduce this perverse incentive because it provides a sector an opportunity to acquire more ACE for this stock and continue fishing, discouraging discards. Note that this provision does not allow a sector to continue fishing if its ACE is exceeded – the measure still requires that sectors stop fishing if this is the case.

The provision also allows sectors to trade ACE for a brief period after the end of the fishing year, to “balance the books” and avoid an overage penalty. This should be a rare occurrence since sectors are required to monitor catches in-season and stop fishing if an ACE is expected to be exceeded. This should not have any impact on fishing mortality.

This option also proposes to allow sectors to carry-over unused ACE into the next fishing year. The percentage of ACE that can be carried-over in this manner is limited to ten percent of the ACE that is allocated. An allocation carry-over can increase the risk that overfishing will occur. The reason is that there is not a one-to-one relationship between uncaught fish in year one and fish available for catching in year two. The relationship will be dynamic and stock specific, depending on such factors as natural mortality, selection pattern for that species, recruitment, and species growth. Allowing carry-over creates the possibility that by design of the management plan catches in year two will exceed the year two TAC/ACL by enough to cause overfishing. This risk increases if the stock is stable or declining in stock size, or if the target fishing mortality is low relative to natural mortality (as is the case for several rebuilding plans).

The Groundfish PDT examined two illustrations of this problem that assumed the entire carry-over and base allocation are caught in the subsequent year and that catch levels are set exactly at the level that determines overfishing will occur. While these three assumptions are unrealistic (it is more likely that part of the available catch will not be caught each year, as noted in Sanchirico et al (2006), and catch levels will not be set at the overfishing level through the ACL process) the illustrations showed that allowing a carry-over increases the risk of overfishing in a given year. The likely schedule of TAC/ACE adjustments means that these risks increase the older the assessment used to calculate the TAC. Other sources of uncertainty - retrospective patterns, etc. – could also exacerbate this problem.

It is possible to implement a carry-over system that does not increase the risk of overfishing by reducing allocations sufficiently so that even if the maximum carry-over is harvested in the following year, overfishing does not occur. One way to design such a program is to withhold part of the sector allocation each year to allow for the possibility of carry-over. It should also be noted that the risk of overfishing as a result of carry-over may be reduced if the ACE is based on an ACL that explicitly accounts for that risk. The development of the ACL system includes evaluating management uncertainty for different components of the groundfish fishery ACL (see section 4.2.1.3). One of those components will be the portion of the ACL that is allocated to sectors. If ACE carry-over is allowed, this fact can be considered when setting the ACL for sectors. As experience is gained with the performance of sectors and the frequency that a carry-over provision is used, the ACL can be adjusted to make certain overfishing does not occur.

Sanchirico et al (2006) reviewed catch share systems in Iceland, New Zealand, Canada, and Australia. They concluded that allowing quota-balancing through trading of ACE and small levels of carry-over can greatly increase the flexibility of fishermen to adapt when allocated ACE is not aligned with catch rates. This produces positive incentives for desired behavior: the ability to acquire ACE reduces the incentive for fishermen to discard catches that may exceed their ACE, and the ability to carry-forward small amounts of ACE into the next allocation period reduces incentives to fish right up to the maximum allowed amount. When these transfers occur between fishermen within an allocation period the net exchange is zero and there is no impact whatsoever on the probability of achieving mortality targets. While they did note that a carry-over provision does result in a risk that mortality targets will be exceeded, the level of risk can be contained by specifying a limit on the amount that can be carried-forward and by not allowing the amounts to accumulate over time. Both of these provisions are included in this action: the maximum carry-over is limited to ten percent of the ACE for each stock and carry-over does not accumulate over time.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.3.5 Participation in Special Management Programs

These measures describe sector participation in special management programs. Because sectors would likely be exempt from trip limits and some gear requirements under the Proposed Action, the catch per unit effort of sector vessels and could increase, particularly if sector vessels participate in special management programs that provide access to closed areas. While this may not increase sector catch, it could alter the composition of sector catch from previous years, particularly if sectors utilize access to closed areas under special management programs to catch a majority of their allocated ACE of high-value groundfish stocks such as cod and haddock. Since these programs do not provide sectors additional effort or catch, and all catches will apply against sector ACE, these measures are not expected to have any overall effect on fishing mortality for groundfish stocks.

Selecting this option will not have direct impacts on non-groundfish stocks, but may have indirect impacts on non-groundfish stocks. This could result if sectors increase participation in special management programs to increase their catch per unit effort on groundfish stocks. Not only would this practice increase catch of non-groundfish stocks, but if such practices result in the early harvest of sector ACE for groundfish stocks, sectors may also shift effort onto non-groundfish stocks and further increase catch and, therefore, mortality on non-groundfish stocks.

7.2.1.2.3.6 Interaction with Common Pool Vessels/Universal Exemptions

This section specifies the measures from which sectors cannot be excused, as well as those measures that that all sectors do not need to adhere to and so receive an automatic exemption. There are no changes to the measures that all sectors must follow (The No Action alternative is adopted for these provisions), and the rationale for those requirements is not repeated. This action, however, establishes several measures that all sectors will not have to follow. Without exception, these measures are elements of the input/effort control system used to control fishing mortality on groundfish vessels. Since sectors are subject to a hard TAC for most stocks, these measures are unnecessary for controlling fishing mortality. Most sectors were expected to request, and receive, exemptions from these measures; including them as universal exemptions simplifies sector administration.

Allowing sectors to be exempt from trip limits may reduce regulatory discards. In recent years many discards have been caused by the need for vessels to discard marketable fish to comply with established trip limits. By exempting sector vessels from these requirements, discards of regulated groundfish stocks may be reduced. This may also lead to reduced time spent fishing since more catch can be landed on a given trip, but this will only occur if it is profitable for sector vessels.

The seasonal closed area on Georges Bank was adopted to reduce fishing mortality on GB stocks, primarily GB cod. Again, since sectors have their catches controlled by a hard TAC there is no need for this closure to control fishing mortality from sector vessels. Cod spawning on GB extends into May, so increased sector effort during this period may impact on spawning activity. Given poor recruitment observed in recent years on GB this may be a concern.

Since sector vessels will have their catches controlled by a hard TAC, there is no need for DAS restrictions to limit groundfish catches.

The Proposed Action authorizes the use of a six-inch mesh codend when sector vessels fish with selective trawl gear. This will facilitate targeting haddock by sector vessels. This may result in sector vessels catching haddock of a smaller size than common pool vessels. These impacts are difficult to predict, as mesh size is only one element that bears on the selectivity of the fishery. If sectors catch smaller fish, and account for a large proportion of the catch, over the long-term this could result in changes to the composition of the stock and possible modifications to status determination criteria. Since fishing mortality is based on the number offish killed, it could also mean that sectors account for a larger percentage of fishing mortality on haddock than is expected based on the quota (ACE) allocated to sectors.

The Proposed Action automatically exempts sector vessels from some of the rolling closures in the GOM. Sectors are exempted from the offshore rolling closure areas in April, the May rolling closure in the Massachusetts Bay area (blocks 124/125) and east of the WGOM closed area, a portion of the June closure extending into the GOM, and the October/November closures of blocks 124 and 125. The biological impacts of this exemption are difficult to predict. When first adopted in FW 25 (NEFMC 1997) the rolling closures were adopted primarily to reduce catches of GOM cod. While not cited in the documents establishing the closures many believe that the timing and areas were intended to reduce fishing activity on cod spawning aggregations. Over the years the closure areas were modified numerous times, most recently in Amendment 13. The Amendment 13 closures were designed to reduce fishing mortality on several groundfish stocks and did not explicitly consider spawning activity.

To the extent the exemptions proposed reflect periods when cod are aggregated (whether for spawning or other reasons), the catch rates by sector vessels may be higher than at other times of the years. Since sector catches are limited by a hard TAC this exemption should not have impacts on fishing mortality. Fishing on spawning aggregations may have impacts beyond those on fishing mortality. Thompson (pers. com.) summarized these in a letter to the Council as follows:

- Fishing activity may disrupt spawning signals and thereby reduce spawning success (Rountree et al. 2006);
- Fishing activity may disturb spawning habitat or habitat essential for early life history stages;

- Spawning fish are stressed and may be less able to survive handling, or capture may reduce egg production, even if fish are released (Taylor et al. 2001);
- Fishing increases mortality which reduces the number of older fish spawning. This may have adverse impacts as there is evidence (at least for cod) that first time spawners perform poorly compared to repeat spawners (Trippel, 1998).

Within the areas of the exemption, there is general information on spawning activity for several stocks. Table 177 summarizes the spawning periods for regulated groundfish in the GOM. According to Lough (2004), cod spawning in the GOM occurs from winter through spring but the time of peak spawning varies with location. Spawning in Massachusetts Bay peaks in January and February, north of Cape Ann it peaks between February and April, and off the coast of Maine it peaks between March and May. Generally, sector vessels are not automatically exempted from closures that overlap these cod spawning periods, though this is further explored below. The extended spawning periods for many groundfish stocks mean it is possible that the areas that are open to sector vessels may include spawning fish. If so, then approving this option may lead to the effects that are described in the previous paragraph. Of particular interest are the peak spawning periods for American plaice and GOM haddock. American plaice maximum spawning occurs in the western Gulf of Maine, with peak spawning in April and May. They are batch spawners, releasing eggs every few days over the spawning period; nursery areas are found in coastal waters of the GOM (Johnson, 2004). Peak spawning for GOM haddock occurs between February and April; Jeffreys Ledge and Stellwagen Bank are the primary spawning sites (Brodziak 2005). Sector a vessel access to the inshore GOM could have impacts on spawning activity of these two stocks.

Recent cod tagging studies provided additional information on cod spawning activity in the inshore GOM, including the areas and times of the rolling closures. Howell et al. (2008) reported a mark and recapture study of cod in the GOM, particularly related to the closed areas. Seasonal changes in abundance in the inshore areas were noted and these seemed consistent with spawning activity. In block 133, two peaks in abundance were observed: November-January and April – July, suggesting two distinct spawning populations. They concluded that the closure of block 124 in April, May, and November seemed appropriate to protect spawning fish, as did the closure of block 133 in April and May but possibly not June. The proposed exemption will allow sector vessels to fish in block 124 in November and May, reducing protection for spawning fish.

Selecting this option will not have direct impacts on non-groundfish stocks.

spawning months

peak spawning months

Species	January	February	March	April	May	June	July	August	September	October	November	December	Notes
American Plaice,GM													Berrien and Sibunka 1999
GOM Atlantic Cod													
Atlantic Halibut													Atlantic Canada waters
GOM Haddock													
Northern Ocean Pout													
Pollock													
Redfish													*copulation from Oct-Jan; fertilization from Feb-April; no peak times evident
GB-GOM White Hake													*no peak times evident
GB Windowpane													
GOM Winter Flounder													
GB-GOM Witch Flounder													
CC-GOM Yellowtail Flounder													

Table 177 - Spawning periods for GOM regulated groundfish. (Source: Essential Fish Habitat source documents)

7.2.1.2.3.7 Movement Between Sectors

This measure is primarily administrative and is not expected to have measureable impacts on fishing mortality. No changes were made to this provision – the No Action alternative was selected.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.4 Reporting Requirements

This action proposes several modifications to reporting requirements. While none of these requirements would be expected to have direct biological impacts, to the extent that they improve the data collected for the fishery the assessment and consequently the management of the stocks should improve. Specific measures are addressed and the improvements expected are described. Note that this discussion does not include those measures specifically designed to improve monitoring of sectors.

7.2.1.2.4.1 Option 2 – Area-Specific Reporting Requirements

Many groundfish species are assessed and monitored based on stock units that are based on geographic areas. In order to assess these stocks, the catch data must be accurately assigned to the correct stock area. The current system relies on an after-the-fact matching of catch locations reported on Vessel Trip Reports (VTRs) to the landings information in the dealer database. Since VTRs do not have to be submitted until 14 days after the end of the month (though this may change in the future), and dealer reports are submitted weekly, there is a time lag before the dealer catch can be assigned to a stock area. This makes timely monitoring of the proposed ACLs difficult.

In addition, two separate papers have examined the accuracy of the VTR catch locations and found it wanting (Palmer and Wigley 2007; Nies and Applegate 2007). Errors were found primarily in trips that fish in multiple statistical areas on the same trip. Both papers noted that for small stocks the errors could be important, though for stocks with larger catches the errors were minor. The importance of the errors also depended on how the data are used. Errors were smaller and thus not as important when assigning catch to stock area, but became more of a concern when catch is assigned to smaller geographic areas.

This option should improve both the timeliness and accuracy of position information that is available for quota monitoring. Because vessel operators will be required to notify NMFS of the areas fished, and this information will be linked to VTRs and dealer reports, more timely assignment of catches to stock areas will occur in the ACL monitoring process. As a result, depending on the AM that is selected, it is less likely that catches will exceed an ACL and approach an overfishing level. Even if in-season AMs are not adopted for this fishery, this measure will allow a more timely evaluation of catches that will facilitate implementing the AM at the beginning of the next fishing year.

Another possible benefit of this measure is that it may improve the accuracy of VTRs. Since there will be a data source that reports fishing locations more frequently than VTRs, this can be used to evaluate VTR accuracy and identify operators that may not be reporting correctly. Improving the accuracy of VTR locations will improve the assignment of catch to stock area. Improvements in data collection could provide more accurate stock assessments as a result.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.4.2 Option 3 – Accounting for Discards by Non-Sector Vessels

This option provides mechanism to estimate discards in a timely fashion. This allows for a more accurate assessment of catches while monitoring ACLs. This makes it less likely that ACLs will be exceeded and overfishing will occur.

Two sub-options were considered for determining the discard rate that is applied to each trip. The Proposed Action (Sub-option B) uses a discard rate based on the previous year's fishing activity if sufficient data is not available to calculate an in-season rate. The two advantages to this approach are that the discard rates will be more current (no more than a year old) and will be based on non-sector fishing activity. This should provide a more accurate estimate of discards, assuming observer coverage of non-sector vessels is sufficient to provide a reasonable degree of precision. The most accurate rates will be when sufficient data is available in-season to use an in-season rate, which this option also allows.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.5 Commercial and Recreational Allocation for Certain Stocks

This action proposes a specific allocation to the commercial and recreational components of the fishery (Option 2). Various time periods and stocks are considered for the allocation – while selecting a specific stock determines which stocks may have biological impacts as a result of an allocation, the different time periods are not expected to have direct impacts.

Establishing an allocation may provide for more effective management of fishing mortality. Since each component will be responsible for a specific amount of the catch, management measures can be designed to more effectively prevent overfishing. At present, no such distinction is made and when reductions in fishing mortality are necessary, management measures are designed that attempt to proportionally reduce fishing mortality on each component. While if effective this should result in achieving mortality targets, this approach makes it difficult to isolate whether any mortality overages are the responsibility of a particular component. An allocation will minimize this problem, but will complicate the design of measures as mortality changes needed will be calculated for each component.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.1.2.6 Changes to the DAS Transfer and Leasing Programs

7.2.1.2.6.1 DAS Transfer Program Conservation Tax Change

This action modifies the DAS transfer program by removing the conservation tax on DAS transfers (Option 2). The DAS transfer program was originally implemented in Amendment 13 to promote consolidation in the groundfish fishery and to remove the potential redirection of effort into other fisheries. The conservation tax was imposed to obtain some additional conservation and removal of excess DAS. Since its inception the transfer program has undergone two changes which lowered the conservation tax from 40 to 20 percent in 2005 and in 2006 allowed purchasing vessels to acquire non-duplicate permits from the seller. To date, participation in the DAS Transfer Program has been limited but increased between FY 2006 and FY 2007. There were only 13 transactions during 2006 and 2007, making it difficult to draw any inferences regarding trends or impacts. Nevertheless, the increase in transfers occurred after the program was modified in 2006 to allow acquisition of permits from the seller, while there was little or no response to the reduction in the transfer tax in 2005. If the ability to acquire additional permits was the key factor making DAS transfers financially attractive, then removing the transfer tax may not result in any notable increase in transfer activity. However, elimination of the transfer tax may increase participation in the program if the tax was a disincentive. Eliminating the transfer tax could effectively increase the current DAS allocations and increase the number of DAS that the vessel may lease. It is difficult to predict participation in this voluntary program. To date, nearly all DAS transferred under the program have been among vessels in the states of Maine, New Hampshire, and Massachusetts. Therefore, groundfish species within the GOM will likely be most affected by the Proposed Action.

In general, removal of the conservation tax would make the biological impact of DAS transfer on groundfish no different than if the DAS were acquired through a lease. The DAS reductions may result in a shortage of DAS which means that the biological impacts of expanded use of the DAS transfer program may be expected to be limited. The scale of impacts to fishing mortality is dependent upon the number of transfers that result from this Proposed Action as well as where participating vessels fish. Further, it is likely that a major constraint that limits DAS transfers for individual vessel owners (i.e., cost) will continue to limit the effort associated with DAS transfers. The extent to which eliminating the conservation tax increases participation in the program may result in positive biological impacts on other fisheries since at least some limited access permits would be eliminated.

This measure considered two sub-options for the treatment of permits that have already participated in the transfer program and were subject to the conservation tax. The Proposed Action adopts sub-option A and does not return any DAS to permits that participated in the DAS transfer program before adoption of this measure

Impacts on Other Species

If participation in the DAS transfer program increases as a result of this option being adopted, there may be some reductions in the number of permits in other limited access fisheries. This could result in reduced mortality in those fisheries as long as the remaining permit does not fish harder than the permit that is terminated. This could result in reduced landings of monkfish, for example. The impacts on species caught in open-access fisheries – primarily skates and spiny dogfish – are less clear.

7.2.1.2.6.2 Eligibility of Permits in the CPH Category to Participate in the Transfer and Leasing Programs

This action proposes to allow permits on the CPH (permit history) category to participate in the DAS transfer and leasing programs. In theory this change should have no impact on fishing mortality. Any permit that is in this category can be reactivated by placing it on a skiff, and then the DAS can be transferred in either the leasing or transfer programs. While this is an administrative burden for a permit holder, the reality is that the existing prohibition is not absolute as nothing prevents a permit from being reactivated. In practice, however, the number of permits in the CPH category indicates that not all permit holders are willing to bear the administrative burden for the relatively small returns they may get from leasing, and so a small, fluctuating number of DAS have remained unavailable to the fishery. By removing the need for a permit holder to activate a permit before participating in the DAS leasing program, the expectation is that more DAS will be available to the leasing market and this could result in a marginal increase in fishing mortality when compared to the No Action alternative.

7.2.1.2.6.3 Removal of the DAS Leasing Cap

The Proposed Action removes the cap on the number of DAS that can be leased by a permit. Amendment 13 limited the DAS that could be used by a vessel to its baseline allocation plus the number of Category A DAS allocated prior to Amendment 13. With the reduction in DAS adopted in this action, many permits would have been limited to a maximum of 112 days or fewer. In order to fish more days than that, a permit holder would need to operate a second vessel, with the additional costs involved.

From a biological standpoint, removing the cap on the number of DAS that a permit can lease would be expected to increase fishing mortality. Removing the cap reduces the costs for a permit holder that wants to fish additional DAS. No longer is it necessary to maintain and operate two vessels in order to fish as many DAS as a permit holder can afford to acquire. Since participating in the leasing program may lower costs, this could result in more DAS being exchanged and used in the fishery.

An additional complication is that this change may modify the distribution of leased DAS. The management measures for the non-sector vessels were designed using the CAM. The model included leasing activity that was observed during the years used for the input data. But leasing activity in those years was subject to a cap. If the patterns of leasing activity change as a result of this measure then the model assumptions will not be valid. The impact of this measure is that it makes it less certain that the management measures will achieve the changes in fishing mortality estimated by the CAM. This may increase the chance that desired fishing mortality rates will be exceeded.

The 50 percent reduction in Category A DAS, however, means there are not enough DAS available for many vessels to exceed the leasing cap limits. With about 20,000 allocated DAS (excluding carry-over DAS), there are only enough DAS available for 178 permits to use 112 DAS. The limited number of DAS available means that while the CAM assumption has been violated, the consequences for estimating the biological impacts of effort controls may not be large.

Impacts on Other Species

If participation in the DAS leasing program increases as a result of this option being adopted, there may be impacts on other species. The impacts will depend on how leasing activity changes. For example, this measure could result in more DAS being used to target monkfish in the Northern Monkfish Management Area. The likely changes are impossible to predict. The impacts on species caught in open-access fisheries – primarily skates and spiny dogfish – are less clear.

7.2.1.2.7 Special Management Programs

7.2.1.2.7.1 Closed Area I Hook Gear Haddock SAP

The proposed expansion of the season and area for the SAP (Option 2) are designed to increase catches of GB haddock by hook gear. As a result, mortality of GB haddock is expected to increase. Because the total catches of the target species are limited by TAC that is based on the available exploitable biomass, this SAP is not expected to result in overfishing of GB haddock.

Longline gear also catches other species. Two stocks of interest in this area are GB cod and white hake, both subject to formal rebuilding plans. The catch of GB cod species by non-sector vessels in the SAP is limited by incidental catch TACs, while any catches of either species by sector vessels will count against sector ACE. While white hake catches by non-sector vessels are not limited by an incidental catch TAC, experimental results show few interactions with white hake. For these reasons expansion of the SAP is not expected to result in overfishing for these two stocks.

Further evidence that the expansion of the SAP will not be harmful to GB cod or white hake can be determined by a review of longline experiments conducted from 2003 – 2005 that tested selectively targeting haddock using specific baits. Correia (2008, Appendix III) explored these issues in depth and this report forms the basis for the following discussion. He noted that the use of the data from these experiments to examine the impacts of expansion of the SAP is subject to several limitations. Analysis and interpretation of the data suffer because the sampling design was not specifically developed to evaluate the SAPs expansion in time and space. Observed sets were not randomly distributed (see Figure 127). There are temporal limitations for the availability of the data and sets were not observed throughout the proposed time period: no sets were observed in January, there is only one sample in August, and there are low numbers of samples in May and July. The baits tested by area were heterogonous, particularly with respect to squid. These caveats should be considered when reviewing the following discussion.

Using a trimmed data set and combining all baits and years, Correia (2008) concluded that catch rates for haddock were similar in both the existing area and the proposed area for all months except for May and June, where haddock catch rates may be higher. Catch rates for cod and haddock were not higher in the proposed area than the current area in any month. The ratios of cod:haddock kept and white hake:haddock kept were less than 5 percent both in the current and proposed areas, and differences between the areas were not statistically different (Table 178).

Based on the analyses of these data, the expansion for the area in time and space is not expected to result in increased catch rates of GB cod and white hake. It is likely that the number of trips to the area will increase, and catches of GB cod and white hake in the area will increase as a result, but the limitations of incidental catch TACs for non-sector vessels and ACE for sector vessels will prevent any increases from threatening mortality targets. Caution should be exercised when applying these conclusions to months or areas that wee not sampled.

Option 2 also modifies provisions that govern the participation of sector and non-sector vessels in the SAP. These are not expected to affect fishing mortality.

Impacts on Other Species

Expanding the SAP in time and area may attract more fishing effort to the SAP. Skates of various species, monkfish, and spiny dogfish are frequently caught on trips using longlines and were caught on all trips in an experimental fishery used to evaluate the original SAP (see NEFMC 2004). Expanding opportunities for non-sector vessels to participate in this SAP may increase the number of Category B DAS used and result in increased catches and mortality for these species.

This could be an issue for the skate stocks that are overfished and subject to rebuilding plans. In the case of sector vessels, the SAP may not provide increased fishing opportunities since the sectors will be limited by their catch of groundfish stocks whether caught inside or outside of the SAP.

Figure 127 - Location of hauls used in the bait selectivity study (Figure provided by Cape Cod Commercial Hook Fisherman's Association). This represents haul locations in the full dataset. From Correia (2008).

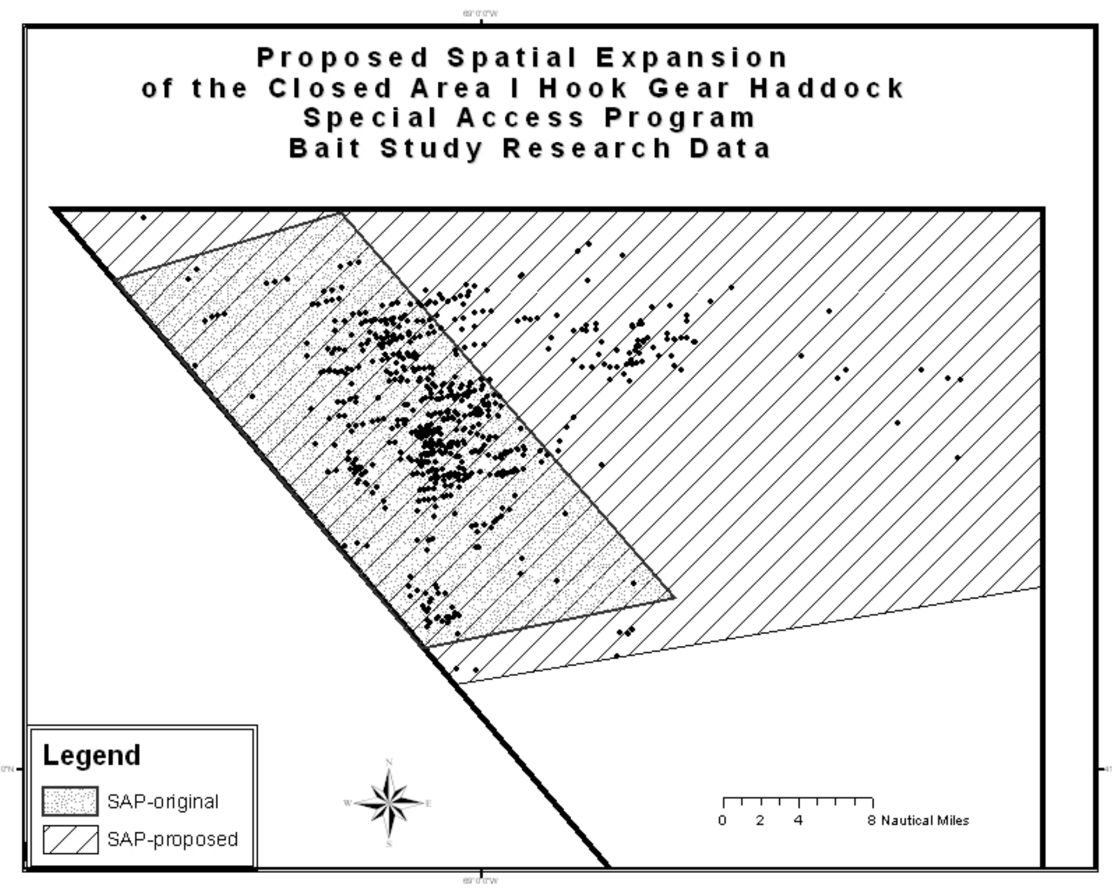


Table 178 - Ratio estimators of total white hake: haddock kept and total cod: haddock kept., Jackknife standard error (SE) and bias (in standard error units), and 95% confidence limits using the Percentile method (1000 bootstrap replications) and the Bias Corrected and Accelerated method (BCa) using 10,000 replications. From Correia (2008)

Species	Area	Ratio estimator (CV)	Jackknife SE	Jackknife bias (SE units)	95% CL percentile method		95% CL BCa method	
Total white hake	Inside	0.013 (12.3%)	0.0016	0.013	0.010	0.016	0.010	0.016
	Proposed	0.013 (18.2%)	0.0024	0.004	0.009	0.018	0.009	0.019
Total cod	Inside	0.021 (13.2%)	0.0027	0.012	0.016	0.026	0.016	0.027
	Proposed	0.014 (18.7%)	0.0026	0.016	0.009	0.019	0.010	0.020

For decades, the closed areas on Georges Bank - including CA I - have been recognized as important to groundfish spawning, particularly for cod, haddock, and yellowtail flounder. The two areas were first established as seasonal spawning closures under ICNAF. They continued to be used as spawning closures – primarily to protect cod and haddock - under the groundfish plan until they became year round closed areas in 1994. Prior to their establishment as year round closed areas, however, scallop dredge fishing was allowed in the seasonal spawning closures. Closed area access programs since 1997 limited scallop dredge access to periods outside of peak spawning periods, and a similar restriction was recently submitted by the Council in Scallop Framework Adjustment 16.

Observed spawning periods are described in the Essential Fish Habitat source documents for each species. For many species, there is a wide range of possible spawning months, but there is also a distinct peak when most spawning activity occurs. The general pattern is for spawning to occur in the southern part of the range for a species earlier in the year, and then move north. For most groundfish species, spawning takes place during the first half of the calendar year. Peak spawning for witch flounder and yellowtail flounder is in the middle of the year. Peak spawning for ocean pout occurs in the fall, while for Atlantic halibut it occurs in November and December.

Spawning periods for groundfish stocks were summarized in FW 40B (NEFMC 2004b). GB cod spawning occurs from October through June, with peak spawning activity in February and March. GB haddock spawning occurs from January through June, with peak periods in March and April. The proposed expansion of the season for this SAP includes spawning months for both of these stocks but avoids the peak spawning months that have been identified. This is less of a concern for GB cod given the low catch rates expected.

7.2.1.2.7.2 Eastern U.S./Canada Haddock SAP

This SAP provides an opportunity to use Category B DAS, and to fish in part of CAII, to target GB haddock in the Eastern U.S./Canada area. Authorization for the SAPA expires on April 30, 2008, though a proposed interim rule is considering a temporary extension.

The Proposed Action (Option 2) extends this SAP indefinitely. Catches for GB haddock might increase compared to Option 1, but if recent experience is any guide this is likely to be a marginal increase as few vessels have taken the opportunity to use the SAP. Catches in the SAP apply against the Eastern U.S./Canada haddock TAC and thus the catches are unlikely to result in overfishing for this stock. Even though the SAP requires use of gear designed to avoid cod and other stocks of concern, extending the SAP may increase discards of GB cod since there is evidence the gear does not work as well in the commercial fishery as in experiments (see section 6.2.3.6). Catches of GB cod in the SAP apply against the Eastern U.S./Canada GB cod TAC and thus the catches are unlikely to result in overfishing for this stock.

Selecting this option will not have direct impacts on non-groundfish stocks. The gear used in the SAP is designed to avoid monkfish and skates.

7.2.1.2.7.3 CA II Yellowtail Flounder SAP

The Proposed Action (Option 2) modifies this SAP so that access to CAII is allowed to access GB haddock. In years when the SAP is open to target GB yellowtail flounder the rules for the SAP remain the same as adopted by Amendment 13 and modified by subsequent frameworks.

The SAP includes limits on the number of trips, gear requirements, and number of trips that can be taken each month; vessels would be subject to all of these provisions until the SAP is closed to fishing for GB yellowtail flounder. The biological impacts would be the same as previously described, and would be the same as the No Action alternative. When the SAP is not open to target GB yellowtail, either because of a lack of availability of GB yellowtail flounder or because the SAP was closed because the number of trips allowed is reached, the regulations may be modified so that the SAP was open from August 1 – January 31 to target GB haddock. Catches of GB haddock from the SAP apply against the Eastern U.S./Canada haddock TAC and as a result the area would be closed if the TAC is achieved. For this reason the SAP is not expected to result in overfishing of the eastern component of GB haddock, and would not lead to overfishing of the entire stock. Current regulations that implemented Amendment 13, however, include a provision that allows fishing in this SAP even if the TAC for EGB cod or GB yellowtail founder is caught. This creates a possibility that allowing the SAP to take place in these circumstances could lead to exceeding the U.S./Canada TAC for these stocks. This possibility can be avoided if NMFS exercises other regulatory authority by making in-season adjustments to the regulations to keep enough of these TACs available so that catches in the SAP do not exceed the TACs. This may prove difficult to do since the regulations also say such changes should give priority to fishing on a Category A DAS. This problem is likely to only occur for non-sector vessels if sector vessels receive specific allocations for this area.

Other species can be expected to be encountered when fishing in this area. The only year the CAII SAP has been open was in FY 2004. Measures in effect allowed the use of a flounder net, and the purpose of the trips was to target yellowtail flounder. Appendix II of FW 42 summarized catches and revenues for 307 identified trips in the SAP; information below is taken from that report. Table 179 shows that the majority of the kept catch in the SAP was yellowtail flounder, haddock, skates, winter flounder, or monkfish. During years when the SAP is open for targeting yellowtail flounder the kept catch composition is likely to be similar to that shown here.

When the SAP is not open for targeting yellowtail flounder gear requirements are imposed that are designed to minimize the catches of cod, flounders, skates, and other bottom-dwelling species. These gears include the haddock separator trawl, the Ruhle trawl, and longline gear. These gears are expected to dramatically reduce the catches of these species. Table 181 summarizes the performance of the proposed trawl gear configurations in experimental fisheries, while section 6.2.3.6 summarizes observed performance of the separator trawl in the commercial fishery. While experimental performance of these gears documents large reductions in catches of flounders, the experience in the commercial fishery has not been as impressive. Table 93 summarizes observed ratios of haddock to cod, skates, yellowtail flounder, and winter flounder on observed tows using a separator trawl. There were dramatic improvements in the ratios in 2007, but prior to this year the ratios were on the order of 5:1 for cod, yellowtail flounder, winter flounder, and monkfish. There aren't any observed trips using the Ruhle trawl or five-point trawl in the commercial fishery for comparison to the experimental data.

While the gear requirements may drastically reduce catches of species other than haddock, it is not likely to eliminate them and the gear may not perform as well in the fishery as in experiments. Catches of GB yellowtail flounder in the SAP are also controlled by the GB yellowtail flounder U.S./Canada area TAC so any SAP catches will not contribute to overfishing this resource. Timing of the SAP may also reduce yellowtail flounder catches, as the experience during the SAP in 2004 was that discards of yellowtail flounder (primarily small fish) declined in July and August when compared to June – starting the haddock SAP in August may reduce yellowtail flounder encounters. Catches of other groundfish stocks by sector vessels will be limited by sector ACE and as a result will also not lead to overfishing the resource. Catches of other groundfish stocks by non-sector vessels are not expected to lead to overfishing because of the gear requirements in this SAP.

Impacts on Other Species

The proposed changes to the SAP are not likely to increase catches of skates, monkfish, and spiny dogfish. When the SAP was open in 2004 skates and monkfish were caught in the SAP area. The proposed revisions, however, require the use of trawl gear that if fished correctly is unlikely to catch skates or monkfish in appreciable quantities.

Table 179 - Pounds reported kept on 307 trips identified as CAII Yellowtail Flounder SAP Trips, FY 2004

	Month Landed				
SPPNAME	June	July	August	September	Total
BARNDOOR SKATE					
BLACK SEA BASS	1,325		100		1,425
BLUEFISH			110		110
CLEARNOSE SKATE WINGS			1,260		1,260
COD	17,782	6,163	2,766	20	26,731
CUSK			10		10
FLOUNDER, AMERICAN PLAICE /DAB	106,938	39,349	21,971	3,305	171,563
FLOUNDER, WINDOWPANE	125	30	70		225
FLOUNDER, SPECIES NOT SPECIFIED		2,870			2,870
FLOUNDER, SUMMER / FLUKE	2,382	2,419	5,250	2,545	12,596
FLOUNDER, WINTER / BLACKBACK	295,096	110,383	161,111	55,690	622,280
FLOUNDER, WITCH / GRAY SOLE	118,228	70,375	37,604	300	226,507
FLOUNDER, YELLOWTAIL	2,816,400	2,810,365	2,255,008	194,205	8,075,978
HADDOCK	594,479	415,645	31,690	269	1,042,083
HAKE, MIX RED / WHITE, ROUND	8	5			13
HAKE, RED / LING	560	240			800
HAKE, SILVER / WHITING		80	2,978		3,058
HAKE, WHITE	50	10	5		65
HALIBUT, ATLANTIC	185				185
LITTLE SKATE					
LITTLE SKATE WINGS	4,385				4,385
LOBSTER, AMERICAN	16,404	73,083	49,813	19,996	159,296
MACKEREL, ATLANTIC		400			400
MONK LIVERS	955		665	600	2,220
MONK TAILS	46,859	40,589	36,190	20,870	144,508
MONKFISH / ANGLERFISH /	32,884	41,501	33,740	17,715	125,840
POLLOCK	129	30	8,685		8,844
REDFISH / OCEAN PERCH		5,500	5,200		10,700
SCALLOP, SEA	48,146	27,527	23,902	5,931	105,506
SCALLOPS/SHELLS		400			400
SCUP / PORGY	200				200
SHARK, PORBEAGLE			150		150
SKATE UNCLASSIFIED	279,340	93,455	79,730	39,625	492,150
SKATE WINGS UNCLASSIFIED	78,301	68,375	48,586	37,050	232,312
SQUID / ILLEX		280			280
SQUID / LOLIGO			50		50
STARFISH	20,200				20,200
WINTER SKATE					
WINTER SKATE WINGS	3,850	4,050	1,285	6,875	16,060
WOLFFISH / OCEAN CATFISH	10		75		85
Grand Total	4,485,221	3,813,124	2,808,004	404,996	11,511,345

7.2.1.2.7.4 SNE/MA Winter Flounder SAP

This action proposes to end this SAP, which allows landing up to 200 pounds of winter flounder without using a DAS on trips west of 72-30W longitude. This SAP was adopted by Amendment 13 and was designed to reduce the discards of winter flounder that occurred on fluke trips in this area. At the time of its adoption, the fishing mortality rate for this stock was expected to be lower than the rebuilding fishing mortality. The low levels of catch allowed were not expected to increase targeting of SNE/MA winter flounder. Since its adoption the need to reduce SNE/MA winter flounder fishing mortality to as close to 0 as possible makes this SAP inconsistent with rebuilding goals.

Because SAP trips are not specifically identified in the available databases, the magnitude of participation in this SAP is unknown. Data used to estimate the economic impacts of the SAP (see section 7.5.1.2.7.4) identified trips that met the criteria of this program landed less than 85,000 pounds of winter flounder in each year from CY 2003 through CY 2007. This is less than 3 percent of the recent commercial landings for this stock and is about one percent of total removals. Under the No Action option, these catches would likely continue.

Prohibiting this SAP, however, is not likely to reduce removals of winter flounder by this percentage. As shown in section 7.5.1.2.7.4, winter flounder revenues are only a small portion of the revenues on the trips that met the SAP criteria. It is likely that the result of this measure is that these winter flounder will be discarded rather than landed. The assessment assumes a fifty percent survival rate for trawl-caught winter flounder. At best, this measure may reduce winter flounder removals by less than one percent. While eliminating the SAP technically reduces fishing mortality the results will not be measureable.

Recent commercial discards for this stock have ranged from 100-150 mt. A 20 mt increase in commercial discard mortality as a result of this measure represents a 13 – 20 percent increase in commercial discards. While this appears to be a large relative increase, it is likely to be dwarfed by other proposed measures that prohibit retention of SNE/MA winter flounder.

Selecting this option will not have direct impacts on non-groundfish stocks. Fishing activity is not likely to change in ways that will change catches of skates, monkfish, or spiny dogfish.

7.2.1.2.7.5 Category B (regular) DAS Program

The Proposed Action (Option 2) modifies the Category B (regular) DAS program to eliminate the opportunity to use the program to target pollock. Pollock catches in this program were approximately 550 mt in CY 2007 (see section 6.2.3.5) and are estimated at 770 mt in CY 2008 (Daniel Caless, NMFS NERO, 2009 pers comm.). Eliminating the ability to target pollock in this program will reduce pollock fishing mortality and the reductions necessary from the Category A DAS measures. In 2008, the pollock catch on this program was 9 percent of the U.S. catch. Eliminating the ability to target pollock in this program means that the effort controls – which are based on Category A DAS – must achieve 91 percent of the necessary change in exploitation, or a reduction of 53 percent.

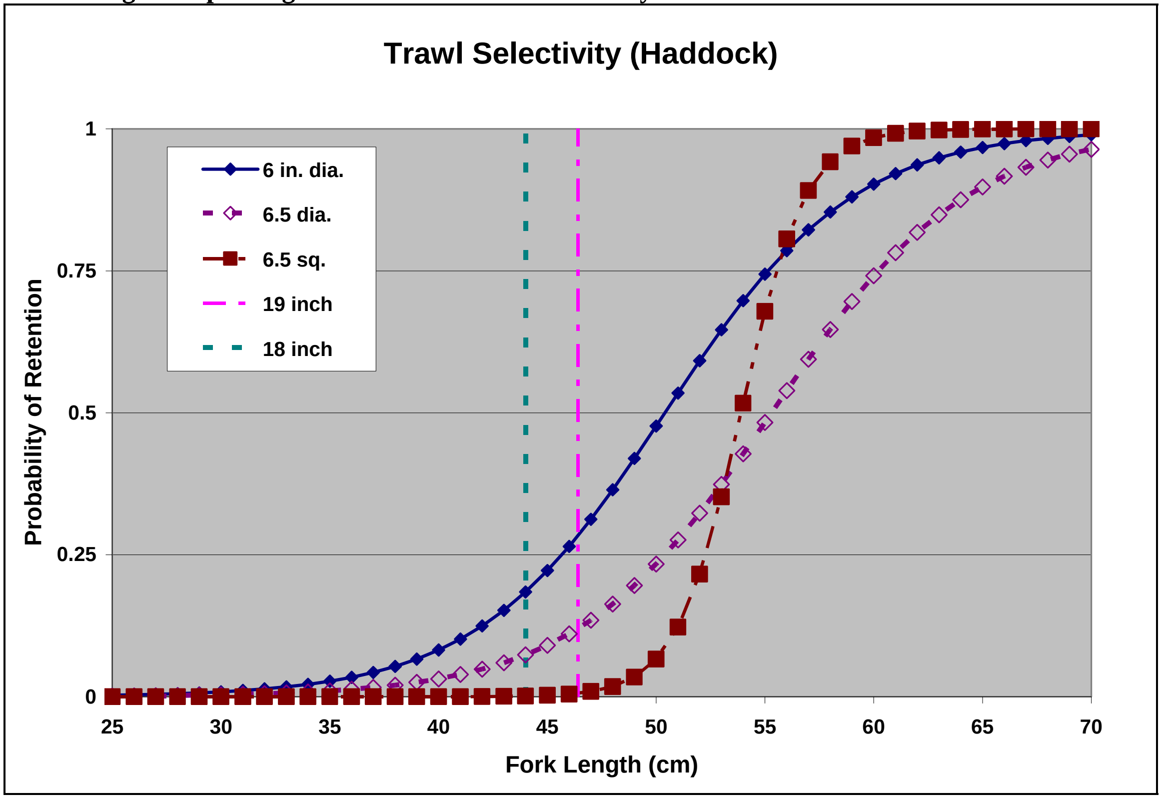
Another modification to the program allows the use of a six-inch diamond or square codend while using the required selective trawl gear (separator trawl, Ruhle trawl, or other approved trawl). This will facilitate the targeting of haddock in the program. Recent mesh experiments have demonstrated that a 6.5 inch diamond or square mesh codend is not an efficient way to catch haddock (He et al 2005; Figure 128). The ineffectiveness of this mesh has been exacerbated by the slow growth of the 2003 year class of haddock. As a result, considerable haddock yield has been inaccessible to U.S. fishermen. Allowing the use of a smaller mesh codend will increase catches of haddock. This may result increased targeting of this stock if it makes trips more profitable. The likely result is that the fishing mortality for haddock will increase. While there is room for considerable growth in GB haddock catches, there is room for only a relatively small increase in GOM haddock catches. Program reporting and monitoring requirements allow NMFS to adopt in-season measures if necessary to limit GOM haddock catches.

Reducing the minimum mesh size for codends will likely result in retention of some fish smaller than the current 19 inch minimum size or the proposed 18 inch minimum size. Approximately 25 percent of 19 inch fish encountering the gear are expected to be retained in 6 inch diamond mesh, while approximately 20 percent of 18 inch fish would be retained by the same mesh. This is roughly twice the percentage offish at either size that would be expected to be retained by 6.5 inch diamond mesh. This will result in increased discards compared to the current mesh requirements at either minimum size. While not plotted here, discards would be lower in 6 inch square mesh than in 6 inch diamond mesh.

The change in mesh size is not expected to have increase fishing mortality on most other groundfish species. First, the selective gear used in the program is designed to avoid most stocks that need reductions in fishing mortality, such as cod, yellowtail flounder, winter flounder, and skates. This is not the case for pollock; the selective gear used in this program does not reduce pollock catches. Indeed, section 6.2.3.5 and 6.2.3.6 present information that suggests that the haddock separator trawl (one of the authorized trawl configurations) has been used to target pollock. As it result, it should not be expected that the gear will exclude pollock, and there may be a marginal increase in pollock catch rates because of the use of the smaller mesh codend. Second, the catches of groundfish species in this program are limited by an incidental catch TAC. This incidental catch TAC for pollock is the control that is likely to prevent the program from increasing pollock mortality.

Selecting this option will not have direct impacts on non-groundfish stocks. Fishing activity is not likely to change in ways that will change catches of skates, monkfish, or spiny dogfish.

Figure 128 – Trawl selectivity for haddock (based on He at al 2005). Note minimum size is converted to fork length for plotting to be consistent with selectivity curve.



7.2.1.2.8 Periodic Adjustment Process

The proposed changes to the periodic adjustment process are administrative measures and are not expected to have direct biological impacts on either groundfish or non-groundfish species. The impacts are similar to the No Action alternative.

7.2.1.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

The impacts of this measure on groundfish fishing mortality are unclear. The measure does not create additional groundfish effort: the pool of available groundfish DAS remains the same. At present, however, a large number of the allocated DAS are not used. If this measures results in scallop vessels acquiring groundfish permits, using the attached DAS, and increasing the percentage of DAS that are used, then fishing mortality might increase on groundfish stocks. While the design of effort controls is based on the number of allocated DAS, the input data for the CAM is based in part on recent fishing activity and if this measure results in changes to that activity model impacts are less certain.

There may also be distributional effects that are difficult to estimate. Many scallop vessels fish out of southern New England or Mid-Atlantic ports. If these vessels acquire groundfish permits and change the area where the accompanying groundfish DAS are fished, fishing mortality rates could be affected. The analysis in section 7.5.1.2.9 indicates that this measure may result in a transfer of groundfish permits from New England states to mid-Atlantic states. If this occurs there may be a shift in fishing effort away from the GOM to the GB and SNE areas. But such an effort shift is not easy to predict. Scallop fishing is managed through a rotational management system. It could be that mid-Atlantic based scallop fishing vessels that acquire a groundfish permit may only fish on groundfish when scallop management areas on GB are open. They may take advantage of the groundfish permit only when scallop activity takes them to the region where groundfish are abundant. These possible shifts in groundfish fishing effort could not be included in the CAM.

Complicating this picture, however, is that it is unclear how vessel owners will react to this measure. For example, if a groundfish vessel owner acquires a scallop permit and as a result spends less time groundfish fishing, groundfish fishing mortality may be reduced. The same could be true if a scallop vessel owner acquired a groundfish permit and does not fish as hard as the prior owner, or targets different stocks.

Impacts on Other Species

It is difficult to predict the impacts of this measure on skates, monkfish, and spiny dogfish. Skates and monkfish are caught by both groundfish and scallop gear. Allowing a vessel to possess both a scallop and groundfish permit may result in fewer vessels as permits are consolidated on one vessel. Whether this results in increased or decreased catches of the non-groundfish species depends on the fishing activity of the permits before they are combined compared to activity after they are combined.

7.2.1.2.10 Catch History

This measure prevents catch history from accruing after implementation of Amendment 16. This is an administrative measure and is not expected to have direct impacts on fishing mortality.

7.2.1.3 Measures to Meet Mortality Objectives

This section addresses the biological impacts of a series of proposed management measures that are intended to control fishing mortality. There are three broad categories: commercial measures, recreational measures, and measures that apply to both components of the fishery. The commercial category includes effort control alternatives for non-sector vessels, implementation of additional sectors, and accountability measures. Within the recreational category are specific measures to control recreational harvest and accountability measures. Both components would be subject to a change in the minimum size for Atlantic halibut and a prohibition on retaining Atlantic wolffish.

7.2.1.3.1 Commercial Fishery Measures

7.2.1.3.1.1 Option 3A – 24 – Hour Clock and Restricted Gear Areas

Impacts on Groundfish Species

Option 3A changes the way DAS are counted. All DAS on all trips are counted as a 24-hour day, rather than by the minute as under existing regulations. In addition, this option reduces Category A DAS allocations, adjusts trip limits for most stocks, and adopts restricted gear areas. Analysis in the CAM suggests this alternative will achieve at least the targeted mortality reductions for all stocks with the exception of SNE/MA winter flounder and Northern windowpane flounder. Indeed, with the additional exception of SNE/MA yellowtail flounder, the CAM results show that the expected exploitation reductions will far exceed those required to achieve the mortality targets. The CAM results may not fully capture the mortality reductions for these stocks. In the case of Northern windowpane flounder, most of the catch is discarded. This limits the data available to the CAM and thus may not completely capture the changes in exploitation that will result.

Although the model results indicate that the reduction in exploitation of the northern stock of windowpane flounder would not be sufficient to bring the fishing mortality down to a theoretical Freb, the CAM indicates that exploitation will be reduced about 86 percent of that necessary to achieve the rebuilding target. In contrast to many other stocks in the complex, this stock is principally a bycatch species, with landings representing only 12 % of the catch in calendar year 2007 (Catch: 1,032 mt, Landings: 119 mt; GARM III). Because this stock is principally a bycatch species with relatively low catch already, additional reductions in fishing exploitation may be very difficult to achieve through reductions in fishing effort. Since 2000, most of the landings have occurred in statistical area 525, south-central Georges Bank, and the bycatch of this stock is likely higher during winter and spring when the species is distributed across a broader area of Georges Bank. Most of the discards are in the large-mesh bottom trawl fishery. The prohibition of retention of windowpane north will eliminate landings and eliminate any incentive to target this stock. The GARM III report included these comments by reviewers that highlight the uncertainty over this projection: "Given that current catch is mostly incidental and also given the high uncertainty of index-based assessments, it was concluded that it was not appropriate to calculate Frebuild for this stock." This action does not adopt a specific Frebuild for this stock because of the scientific advice.

With respect to SNE/MA winter flounder the CAM indicates this option achieves a 67 percent reduction in exploitation when a 100 percent reduction is targeted. While some additional reduction may result from the elimination of the SNE/MA winter flounder SAP (section 7.2.1.2.7.4) this will not completely eliminate catches of this stock. Since winter flounder is caught in other fisheries (small mesh, fluke, and scallop) the only way to eliminate all exploitation on this stock is to prohibit all fishing in the stock area. The Council does not consider it reasonable to forfeit all yields from other stocks for a marginal shortening of the rebuilding program for this stock. A proposed interim action (*74 FR 2959*) considers closing an extensive area to the use of groundfish DAS. According to the supporting EA, that approach achieves only a marginal improvement in the reduction in exploitation (82 percent vice the 67percent shown here) and results in reduced yield from fisheries.

With respect to pollock, this action proposes to eliminate the ability to target pollock on a Category B DAS program. In 2008, pollock catches in the Category B DAS program were 9 percent of U.S. removals. These effort controls thus need to achieve 91 percent of the needed reduction for pollock, or a 66 percent reduction in exploitation.

The CAM model results also do not include the impacts of restricted gear areas and the gear requirements imposed for those areas. A number of experiments have tested the trawl gears proposed for these areas. The results are summarized in Table 181. Note that not all of the experiments have been subject to a peer review or published. Several of the gears show dramatic reductions in the catches of flounders and other bottom-dwelling species. These reductions would be in addition to the reductions estimated by the CAM. AS an example, the catches of SNE/MA winter flounder within the RGAs would be expected to be almost completely eliminated if the gear performs in the commercial fishery as well as it did in experiments.

In contrast to the No Action alternative, this option is likely to reduce discards of GOM and GB cod, CC/GOM yellowtail and SNE/MA yellowtail flounder, white hake, and GB winter flounder. The option either increases or removes trip limits for these stocks, which should reduce regulatory discards.

Table 180 – Option 3A changes in exploitation

Spec	AREA	Needed Difference	Option 3A Action % Difference
COD	GBANK	-50%	-54%
COD	GM	-37%	-52%
HADDOCK	GBANK	202%	-53%
HADDOCK	GM	24%	-54%
WINTER	GBANK	48%	-52%
WINTER	GM		-45%
WINTER	SNEMA	-100%	-67%
PLAICE	ALL	39%	-56%
WITCH	ALL	-46%	-56%
WHK	ALL	28%	-63%
WIND	NORTH		-59%
WIND	SOUTH		-61%
YTF	CCGOM	-34%	-57%
YTF	GBANK	-15%	-59%
YTF	SNEMA	-39%	-39%
POLLOCK	ALL	-66%	-61%
REDFISH	ALL	271%	-62%
WINDOWPANE	GOM/GB		-59%
WINDOWPANE	SNE/MA		-61%

Table 181 – Summary of gears proposed for restricted gear areas

Species	Separator Trawl	Eliminator/ RuhleTrawl	Five-Point Trawl	Raised Footrope Trawl	Tie-Down Gillnets	Rope Trawl
Number of Reports/Experiments/ Publications	5 (2 foreign, 3 U.S.)	1	1	?	None	1
Peer reviewed?	Yes	Yes	No	NA	NA	Yes
RSC Comments	(1) One experiment had design problems, serious report flaws (2) Second report was useful, thorough. Information provided "would add to the body of work on separator trawl as well as provide ancillary information that could be useful in management decision-making."	Report well done and organized; experiment successfully demonstrated a net design that allowed the harvest of haddock while reducing cod catches as well as the catch of other stocks of concern.	None	None	None	Report well-done; some concerns over skewed and variable data
Metric Presented	Expected Reduction	Experimental Catch/Control Catch	Experimental Catch/Control Catch			Expected Reduction
Cod	60% - 80%	0.19	0.42			61%
Haddock		*1.14 (NS)*	0.02			16%
Pollock	Small	*1.62 (NS)*				
White Hake	Large	0.08				
Witch Flounder	Large	0.07	0.05			97%
Plaice	Large	0.01	0.00			97%
Winter Flounder	97%	0.06	0.00			96%
Yellowtail Flounder	Large	0.10	0.01			99%
Windowpane Flounder		0.05	0.02			
Redfish						
Halibut						
Monkfish	99%	0.05	0.01			
Lobsters		0.12	0.02			
Skates	99%	0.01				

In addition to modifying effort controls for limited access fishing vessels, this option modifies the GOM cod trip limit for vessels with Handgear A (to 750 pounds) and Handgear B permits (to 200 pounds). These permit holders are allowed to use both handgear and tub-trawls. The only limits on fishing days are a requirement to not fish during a 20-day period in the spring. The period is selected by the permit holder and can be taken during a rolling closure. This increase in the trip limit is likely to increase fishing mortality from these permits. The Handgear A trip limit is nearly as large as the FW 42 trip limit for limited access vessels (800 pounds). As shown in 6.2.3.3.1, the number of Handgear B permits landing groundfish has increased and the landings of groundfish increased from 68,427 pounds in FY 2004 to over 150,000 pounds in FY 2007. The number of Handgear A permits landing groundfish declined from 44 in FY 2004 to 23 in FY 2007, and landings have fluctuated with a declining trend over the last four years. Even with this increases, these two permit categories only account for a small fraction of total groundfish landings.

While the Handgear A permit category is limited access, the Handgear B category is not. It is possible that the increases in trip limits will attract more effort to these two categories in the GOM. Some limited access permit holders that do not have any Category A DAS may even decide to relinquish their limited access permit and fish with a Handgear B permit, increasing fishing effort albeit with a relatively inefficient gear. While the CAM suggests that the limited access measures will exceed the needed reduction in exploitation and a small increase in handgear permit catches could be accommodated, catches will need to be monitored to ensure that mortality objectives are no threatened.

Impacts on Other Species
Because this option reduces groundfish DAS and changes the way DAS are counted, catches (both landings and discards) of skates, monkfish, and spiny dogfish while fishing on groundfish DAS would be expected to decline as compared to the No Action alternative. Counter-acting this tendency is that some vessel owners may choose to increase fishing activity in the open-access fisheries of skates and spiny dogfish to make up for lost groundfish revenue. There are only limited opportunities to catch these species outside the groundfish DAS system, though, so it is unlikely that the overall catch of these species will increase if this measure is adopted. In the case of monkfish, monkfish landings may decline because of the different allocations and counting methods used for monkfish and groundfish DAS (see section 7.7.6 for an expanded discussion of this issue).

7.2.1.3.1.2 Comparison of the Biological Impacts of Effort Control Options

There are several difficulties in comparing the biological impacts on groundfish of the effort control alternatives. First, all options were designed and evaluated as if all permits remain subject to effort controls and no permits join sectors. Since there are seventeen additional sectors that have requested authority to operate, this is unlikely, but how different sector membership composition affects the biological impacts of the effort control alternatives is unknown. It is possible some permit holders may base their decision to join a sector on the choice of an effort control alternative. This means that there is more uncertainty over the impacts of the effort control measures than when analyzed in previous management actions. Second, there are some elements of the options that cannot be reliably quantified. For example, the use of restricted gear areas in two of the options may result in additional changes in fishing mortality but the magnitude and direction are uncertain. These elements make it difficult to compare the alternatives. Option 2A is the option that is most similar to options considered in earlier actions, but even this option modifies the way DAS are counted for differential DAS areas and is difficult to analyze in the CAM. Option 3A uses a 24-hour clock, another measure that the CAM can only approximate. Finally, two of the options will need to be modified to meet pollock rebuilding requirements.

Keeping in mind these caveats, Table 182 summarizes the changes in exploitation expected to be achieved by the four effort control alternatives. The No Action alternative reduces fishing mortality the least of the alternatives and would not be expected to meet rebuilding requirements for GB cod, SNE/MA winter flounder, witch flounder, northern windowpane flounder, SNE/MA yellowtail flounder, or pollock. None of the other alternatives will eliminate fishing mortality on SNE/MA winter flounder, but all are expected to reduce fishing mortality to less than F=0.10. Options 2A and 4A will require modifications to meet the pollock rebuilding target. All options are expected to greatly reduce mortality on northern windowpane flounder but a rebuilding target cannot be calculated so it is not clear that rebuilding objectives for this stock will be met. All the options meet all other rebuilding targets. Based on the CAM results, Option 3A appears to have the greatest likelihood of achieving rebuilding objectives but it must be remembered that the 24-hour clock in this option is difficult to evaluate in the CAM. The overall conclusion is that with the exception of the impacts on pollock, there is little difference between the biological impacts on groundfish of the three alternatives when compared to the No Action option.

Table 182 – Summary of changes in exploitation expected from effort control options

Species	AREA	Needed Difference	No Action % Difference	Option 2A Action % Difference	Option 3A Action % Difference	Option 4 Action % Difference
COD	GBANK	-50%	-17%	-51%	-54%	-41%
COD	GM	-19%	-16%	-22%	-52%	-34%
HADDOCK	GBANK	290%	-19%	-45%	-53%	-42%
HADDOCK	GM	59%	-18%	-22%	-54%	-39%
WINTER	GBANK	51%	-19%	-34%	-52%	-36%
WINTER	GM		-15%	-14%	-45%	-35%
WINTER	SNEMA	-100%	-20%	-73%	-67%	-60%
PLAICE	ALL	83%	-16%	-38%	-56%	-36%
WITCH	ALL	-42%	-16%	-36%	-56%	-37%
WHK	ALL	28%	-17%	-40%	-63%	-39%
WIND	NORTH		-19%	-30%	-59%	-43%
WIND	SOUTH		-21%	-44%	-61%	-56%
YTF	CCGOM	-16%	-18%	-39%	-57%	-47%
YTF	GBANK	-15%	-20%	-32%	-59%	-41%
YTF	SNEMA	-39%	-18%	-55%	-39%	-45%
POLLOCK	ALL	-66%	-17%	-40%	-61%	-38%
REDFISH	ALL	368%	-18%	-41%	-62%	-39%

7.2.1.3.1.3 SNE/MA Small Mesh Fisheries Gear Requirements

Impact on Groundfish Species

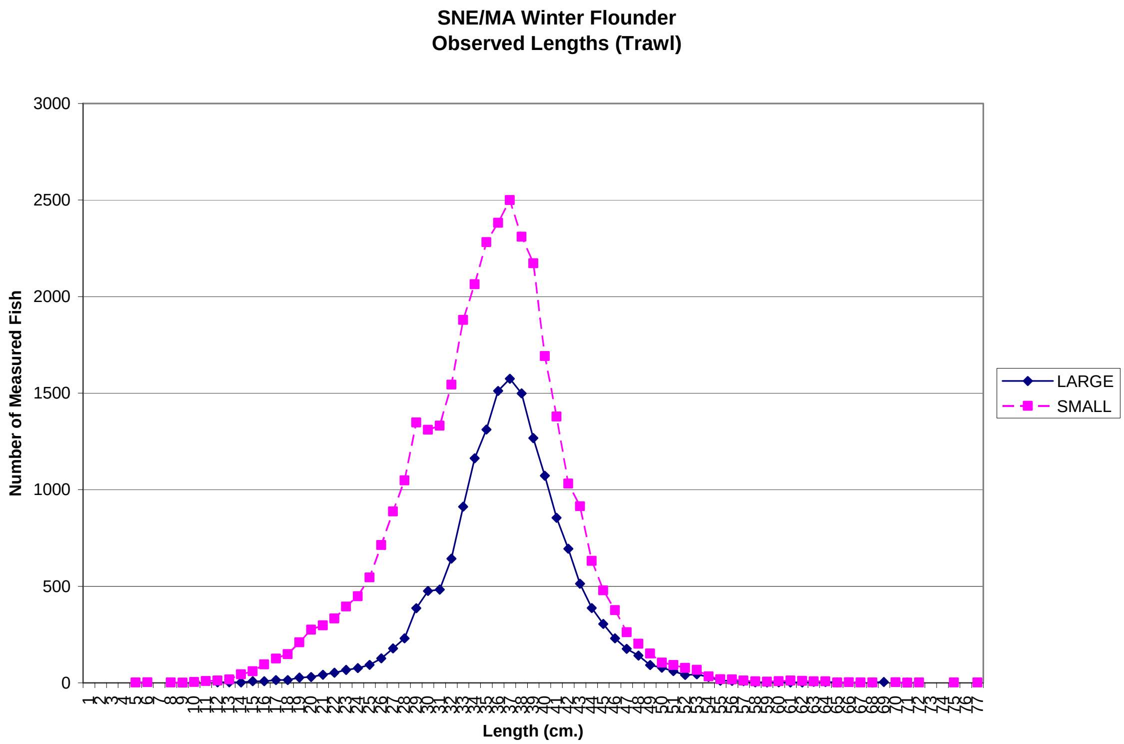
The Proposed Action adopts Option 1, the No Action alternative, and does not make any changes to existing trawl gear requirements in the SNE area for other fisheries that may encounter groundfish. GARM III assessments provided estimates of discards by otter trawl vessels for these two stocks. For SNE/MA yellowtail flounder discard estimates were developed for large and small mesh trawls, but small mesh is defined as less than 5.5 inches in the assessment. Between

1996 and 2007, discards of SNE/MA yellowtail flounder in small mesh trawls ranged between 12 -19 mt but the CV associated with these estimates is generally high. In comparison, discards by large mesh trawls during the same period ranged from 0 to 271 mt (again, with generally high CVs). Small mesh discards were about three percent of removals in 2006 and about 1 percent of removals in 2007 (GARM III). It is not possible to refine the GARM III estimates to identify the discards taken by meshes between 5.5 and 6.5 inches. SNE/MA winter flounder discard estimates did not differentiate by mesh size. For the same years discards ranged from 38 – 230 mt; since 2002, CVs for these estimates have been less than 30 percent. Otter trawl discards were 11.5 percent of SNE/MA winter flounder removals in 2006 and 9 percent of removals in 2007.

It is likely that fish caught by smaller meshes are smaller than those caught in the larger mesh. The relative weight of discards may hide the fact that in terms of numbers, the discards by smaller mesh may be more important than indicated by weight alone. To illustrate the different sizes of fish caught by the different meshes, observed lengths were examined. For this analysis, large mesh trawls were defined as trawls using a codend of 6.25 inches or larger. This value was chosen rather than 6.5 inches to account for uncertainty in measuring mesh size. Figure 129 shows the length distributions of observed winter flounder caught by trawl vessels in the SNE/MA winter flounder stock area. Large mesh trawls tend to catch slightly larger winter flounder than trawls using codends that are smaller than 6.25 inches. This is most obvious when the observations are viewed as a percent of the measured fish, where it is more easily seen that small mesh trawls catch a higher percent of fish less than 31 cm. Reducing catches of winter flounder by small mesh trawls should reduce catches of smaller fish. While the distribution for SNE/MA yellowtail flounder is similar, the shift of the length frequency distribution to smaller fish with the smaller mesh is not as pronounced (Figure 130).

Clearly, trawl vessels using mesh of less than 6.25 inches catch winter flounder and yellowtail flounder and the catches consist of smaller fish than those caught in the larger mesh. While the weights of the catch cannot be determined for mesh less than 6.25 inches from the GARM III assessments they probably a small, but not inconsequential, part of the removals for both stocks. These removals would continue under No Action.

Figure 129 – Observed lengths of SNE/MA winter flounder, CY 2002 - 2008



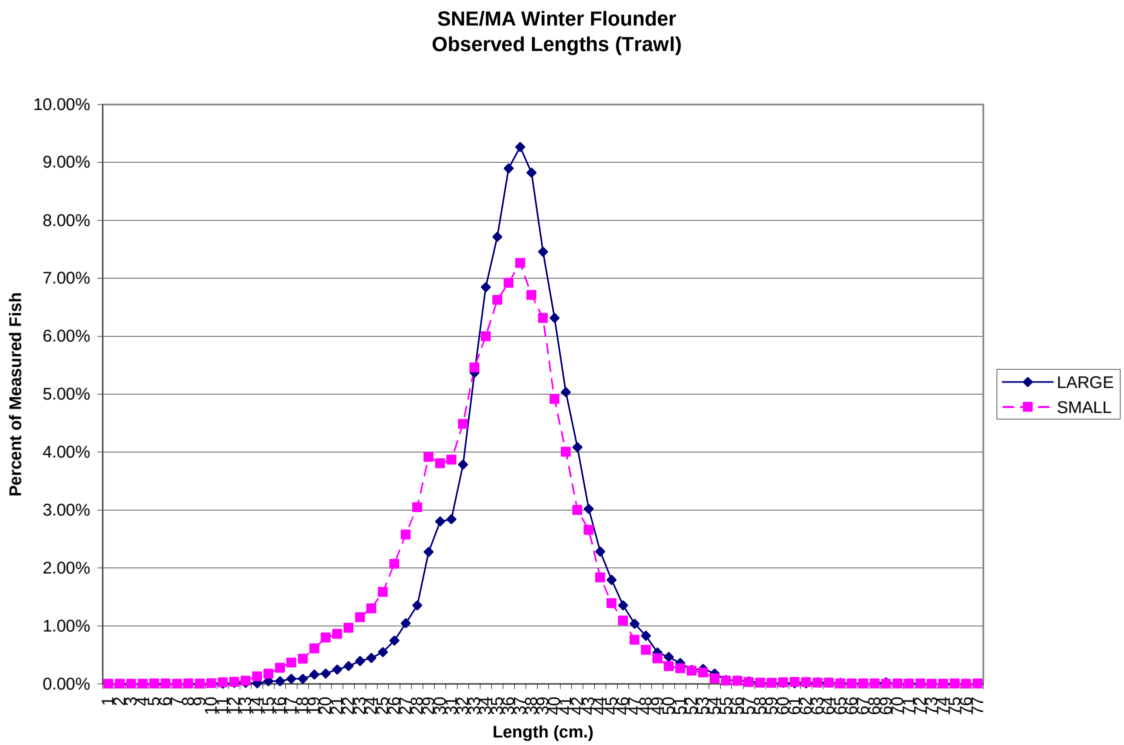
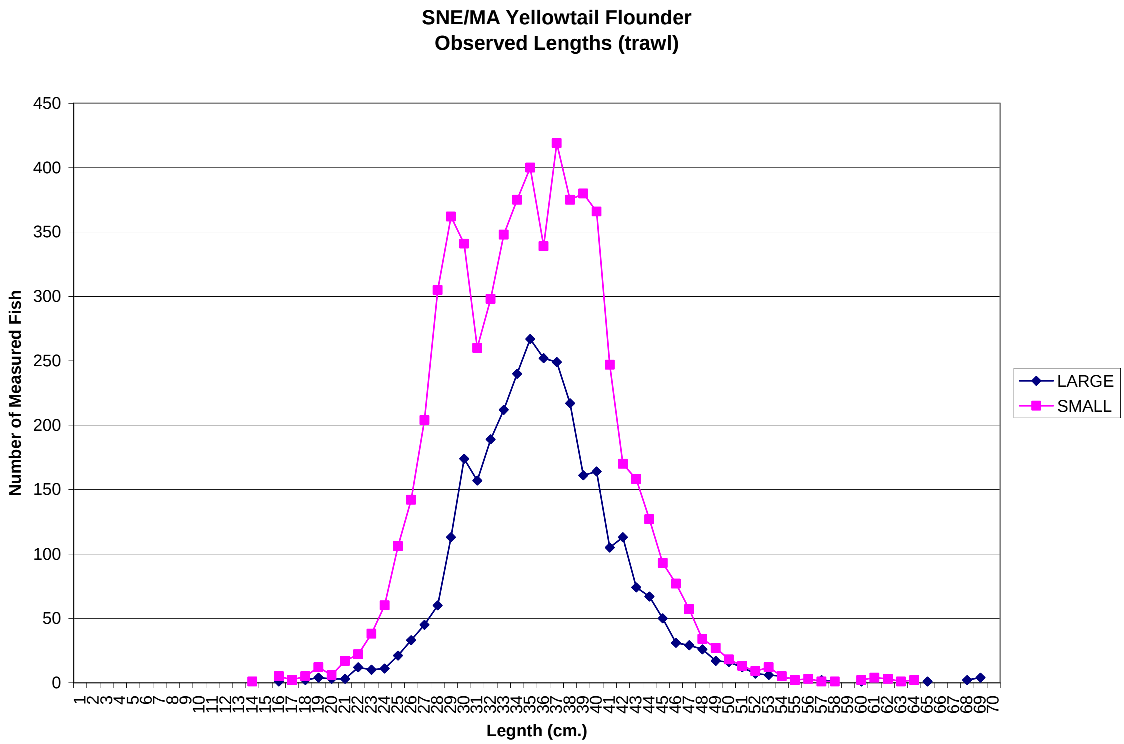


Figure 130 - Observed lengths of SNE/MA yellowtail flounder, CY 2002 - 2008



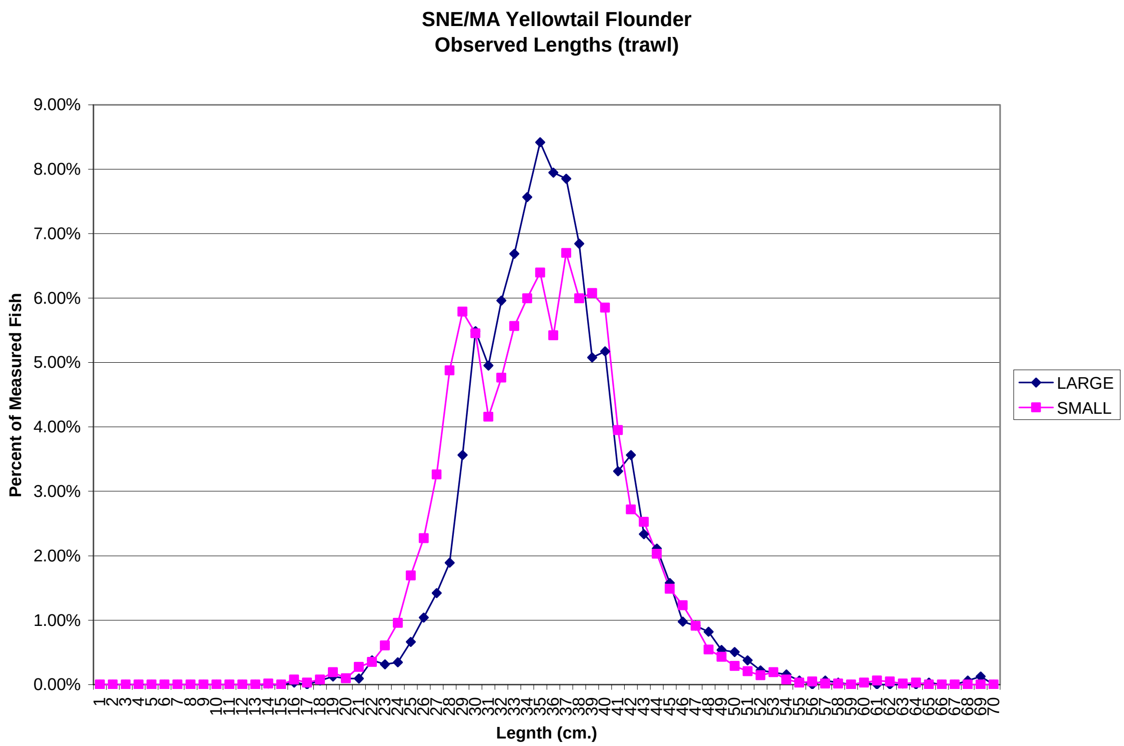
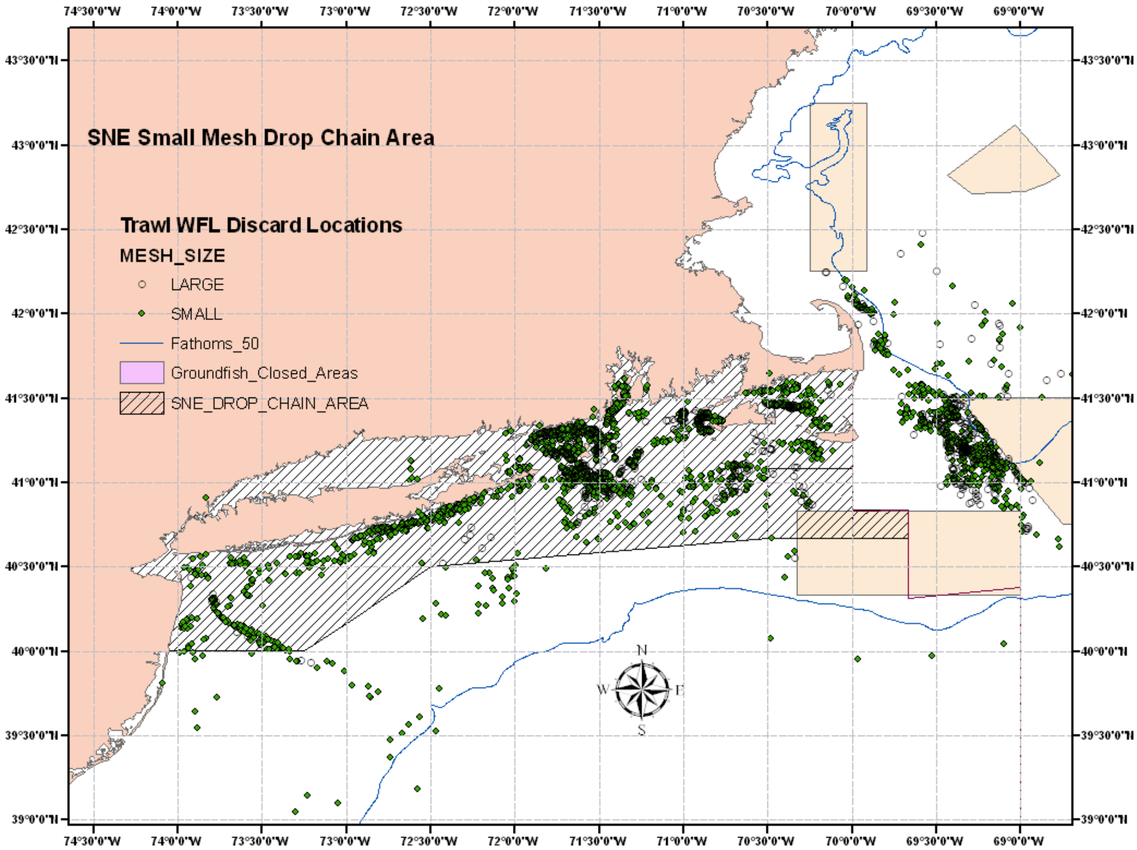


Figure 131 – Observed discard locations for SNE/MA winter flounder, CY 2002 - 2008



7.2.1.3.1.4 GOM Haddock Sink Gillnet Pilot Program

Impacts on Groundfish Species

The Proposed Action (Option 2) establishes a pilot program to facilitate targeting GOM haddock by sink gillnet vessels. This pilot program is designed to increase the ability of sink gillnet fishermen to target haddock in the Gulf of Maine. Throughout the recent history of the multispecies FMP, the minimum mesh size for sink gillnets and trawl codends has been the same. A recent experiment (Marciano et al. 2005) provided selectivity information for cod, pollock, and haddock (see Figure 132). These experiments confirm that gillnet gear tend to catch larger fish than trawl gear of the same nominal mesh size. While the haddock selectivity curves are less robust than those for cod and pollock (due to lower experimental sample sizes), it is clear that few haddock are likely to be caught with gillnets of the current minimum size and a reduced mesh size might improve the ability for gillnets to target haddock. The expectation in this measure is that reducing the minimum size will allow gillnets to catch more haddock and haddock mortality will increase as a result. The program is limited to a four month period when haddock are most available. In addition, it is established as a pilot program and absent future Council action will end after FY 2012, or earlier if the Regional Administrator determines it threatens mortality objectives.

Sink gillnets are also effective at targeting cod and pollock, and this measure may also affect mortality of these two stocks. In the Gulf of Maine, both of these stocks are in rebuilding programs. As can be seen in the cod selectivity curve (Figure 132), 6 inch gillnets will select smaller cod than 6.5 inch gillnets, but the mode is still well above the minimum size. Very few fish less than the minimum legal size are expected to be caught. The same is true for pollock, where almost no sub-legal fish are expected to be retained in 6 inch gillnets.

While this program provides limited, controlled opportunities to target GOM haddock, it could result in a change in mortality (relative to the No Action alternative where the program is not implemented) in the following ways:

- The program might attract additional gillnet effort to the Gulf of Maine and if catch rates of cod and pollock are similar to or higher than the catch rates with 6.5 inch mesh mortality might increase.
- Even if additional effort is not attracted to the Gulf of Maine, if catch rates of cod and pollock are higher than with 6.5 inch mesh mortality might increase. The opposite would occur if catch rates are lower with 6 inch mesh: mortality on these stocks might decrease.
- The program might attract effort onto haddock and away from cod and pollock, reducing effort and mortality on those stocks.

In an effort to examine these possible impacts, observed sink gillnet tows in the Gulf of Maine were examined for the period 1996 through early 2008. Catches of cod, haddock, pollock, and white hake were identified. The average weighted mesh size, number of nets, and average length of nets were determined for each set. Sets were binned into seven categories of mesh size in half inch increments from 5.25 inches to 8.25 inches and an eighth category that was all mesh larger than 8.25 inches. For each species and for total catch, the pounds per foot of net was calculated as a measure of CPUE. Analyses are reported here for the first quarter (January through March) which is the primary period for this program (while April is included, rolling closures limit access to the program in April). All weights, set lengths, and soak durations were transformed with a natural logarithm with a small quantity added to observations of 0 in order to stabilize variance. Because of limited observations, data for mesh groups 1 and 2 (less than 5.75 inches) nor was data for statistical areas 464, 465, and 512. The data set analyzed included 428 observed tows where haddock was caught. The data for all years and areas was pooled.

Figure 133 shows box plots of catch per set and catch per foot of net for haddock, cod, and pollock, binned by mesh category. While the data are highly variable there is a suggestion that haddock catch per set and catch rates increase with smaller mesh sizes. This pattern is not as pronounced for cod. The pollock charts are difficult to interpret because the large number of tows with no pollock drives the plots.

Based on these charts, an analysis of variance using mesh group as the factor was performed for catch per set and catch per foot of net for haddock and cod. Again, since the program is designed to target haddock, only sets catching haddock were examined. Mesh group was determined to be significant for haddock catch per set and haddock catch rates and cod catch rates but explained little of the variation in these values with r^2 of less than 10 percent in all cases (see Table 183). Mesh group was not a significant factor for determining cod catch per set.

Pairwise comparisons were made for the ANOVA results that indicated mesh group was significant. For haddock catch and catch rates, mesh category 3 was significantly different than mesh categories 4, 5, 6, and 8 ($\alpha=0.05$). For cod catch rates, only mesh category 8 was significantly different than mesh category 3 and 5. Based on these results, the observed data does not support the conclusion that this program will significantly increase catch rates or catch per set of cod. There is no evidence that cod catch rates with six inch mesh will be higher than catch rates with 6.5 inch mesh. This makes it less likely that this program will increase cod mortality as a result of increases in catch rates. While the analysis is not as detailed for pollock, there is little evidence in Figure 132 that pollock catches or catch rates are very sensitive to the small change in mesh size being considered.

The program also reduces the number of nets that can be fished by day gillnet vessels by 40 percent: from 50 nets to 30 nets. It is not clear how many vessels fish the maximum number of nets allowed – the data used here is based on individual sets and does not include the total nets being fished at any one time. Assuming no increase in the number of days fished, if vessels are fishing the maximum number of nets catch rates of cod and pollock would have to increase by more than 40 percent to result in an increase in mortality from day gillnet vessels participating in the program. The same is not true for trip gillnet vessels since the proposal does not limit the number of nets that can be fished by these vessels.

In summary, this pilot program will likely increase fishing mortality on GOM haddock as it will allow sink gillnets to catch more haddock. It may result in a slight change in the size of cod and pollock caught by gillnets but most of the catch will still be larger than the minimum size. This measure is not expected to increase mortality of cod and pollock since the number of nets that can be fished is reduced and vessels are required to use Category A DAS for this program. It should also be noted that whether this program will result in exceeding mortality targets depends on the effort control measures and AMs that are adopted for the fishery as a whole. For example, one effort control option is estimated to reduce pollock mortality more than necessary, creating an additional buffer that reduces the possibility this measure will affect pollock rebuilding. One AM under consideration would impose a hard TAC overlay that would prevent catches from exceeding ACLs. In addition, if most gillnet vessels join sectors that have catches controlled by hard TACs then it is even less likely this program will exceed mortality targets.

Impacts on Other Species

Since this proposed option does not increase the amount of fishing effort that can be used by gillnet vessels, it is not expected to increase catches of skates, monkfish, or spiny dogfish when compared to the No Action alternative. While it may be that the smaller mesh net retains more or less of these species, there is no experimental data to support either conclusion.

Table 183 – ANOVA results for observed gillnet sets catching haddock

Dependent Variable	LOG_HAD	LOG_CPU_HAD	LOG_COD	LOG_CPU_COD
N	428	428	428	428
Multiple R	0.317	0.301	0.145	0.202
Squared Multiple R	0.100	0.091	0.021	0.041
P value	0.000	0.000	0.110	0.003

Figure 132 - Gillnet selection curves for cod, pollock, and haddock (from Marciano et al. 2005). Note different scales. In all graphs, curve to the far right is 6.5 inch (current minimum mesh size).and each curve to the left of that is ½ inch smaller

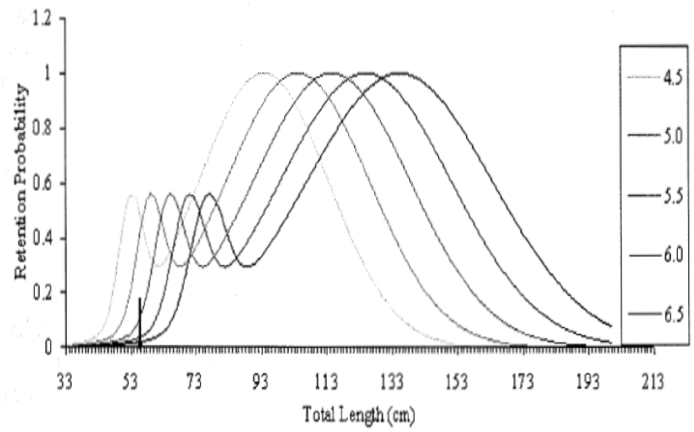


Figure 3: Bimodal retention curves for Atlantic cod for five mesh sizes. All lengths were pooled. Arrow indicates minimum landing size.

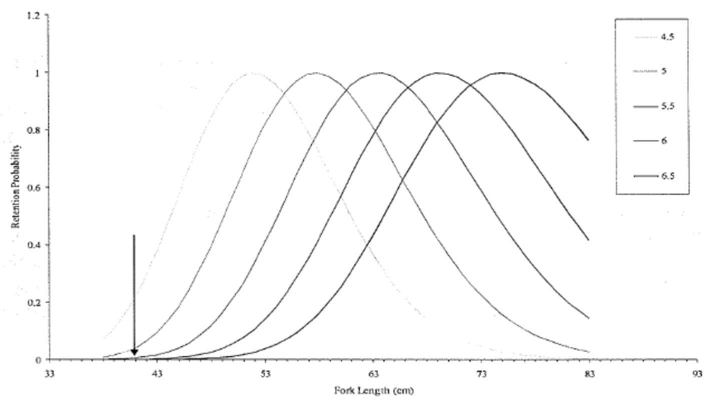


Figure 2: Haddock lognormal retention curves for five mesh sizes. All lengths were pooled. Arrow indicates minimum landing size, converted to fork length.

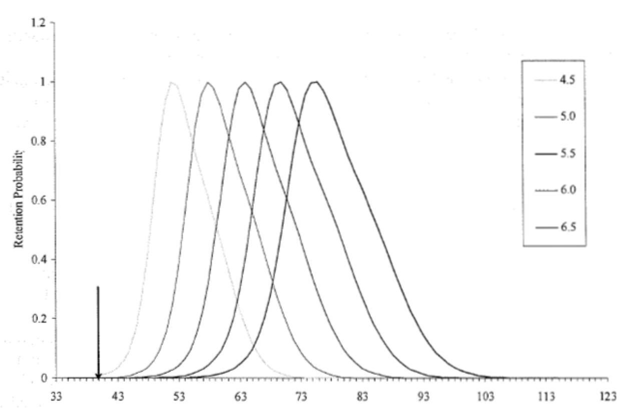
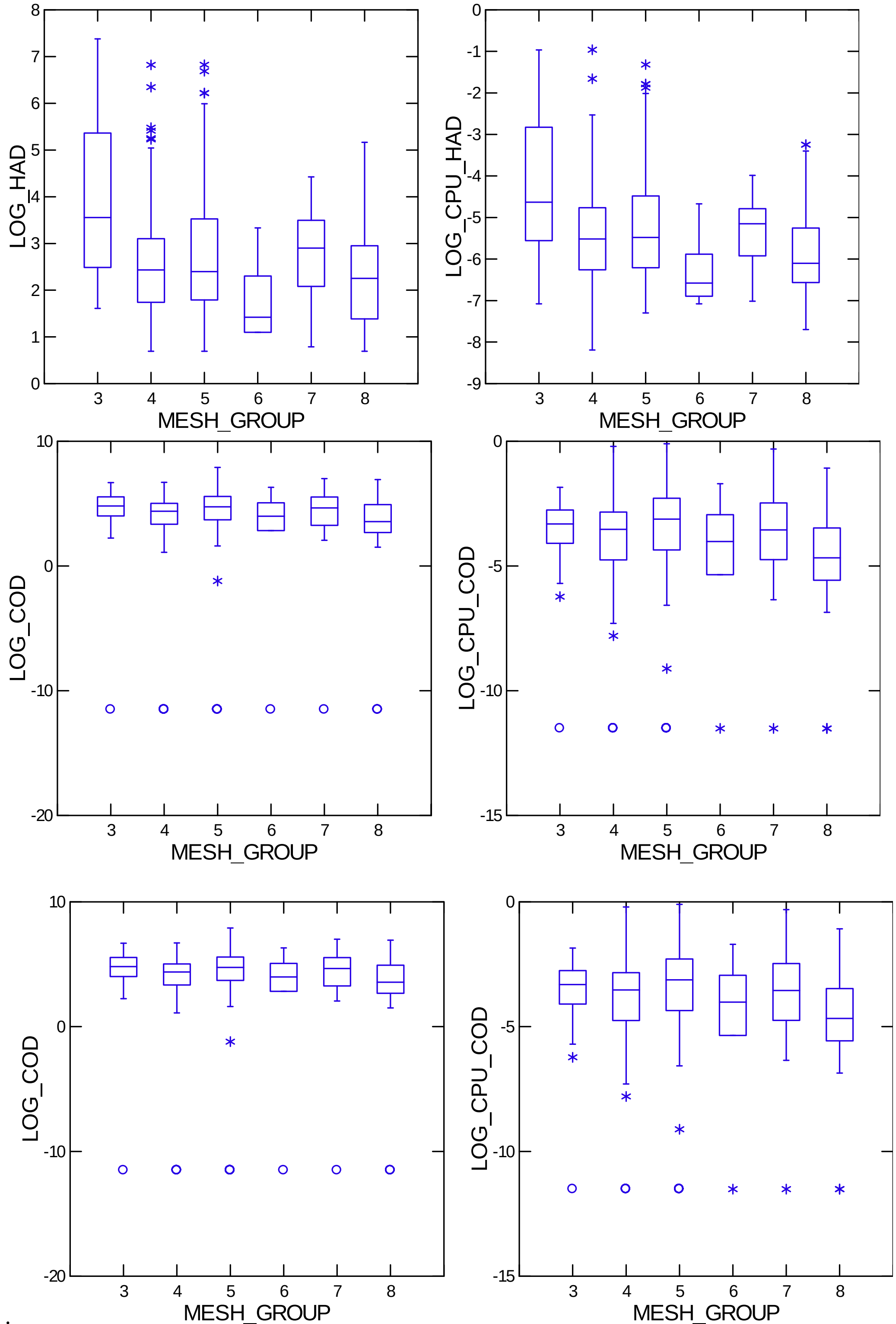


Figure 4: Pollock bimodal retention curves for five mesh sizes. Curves were derived from REML analysis of five individual sets. Arrow indicates minimum landing size, converted to fork length.

Figure 133 – Catch per set and catch per foot of net for haddock, cod, and pollock on observed gillnet sets catching haddock in the Gulf of Maine, CY 1996 – 2008.



7.2.1.3.1.5 Haddock Minimum Size

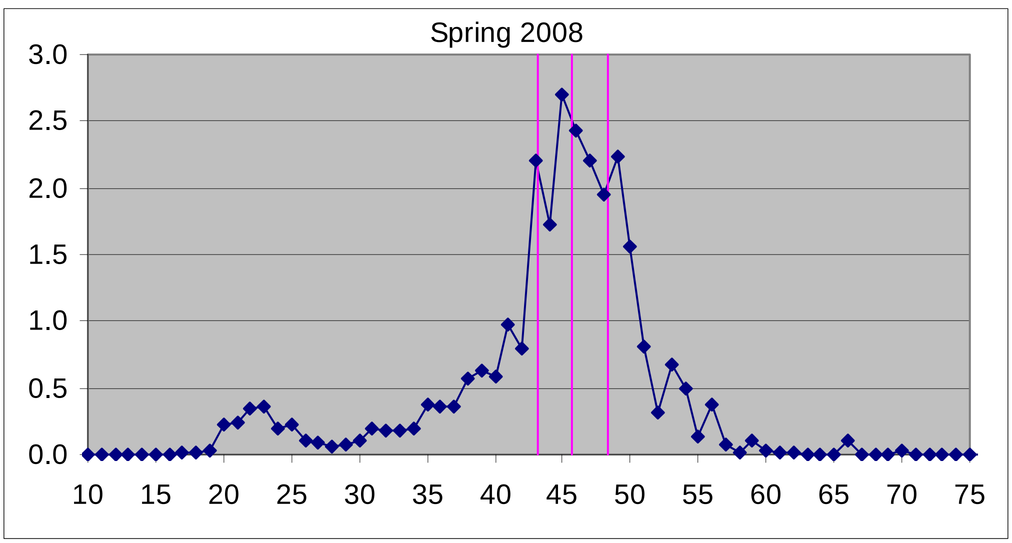
The Proposed Action (Option 2) proposes to reduce the minimum size for retention of haddock to 18 inches (45.7 cm.) total length. This measure would apply to both GOM and GB haddock. Adopting this measure would reduce regulatory discards of sub-legal haddock if minimum mesh regulations remain the same.

Reduction of the haddock minimum size to 18 inches is not likely to impact fishing mortality because there would be no concurrent change to the gear selectivity in the fishery. If fishing behavior changes substantially, there could be some selectivity changes and a slight change in fishing mortality. The large 2003 year class of haddock still represents a substantial portion of the fishery, a portion of which is still less than 19 inches. Reducing the minimum size for haddock from 19 to 18 inches will convert some of the discarded catch into landings, while having no negative impact on the sustainability or size structure of the rebuild GB stock or nearly rebuilt GOM stock. Figure 134 below provides data on haddock size from the spring 2008 trawl survey conducted by the Northeast Fisheries Science Center. The three vertical bars represent 17, 18 and 19 inches, the X axis is centimeters, and the Y axis is numbers of fish.

One option in this action proposes to reduce the minimum mesh size required in codends under certain circumstances, in which case if the minimum size is not reduced then regulatory discards will increase. The proposed minimum size is larger than the median length at maturity for both GOM and GB haddock. Changing the selectivity of the fishery, which may result as a result of this measure, may affect status determination criteria in the future. Such changes will be identified when the haddock stocks are assessed.

This measure is not expected to affect non-groundfish species.

Figure 134 - Haddock Length Frequency Distribution from the Spring 2008 NEFSC Trawl Survey



7.2.1.3.2 Recreational Fishery Management Measures

None of the recreational measures being considered are expected to affect monkfish, skates, or spiny dogfish catches by recreational fishermen. While some of these species are caught by recreational fishermen (most notably spiny dogfish) the proposed measures are not expected to substantially change fishing effort and lead to changes in catches of these species.

7.2.1.3.2.1 Provisions for Landing Fillets

The Proposed Action (Option 2) is similar to Option 1 in that it allows landings fillets with the skin off, but differs in that small amounts of skin must remain on the fillet in order to facilitate identification of the species and the fillets must be from fish that met the minimum size restrictions. The requirement that there be small amounts of skin on the fillet should reduce concerns that a species is landed during a seasonal closure (currently only an issue for GOM cod).

7.2.1.3.2.2 Removal of the Limit on Hooks

The Proposed Action (Option 2) removes the regulation that limits recreational groundfish fishing to two hooks per line. The impacts of this measure are uncertain because recreational data are not collected in a way that allows determining the catch per angler per hook per day. Presumably anglers will only increase the number of hooks used per line if they perceive a benefit, either in catching more groundfish or in increasing the probability if catching groundfish. Either perception would seem likely to increase the mortality of the targeted species. If bag limits and minimum size restrictions remain in place then discards may increase even if landed catch does not. What is unclear is whether removing this restriction will result in a change in fishing practices or anglers will continue to use two hooks per line.

7.2.1.3.2.3 Measures to Reduce Mortality

A number of options are being considered to control fishing mortality for recreational vessels. The need to reduce mortality, and the targeted reduction, is dependent on choices that are made for the commercial and recreational allocation of groundfish stocks. Under certain allocation decisions there is no need to target a reduction, while under others there is a need. The options discussed below assume that the allocation decision results in a needed reduction in recreational mortality.

Analyzing the impacts of the proposed measures is uncertain. None of the measures being considered stops the catching of fish – they only control retention. The impacts are this sensitive to assumptions on compliance and discard mortality. There is evidence in the MRFSS/MRIP data that compliance is not 100 percent, and some studies have indicated discard mortality for jigged cod to be as high as 50 percent (Farrington et al 1998), but there are no discard mortality studies specific to the GOM cod recreational fishery.

Table 184 – Needed recreational mortality reductions under two allocation options

Stock	Overall Needed Reduction	Allocation Years 1996-2006 Rec.
GOM cod	-40%	.-25%
GOM haddock	NA	Increase

Option 3 (the Proposed Action) extends the prohibition on landing cod into April, increasing the closed season to November 1 through April 15. The impacts are not sensitive to assumptions on discard mortality. Table 185 shows the impacts if landing of cod is prohibited for the entire month of April - data limitations prevent calculating the impacts for a partial month. Impacts clearly differ between components – this measure achieves a larger reduction on the private boat fleet.

Table 185 – GOM cod recreational Option 3 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-44.1%	-28.7%	-39.9%
0.1	-44.1%	-28.7%	-39.9%
0.2	-44.1%	-28.7%	-39.9%
0.3	-44.1%	-28.7%	-39.9%
0.4	-44.1%	-28.7%	-39.9%
0.5	-44.1%	-28.7%	-39.9%

The Proposed Action - Option 5 - for GOM haddock is No Action. The sort term biological impacts would be similar to the impacts of the current fishery with respect to the level of fishing exploitation. The recreational fishery as well as the commercial fishery would be contributing to fishing mortality levels that are incompatible with those required to rebuild stocks in the required rebuilding period. This action also adopts a reduction in the minimum size for GOM haddock. While this may result in an increase in haddock catches by this fishery, it is difficult to determine the amount because of limited data on the frequency of catches of fish at this size.

The estimated changes in mortality for GOM haddock are calculated without respect to the management measures for GOM cod. As there is evidence that cod and haddock are caught on the same trips, the seasonal closure for GOM cod may also reduce haddock catches, while other changes in cod measures may encourage targeting of haddock. These possible interactions are not reflected in the impacts described above.

7.2.1.3.3 Atlantic Halibut Minimum Size

The Proposed Action (Option 2) proposes to increase the minimum size of Atlantic halibut to the median length at maturity for female halibut in the Gulf of Maine as reported by Sigourney et al. (2006). This change may reduce fishing mortality on Atlantic halibut by a small amount, and may slightly increase the reproductive capability of this stock. At the current minimum size of 91 .r cm./36 inches, over half of female halibut are not mature when they can be retained in the fishery. Increasing the minimum size will provide female halibut about an additional year of growth and reproduction before they can be retained. The impacts of this measure will depend on compliance rates. GARM III noted that halibut are frequently landed below the current minimum size; an increase will only have positive biological impacts if it increases the size of fish that are landed. When compared to No Action, this measure should provide some additional protection for Atlantic halibut but the differences are difficult to measure.

7.2.1.3.4 Prohibition on Retention of Atlantic Wolffish

The Proposed Action (Option 2) is designed to reduce fishing mortality for Atlantic wolffish. Fishery removals of this stock are at low levels and is estimated to be less than 150 mt since

2002. While overfishing is not likely to be occurring the stock is probably overfished. Reducing fishing mortality further should help the recovery of this stock.

Since wolffish are not specifically targeted in either the commercial or recreational fisheries and catches are already at low levels, this measure is unlikely to change fishing behavior. Its effectiveness relies on the hardiness of wolffish and their ability to survive when discarded promptly. 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. When not returned for over two hours survival rates declined rapidly and almost all wolffish died. These experiments were confined to trawl gear; survival rates with hook gear are expected to be high as well. Survival rates with gillnet gear are uncertain. If wolffish get tangled in sink gillnets, it may prove difficult to safely extract them from the nets and fishermen may choose to kill the fish before removing them.

The measure considers requiring the return of wolffish year-round. Requiring return to the sea year round would have the most impact on wolffish mortality but would result in the loss of a major source of information on wolffish stock status.

The proposed effort control options will also result in an overall reduction in fishing mortality. While not specifically designed to reduce mortality on wolffish they will likely reduce encounters with this species and reduce mortality as a result.

This measure is not expected to affect catches of spiny dogfish, monkfish, or skates.

7.2.1.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

Impacts on Groundfish Species

This action considers authorizing seventeen additional sectors and modifying the two existing sectors. The biological impacts could be substantial, but the exact impacts hinge on the number of vessels that choose to join sectors and the number that remain subject to the effort control system. The number of vessels that will actually join sectors will not be known until after the amendment is submitted by the Council and approved by NMFS, but there does appear to be widespread interest in this option. In early 2008, the NMFS asked vessel owners to declare their interest in sectors. Owners of nearly 650 permits expressed an interest in joining one of the nineteen sectors. This is nearly half the existing limited access permits and is believed to represent a majority of the permits that are currently landing regulated groundfish.

Fishing mortality for sector vessels will be controlled by quotas (ACE) issued to each sector. If a large number of vessels join sectors, then a large part of the fishery will no longer be reliant on most elements of the effort control system to control fishing mortality. In theory, this use of an output control allows for a more precise control of fishing mortality and reduces the risk that overfishing will occur. Specifying a quantity of fish that will limit the fishing activity of each sector is viewed as a more definite control on mortality than attempting to design effort controls to do the same. The effort control system used since 1994 has been criticized as failing to adequately capture the behavioral responses of fishermen to regulatory changes because of the complex nature of the fishery. An output control system reduces the need to anticipate these changes and focuses on specifying the catch in the fishery. If adequate monitoring systems are in place so that catch is reliably known then there is less likelihood that target catch levels will be exceeded. In a review of input and output control systems, Morgan (1997) noted that effort (input) control systems tend to slow increases in, but not limit, fishing mortality. He also observed that frequent changes are necessary to adapt to increases in fishing efficiency – an observation that appears to be supported by the history of the multispecies fishery and its extensive list of adjustments. This is not to say that output control systems are without problems. In the same paper, Morgan (1997) noted that the record is mixed on both setting TACs for these systems at appropriate levels and at effectively constraining catch to the TACs.

The sectors that are proposed are a variant of a catch-share management system. While the economic benefits of such systems have been demonstrated in the past, Costello et al. (2008) recently evaluated the ability of these systems to improve sustainability. Their analyses focused on Individual Transferable Quota (ITQ) systems, which have different characteristics than the sector system adopted by Amendment 13. The primary difference is that in the multispecies sectors each permit holder does not own a share of the quota, and neither does the sector itself. The quota (ACE) is allocated to a sector on an annual basis based on the permits that have joined the sector. Keeping this difference in mind, Costello et al. concluded that when compared to non-ITQ systems the existence of an ITQ system did increase the likelihood that a fishery will be sustainable.

The effectiveness of controlling fishing mortality using sectors depends on two key factors. The first is that the TACs (ACE) for sectors are appropriately set. Not only does this mean that the catch level is set consistent with scientific advice, but the scientific advice must also be accurate. The record in the multispecies fishery in the recent past is that management measures (effort controls) have kept the catches of most stocks at or below the TTACs based on scientific advice, but those TTACs proved after the fact to be set higher than was warranted. This is not because the TTACs were set inconsistent with the scientific advice; it is because the scientific advice was in error or did not fully account for uncertainty. As a result, even though TTACs have not been exceeded in 87 percent of the cases when set, overfishing continues to occur. Table 186 provides an illustration of this problem. Note that in three of the four examples shown, the catch realized in CY 2006 was expected to have a small probability of exceeding F_{MSY} when the TTAC was set, yet the realized mortality was much higher than F_{MSY}. The GARM III assessment review panel explicitly considered one source of error common in many assessments (referred to as a “retrospective pattern” and devised approaches to adjust for that error. In addition, the ACL process that will be adopted by this action proposes a more explicit consideration of both scientific and management uncertainty. These two changes should improve the matching of desired catch levels with realized fishing mortality rates.

Table 186 – Examples of continued overfishing in spite of catch levels below TTAC

Stock	CY 2006 Catch as Percent of TTAC	Projected probability that CY 2006 Catch Exceeds F_{MSY}	GARM III Ratio of F/F_{MSY}
GOM Cod	82%	10%-25%	1.5
GB cod	60%	<1%	1.24
CC/GOM yellowtail flounder	95%	50%	3.75
SNE/MA winter flounder	82%	<1%	3.5

The second key factor is that catch must be accurately known. This action proposes extensive modifications the reporting systems for sectors. The biological impacts of these requirements are discussed in section 7.2.1.2.3.

An additional benefit of forming additional sectors is expected to be a reduction in regulatory discards. Trip limits are one of the few effort control measures that can be tailored for a specific stock or species. As a result, their use has increased from just one stock (GB haddock) in 1994 to seven stocks in FY 2008 (GOM cod, GB cod, GB yellowtail flounder, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, GB winter flounder, white hake). In almost all instances the adoption of a trip limit, or the reduction of an existing trip limit, resulted in an increase in the discard rate for a particular stock. Since sectors are not subject too the trip limits adopted for non-sector vessels, and are unlikely to choose to use trip limits to control catch, this source of discards should be reduced. There is evidence that this may have occurred with the Fixed Gear Sector in FY 2007, though that evidence is not conclusive (see section 6.2.4.2.2). While this source of regulatory discards may be removed, it is possible that the requirement that sectors stop fishing when an ACE is reached may create a different discard incentive. As an ACE is approached, there could be an incentive for sector vessels to discard catch, particularly if monitoring is not sufficient to detect or prevent this activity. Sector vessels will be prohibited from discarding legal-sized regulated groundfish, but this prohibition could prove difficult to enforce.

As mentioned previously, vessels that participate in sectors will not be subject to many effort control measures, such as DAS limits and trip limits. They can also request exemptions from other measures, such as those GOM rolling closures that still apply to sectors. Sector proponents expect that removing these restrictions will allow them to fish more efficiently, catching more fish on a trip, discarding less, and saving operating costs. A question that bears on analyzing the impacts of sectors is how efficient will the vessels be? How many DAS (or days absent) will be necessary to harvest the sector TACs? The answers to these questions influence estimates of sector operating and monitoring costs, as well as the likely impacts of sectors on effects on essential fish habitat, discards, and other factors. Without knowing the precise membership of sectors these questions are difficult to answer, but the following discussion provides rough estimates.

The observer database was queried to determine the catches (kept or discarded) of cod, haddock, witch flounder, winter flounder, and pollock by large mesh otter trawls for the calendar years 2004 through 2007. Only tows that caught (kept or discarded) one of these species were analyzed. Tows were binned into a trip/area/annual quarter basis. Two types of targeting behavior were also identified. Trips were coded to indicate whether the vessel operator identified specific round or flatfish target species, and again whether the operator specifically identified cod as a target species. A General Linear Model of these data showed that year, area, tow time, and targeting behavior accounted for about 10 percent of the variability in catches. Rather than attempt an analysis using all of these factors, the average catch per hour towed was calculated for year, species, stock area, and targeting behavior. Since all catch (kept and discarded) will count against the sector ACE all catch was included in these averages. The result provides a gross overview of the average catch rates over time. The data was further examined to determine an average tow length in the GOM (SA 511-515) or GB (SA 521, 522, 525, 526, 562, 562) areas and the average number of tows per day absent. The TTACs for FY 2009 were divided by the catch rates and average number of hours towed per day to determine an estimate of the number of DAS necessary to harvest the available TTAC (TTAC less an allowance for Canadian and recreational catches, catches by other gears, other ACL sub-components, etc.)) .

This result should be viewed as a broad indicator of necessary effort levels that might be needed to harvest the TTAC if all vessels join sectors. These estimates may prove inaccurate for several reasons. Vessels in sectors may operate very differently from the way they operated under the effort control system. Trip length may change to reduce steaming time and operating costs. The average number of tows per day may change under sectors, particularly for single-day trips that will no longer be limited by DAS or trip limits. The use of overall average catch rates observed under a restrictive management program likely discounts improvements in catch rates that sectors may achieve and may over-estimate the number of DAS necessary. Vessel operators may change when they fish, taking advantage of either high catch rates or high prices, and so the catch rates observed in the past may not be consistent with future catch rates. It will be difficult to evaluate these different effects until data is available from additional sectors.

The results are shown in Table 187 through Table 192. With the exception of GB haddock, all of the TTACs could be harvested with under 8,000 DAS if the stock is targeted. The TTACs of GB and GOM yellowtail and winter flounder, witch flounder, and pollock could be harvested with less than 9,000 DAS even when these species are not specifically targeted. The biggest difference in CPUE resulting from targeting behavior occurs with GOM cod, where the number of DAS to harvest the TTAC when the stock is not targeted increases by a factor of eight over the number needed to harvest the TAC when targeted.

Because multiple species are caught on any given trip, the DAS necessary to harvest the TAC for each stock cannot be merely added together to get a total amount of days. One way to approach the question of total days is to consider that the vessels target a high value species such as cod and all other species are harvested at the rate when they are not targeted. In this case, in the GOM about 5,785 DAS would be needed to harvest GOM cod. This is enough DAS to harvest witch flounder, GOM winter flounder, pollock, and yellowtail flounder at the rate when roundfish is targeted. Only the GOM haddock TTAC would not be caught. On GB, about 4,248 DAS would be needed to harvest GB cod. Only the portion of witch flounder caught in the GB area would be expected to be harvested, and GB haddock, yellowtail flounder, and winter flounder would need additional DAS. GB haddock is unlikely to be harvested unless catch rates improve from those observed in 2004-2007 (which is likely as the slow-growing 2003 year class increases in length).

This suggests that the portion of the catch for trawls could be caught with about 10,000 DAS if all vessels joined sectors, with the exception of GB haddock. To put this in context, according to a combined dealer/VTR database maintained by the NEFSC, in 2007 a total of 573 permits spent 17,431 days absent on trips that caught at least one of these five species from the GOM or GB areas. Based on recent catch rates, trawl vessels could catch most of their share of the FY 2010 median catch levels while using 60 percent of the days absent that were used in the effort control system in FY 2007. Additional positive biological impacts expected from this reduction in effort include fewer interactions with other species and reduced discards.

A similar analysis was not performed for gillnet vessels. Gillnet fishermen may be able to alter their daily catch rates by adjusting soak time, number of nets, and mesh size. It is not clear that their catch rates are as dependent on time at-sea as is the case with trawl vessels. The experience of the Fixed Gear Sector does indicate that the vessels in this sector increased their landings per day absent once organized into sectors, and may have reduced discard rates as well (section 6.2.4.2.1). While a quantitative estimate is not provided here, it is reasonable to expect that the formation of additional sectors using may reduce the days fished by gillnet vessels as well.

Impacts on Other Species

It is difficult to predict the impact of the formation of sectors on other species such as skates, spiny dogfish, and monkfish. Sectors are expected to more efficiently harvest groundfish resources, leading to fewer days fished. This would be expected to reduce all discards on groundfish trips, including discards for the three species identified. Sector vessels may choose to more actively participate in open-access fisheries once their groundfish ACE is harvested, leading to increased catches of skates and/or spiny dogfish, but this opportunity will be limited. There is some indication from the members of the GB Cod Hook Sector that effort shifts due occur when vessels join sectors, but the evidence from the one full year of operation by the Fixed Gear Sector does not support that conclusion.

Table 187 – Estimated DAS to harvest FY 2009 cod TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007

Target Species	Stock Area	GB				GOM			
		2004	2005	2006	2007	2004	2005	2006	2007
Flatfish	Mean catch/hour	9	14	16	28	33	27	44	15
Roundfish	Mean catch/hour	42	47	35	59	89	56	104	111
Tow Length		3.7	3.7	3.7	3.7	4.401	4.401	4.401	4.401
Tows/Day		4.5	4.5	4.5	4.5	2.678	2.678	2.678	2.678
Available TAC (pounds)		4,153,240	4,153,240	4,153,240	4,153,240	7,569,996	7,569,996	7,569,996	7,569,996
Days to TAC based on Target									
Flatfish		28,245	17,505	15,177	8,977	19,465	23,866	14,435	44,250
Roundfish		5,903	5,354	7,230	4,248	7,215	11,369	6,152	5,785

Table 188 – Estimated DAS to harvest FY 2009 haddock TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007

Target Species	Stock Area	GB 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 2007
Flatfish	Mean catch/hour	23	35	16	26	13	7	7	5
Roundfish	Mean catch/hour	167	122	63	49	12	11	6	11
Tow Length			3.7	3.7	3.7	4.401	4.401	4.401	4.401
Tows/Day		4.5	4.5	4.5	4.5	2.678	2.678	2.678	2.678
Available TAC (pounds)		141,621,299	141,621,299	141,621,299	141,621,299	1,965,357	1,965,357	1,965,357	1,965,357
Days to TAC based on Target									
Flatfish		288,466	192,644	409,005	261,787	6,535	11,902	11,179	15,077
Roundfish		40,381	55,100	106,695	138,504	6,879	7,571	14,020	7,631

3.7

Table 189 – Estimated DAS to harvest FY 2009 yellowtail flounder TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007

Target Species	Stock Area	GB				GOM			
			2005	2006	2007	2004	2005	2006	2007
Flatfish	Mean catch/hour	141	70	43	66	32	26	25	17
Roundfish	Mean catch/hour	56	30	29	33	28	16	24	33
Tow Length		3.7	3.7	3.7	3.7	4.401	4.401	4.401	4.401
Tows/Day		4.5	4.5	4.5	4.5	2.678	2.678	2.678	2.678
Available TAC (pounds)		3,386,596	3,386,596	3,386,596	3,386,596	1,801,158	1,801,158	1,801,158	1,801,158
Days to TAC based on Target	2004								
Flatfish		1,439	2,895	4,748	3,064	4,753	5,799	6,005	8,908
Roundfish		3,608	6,765	6,954	6,152	5,467	9,484	6,407	4,646

Table 190 – Estimated DAS to harvest FY 2009 witch flounder TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007. While witch flounder is a single stock, it is caught on both GB and GOM so the TAC was divided between these two areas and the days necessary to catch each portion are different.

Target Species	Stock Area	GB				GOM			
			2005	2006	2007	2004	2005	2006	2007
Flatfish	Mean catch/hour	33	28	29	25	17	24	15	25
Roundfish	Mean catch/hour	30	28	17	25	41	16	18	21
Tow Length		3.7	3.7	3.7	3.7	4.401	4.401	4.401	4.401
Tows/Day		4.5	4.5	4.5	4.5	2.678	2.678	2.678	2.678
Available TAC (pounds)		971,788	971,788	971,788	971,788	971,788	971,788	971,788	971,788
Days to TAC based on Target	2004								
Flatfish		1,743	2,094	2,042	2,315	4,756	3,494	5,517	3,355
Roundfish		1,929	2,078	3,374	2,327	1,988	5,240	4,531	3,953

Table 191 – Estimated DAS to harvest FY 2009 pollock TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007

Target Species	Stock Area	GB 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 2007
Flatfish	Mean catch/hour					69	40	64	106
Roundfish	Mean catch/hour					62	765	104	380
Tow Length						4.401	4.401	4.401	4.401
Tows/Day			N/A			2.678	2.678	2.678	2.678
Available TAC (pounds)						13,584,084	13,584,084	13,584,084	13,584,084
Days to TAC based on Target									
Flatfish						10,076	17,251	10,844	6,532
Roundfish						11,158	903	6,637	1,821

Table 192 – Estimated DAS to harvest FY 2009 winter flounder TTAC for large mesh otter trawls based on observed catch rates CY 2004 – CY 2007

Target Species	Stock Area	GB 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 2007
Flatfish	Mean catch/hour	11	9	10	6	21	17	11	10
Roundfish	Mean catch/hour	11	10	7	7	14	10	6	4
Tow Length		3.7	3.7	3.7	3.7	4.401	4.401	4.401	4.401
Tows/Day		4.5	4.5	4.5	4.5	2.678	2.678	2.678	2.678
Available TAC (pounds)		4,197,117	4,197,117	4,197,117	4,197,117	714,390	714,390	714,390	714,390
Days to TAC based on Target									
Flatfish		7,528	9,043	8,821	9,998	4,794	4,030	8,896	3,849
Roundfish		8,333	8,975	14,573	10,050	2,696	7,699	9,149	4,294

7.2.1.3.6 Accountability Measures

Accountability measures (AMs) are supposed to work in concert with the adoption of ACLs to end overfishing if it occurs. In general, if ACLs are correctly set and effective AMs are designed and implemented, the risk of overfishing should be reduced, fishing mortality should be controlled, and groundfish stocks should recover and be maintained at sustainable levels. These two measures do not work in isolation, however, and interact with other elements of the management plan. Indeed, if effective effort controls are adopted or sectors successfully control their catch the AMs may never be implemented. These theoretical benefits of AMs will be explored in more detail for the specific options under consideration. This section focuses on the impacts of AMs on groundfish stocks; impacts on other species and fisheries are described in section 7.7.

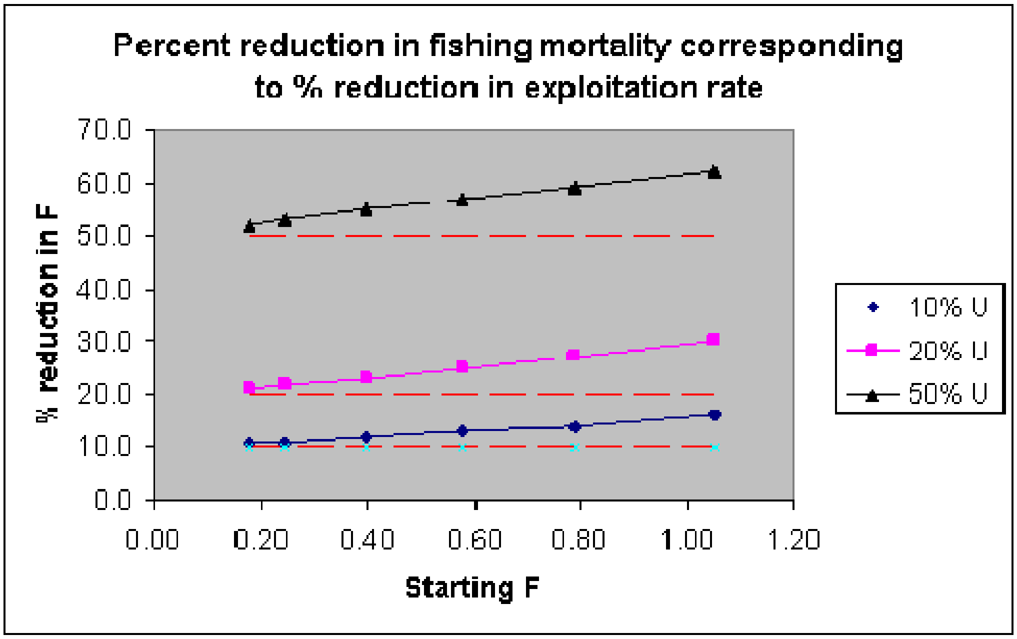
7.2.1.3.6.1 Commercial Groundfish Common Pool Accountability Measures

Two AMs are proposed for non-sector vessels. Differential DAS would be used as an AM for FY 2010 and FY2011, with a hard TAC AM applying to non-sector vessels for FY 2012 and beyond.

For FY 2010 and FY 2011, the Proposed Action adopts Option 2 - a differential DAS adjustment in a following year if there is an overage of an ACL. This is a reactive, post-season AM. Action is taken for the following year when it is projected that an AM has been exceeded, or is likely to be exceeded before the end of the current fishing year. The adjustment to DAS counting is designed to prevent overfishing and is not designed specifically to correct conditions that may have resulted from exceeding the ACL in the previous year. The amount of the DAS adjustment is simply based on the ratio of the catch to the ACL. The basis underlying this approach is that the difference between the catch and the ACL represent the difference between desired and realized exploitation.

Exploitation (as opposed to fishing mortality) is simply the catch divided by the stock size. For a given stock size, a chance in catch of a given percent results in the same percentage change in exploitation. If stock size is correctly predicted, exceeding a targeted catch level by X percent means that the exploitation targeted by that catch is exceeded by the same percent. The relationship between exploitation and fishing mortality is not linear, though it is nearly so at desired fishing mortality rates. A percent change in exploitation results in a slightly larger percent change in fishing mortality. As an example, this means that a 20 percent overage in exploitation translates into a 21 percent change in mortality (at low fishing mortalities – the exact amount increases as exploitation/mortality increases). Figure 135 illustrates this relationship for three percentage changes in exploitation. What this means for AMs is that if stock size is correctly estimated, exceeding the ACL by a specific percentage means that the fishing mortality associated with that ACL will be exceeded by a larger percentage. Similarly, a DAS adjustment designed to reduce exploitation by a certain percentage will result in a slightly larger percentage reduction in fishing mortality.

Figure 135 – Percent changes in fishing mortality resulting from a fixed change in exploitation.



There are three critical assumptions in this approach. First, arguing that a percentage overage of the ACL results in the same percentage overage in exploitation is valid only as long as stock size is correctly estimated. If stock size is over-estimated, then an ACL overage of a given percentage will result in a larger percentage change in exploitation. Uncertainty over this assumption can be built into the setting of the ABC and/or ACL. Second, this approach assumes changes in DAS result in corresponding changes in exploitation. The validity of this second assumption is more difficult to evaluate. While the Closed Area Model results suggest that changes in DAS result in similar changes in exploitation for many stocks (particularly the target stocks of cod, haddock, and yellowtail flounder), the management system has never actually tried to control mortality in this manner without modifying other measures at the same time. As a result, there is no empirical evidence that a percentage change in DAS gives the same percentage change in exploitation. In addition, shifts in effort from one area to another may result from changes in DAS counting implemented through AMs. This cannot be explicitly accounted for with an automatic adjustment to the DAS system. It would require a complete redesign of the effort control system which does not seem possible given the desire to have AMs implemented with minimal analyses and absent a Council action. Once again, these uncertainties could be elements of management uncertainty when setting ACLs. Third, the approach implicitly assumes that absent other management changes fishing activity is similar from year to year. While the validity of these assumptions is uncertain, the management program does provide a mechanism to react should they prove in error. The periodic adjustment process provides for a review every two years and more frequent action can be taken if necessary.

How would this measure have performed if adopted by Amendment 13 in FY 2004? The overages of CC/GOM yellowtail flounder and GB cod in 2004 would have adjusted DAS counting in the GOM to 1.4:1 and on GB to 1.2: in 2005. There would have not been any change in these areas in 2006 as a result of 2005 catches, but DAS counting in the SNE areas would have been revised to 0.7:1 because of the underage of stocks in those areas. Differential counting would have remained at 1.4:1 in the GOM in 2007, declined to 1.2:1 on GB, and increased to

3.6:1 in SNE in 2007 as a result of 2006 catches. Overall, this option would probably have reduced fishing mortality on GOM and GB stocks during this period but would have initially increased mortality on SNE/MA yellowtail and SNE/MA winter flounder from 2005 to 2006 before drastically reducing mortality for these stocks in 2007.

The differential DAS areas in the Proposed Action were modified to be similar to the reporting areas adopted in this action. The revised areas more closely match stock areas, and implementing differential DAS changes in these areas will apply the changes to most of the catch of these stocks. The proportion of the kept catch that came from the areas during the period CY 2006 through 2008 is shown in Table 193. Several comparisons are made to the landings that came from the areas proposed in draft Amendment 16, showing that the proposed areas will provide a more effective AM by applying any changes to more of the harvest.

Table 193 – Landings (2006-2008) from proposed areas used for differential DAS AM.

Stock	Landings From Revised Area	Draft A16 Area Landings
Witch Flounder	82%	36.50%
Plaice	92%	50%
White Hake	86%	69%
Halibut	81%	
Redfish	73%	
Pout	96%	
Pollock	90%	28%
Atlantic wolffish	86%	NA
GOM Cod	92%	91%
GOM Haddock	91%	
GOM WFL	95%	
CC/GOM Yellowtail Flounder	95%	78%
GOM/GB Windowpane	87%	3%
GB Cod	92%	28%
GB Haddock	91%	
GB Yellowtail Flounder	100%	
GB Winter Flounder	100%	
SNE/MA Winter Flounder	98%	
SNE/MA Yellowtail Flounder	100%	
SNE Windowpane	100%	

For FY 2012 and beyond, the Proposed Action adopts Option 1, which overlays a hard TAC AM system over the effort control measures adopted for non-sector vessels (common pool vessels). The ACL, or quota, for each stock is subdivided between three periods in each fishing year. Catches (both landings and discards) are monitored and when it is projected that ninety percent of a quota is caught an area is closed to groundfish fishing. This area is designed to be the area that contributed ninety percent of the landings in recent years. Any overages in a trimester period are deducted from the following period, and any overage for the year is deducted from the ACL/quota for the following year.

This system provides a proactive, in-season AM. Action is taken to control catches prior to an overage. These actions include trip limits that are adjusted for some stocks, which should slow catch rates and reduce the likelihood that trimester TACs are reached. Assuming efficient catch monitoring and setting of trimester ACLs/quotas the use of a fishery closure allows for a prompt response to excessive harvesting rates. While the closures do not end all fishing on the stock, they are large enough and complete enough that if implemented in a timely fashion the ACL/quota is not likely to be exceeded and overfishing is not likely to occur. The payback provisions- both between quarters and between years – mean that there is an automatic adjustment should catches be too high in any given period. Some stocks are not subject to a closure, which means that the AM would be less effective for these stocks. In particular, halibut and windowpane flounder are not covered by either a closure or a trip limit so there is effectively no AM for those stocks.

One concern with this approach is that the threat of an in-season closure may encourage derby fishing behavior. While this is primarily an adverse economic impact it may have biological impacts as well. Knowledge of a possible closure may encourage discarding and/or misreporting of catch. Assessments of stocks will degrade absent adequate catch information. These types of behaviors would increase the management uncertainty and would trigger a need for more cautious setting of ACLs.

If this AM would have been adopted in Amendment 13, how would it have performed for FY 2004 through FY 2008? Some idea of the biological impacts can be estimated by considering the information in Table 51 assuming that the ACL would have been set at the TTAC used for those years. The information is not sufficient to identify whether trimester adjustments would have been triggered. Based on annual catch, the AM would have been triggered for GOM cod, GB cod, GB yellowtail flounder, and CC/GOM yellowtail flounder as a result of calendar year catches in 2005. Overages would have been deducted for the following year and may have been large enough that the AM would have been triggered in 2005 for GOM cod and CC/GOM yellowtail flounder reducing catches for those stocks in 2005. In 2006 the catch of SNE/MA yellowtail flounder would likely have triggered the AM, reducing catches of this stock and SNE/MA winter flounder. In 2007 this would likely have occurred again, and also would have occurred for GB yellowtail flounder. Triggering the AM for GB yellowtail flounder would probably reduce catches of other GB stocks such as GB cod and GB winter flounder but might shift effort into the GOM, increasing mortality on those stocks. Overall, the AM system would probably have reduced mortality on SNE/MA yellowtail flounder and SNE/MA winter flounder, and may have reduced mortality on GB cod, yellowtail flounder, and winter flounder. This may have shifted effort into the GOM and increased mortality on those stocks.

Compared to No Action, either one of these options should improve the ability of the management plan to remain within fishing mortality targets. Under No Action, no AMs are in place and any adjustments to the management system require a specific Council action. Because of administrative delays there is considerable lag between evidence of overfishing and the implementation of corrective measures. The No Action alternative also does not comply with current legal requirements.

Compared to the No Action alternative, either option would result in more timely adjustments to the management plan that the planned biennial adjustment process. The success in ending overfishing will depend in large measure on the accuracy of the ACLs rather than the choice of a specific AM.

7.2.1.3.6.2 Recreational Groundfish Fishing Accountability Measures

The Proposed Action (Option 3) establishes an AM for the recreational fishery. The recreational harvest in fishing year 1 will be evaluated early in fishing year 2. NMFS determines the AM after consultation with the Council. These AMs will be either changes in season, bag limits, or minimum sizes. The AMs will be implemented by NMFS as soon as possible; this makes it likely that the AM will begin to address the catch overage in the year immediately following the overage As a result of this AM it is more likely that recreational harvest will be kept at or below the ACL, reducing the risk of overfishing. An issue that may make the AM less effective is that if bag limits and minimum size regulations are used to reduce the kept portion of catch, they do not have as large an impact on total removals. These factors will have to be considered when choosing the AM.

7.2.2 Biological Impacts of Alternatives to the Proposed Action

This section identifies the biological impacts of the alternatives that were not selected, including the No Action alternatives where appropriate.

7.2.2.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

7.2.2.1.1 Revised Status Determination Criteria

Under the No Action alternative, the SDC adopted by Amendment 13 would continue to guide management actions. The impacts of this choice vary among stocks. For some stocks, the biomass SDC (or target biomass) is higher than the value in the Proposed Action. In these cases, the stock would be ultimately rebuilt to a larger stock size. For other stocks, the Amendment 13 value is lower and if this option is selected the stock's rebuilding potential might not be realized. These differences are highlighted in Table 174. There are also differences in fishing mortality thresholds – for some stocks, the Amendment 13 values are higher, and for others they are lower. Keeping a lower value might be viewed as a biological benefit to the stock as it would result in lower catches from the fishery.

In addition to differences in values, in some instances the No Action/Amendment 13 SDCs are a different parameter than what is proposed. Selecting the No Action alternative is also not consistent with using the best available science for management actions.

7.2.2.1.2 ABC Control Rules

Under the No Action alternative, the MSY control rules adopted by Amendment 9 and modified in Amendment 13 would be used to guide the setting of ABCs. These control rules call for fishing mortality to be reduced as stock size declines below SSB_{MSY}, and the target fishing mortality rate is set at 75 percent of the MSY control rule. While the target fishing mortality rate would be lower than the mortality rates resulting from the proposed ABC control rule, the mortality resulting from the MSY control rule would be higher. Long-term, the effect on stock size of this alternative would be similar to the Proposed Action if target fishing mortality rates were maintained.

7.2.2.1.3 Revised Mortality Targets for Formal Rebuilding Programs

7.2.2.1.3.1 Option 1 – No Action

This option would use the fishing mortality targets calculated for Amendment 13 to rebuild the stocks. In addition, it would retain the biomass targets adopted in Amendment 13. Projections were used to predict estimates of future stock size. The following figures illustrate predicted stock growth given the fishing mortality rates are achieved for all stocks with reliable projections. The charts include recent stock size for comparison to future predictions, as well as the Amendment 13 SSB_{MSY} level. In each chart the solid SSB line reflects the rebuilding strategy.

There are some technical concerns with the charts shown here. The GARM III assessments updated selectivity in the fishery, growth rates, and recruitment estimates for many stocks to values that are different than those used for Amendment 13 calculations. Using those values with the Amendment 13 biomass and mortality targets is not consistent. The old values were not used because while the Council could choose to use the Amendment 13 mortality targets, the basis for the new recruitment, selectivity, growth, and other factors used in the projections is technical and is not subject to a Council choice.

Charts are not shown for GOM winter flounder, GOM haddock, Northern and Southern windowpane flounder, pollock, white hake, Atlantic halibut, or ocean pout. The GARM III review panel advised against using the assessment results to calculate projections for the windowpane flounders, GOM winter flounder, and ocean pout. It would not be consistent with the best scientific information available to present those projection results. Projections are not shown for white hake, GOM haddock, and Atlantic halibut because those stocks were assessed with an index-based assessment in the past but use and age-based assessment now. There isn't a reliable way to use the index-based values ion the current projection model.

The projections indicate that the No Action alternative will not achieve rebuilding targets for GB cod, GOM cod. GB yellowtail flounder, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, plaice, witch flounder, and SNE/MA winter flounder. It will achieve the Amendment 13 targets for GB haddock and redfish. For the stocks that would not achieve the targets, the reason is a combination of higher biomass targets adopted by Amendment and/or higher fishing mortality rates than are needed for rebuilding. The stock sizes achieved under the No Action option for GB cod, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, and plaice are similar to those achieved under Option 2, and the failure of the No Action option is due to higher biomass targets.

Selecting this option will not have direct impacts on non-groundfish stocks.

A No Action projection is not provided for white hake, GB winter flounder, and GOM haddock. The projection model for these stocks changed since GARM II.

Figure 136 – GB cod predicted SSB, No Action

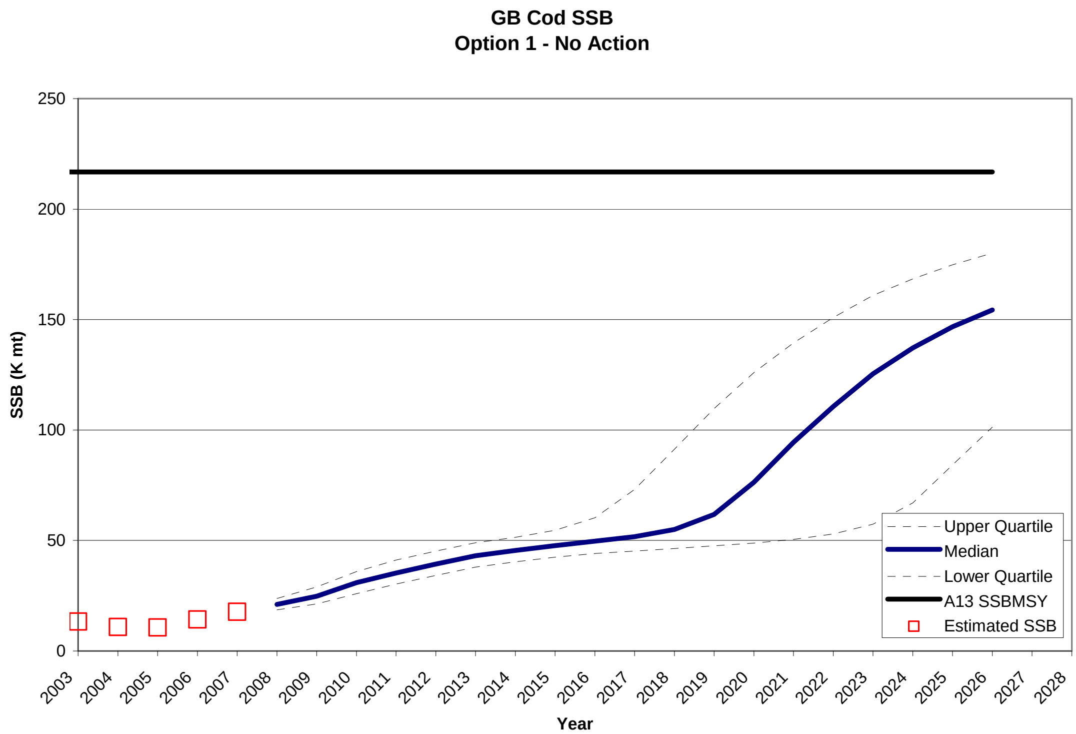


Figure 137 - GOM cod predicted SSB, No Action

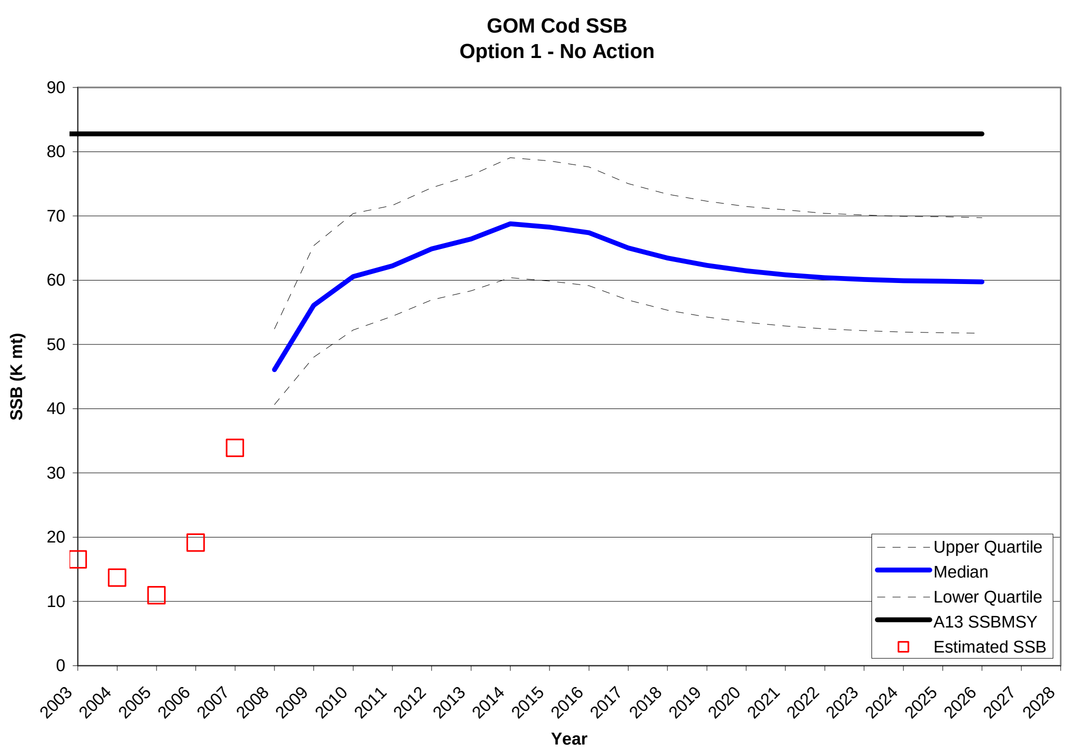


Figure 138 - GB haddock predicted SSB, No Action

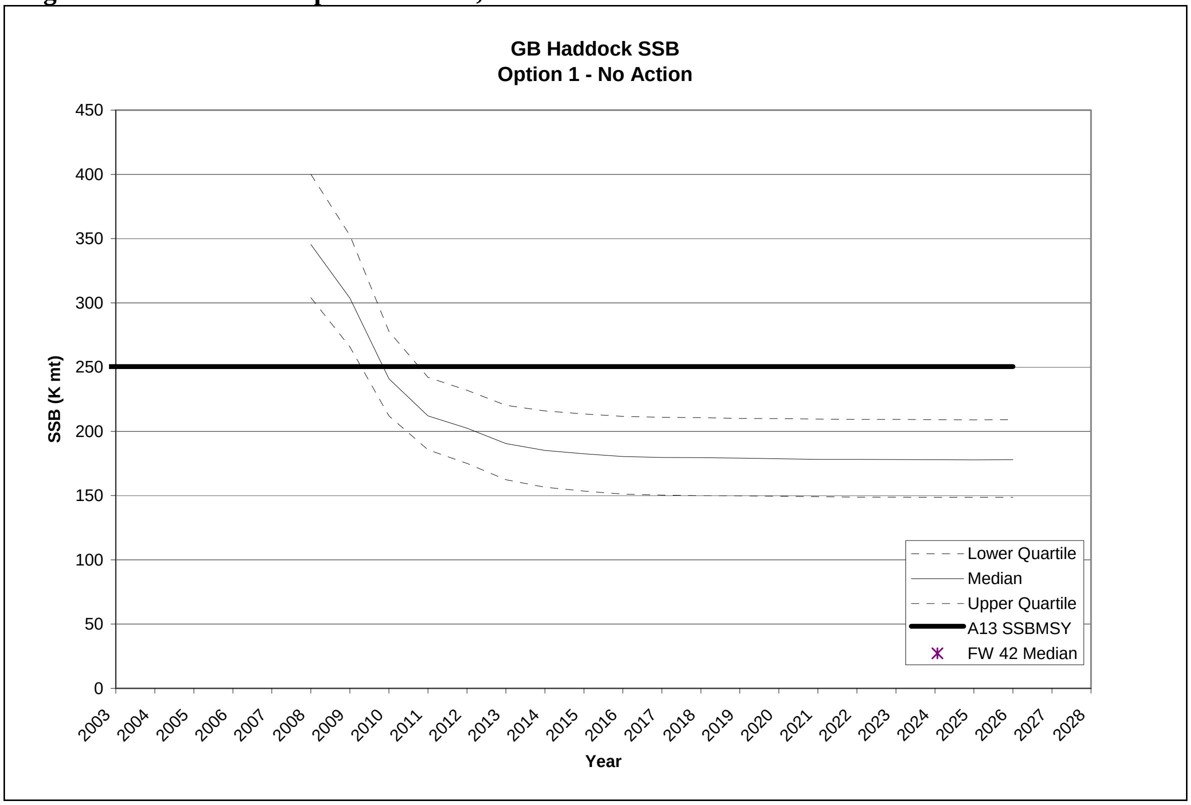


Figure 139 - GB yellowtail flounder predicted SSB, No Action

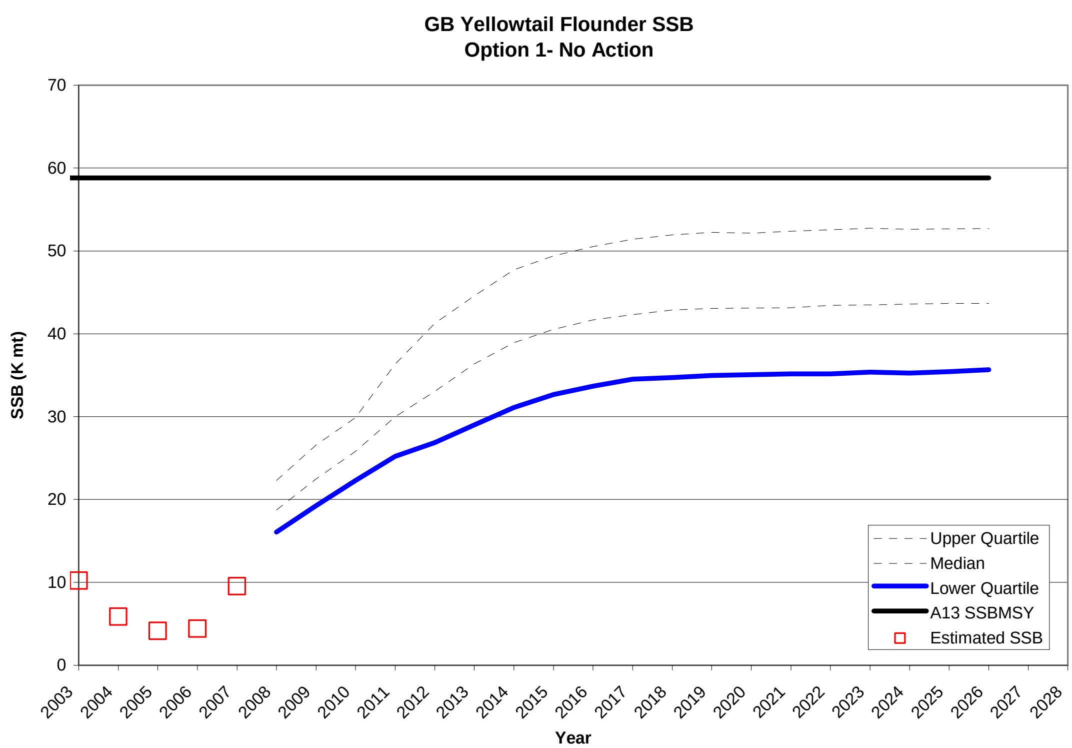


Figure 140 – SNE/MA yellowtail flounder predicted SSB, No Action

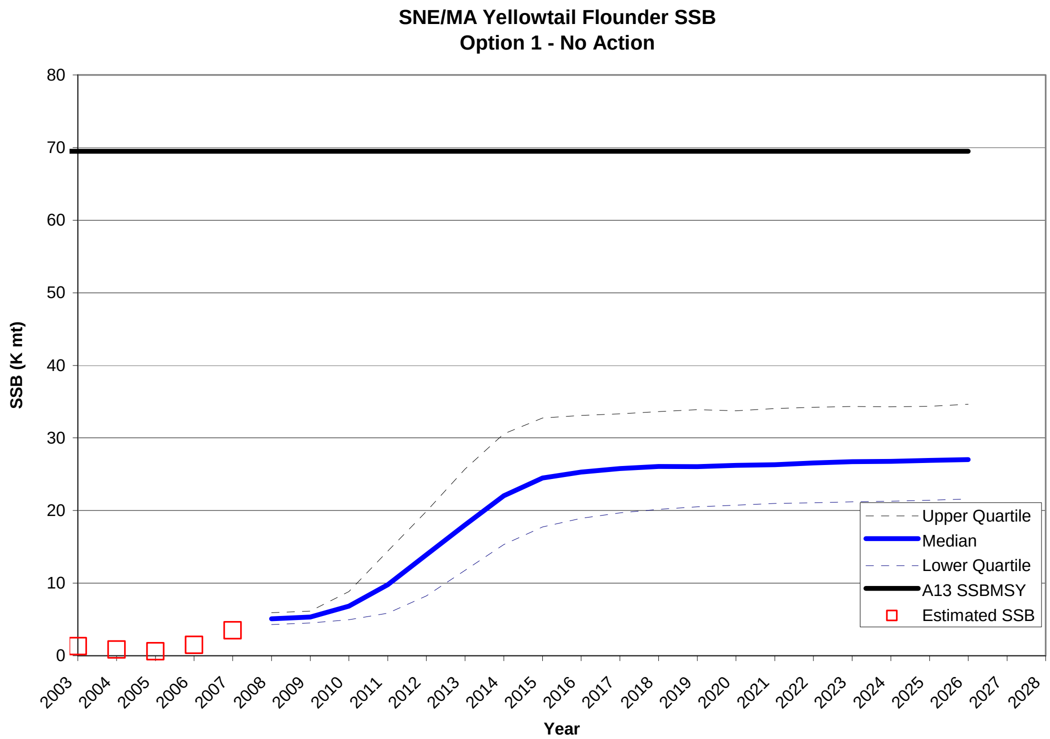


Figure 141 – CC/GOM yellowtail flounder predicted SSB, No Action

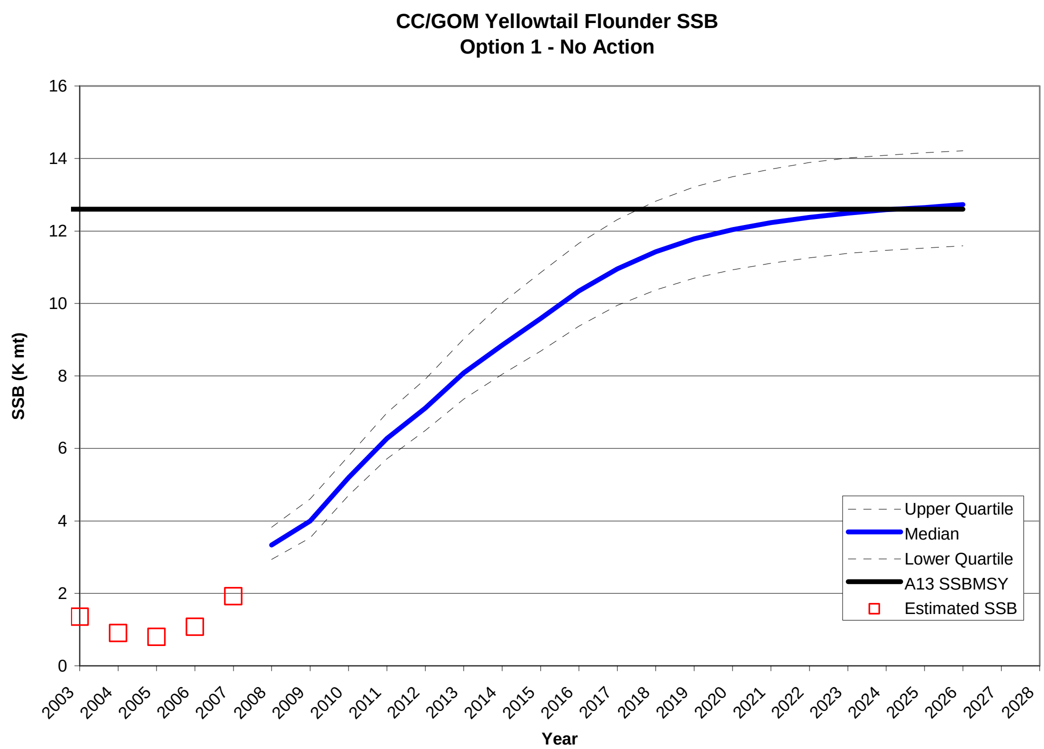


Figure 142 – American plaice predicted SSB, No Action

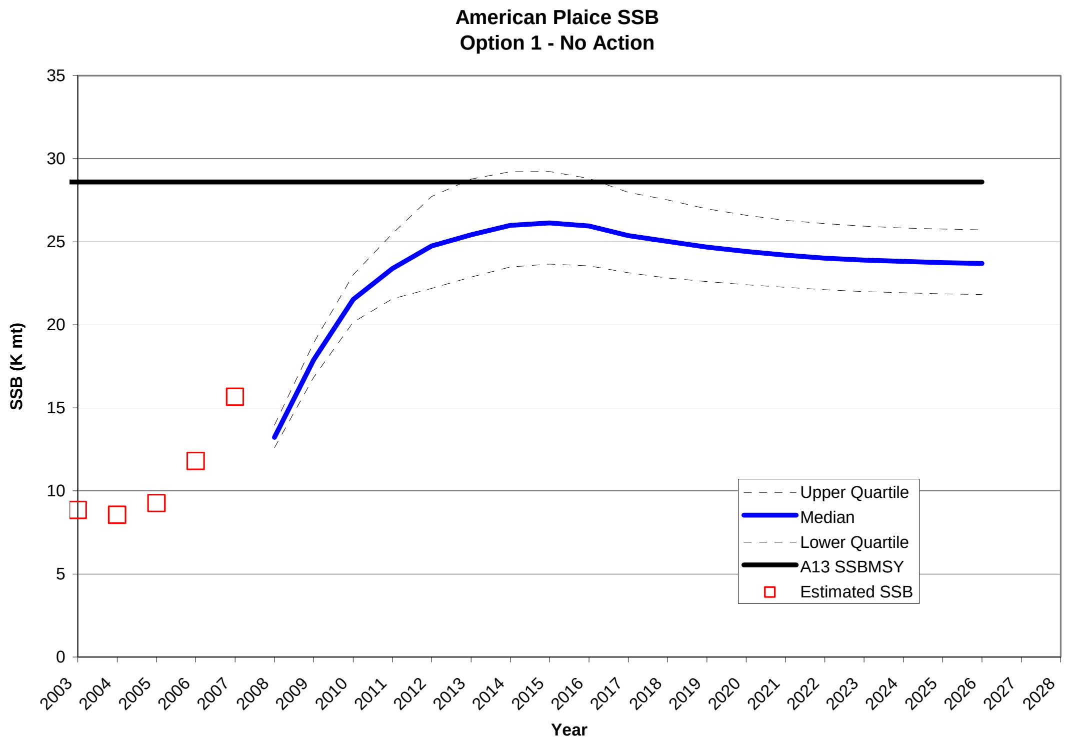


Figure 143 – Witch flounder predicted SSB, No Action

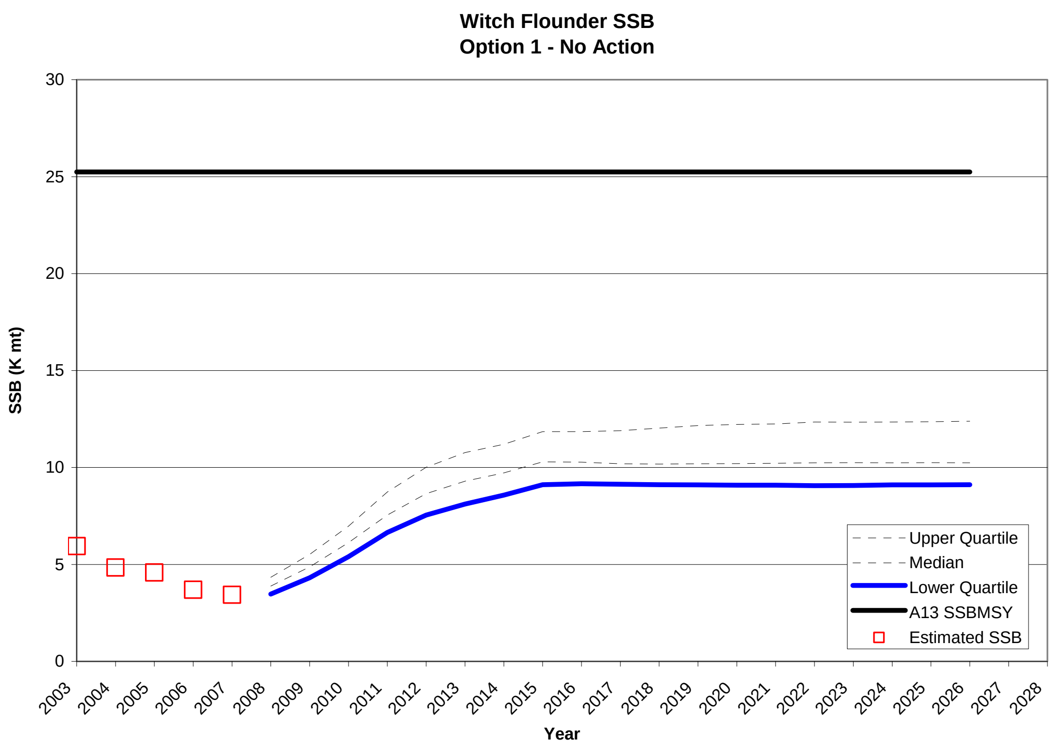


Figure 144 – SNE/MA winter flounder predicted SSB, No Action

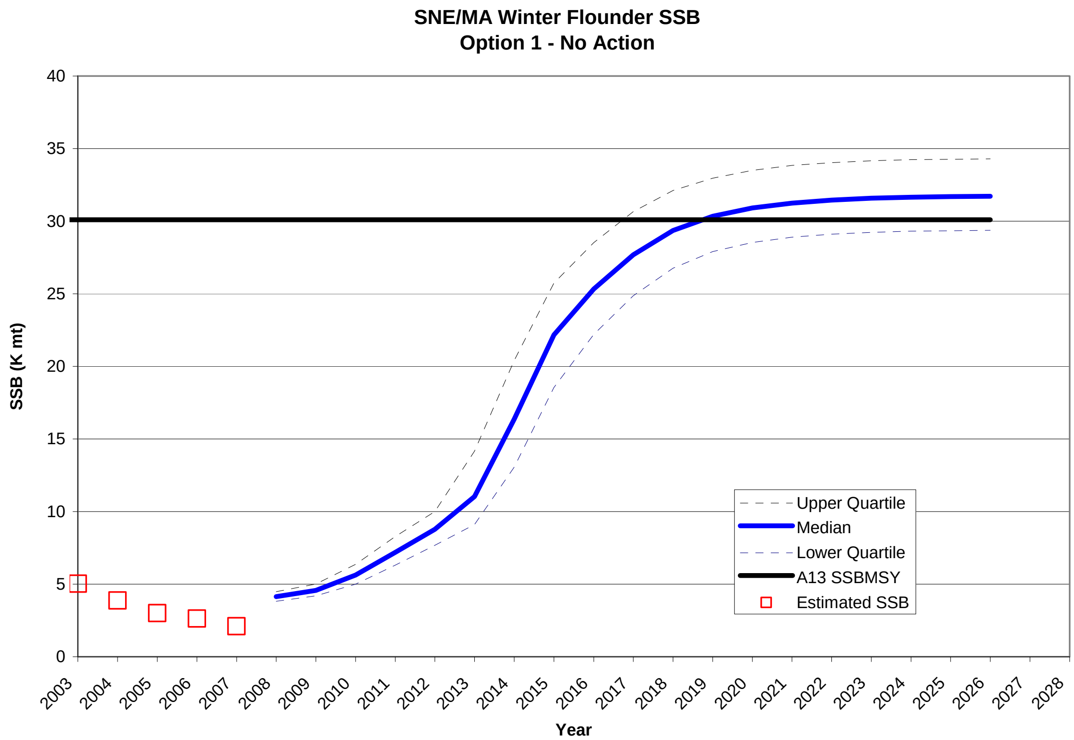
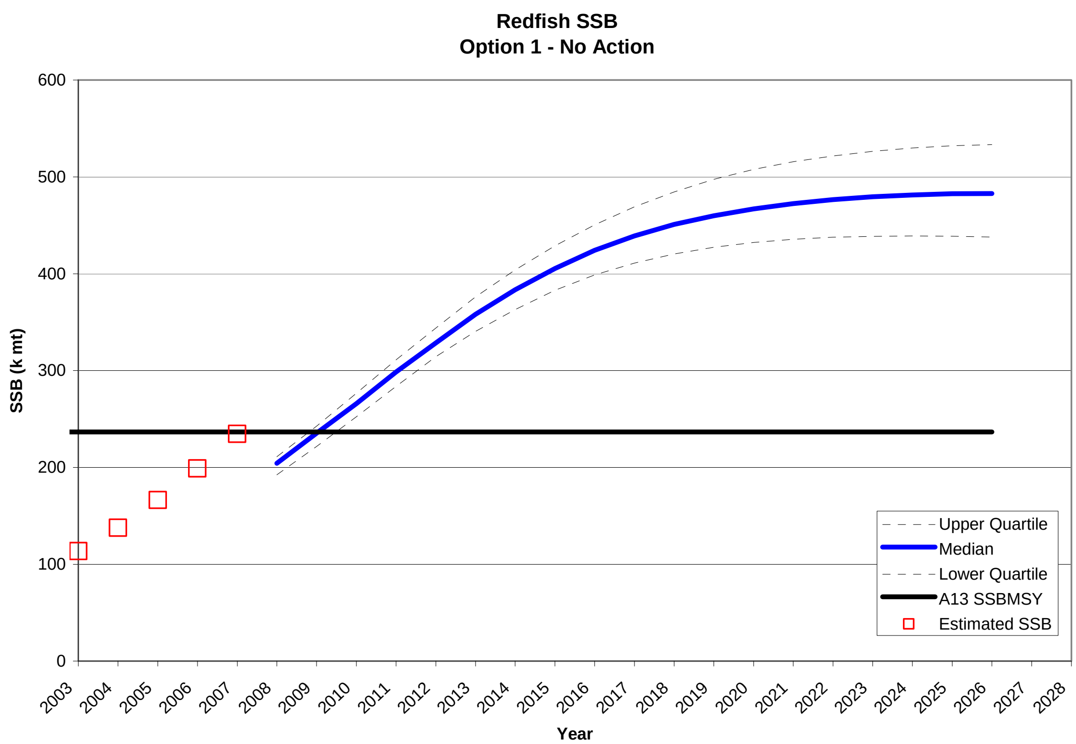


Figure 145 - Redfish predicted SSB, No Action



7.2.2.2 Fishery Program Administration

7.2.2.2.1 Annual Catch Limits

The No Action alternative would not define ACLs. Choosing this alternative would not comply with current legal requirements. It is not clear what the biological impact s of selecting this alternative would be. As noted in the AE (section 6.1.8), the current management program has struggled to meet mortality objectives even though since 2004 it has held catches below TTACs for most stocks (section 6.2.2). While admittedly TTACs provided by the NEFSC for 2004 and 2005 used assumptions for recruitment and growth that did not take into account recent trends but were based on long-term expectations, the same did not occur for the TTACs set for 2006 and 2007. These were calculated using assumptions that were approved by the GARM II review panel and were believed to be more realistic, yet many mortality targets were exceeded even though TTACs were not. As a result it is not immediately obvious that establishing a system of ACLs and AMs will increase the probability of achieving mortality targets or that choosing the No Action alternative increases the risk of exceeding targets and will result in excessive fishing mortality. Choosing this alternative, however, will not improve the assessment of uncertainty in setting TTACs or TACs and achieving mortality targets. At present there is little formal structure to the TTAC setting approach and there has not been effective SSC review of the TTACs/TACs. This is likely to continue if No Action is selected.

7.2.2.2.2 Addition of Atlantic Wolffish to the Management Unit

As a result of the No Action alternative, Atlantic wolffish would not be added to the management unit and measures that are specifically designed to rebuild this species could be adopted under the M-S Act. A formal rebuilding plan would not be adopted and EFH would not be specified.

7.2.2.2.3 Sector Administration Provisions

This action proposes numerous changes to the administration of voluntary, self-selecting sectors. All of these changes are designed to improve the effectiveness of sectors as a management option. Some of the proposed changes are primarily administrative in nature. Under the No Action alternative, these revised administrative measures would not be adopted. Many of these administrative measures provide more detail on the information sector organizers should submit when applying for a sector or in annual reports. These are unlikely to have any direct biological impacts, and the No Action alternative would not be expected to have any biological impacts, either.. The proposed measures that fall into this category are:

- Sector formation proposal and operations plan revisions
- Sector annual reports

In addition to the proposed PSC alternatives, this action considered a No Action and three other alternatives for allocating the resource to sectors. None of these allocation options were expected to have direct biological impacts as they were merely different ways of allocating the same amount of fish. They could have different indirect biological impacts if the allocation methods distribute the resource differently, such as to a gear that has a higher bycatch. These impacts are impossible to predict without knowing sector membership and fishing practices under sectors.

7.2.2.2.3.1 Allocation of Resources

This action changes how resources are allocated to sectors. Under the No Action alternative, sectors are allowed to choose which stocks will be fished under a hard TAC and can rely on DAS to control mortality on other stocks. This could result in increased fishing mortality on other stocks that is not anticipated by the sector concept. This is because DAS are only part of the effort control system, which includes gear restrictions, trip limits, and seasonal and year round closed areas. Catch rates while using DAS without these other restrictions would likely be higher, so the DAS cannot be expected to be an adequate mortality control. This would likely cause the No Action alternative to have higher fishing mortality than the Proposed Action, as further described below.

In addition to No Action, the action considered five options for allocating TAC to sectors. Biological impacts differ between the options. Options 2-4 (i.e., allocation options that include vessel capacity in addition to recent landings history have the potential that the resulting sector TACs would result in landings that differ from recent landings patterns and represent a redistribution of fishing effort among the groundfish fishery. This is particularly relevant for Options 3 and 4 that would allocate potential sector contribution of all stocks to all vessels, regardless of an individual vessel's history of landing a particular stock. For example, under these options, a vessel that fished exclusively in the GOM would be allocated a potential sector contribution for SNE/MA yellowtail flounder even though the vessel never fished for yellowtail flounder in the SNE/MA Regulated Mesh Area. Such redistribution of fishing effort could increase catch of other groundfish stocks, particularly if participating sector vessels fish in areas they've never fished in or target other groundfish species they've never targeted before. These impacts would likely be mitigated by other measures proposed in this action, including ACE trading, the prohibition on sector vessels fishing in stock areas in which they are not allocated ACE for stocks within such areas, and the requirement for sectors to cease fishing operations once their ACE is caught.

Under the No Action alternative, sectors would receive all ACE at the beginning of the fishing year. This means that it would be difficult for NMFS to reduce ACE if an overage from the previous year is detected after the year is over. This would increase the possibility that overfishing would occur.

The different options, including No Action, may have different indirect impacts. If a sector is not allocated ACE for all groundfish stocks within a particular stock area, participating vessels cannot fish for groundfish in that particular stock area. This would reduce the catch and, therefore, mortality of non-groundfish stocks. The opposite impacts may result if the Council selects an option that allocates sectors ACE for groundfish stocks in all areas. Such impacts may be mitigated at least in part by other provisions proposed in this action, including ACE transfers and the requirement for sectors to cease fishing operations in a particular stock area once sector ACEs for relevant stocks in that area have been caught. If sector ACEs are small and caught early in the fishing year, there is the potential that sector operations may shift to targeting other fisheries in other areas. If this were to occur, catch and, therefore, mortality on those non-groundfish stocks would increase.

7.2.2.2.3.2 U.S./Canada Area

Under the No Action alternative, sectors would not receive a specific allocation of cod and haddock on eastern GB, an area that is subject to management under the terms of an understanding between the U.S. and Canada. This is not expected to have any direct biological impacts, as it is primarily an allocation issue. It may have some indirect adverse impacts if the lack of an allocation leads sector vessels to compete against non-sector vessels in a derby for the available harvest. This could lead to increased discards of non-target species.

7.2.2.2.3.3 Monitoring and Enforcement

Under the No Action alternative, monitoring and enforcement requirements would remain as described in Amendment 13 (NEFMC 2003). While this document established broad principles for sector monitoring; it did not provide many details. If the No Action alternative were selected, information on sector catches would be less reliable because of a lack of dockside and at-sea observations. It is possible sectors could exceed their ACE and overfishing could result.

Under No Action, sectors would not be required to land all legal-size groundfish. This could encourage high-grading and lead to increased catches that, if not adequately monitored, could lead to overfishing.

With respect to accounting for sector discards prior to adoption of an at-sea monitoring program, two approaches were included in this amendment. The non-selected approach (Option 1) applies an estimated discard rate to sector landings on a trip-by-trip basis. This discard rate will be determined using the discard rates determined by the last assessment, by gear when available. Table 194 shows these estimates that were derived in the GARM III assessments. These may not be the values used by NMFS as discard ratios can be calculated several different ways. These values use the discards by gear divided by the kept by gear for the same stock. With the initiation of additional sectors, this discard rate will be based on fishing activity prior to implementation of the new sectors. Many of the discards during this period are caused by regulations (trip limits, quotas, etc.) that sectors will not be required to adhere to. As a result, it is likely that these discard rates will be higher than those experienced by the sector and using this rate will over-estimate sector catches. Support for this assumption can be found in the experience of the Fixed Gear Sector in FY 2007, where it appears that discard rates for permits in the sector may have been lower than when those permits were not in the sector (see section 6.2.4.2.2). This could help reduce fishing mortality, since the catches that are applied against ACE are likely to be higher than actual catches, and sectors may have to stop fishing earlier as a result.

Another possibility, however, is that while this may hold true while sectors have sufficient ACE available to continue fishing, as they approach an ACE that could result in stopping fishing, discard rates might increase above those used in the estimated discard rate. For this reason, the use of an estimated discard rate is intended to be a temporary measure. Sectors will be required to develop a monitoring system that meets NMFS standards that will adequately monitor discards by sector vessels. Standards will be developed and published to facilitate the development of such systems. Once the system is developed, a sector will be required to use it, which should improve discard estimation for sectors.

Table 194 – Ratio of discards to kept for stocks allocated to sectors based on GARM III estimates for CY 2007

Note: (1) Overall discard rate because gear-specific estimate not available

Species	Stock	Gear		
		Trawl	Gillnet	Longline
Cod	GOM	0.22	0.09	0.13
	GB	0.34	0.03	0.28(1)
Haddock	GOM	0.01	0.01	0.10
	GB	0.70	0.22	0.27
Yellowtail Flounder	CC/GOM	0.25	0.20	
	GB	0.37	0.00	
	SNE/MA	0.40	5.00	
American Plaice		0.23	0.24	
Witch Flounder		0.05		
Winter Flounder	GOM	0.18	0.01	
	GB	0.07	0.25	
	SNE/MA	0.05		
Redfish		0.47(1)		0.47(1)
White hake		0.02	0.01	0.41(1)
Pollock				

7.2.2.2.3.4 Transfer of Catch Entitlements

The Proposed Action will allow sectors to transfer ACE between sectors and allows sectors to trade ACE for a brief period after the end of the fishing year, to "balance the books" and avoid an overage penalty. Under the No Action alternative, neither transfers nor carry-over would be allowed.

As discussed in section 7.2.1.2.3.4, allowing carry-over of ACE does increase the risk that overfishing may occur in subsequent years. The cause is that the catch allowed, including carry-over, may be higher than can be supported. This risk is greater if a stock is declining in size. As a result, under the No Action alternative, this type of risk is lower. But the No Action alternative could affect fishing behavior in negative ways. As noted in Sanchirico et al (2006), a carry-over reduces the incentive for fishermen to fish right up to the ACE, which can lead to overages or discarding.

The lack of the ability to transfer ACE between sectors may lead to discarding as fishermen cannot acquire additional ACE to account for inadvertent overages (Sanchirico et al (2006)).

The No Action alternative was not expected to have direct impacts on non-groundfish stocks.

7.2.2.2.3.5 Participation in Special Management Programs

These measures describe sector participation in special management programs. Currently, with the exception of the Closed Area I Hook Gear Haddock SAP, there are no provisions that affect sector participation in special management programs. Accordingly, the No Action alternative would not result in additional biological impacts beyond those previously analyzed in earlier actions.

7.2.2.2.3.6 Interaction with Common Pool Vessels/Universal Exemptions

This section specifies the measures from which sectors cannot be excused, as well as those measures that that all sectors do not need to adhere to and so receive an automatic exemption. No changes were considered to the list of measures from which a sector cannot be excused. No alternatives were considered for these measures.

This Proposed Action specifies management measures that do not apply to all sector vessels. The No Action alternative would not have adopted this list of universal exemptions. For most of the exemptions, it is probable that there is little practical difference in the biological impacts of the Proposed Action as compared to the No Action alternative. That is because sectors would have requested, and likely received, an exemption from trip limits, DAS, seasonal closed areas, and the requirement to use six and a half inch mesh codends when fishing with selective trawl gear.

It is less certain that sectors would have received an exemption from the GOM rolling closures, if requested. If NMFS declined those requests, then the No Action alternative would provide additional protection to spawning fish as compared to the Proposed Action. Howell et al. (2008) reported results of a cod mark and recapture experiment conducted in the Western GOM. They concluded that several of the rolling closures were appropriately timed and located to protect spawning cod aggregations. Since the No Action alternative maintains all of these current closures for sector vessels, it would provide additional protection to spawning cod that is not provided by the Proposed Action.

7.2.2.2.3.7 Movement Between Sectors

No alternatives to the Proposed Action (the No Action alternative) were considered.

7.2.2.2.4 Reporting Requirements

This action proposes several modifications to reporting requirements. The No Action alternative would have maintained the current reporting system. Because under the current system discards are not determined until some point after the fishing year is completed, the No Action alternative would have made it more likely that catches might exceed ACLs, increasing the risk of overfishing. Two sub-options were considered for determining the discard rate that is applied to each trip. The non-selected alternative (Sub-option A) would use a rate based on the most recent assessment. Because the most recent assessment may be several years old, there will considerable uncertainty if this estimate is used. In addition, this estimate will be based on all fishing activity, including that within sectors, and may not reflect the discards that occur in fishing outside of sectors. While the information that is currently available from GARM III reflects discard rates when most vessels were subject to trip limits, after implementation of this amendment it is possible that many vessels will operate within sectors, will not be subject to trip limits, and may have lower discard rates than non-sector vessels as a result. Unless the assessment reports discard rates for sector and non-sector vessels, the overall discard rate will reflect a mix of fishing activity: some subject to trip limits and some not subject to trip limits. Presumably this overall rate will be lower than the rate for vessels subject to trip limits. Since non-sector boats are subject to trip limits, using the assessment discard rate might bias the discard estimate low – unless sectors discard to avoid exceeding a sector TAC and closing their fishing year. This option would be expected to result in a less accurate discard estimate, but it is not clear that there will be a consistent bias in the estimate: it may be either too high or too low.

The No Action alternative would not have adopted broad reporting areas that should help with the assignment of catch to stock area; as a result, uncertainty over the correct attribution of the catch of a species to a stock would continue.

Selecting these options would not have direct impacts on non-groundfish stocks.

7.2.2.2.4.1 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

This measure considered two options for allocating specific groundfish stocks between the recreational and commercial components of the fishery.

7.2.2.2.4.2 Option 1 – No Action

No additional biological impacts are expected if this option were adopted. The lack of an allocation between the commercial and recreational components of the fishery, while it does simplify the design of management measures, may make them less effective. In the absence of an allocation management actions have attempted to achieve similar mortality changes from each sub-component. The result of this approach is that the measures do not specifically target the component that may be responsible for the mortality overage. As a result, the measures may not be correctly designed if a component’s contribution to mortality is changing over time.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.2.2.5 Changes to the DAS Transfer and Leasing Programs

7.2.2.2.5.1 Option 1 - No Action

No additional biological impacts would be expected if the DAS transfer and leasing programs are not modified. The No Action alternative would have maintained the regulation that prevented permits in the CPH category from participating in the DAS transfer and leasing programs. Since the experience has been that some permit holders continue to keep permits in this category, the expectation is that the No Action alternative would have am marginally lower amount of effort available to the fishery, resulting in minor reductions in fishing mortality when compared to the Proposed Action.

Adopting the No Action alternative would also have maintained the cap on the number of DAS that can be leased by a permit. While removing the cap was not considered in the draft amendment, this action proposes to remove the cap. By limiting the number of DAS that each permit can acquire through leasing the cap may have helped limit shifts in effort that can take place as a result of the DAS leasing program. This may have helped control fishing mortality on some stocks, but the exact impacts are uncertain. As discussed in section 7.2.1.2.6.3, the CAM used to design effort controls used input data that was limited by the existing DAS leasing cap. Keeping the cap in place means there would be less uncertainty about the results of the CAM and whether the effort controls are adequate to control fishing mortality for common pool vessels.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.2.2.5.2 Option 2 – DAS Transfer Program Conservation Tax Change

This measure – which was included in the Proposed Action – included a sub-option for the treatment of permits that used the DAS transfer program in the past and as a result have been subject to the conservation tax. This sub-option was not adopted and tube biological impacts are described here. Sub-Option B would return the DAS that were lost to the conservation tax. Sub-Option B would increase DAS from current levels by the number of DAS that have been lost, but the increase is not large. Sub-Option B would increase the available Category A DAS by 81 DAS and Category B DAS by 66 DAS. This could result in increased fishing activity compared to recent levels, resulting in harvesting more groundfish. Given the very small participation in the transfer program to date, the change would be difficult to measure.

7.2.2.2.5.3 Option 3 – DAS Leasing Program Conservation Tax

The current DAS leasing program does not impose a tax on the leasing of DAS between permits. This measure – which was not adopted - considered setting a tax that is equivalent to that used for the DAS transfer program, the implication being that the DAS transfer program tax is not completely eliminated (as is the case for the Proposed Action). Analyses of the DAS leasing program for FW 42 concluded that the program was not conservation neutral, tended to shift DAS to vessels that fish in the GOM or on GB, and likely increased fishing mortality on stocks in those areas while reducing mortality on stocks in the SNE/MA area. At the same time, the analysis found it impossible to reliably quantify the biological impacts of leasing activity. As noted in section 6.2.3.7, participation in the leasing program has steadily increased: in FY 2007, 29 percent of the allocated DAS were leased and they totaled 42 percent of the DAS used.

Applying a conservation tax would serve to reduce the number of DAS leased that can be used. This would result in a further reduction in fishing effort and could benefit stocks in the GOM and GB areas. It is impossible to quantify the extent of this benefit.

Impacts on Other Species
If a conservation tax on leased DAS is imposed, the number of DAS available to fish for groundfish will decrease. Catches of skates, monkfish, and spiny dogfish while using groundfish DAS would also be expected to decrease. Reduced catches on groundfish DAS would benefit those stocks.

7.2.2.2.5.4 Option 4 – DAS Transfer Program Conservation Tax Exemption Window

In essence this option would have temporarily removed the DAS Transfer Program Conservation Tax. The concept was to encourage vessel owners to take advantage of the transfer program rather than to participate in the leasing program. The biological benefits would be similar to the benefits expected if the tax is removed as in Option 2. The benefits might accrue more quickly if vessel owners act quickly to take advantage of the exemption. On the other hand, the action might deter future transfers by undecided owners: having missed the exemption window they may be reluctant to be subject to a tax in the future.

Selecting this option will not have direct impacts on non-groundfish stocks.

7.2.2.2.6 Special Management Programs

7.2.2.2.6.1 Closed Area I Hook Gear Haddock SAP

Option 1 would not expand the area or season for the CA Hook Gear Haddock SAP. This is the No Action alternative. When compared to the Proposed Action, the shorter season and smaller area would be expected to result in lower fishing mortality for GB haddock. Selecting this option would not have direct impacts on non-groundfish stocks.

7.2.2.2.6.2 Eastern U.S./Canada Haddock SAP

Under Option 1 (No Action), this SAP would expire and would not be renewed. As a result, opportunities to target GB haddock would be reduced and catches of that stock would be expected to decline. Participation in this SAP has been limited in recent years: GB haddock catch in the SAP in FY 20005 was 416,000 pounds, declined to 20,000 pounds in FY 2006, further declined to 0 pounds in FY 2007, and increased to about 125,000 pounds in FY 2008 (through January 15, 2009). Allowing this SAP to expire may result in a slight reduction in GB haddock catches and reduce fishing mortality by an imperceptible amount. It is not clear how this would impact other groundfish stocks and other species. While allowing this SAP to expire reduces opportunities to target GB haddock and this may result in increased effort on groundfish or other stocks, there has been little participation in this SAP in recent years so any changes are probably immeasurable.

7.2.2.2.6.3 CA II Yellowtail Flounder SAP

Option 1 of this measure is the No Action option and would not change the CAII yellowtail flounder SAP. The major difference between the No Action alternative and the Proposed Action is that under the No Action alternative the SAP is only open to facilitate targeting yellowtail flounder when that stock can support additional catches. The Proposed Action allows access to the SAP area to target haddock, even when the SAP is not opened for yellowtail flounder fishing. As a result, the No Action alternative would be expected to result in lower fishing mortality for GB haddock and other stocks caught in the SAP area. The differences for many other stocks are expected to be minor, since the Proposed Action requires gear that if fished correctly is not expected to catch appreciable amounts of bottom-dwelling species such as cod, monkfish, skates, etc.

7.2.2.2.6.4 SNE/MA Winter Flounder SAP

Under the No Action alternative, this SAP would continue to be allowed. While difficult to determine the biological impacts of the SAP, the estimated landings from this program in recent years have been on the order 38 mt (see section 7.2.1.2.7.5). If the program were allowed to continue, landings would likely be similar. The Proposed Action is not likely to eliminate these catches; it is more likely to turn them into discards.

7.2.2.2.6.5 Category B (regular) DAS Program

Option 1 for this measure is the No Action alternative. If adopted, the Category B DAS program could still be used to target pollock, a stock that is approaching an overfished condition. This could contribute to excessive levels of fishing mortality for this stock. Catches of pollock in this program exceeded one million pounds in FY 2007, or nearly 10 percent of the commercial landings.

7.2.2.2.7 Periodic Adjustment Process

The No Action alternative does not change the administrative measures used for the periodic adjustment process. It would not have any direct biological impacts on either groundfish or non-groundfish species.

7.2.2.2.8 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

The No Action alternative was not selected. This alternative would have maintained the current provision that prevents a vessel from holding a limited access scallop and groundfish permit at the same time. No additional biological impacts would result. As compared to the Proposed Action, there would be less uncertainty about the results of the CAM used to develop the effort control measures for non-sector vessels.

7.2.2.2.9 Catch History

The No Action alternative would allow catch history to accrue to the vessel that lands the catch. This is an administrative measure and is not expected to have direct impacts on fishing mortality.

7.2.2.3 Measures to Meet Mortality Objectives

7.2.2.3.1 Commercial Fishery Measures

7.2.2.3.1.1 No Action

Under the no action alternative there would be an 18 percent reduction in DAS, the Eastern U.S./Canada Haddock SAP would not be renewed. There are many other elements to the No Action alternative that are discussed in other sections. For example, see section 7.2.1.2.2 for a discussion of the biological impacts of not including Atlantic wolffish in the management unit. This section focuses on the effort controls for non-sector vessels.

The impacts of the 18 percent DAS reduction, seasonal and year round closed areas, and trip limits were analyzed using the CAM. The results of the model suggest that the No Action alternative will not achieve the mortality reductions necessary to rebuild all groundfish stocks. Table 195 summarizes the results of the analysis; note that the targeted reductions in fishing mortality have been reported in this table as changes in exploitation. The No Action alternative would achieve mortality goals for GB haddock, GOM haddock, GB winter flounder, GOM winter flounder, plaice, Southern windowpane flounder, CC/GOM yellowtail flounder, GB yellowtail flounder, and redfish. It would fall short of the mortality targets for GB cod, SNE/MA winter flounder, Northern windowpane flounder, SNE/MA yellowtail flounder, and pollock.

It is likely that discards of GOM cod would increase under the No Action alternative because the trip limit remains constant. GARM III documented that discard rates declined between CY 2003 and CY 2004, declined further in CY 2005, before increasing in CY 2006. The decline in CY 2004 is coincident with an increase in the GOM cod trip limit. With the stock expected to increase in the near future to levels not seen in thirty years, it is likely that catch rates will increase and the low trip limit will lead to increased discards.

Table 195 – No Action changes in exploitation

Spec	AREA	Needed Difference	No Action % Difference
COD	GBANK	-50%	-17%
COD	GM	-37%	-16%
HADDOCK	GBANK	202%	-19%
HADDOCK	GM	24%	-18%
WINTER	GBANK	48%	-19%
WINTER	GM		-15%
WINTER	SNEMA	-100%	-20%
PLAICE	ALL	39%	-16%
WITCH	ALL	-46%	-16%
WHK	ALL	28%	-17%
WIND	NORTH		-19%
WIND	SOUTH		-21%
YTF	CCGOM	-34%	-18%
YTF	GBANK	-15%	-20%
YTF	SNEMA	-39%	-18%
POLLOCK	ALL	-66%	-17%
REDFISH	ALL	271%	-18%

Impacts on Other Species

Because this option reduces groundfish DAS, catches (both landings and discards) of skates, monkfish, and spiny dogfish while fishing on groundfish DAS would be expected to decline. Counter-acting this tendency is that some vessel owners may choose to increase fishing activity in the open-access fisheries of skates and spiny dogfish to make up for lost groundfish revenue.

7.2.2.3.1.2 Option 2A – Differential DAS and Trip Limits

Impacts on groundfish stocks

Option 2A extends differential DAS counting throughout much of the fishing area, maintains the default DAS reduction, and adjusts trip limits for most stocks. Three variations of this option were considered. The initial version of Option 3A was developed prior to the determination that pollock was overfished. When this determination, was made, it was determined that Option 3A did not meet the mortality objectives for pollock. The Council then considered two modifications to this option. Both added a pollock trip limit and further reduced DAS. Either of these two revised options would have met the pollock objectives.

Analysis in the CAM suggests this alternative (the two revised versions) would achieve the targeted mortality reductions for all stocks with the exception of SNE/MA winter flounder and Northern windowpane flounder (the estimated reductions for witch flounder falls within the range of error assumed for the CAM). The CAM results may not fully capture the mortality reductions for these stocks. The primary data input into the CAM is landings, and windowpane flounder is only landed in small quantities. This limits the data available to the CAM and thus may not completely capture the changes in exploitation that will result. The model also estimates changes without taking into account differential DAS rates that may be encountered enroute an area. For example, as this alternative is drafted, a vessel transiting the inshore GOM differential DAS area is charged differential DAS at a 2.25:1 rate even when fishing will take place in an area at a lower rate. As a result, the model under-estimates effort reductions that result from transiting these areas.

Although the model results indicate that the reduction in exploitation of the northern stock of windowpane flounder would not be sufficient to bring the fishing mortality down to a theoretical Frebuild, the CAM indicates that exploitation will be reduced about 40 percent of the necessary reduction to achieve the rebuilding target. In contrast to many other stocks in the complex, this stock is principally a bycatch species, with landings representing only 12 % of the catch in calendar year 2007 (Catch: 1,032 mt, Landings: 119 mt; GARM III). Because this stock is principally a bycatch species with relatively low catch already, additional reductions in fishing exploitation may be very difficult to achieve through reductions in fishing effort. Since 2000, most of the landings have occurred in statistical area 525, south-central Georges Bank, and the bycatch of this stock is likely higher during winter and spring when the species is distributed across a broader area of Georges Bank. Most of the discards are in the large-mesh bottom trawl fishery. The prohibition of retention of windowpane north will eliminate landings and eliminate any incentive to target this stock. It should also be noted there is considerable uncertainty concerning this theoretical rebuilding target. Indeed, the GARM III report included these comments by reviewers that highlight the uncertainty over this projection: "Given that current catch is mostly incidental and also given the high uncertainty of index-based assessments, it was concluded that it was not appropriate to calculate Frebuild for this stock." This action does not adopt a specific Frebuild for this stock because of the scientific advice.

With respect to SNE/MA winter flounder the CAM indicates this option achieves a 73 percent reduction in exploitation when a 100 percent reduction is targeted. While some additional reduction may result from the elimination of the SNE/MA winter flounder SAP (section 7.2.1.2.7.4) this will not completely eliminate catches of this stock. Since winter flounder is caught in other fisheries (small mesh, fluke, and scallop) the only way to eliminate all exploitation on this stock is to prohibit all fishing in the stock area. The Council does not consider it reasonable to forfeit all yields from other stocks for a marginal shortening of the rebuilding program for this stock. A proposed interim action (*74 FR 2959*) considers closing an extensive area to the use of groundfish DAS. According to the supporting EA, that approach achieves only a marginal improvement in the reduction in exploitation (82 percent vice the 73 percent shown here) and results in reduced yield from fisheries.

With respect to pollock, this action proposes to eliminate the ability to target pollock on a Category B DAS program. In 2008, pollock catches were 9 percent of U.S. removals. These effort controls thus need to achieve 91 percent of the needed reduction for pollock, or a 66 percent reduction in exploitation. The additional measures considered were necessary to further reduce pollock exploitation.

In contrast to the No Action alternative, this option is likely to reduce discards of GOM and GB cod, CC/GOM yellowtail and SNE/MA yellowtail flounder, white hake, and GB winter flounder. The option either increases or removes trip limits for these stocks, which should reduce regulatory discards. It might increase discards of pollock by imposing a trip limit.

Table 196 – Option 2A changes in exploitation. Values shown are for three versions of Option 2A considered by the Council.

Spec	AREA	Needed Difference	Option 2A Action % Difference	Option 2A W/30% reduction in DAS	Option 2A W/35% reduction in DAS
COD	GBANK	-50%	-51%	-45.9%	-49.8%
COD	GM	-37%	-22%	-46.9%	-50.8%
HADDOCK	GBANK	202%	-45%	-42.1%	-46.4%
HADDOCK	GM	24%	-22%	-50.4%	-54.3%
WINTER	GBANK	48%	-34%	-41.2%	-45.6%
WINTER	GM		-14%	-34.1%	-38.8%
WINTER	SNEMA	-100%	-73%	-67.5%	-70.3%
PLAICE	ALL	39%	-38%	-56.1%	-59.2%
WITCH	ALL	-46%	-36%	-52.6%	-56.0%
WHK	ALL	28%	-40%	-63.9%	-66.7%
WIND	NORTH		-30%	-43.0%	-47.0%
WIND	SOUTH		-44%	-43.5%	-48.1%
YTF	CCGOM	-34%	-39%	-50.3%	-54.5%
YTF	GBANK	-15%	-32%	-37.6%	-42.4%
YTF	SNEMA	-39%	-55%	-45.4%	-48.7%
POLLOCK	ALL	-66%	-40%	-61.4%	-64.1%
REDFISH	ALL	271%	-41%	-63.5%	-66.3%

In addition to modifying effort controls for limited access fishing vessels, this option modifies the GOM cod trip limit for vessels with Handgear A (to 750 pounds) and Handgear B permits (to 200 pounds). These permit holders are allowed to use both handgear and tub-trawls. The only limits on fishing days are a requirement to not fish during a 20-day period in the spring. The period is selected by the permit holder and can be taken during a rolling closure. This increase in the trip limit is likely to increase fishing mortality from these permits. The Handgear A trip limit is nearly as large as the FW 42 trip limit for limited access vessels (800 pounds). As shown in 6.2.3.3.1, the number of Handgear B permits landing groundfish has increased and the landings of groundfish increased from 68,427 pounds in FY 2004 to over 150,000 pounds in FY 2007. The number of Handgear A permits landing groundfish declined from 44 in FY 2004 to 23 in FY 2007, and landings have fluctuated with a declining trend over the last four years. Even with these increases, these two permit categories only account for a small fraction of total groundfish landings.

While the Handgear A permit category is limited access, the Handgear B category is not. It is possible that the increases in trip limits will attract more effort to these two categories in the

GOM. Some limited access permit holders that do not have any Category A DAS may even decide to relinquish their limited access permit and fish with a Handgear B permit, increasing fishing effort albeit with a relatively inefficient gear. While the CAM suggests that the limited access measures will exceed the needed reduction in exploitation and a small increase in handgear permit catches could be accommodated, catches will need to be monitored to ensure that mortality objectives are no threatened.

Impacts on Other Species

Because this option reduces groundfish DAS and expands differential DAS counting areas, catches (both landings and discards) of skates, monkfish, and spiny dogfish while fishing on groundfish DAS would be expected to decline as compared to the No Action alternative. Counter-acting this tendency is that some vessel owners may choose to increase fishing activity in the open-access fisheries of skates and spiny dogfish to make up for lost groundfish revenue. There are only limited opportunities to catch these species outside the groundfish DAS system, though, so it is unlikely that the overall catch of these species will increase if this measure is adopted. In the case of monkfish, monkfish landings may decline because of the different allocations and counting methods used for monkfish and groundfish DAS (see section 7.7.6 for an expanded discussion of this issue).

7.2.2.3.1.3 Option 4 – DAS reduction and Restricted Gear Areas

Impacts on Groundfish Species

Option 4 reduces Category A DAS allocations, adjusts trip limits for most stocks, and adopts large restricted gear areas. Analysis in the CAM suggests this alternative will achieve at least the targeted mortality reductions for all stocks with the exception of GB cod, SNE/MA winter flounder and Northern windowpane flounder. The CAM results show that the expected exploitation reductions will far exceed those required to achieve the mortality targets. In the case of Northern windowpane flounder, most of the catch is discarded. This limits the data available to the CAM and thus may not completely capture the changes in exploitation that will result.

Although the model results indicate that the reduction in exploitation of the northern stock of windowpane flounder would not be sufficient to bring the fishing mortality down to a theoretical Freb, the CAM indicates that exploitation will be reduced about 58 percent of the reduction necessary to achieve the theoretical rebuilding target. In contrast to many other stocks in the complex, this stock is principally a bycatch species, with landings representing only 12 % of the catch in calendar year 2007 (Catch: 1,032 mt, Landings: 119 mt; GARM III). Because this stock is principally a bycatch species with relatively low catch already, additional reductions in fishing exploitation may be very difficult to achieve through reductions in fishing effort. Since 2000, most of the landings have occurred in statistical area 525, south-central Georges Bank, and the bycatch of this stock is likely higher during winter and spring when the species is distributed across a broader area of Georges Bank. Most of the discards are in the large-mesh bottom trawl fishery. The prohibition of retention of windowpane north will eliminate landings and eliminate any incentive to target this stock. The GARM III report included these comments by reviewers that highlight the uncertainty over this projection: “Given that current catch is mostly incidental and also given the high uncertainty of index-based assessments, it was concluded that it was not appropriate to calculate Frebuild for this stock.” This action does not adopt a specific Frebuild for this stock because of the scientific advice.

With respect to SNE/MA winter flounder the CAM indicates this option achieves a 60 percent reduction in exploitation when a 100 percent reduction is targeted. While some additional reduction may result from the elimination of the SNE/MA winter flounder SAP (section 7.2.1.2.7.4) this will not completely eliminate catches of this stock. Since winter flounder is caught in other fisheries (small mesh, fluke, and scallop) the only way to eliminate all exploitation on this stock is to prohibit all fishing in the stock area. The Council does not consider it reasonable to forfeit all yields from other stocks for a marginal shortening of the rebuilding program for this stock. A proposed interim action (*74 FR 2959*) considers closing an extensive area to the use of groundfish DAS. According to the supporting EA, that approach achieves only a marginal improvement in the reduction in exploitation (82 percent vice the 60 percent shown here) and results in reduced yield from fisheries.

With respect to pollock, this action proposes to eliminate the ability to target pollock on a Category B DAS program. In 2008, pollock catches were 9 percent of U.S. removals. These effort controls thus need to achieve 91 percent of the needed reduction for pollock, or a 66 percent reduction in exploitation. Additional measures would be needed to reduce exploitation for pollock before this option could be selected as the Proposed Action.

The CAM model results do not include the impacts of restricted gear areas and the gear requirements imposed for those areas. A number of experiments have tested the trawl gears proposed for these areas. The results are summarized in Table 181. Note that not all of the experiments have been subject to a peer review or published. Several of the gears show dramatic reductions in the catches of flounders and other bottom-dwelling species. These reductions would be in addition to the reductions estimated by the CAM. As an example, the catches of SNE/MA winter flounder within the RGAs would be expected to be almost completely eliminated if the gear performs in the commercial fishery as well as it did in experiments.

In contrast to the No Action alternative, this option is likely to reduce discards of GOM and GB cod, CC/GOM yellowtail and SNE/MA yellowtail flounder, white hake, and GB winter flounder. The option either increases or removes trip limits for these stocks, which should reduce regulatory discards.

Table 197 – Option 4 changes in exploitation

Spec	AREA	Needed Difference	Option 3A Action % Difference
COD	GBANK	-50%	-41%
COD	GM	-37%	-34%
HADDOCK	GBANK	202%	-42%
HADDOCK	GM	24%	-39%
WINTER	GBANK	48%	-36%
WINTER	GM		-35%
WINTER	SNEMA	-100%	-60%
PLAICE	ALL	39%	-36%
WITCH	ALL	-46%	-37%
WHK	ALL	28%	-39%
WIND	NORTH		-43%
WIND	SOUTH		-56%
YTF	CCGOM	-34%	-47%
YTF	GBANK	-15%	-41%
YTF	SNEMA	-39%	-45%
POLLOCK	ALL	-66%	-38%
REDFISH	ALL	271%	-39%

In addition to modifying effort controls for limited access fishing vessels, this option modifies the GOM cod trip limit for vessels with Handgear A (to 750 pounds) and Handgear B permits (to 200 pounds). These permit holders are allowed to use both handgear and tub-trawls. The only limits on fishing days are a requirement to not fish during a 20-day period in the spring. The period is selected by the permit holder and can be taken during a rolling closure. This increase in the trip limit is likely to increase fishing mortality from these permits. The Handgear A trip limit is nearly as large as the FW 42 trip limit for limited access vessels (800 pounds). As shown in 6.2.3.3.1, the number of Handgear B permits landing groundfish has increased and the landings of groundfish increased from 68,427 pounds in FY 2004 to over 150,000 pounds in FY 2007. The number of Handgear A permits landing groundfish declined from 44 in FY 2004 to 23 in FY 2007, and landings have fluctuated with a declining trend over the last four years. Even with this increases, these two permit categories only account for a small fraction of total groundfish landings.

While the Handgear A permit category is limited access, the Handgear B category is not. It is possible that the increases in trip limits will attract more effort to these two categories in the GOM. Some limited access permit holders that do not have any Category A DAS may even decide to relinquish their limited access permit and fish with a Handgear B permit, increasing fishing effort albeit with a relatively inefficient gear. While the CAM suggests that the limited access measures will exceed the needed reduction in exploitation and a small increase in handgear permit catches could be accommodated, catches will need to be monitored to ensure that mortality objectives are no threatened.

Impacts on Other Species
Because this option reduces groundfish DAS, catches (both landings and discards) of skates, monkfish, and spiny dogfish while fishing on groundfish DAS would be expected to decline as

compared to the No Action alternative. Counter-acting this tendency is that some vessel owners may choose to increase fishing activity in the open-access fisheries of skates and spiny dogfish to make up for lost groundfish revenue. There are only limited opportunities to catch these species outside the groundfish DAS system, though, so it is unlikely that the overall catch of these species will increase if this measure is adopted. In the case of monkfish, monkfish landings may decline because of the different allocations and counting methods used for monkfish and groundfish DAS (see section 7.7.6 for an expanded discussion of this issue).

7.2.2.3.1.4 SNE/MA Small Mesh Fisheries Gear Requirements

Impact on Groundfish Species
Option 2 proposed a requirement in the SNE/MA area that was designed to reduce catches of winter flounder and yellowtail flounder by trawl vessels using codends mesh that is smaller than 6.5 inches. This is intended to further reduce mortality on both SNE/MA winter and yellowtail flounder. It is particularly important for SNE/MA winter flounder since the management goal is to reduce fishing mortality to as close to 0 as possible without completely closing all fisheries in the stock area.. Reducing these catches should benefit rebuilding of these stocks.

The area selected for the proposed mesh requirement was based primarily on the observed discard locations for SNE/MA winter flounder. Figure 131 shows that the proposed area overlaps the locations for most observed winter flounder discards from 2002 – 2008. The exception is the Great South Channel area east and south of Cape Cod. This area is in the Georges Bank regulated mesh area and any cod ends that are less than 6.5 inches are only supposed to be used in approved exempted fisheries with a bycatch.

The proposed gear requirement uses a net with drop chains to lift the opening of the net off the bottom. This allows winter flounder that are encountered to slide under the net without being retained. There are no experiments that have been conducted to test this specific net design. The concept behind the net, however, is well documented. AS far back as 1984 the Northwest Atlantic Ocean foreign fishery that targeted squid, mackerel, and butterfish was required to use "off-bottom" trawl nets rigged with hanging line chains of 60 centimeters in order to bring the net mouth off the bottom and reduce bycatch of prohibited species such as cod, yellowtail flounder, summer flounder, etc. (see 50 CFR 611.50 published in 49 *Federal Register* 4213). More recently, in certain areas the whiting fishery is required to use a "raised footrope" trawl that uses 42 inch drop chains and is rigged so that the sweep is longer than the footrope and the footrope is off the bottom (see 50 CFR 648.80(a)(9)). This net requirement is most similar to that being proposed.

The whiting raised footrope trawl fishery was first implemented by FW 35 (NEFMC 2000) and then its use expanded into the inshore GOM by FW 38 (NEFMC 2003). Extensive experimental work conducted to justify the use of the raised-footrope trawl is included in those two documents. Regulated groundfish species catch in two experiments conducted in 1997 and 1998 was between 1 and 4 percent of the total catch. Flatfish species catch rates averaged between <1 and 24 pounds/hour. While these tows were targeting whiting in the Gulf of Maine and not the species that will be targeted in the SNE/MA area, the experimental results demonstrates that the raised footrope trawl can be fished with minimal catches of flatfish. Unfortunately, the framework documents do not report any results of side-by-side tows with a control net so an estimate of the reduction in flatfish catch cannot be made. The whiting raised footrope trawl design is also not exactly the same as the proposed measure so while these results can be considered illustrative they are not definitive. Because of the uncertainty over the impacts of this measure, it is important to note this measure was intended to contribute to additional mortality reductions for these two stocks and was not being relied upon to achieve mortality targets.

Impacts on Other Species
While adopting a gear that does not catch bottom-tending species would be expected to reduce catches of monkfish and skates in the area that it is required, there is no experimental data to support this expected result. The impacts on catches of spiny dogfish are also unclear. There is no information on the impacts of the proposed changes on other species caught by trawl gear in this area, such as summer flounder, black sea bass, scup, squid and butterfish. Pol (2001) reported results from a limited number of paired tows using a raised footrope trawl. Generally, he did not note any significant difference in catch rates of scup and squid, but did detect a possible change in the size composition of squid with the raised footrope trawl catching smaller animals. Catching smaller animals for a given quota would lead to higher mortality rates. Results are discussed in more detail in section 7.7. With respect to summer flounder, presumably a net designed to reduce catches of other flounders would also reduce catches of summer flounder. The likely response of fishermen would be to use a 6.5 inch cod end rather than sacrifice all flounder catches. This would change the size composition of the catch, reducing mortality for a given TAC: fewer, but larger fish would be caught for a given quota, reducing the numbers of flounder caught. This discussion, however, is highly speculative absent experimental data for the specific net configurations proposed.

7.2.2.3.1.5 GOM Haddock Sink Gillnet Pilot Program

Impacts on Groundfish Species
Option 1 is the No Action alternative. If this option were selected then it is expected the sink gillnet vessels will have limited opportunities to target GOM haddock and will be fairly ineffective at doing so because of mesh size. Mortality from this gear component would remain small.

7.2.2.3.1.6 Haddock Minimum Size

Option 1 – The No Action alternative - would keep the haddock minimum size at 19 inches for both GOM and GB haddock. During periods when large year classes are present and if as a result haddock grow slowly, this option would lead to increased discards. This occurred with the 2003 year class (see following discussion). This is not expected to have direct impacts on other groundfish species, though the inability to effectively a large haddock year class might increase pressure on weaker older year classes or other stocks.

7.2.2.3.2 Recreational Fishery Management Measures

7.2.2.3.2.1 Provisions for Landing Fillets

Two options to the Proposed Action were considered.

Option 1 would have allowed the landing of fillets with the skin off. It did not change the current regulation that allows the landing of fillets that are smaller than the minimum size as long as they were taken from legal-sized fish. In general, this option was not expected to have direct biological impacts. If this change resulted in the landing of cod during closures (because skinned fillets cannot be readily identified by enforcement personnel) it could have resulted in an increase in fishing mortality and a degradation in data quality, affecting future assessments.

Option 3 was No Action. If this option was adopted, there would not be expected to be any change in recreational harvest of groundfish.

7.2.2.3.2.2 Removal of the Limit on Hooks

Option 1 (the No Action alternative) would continue to limit recreational groundfish fishing to two hooks per line. If this option was adopted recreational harvest would be expected to remain at current levels.

7.2.2.3.2.3 Measures to Reduce Mortality

There are three alternatives to the Proposed Action that were considered to reduce recreational fishing mortality for GOM cod.

Option 1 would increase the minimum size for GOM cod to 26 inches but does not change the bag limit or season. The estimated impacts of this measure are sensitive to assumptions on discard mortality and regulatory compliance. This option meets mortality objectives if discard mortality is 20 percent or less. Biological impacts are similar for the different components of the recreational fishery.

Table 198 – GOM cod recreational Option 1 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-32.6%	-32.0%	-32.4%
0.1	-29.3%	-28.8%	-29.2%
0.2	-26.1%	-25.6%	-25.9%
0.3	-22.8%	-22.3%	-22.7%
0.4	-19.5%	-19.1%	-19.4%
0.5	-16.3%	-15.9%	-16.2%

Option 2 would reduce the GOM cod bag limit to six fish per angler per trip. These impacts are also sensitive to assumptions on fishing mortality, and the targeted reduction is met if discard mortality is less than 10 percent. There are slightly different impacts between the private boat and party/charter components of the fishery.

Table 199 – GOM cod recreational Option 2 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-30.9%	-23.7%	-28.9%
0.1	-27.8%	-21.3%	-26.0%
0.2	-24.7%	-19.0%	-23.1%
0.3	-21.6%	-16.6%	-20.2%
0.4	-18.5%	-14.2%	-17.3%
0.5	-15.4%	-11.9%	-14.4%

Option 4 is No Action. The short term biological impacts would be similar to the impacts of the current fishery with respect to the level of fishing exploitation. The recreational fishery as well as the commercial fishery would be contributing to fishing mortality levels that are incompatible with those required to rebuild stocks in the required rebuilding period.

In addition to the Proposed Action, there were four options considered for GOM haddock. Option 1 would increase the minimum size for GOM haddock to 21 inches. Impacts are sensitive to assumptions on discard mortality and compliance, but this option appears likely to meet the targeted reduction at all discard mortalities between 0 and 50 percent. Impacts are similar for the components of the fishery.

Table 200 - GOM haddock recreational Option 1 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-37.5%	-37.6%	-37.6%
0.1	-33.8%	-33.9%	-33.8%
0.2	-30.0%	-30.1%	-30.1%
0.3	-26.3%	-26.3%	-26.3%
0.4	-22.5%	-22.6%	-22.6%
0.5	-18.8%	-18.8%	-18.8%

Option 2 would implement a nine fish bag limit, per angler per trip. Impacts are sensitive to assumptions on discard mortality and compliance. This option meets the targeted reduction at discard mortality assumptions ranging from 0 to 20 percent. Impacts are similar for the two components of the fishery.

Table 201 - GOM haddock recreational Option 2 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-24.0%	-21.1%	-22.5%
0.1	-21.6%	-19.0%	-20.3%
0.2	-19.2%	-16.9%	-18.0%
0.3	-16.8%	-14.8%	-15.8%
0.4	-14.4%	-12.7%	-13.5%
0.5	-12.0%	-10.6%	-11.3%

The biological impact of lowering the size limit from 19-inches to 18-inches may be expected to increase recreational fishing mortality on Gulf of Maine haddock. The magnitude of this increase depends on release mortality of haddock that will be less than 18-inches and angler response to the size limit change. In the absence of an angler response and assuming full compliance with the 19-inch size limit, lowering the size limit would convert haddock that would otherwise have been released into harvested catch. On party boat trips the percentage of released catch that measured 18-inches averaged 12% of total released haddock during 2005 to 2007. Assuming 100% survival of released haddock and that the size distribution of released catch on other recreational fishing modes is similar to that of party boat anglers, one estimate of increased mortality would be equal to 12% of total released Gulf of Maine haddock. During 2005 to 2007 the total number of Gulf of Maine released haddock (type B2, released alive) averaged 129 thousand fish. Thus under these assumptions, the reduced size limit would result in an increase of 15.5 thousand harvested haddock. This estimate was based on several assumptions one of which was full compliance with the current size limit.

Available data indicate that approximately 10% of harvested Gulf of Maine haddock in the party/charter mode was 18-inches; one inch below the minimum legal size. Note that retention of haddock less than 18-inches was also observed, but fish less than 18-inches accounted for less than 1% of harvested haddock. This suggests that some level of non-compliance with the 18-inch size limit may be expected and that this non-compliance would most likely be associated with 17-inch haddock. During 2005 to 2007 released haddock that measured 17-inches accounted for an average of 43% of total released Gulf of Maine haddock in the party mode. If the observed noncompliance rate is similar to that of the current limit then an 18-inche size limit may result in additional harvest of 10% of 17-inch fish that would otherwise have been released. Accounting for the haddock harvested at 18-inches harvest of non-compliant 17-inch haddock would increase harvest by 5.5 thousand Gulf of Maine haddock.

Given the caveats and assumptions noted, based on 2005 to 2007 averages the 18-inch size limit may result in an overall increase of 21 thousand fish representing an increase of approximately 6% in harvested Gulf of Maine haddock. Whether the change in haddock size limit would affect angler demand for haddock trips is uncertain. Lowering the size limit would enhance retention opportunities which may be an important motivation for angler demand in a meat fishery like haddock or cod. If angler effort were to increase, then the increase in harvested haddock may be expected to be higher than 6%.

Because the reduced size is likely to increase haddock mortality, Option 3 adopts a bag limit in order to achieve the objective. This bag limit is set at seven fish per angler per trip. This option appears to meet mortality objectives if discard mortality ranges from 0 to 30 percent.

Table 202 - GOM haddock recreational Option 3 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-33.3%	-23.9%	-28.4%
0.1	-30.0%	-21.5%	-25.6%
0.2	-26.7%	-19.1%	-22.7%
0.3	-23.3%	-16.7%	-19.9%
0.4	-20.0%	-14.3%	-17.1%
0.5	-16.7%	-11.9%	-14.2%

Option 4 would reduce the GOM haddock minimum size for recreational vessels. As discussed above, this will likely increase recreation fishing mortality for this stock. It will not meet mortality targets if a reduction is needed but if an allocation is not made to the commercial and recreational components, or if the allocation years are FY 2001 – FY 2006, it will meet the objectives. The increase in recreational mortality would range from 5.6 percent to 11.2 percent for discard mortality assumptions between 0 and 50 percent. This option was essentially adopted by reducing the minimum size for GOM haddock for both commercial and recreational fishermen (see section 4.3.2.3).

The estimated changes in mortality for GOM haddock are calculated without respect to the management measures for GOM cod. As there is evidence that cod and haddock are caught on the same trips, the seasonal closure for GOM cod may also reduce haddock catches, while other changes in cod measures may encourage targeting of haddock. These possible interactions are not reflected in the impacts described above.

7.2.2.3.3 Atlantic Halibut Minimum Size

Option 1 (No Action) retains the current minimum size for Atlantic halibut of 36 inches (91.4 cm.). This is smaller than the median length at maturity. This may slow rebuilding of Atlantic halibut but the impacts are likely immeasurable.

7.2.2.3.4 Prohibition on Retention of Atlantic Wolffish

Option 1 (No Action) would continue to allow Atlantic wolffish to be retained. Commercial landings have ranged from 66 mt to 29 mt since 2002 and recreational landings have ranged from 10 mt to 24 mt during the same period. Fishing mortality is uncertain but overfishing does not appear to be occurring. If No Action is selected these levels of removals would continue.

7.2.2.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

Impacts on Groundfish Species

If No Action is selected for this alternative there will be no additional sectors and no changes to the two existing sectors. If this occurs, most groundfish fishing vessels will continue to be subject to the effort control system. This makes it more likely that the biological impacts described for the effort control alternatives will be realized (see section 7.2.1.3.1). The two existing sectors will not have their mortality controls modified and the biological impacts would be expected to be similar to the current measures.

7.2.2.3.6 Accountability Measures

7.2.2.3.6.1 Commercial Groundfish Common Pool Accountability Measures

The No Action alternative would not have adopted AMs for the commercial groundfish fishery. This alternative does not comply with the current requirements of the M-S Act. If adopted, it is expected that the management measures would be less certain to achieve fishing mortality objectives and stock rebuilding would be at risk.

7.2.2.3.6.2 Recreational Groundfish Fishing Accountability Measures

Three alternatives to the Proposed Action were considered for this measure. Two of the options are very similar and differ only in the process used to determine the AM and in the order that specific measures are considered. These options are not expected to impact catches of other species.

Option 1 proposes that the recreational harvest in fishing year 1 will be evaluated early in fishing year 2. The Council will review this information and if there is an overage of a stock with an ACL will develop a recommendation for AMs. These AMs will be either changes in season, bag limits, or minimum sizes. The AMs will be implemented by NMFS as soon as possible. One problem with this approach is that the AM may not be implemented before the end of fishing year 2. This means that if there is an overage in year 1 and measures are not implemented in year 2, an additional overage may take place in year 2. As a result, the AMs will need to be more stringent and the ACLs will need to be set lower to reduce the risk of overfishing by the recreational fishery. An additional issue is that bag limits and minimum size regulations reduce the kept portion of catch but do not have as large an impact on total removals. These factors will have to be considered when choosing the AM.

Option 2 differs from Option 1 in two ways. First, the AM is selected by NERO without waiting for a Council recommendation. This makes it more likely that the AM will be implemented more quickly and will at least begin to address a year 1 overage by the end of year 2. In addition, Option 2 gives precedence to a change in season which can be a more effective way to reduce all parts of the catch and not just kept catch. This depends whether the season prohibits all recreational fishing or just prohibits retention of a particular species.

Option 4 is the No Action alternative, and AMs would not be adopted. If this were to occur, there would be no mechanism to adjust management measures as a result of exceeding an ACL unless a framework adjustment or amendment was adopted. Because of the time required to implement such changes, overfishing would be likely to continue for a longer period and rebuilding objectives might be threatened. This could be addressed by exercising more caution in the development of measures to reduce the risk of overfishing or exceeding rebuilding targets.

7.3 Protected Species Impacts of the Alternatives

The primary impact of the alternatives being considered in this amendment on protected species is being driven by the magnitude and breadth of changes in fishing (reductions or increases depending on the stock) that will are required as a result of the GARM assessment. Fishing patterns and overall effort, in terms of the times, areas and fishing gears used will most certainly change in response to the management measures that the Council adopts as a result of changes in the status of individual stocks relative to their biological reference points. These changes in effort will determine the overall and specific impact of the measures in the amendment on protected species.

While some stocks will require substantial effort reductions to end overfishing or rebuild overfished stocks, it does not necessarily follow that those reductions will automatically result in overall reduced impact of the fishery on protected species. As the industry adapts to additional restrictions in effort on some species, and increased opportunity to fish for others, the pattern of effort will determine the fisheries' interaction with protected species relative to its current level. The impact of the proposed measures on protected species are difficult to predict with great precision because it is unclear how fishermen will adapt to new restrictions on some activities and increased opportunities in other areas. Therefore, the following measure-by-measure sections will qualitatively discuss the likely or expected direction of protected species impacts, or highlight those measures where even the direction of the impacts on protected species cannot be predicted. The magnitude of the overall effort reductions, however, make it likely that interactions with protected species will decline.

7.3.1 Protected Species Impacts of the Proposed Action

7.3.1.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

Revised status determination criteria (section 4.1.1), ABC control rules (section 4.1.2), and revised mortality targets for formal rebuilding programs (section 4.1.3) will not have a direct impact on protected species because they do not, in and of themselves, change fishing effort or behavior. As such the alternatives under consideration will not directly impact protected species compared to the No Action alternatives. Whatever impact indirectly precipitates from any changes to status determination criteria or mortality targets will be discussed in the context of the specific management measures the Council adopts in order to meet mortality targets derived from the new criteria and control rules.

7.3.1.2 Fishery Program Administration Measures

7.3.1.2.1 Annual Catch Limits

The Proposed Action adopts a process for setting annual catch limits (ACLs) as mandated by the M-SA. As such, it is a purely administrative measure with no direct impact on protected species. Depending on whether those limits are greater or less than current levels on which management measures are based, there could be an indirect impact, but such impacts would be the result of the measures themselves, and not of the process of setting the limits.

7.3.1.2.2 Addition of Atlantic Wolffish to the Management Unit

On January 5, 2009, NMFS announced a 90-day finding for a petition, submitted on October 1, 2008, to list Atlantic wolffish (*Anarhichas lupus*) as endangered or threatened under the ESA, and to request information to determine if the petition action is warranted (74 *Federal Register* 249). This action proposes to include wolffish in the multispecies management unit, impose a prohibition on retention of wolffish by commercial and (private, party and charter) recreational fishermen, and to designate wolffish EFH. Depending on the outcome of the agency's determination regarding the petition, and its ultimate decision about listing wolffish under the ESA, wolffish may, or may not be considered a "protected species". If the finding is in the affirmative, however, the Council's decision to include wolffish in the management unit will provide a regulatory mechanism to impose appropriate management measures, and will, therefore, have a positive impact (see discussion below under section 7.3.1.3.7). If NMFS finds that listing is not warranted, then discussion of the impact of the Proposed Action in this section is not necessary.

There could potentially be indirect effects of the wolffish EFH designation alternatives on protected species if they lead to habitat protection regulations that limit the use of particular fishing gears in particular areas (e.g., capture of harbor porpoise in bottom gill nets or seals in bottom trawls). However, no additional benefits would be provided for protected species by any of the wolffish EFH designation alternatives because they would overlap entirely with existing EFH designations for other federally-managed species which are already protected by existing habitat management regulations. There would, therefore, be no impact of any of the EFH designation alternatives on protected species.

7.3.1.2.3 Sector Administration Provisions

This action adopts a number of measures pertaining to the administration of sectors. Detailed requirements are established for defining and forming a sector; preparation of a sector formation proposal and operations plan; movement between sectors; allocation of resources; transfer of annual catch entitlements; mortality/conservation controls; interaction of sector with common pool vessels; sector participation in special management programs; sector annual reports; and, sector monitoring, enforcement and transparency. Since these measures are administrative in nature, they are as a group not likely to cause any impact on protected species, and there is no difference between these impacts and those of the No Action alternative. To the extent that there will be enhanced monitoring of sectors' fishing activities through the use of at-sea observers, including the establishment of standards for service providers, there may be improved information regarding the interaction of such fisheries with protected species. The impact of individual sectors on protected species is discussed below under section 7.3.1.3, Measures to Meet Mortality Objectives.

One element of the administrative measures is worth further discussion. The Proposed Action will automatically exempt sectors from some effort control measures. These include groundfish DAS restrictions, trip limits, seasonal closed areas, and the requirement to use a 6.5 inch mesh codend under certain circumstances. In addition, the Proposed Action permits sector vessels to fish in some of the areas and months that are closed to common pool vessels by the GOM rolling closures. This latter measures could have impacts on harbor porpoise takes to the extent gillnet vessels in sectors fish in these areas. The Harbor Porpoise Take Reduction Plan (HPTRP; see section 3.1.1.2 for a brief explanation) imposes requirements for sink gillnet vessels fishing in the inshore GOM and SNE in order to reduce takes of these animals. While sector provisions apply throughout New England and Southern New England waters, this discussion focuses on the proposed universal exemption of sector vessels from some of the GOM rolling closures. There are four management areas in the GOM where sink gillnet vessels are either prohibited from fishing or are required to use pingers when fishing in these areas (pingers are devices attached to gillnets that broadcast an audible signal, reducing interactions between the nets and harbor porpoise). These areas and the requirements are illustrated in Figure 146. On July 21, 2009, NOAA proposed modifications to the HPTRT that add additional areas and times when pingers are required. In addition to expanding areas in the vicinity of Stellwagen Bank National Marine Sanctuary and east of Cape Cod, the proposed regulations include "consequence" areas: areas with additional requirements if takes are too high for two consecutive years. Figure 147 and Figure 148 show the proposed areas with and without the consequence areas.

While Amendment 16 proposes to exempt sector vessels from the GOM rolling closures, it cannot (and does not) exempt sector gillnet vessels from complying with the HPTRP. As such, it does not modify any closures adopted by the HPTRP (such as the existing March closure of Massachusetts Bay). With respect to the current HPTRP, allowing sector vessels access to GOM rolling closure areas could result in increased sink gillnet activity (with pingers required) in portions of the following HPTRP management areas:

Offshore Management Area: March
Midcoast Management Area: April, May
Massachusetts Bay Management Area: May

With respect to the Preferred Alternative modifications to the HPTRP, allowing sector vessels access to GOM rolling closures could result in increased sink gillnet activity in the modified areas (with pingers required; in addition to those described above):

Stellwagen Bank Management Area: April, May
Massachusetts Bay Management Area: November

Palka and Orphanides (2008b) summarized harbor porpoise bycatch rates for compliant sets: that is, sets with all required pingers (Table 203). The only proposed management area with any takes in compliant tows during the period 1999-2007 is the Midcoast area. For the areas combined the bycatch rate for compliant tows is 0.031 harbor porpoise per metric ton of landed catch (hp/mt);

within the Midcoast Management Area the rate was 0.041 hp/mt. These data suggest that allowing sector gillnet vessels into the Stellwagen Bank, and Massachusetts Bay Management Areas may not result in harbor porpoise takes if compliance with pinger regulations is 100 percent, while takes would be expected to occur in the Midcoast Management Area even with 100 percent pinger compliance.

There is evidence, however, that compliance rates fluctuate and has never been higher than 80 percent (Figure 149; HPTRP EA 2009). Palka et al (2008a) reported that bycatch rates in the Midcoast Management Area and the proposed Stellwagen Bank Management Area were 0.052 hp/mt and 0.040 hp/mt, respectively, from 1999 through 2007. This rate includes both compliant and non-compliant sets. The highest bycatch rates were observed in February and November. No takes were observed in the Offshore Management Area in recent years, making it less likely that allowing sectors access to this area during the existing rolling closures will substantially increase harbor porpoise takes.

According to the EA accompanying the proposed modifications to the HPTRP, bycatch rates of harbor porpoise in the Massachusetts Bay Management Area in November were observed at a rate of 0.052 hp/mt, a relatively high rate. If the proposed expansion of the HPTRP rules is not adopted, then allowing sector gillnet vessels into this area can be expected to result in increased harbor porpoise takes. If the HPTRP Preferred Alternative is adopted and pingers are required in this area in November then the impact on takes will depend on pinger compliance rates.

Analyses accompanying the HPTRP Preferred Alternative estimated the harbor porpoise takes that could be expected using observed rates. The analyses also assumed no change in fishing effort as a result of revised HPTRP measures. It is possible that the provisions in Amendment 16 that allow sector vessels access to the rolling closure areas may change the distribution of fishing effort. Any increase in sink gillnet effort within the Midcoast Management Area in November might increase harbor porpoise takes during this month. If effort shifts out of February, however, there may not be a net increase.

A critical factor on whether takes will increase will be the pinger compliance rates for sector vessels. Sectors have a strong incentive to ensure compliance because if the consequence areas are triggered then access to the GOM rolling closure areas will be lost. The HPTRP Preferred Alternative includes management measures (the consequence areas) that are designed to meet the plan’s objectives should takes be too high. The incentive for sectors to comply with pinger requirements in order to maintain rolling closure access, and the consequence measures within the HPTRP, suggest that the Amendment 16 sector provisions are not likely to have an adverse effect on the HPTRP if some form of the HPTRP Preferred Alternative is adopted. This result is less certain if the HPTRP Preferred Alternative is not adopted, but the specific HPTRP measures adopted would have to be evaluated for a better evaluation. Ultimately, sector operations plans and EAs that are tiered from this document will have to address impacts of their operations on protected species, including harbor porpoise.

Figure 146 – Summary of current harbor porpoise take reduction plan requirements

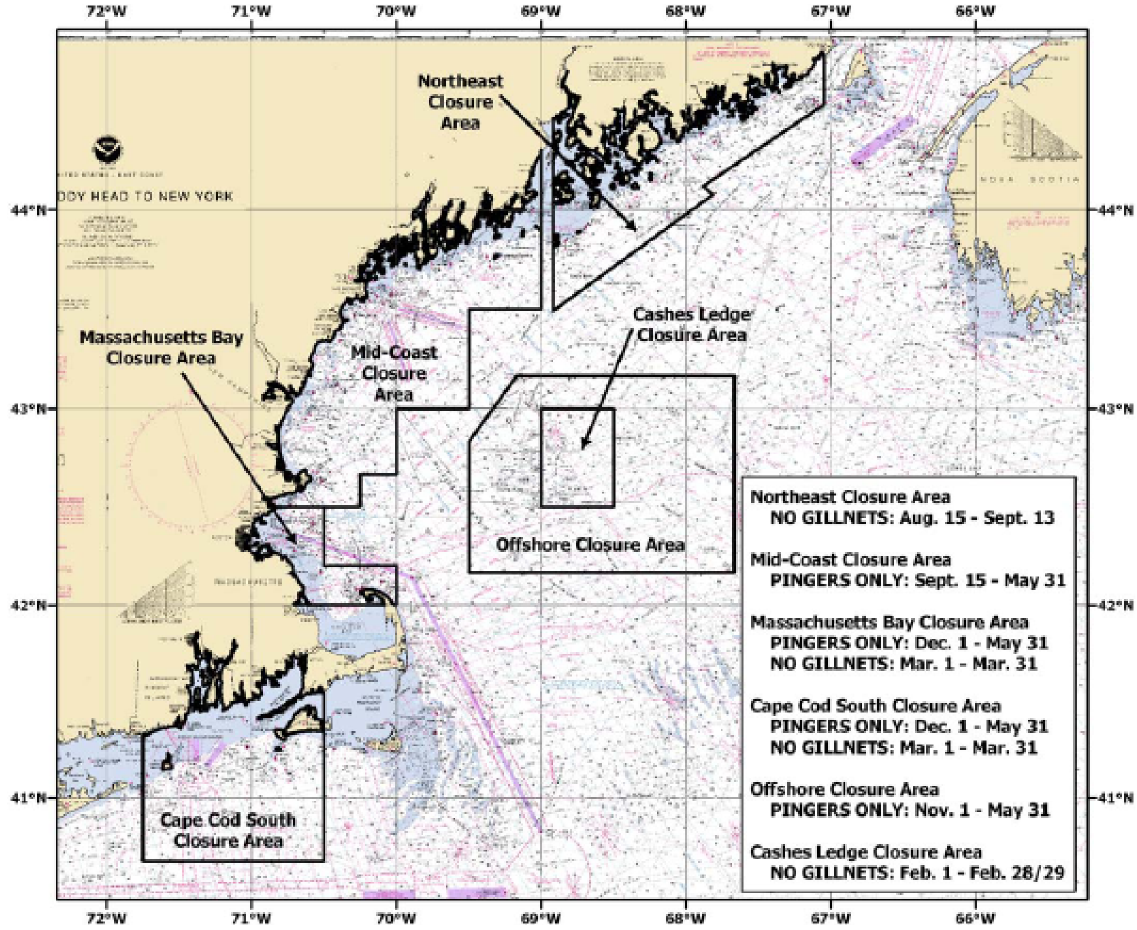


Figure 147 – HPTRP proposed management areas (without consequence areas)

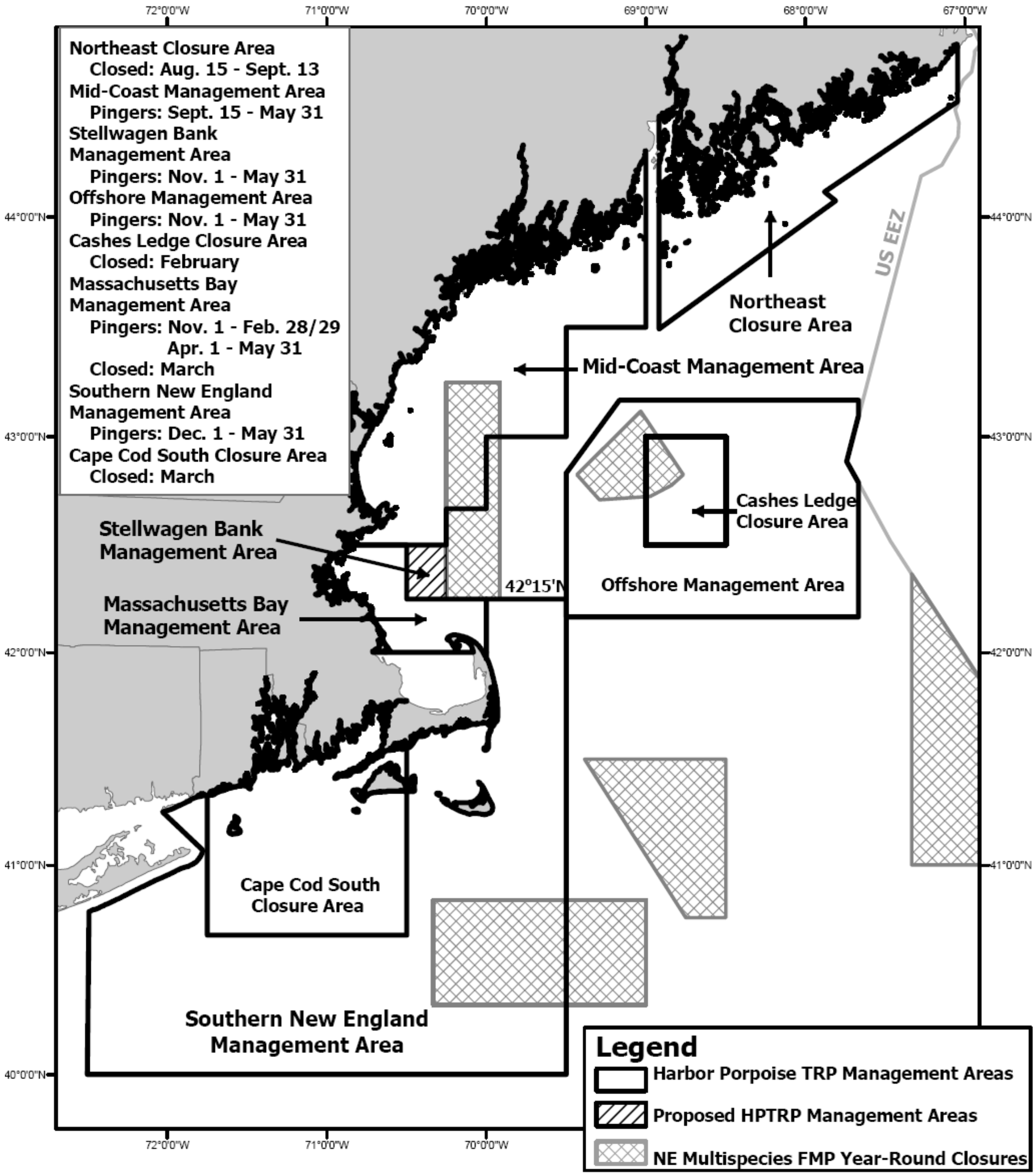


Figure 148 – HPTRP proposed management areas (with consequence areas)

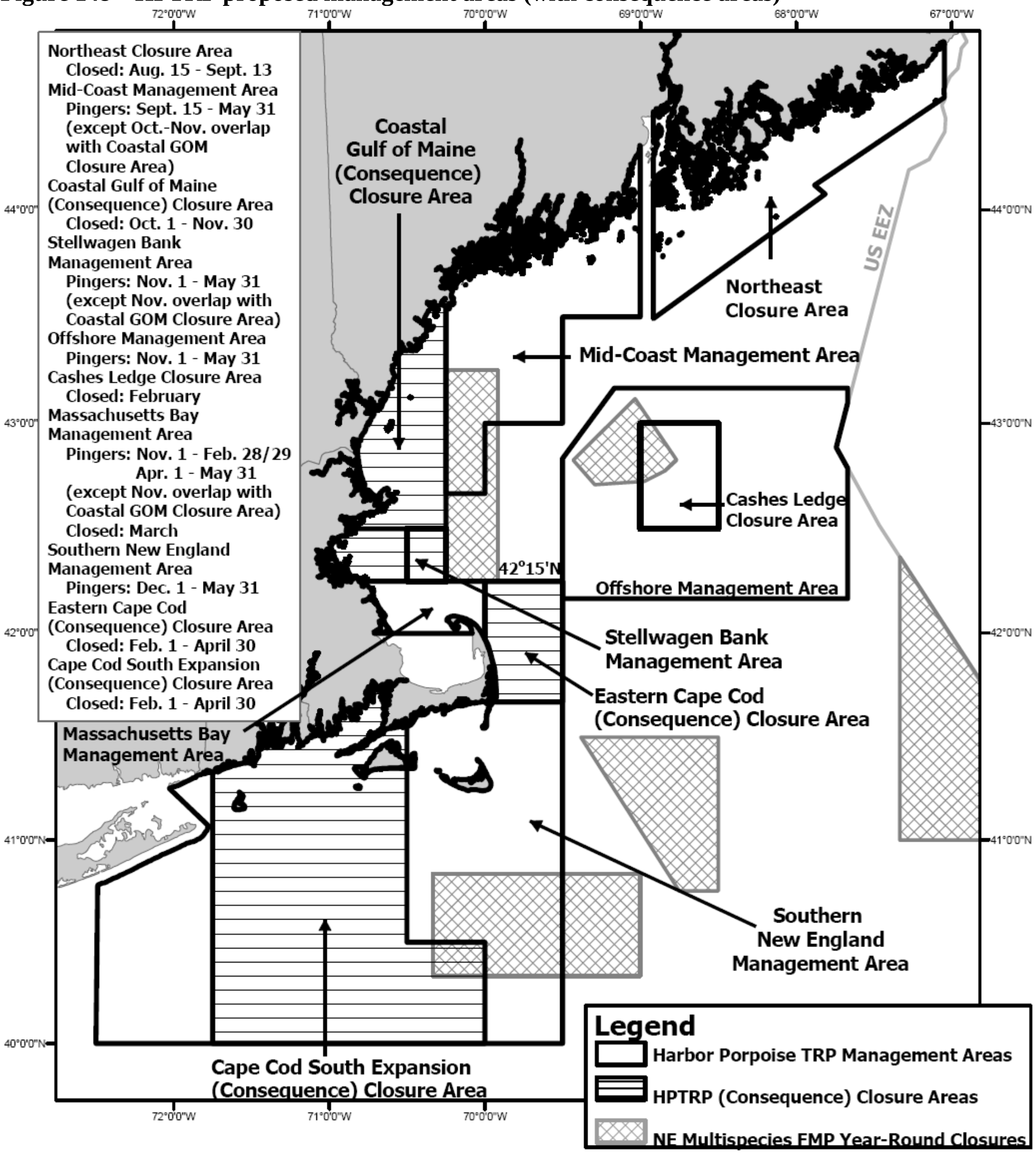


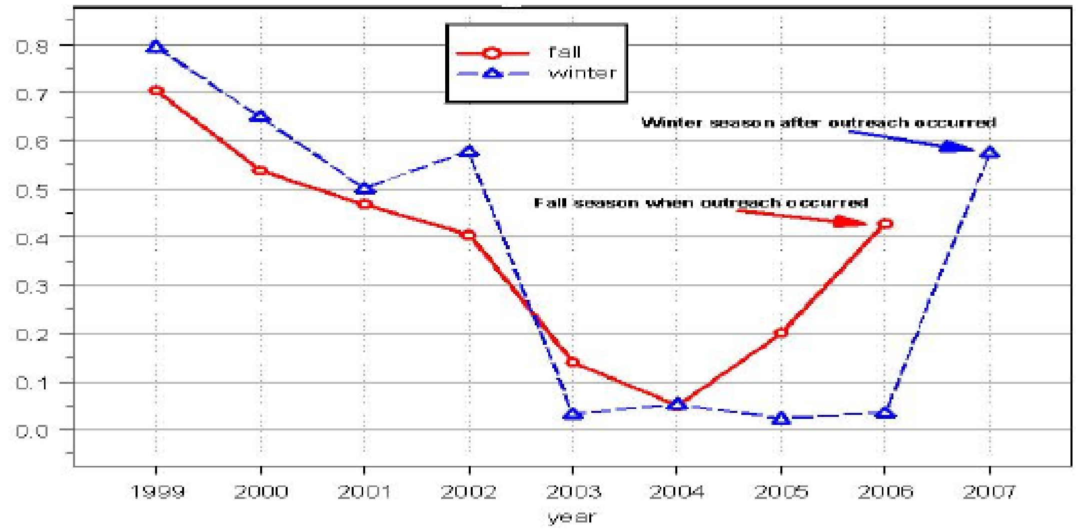
Table 203 - By region and over all three Gulf of Maine management areas, the number of observed hauls, takes and landings (obs landings) and the resulting bycatch rate (number of harbor porpoise takes/metric ton of landings) of hauls that had all of the required number of pingers and were observed from 1 January 1999–31 May 2007. From Palka and Orphanides (2008).

Year	Massachusetts Bay				MidCoast			
	Number of hauls	Number of takes	Obs landings	Bycatch rate	Number of hauls	Number of takes	Obs landings	Bycatch rate
1999	59	0	5.35	0	232	3	65.50	0.046
2000	115	0	16.77	0	198	0	15.88	0.000
2001	74	0	7.00	0	109	2	21.29	0.094
2002	8	0	0.62	0	199	2	30.15	0.066
2003	8	0	0.94	0	40	0	4.46	0.000
2004	3	0	0.23	0	49	0	11.33	0.000
2005	4	0	4.59	0	134	1	29.30	0.034
2006	29	0	5.70	0	87	0	17.77	0.000
2007*	53	0	5.70	0	9	0	0.29	0.000
TOTAL	**353**	**0**	**46.90**	**0**	**1057**	**8**	**195.97**	**0.041**

Year	Stellwagen Bank				ALL			
	Number of hauls	Number of takes	Obs landings	Bycatch rate	Number of hauls	Number of takes	Obs landings	Bycatch rate
1999	10	0	0.56	0	301	3	71.41	0.042
2000	1	0	0.04	0	314	0	32.69	0.000
2001	1	0	0.02	0	184	2	28.31	0.071
2002	1	0	0.38	0	208	2	31.15	0.064
2003	1	0	0.10	0	49	0	5.50	0.000
2004	6	0	0.95	0	58	0	12.51	0.000
2005	10	0	2.83	0	148	1	36.72	0.027
2006	9	0	2.16	0	125	0	25.63	0.000
2007*	79	0	7.38	0	141	0	13.37	0.000
TOTAL	**118**	**0**	**14.42**	**0**	**1528**	**8**	**257.29**	**0.031**

* Data in this row only from 1 January through 31 May 2007.

Figure 149 – Percent of observed hauls that used the correct number of pingers per string in times/areas when pingers were required. (From the EA for the HPTRP, 2009)



7.3.1.2.4 Reporting Requirements

The Proposed Action adopts a measure that requires all limited access groundfish vessels that are required to use VMS to declare at the start of the trip whether they intend to fish in one broad reporting area or multiple reporting areas. This proposal would not currently replace the VTR reporting requirement. This proposal is purely administrative in nature, and as such, would not have a direct impact on protected species, although improved reporting of the location of fishing activity could enhance the understanding of fishery interactions with protected species.

The Proposed Action also identifies how discards by non-sector vessels will be estimated for comparing catches to ACLs. This measure will not have any impacts on Protected Species, and its impacts are no different than the No Action alternative.

7.3.1.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

This proposal adopts a process for allocating the available catch to different components of the fishery (commercial and recreational). It is administrative, and would not, in and of itself, have a direct impact on protected species. Since the proposal is to use recent relative catch histories for the two components to allocate shares of the overall available catch, the action items will, on the surface, have no different impact than the No Action alternative on protected species. If, however, and for whatever reason (poor data, evolving/changing relative effort, etc.), the actual allocation results in an increased commercial share, there could be an indirect negative impact on protected species compared to no action, if that increase would otherwise not have taken place and is realized in gears/times/areas where there is potential for protected species interactions. Conversely, if the commercial share ends up being less than what would otherwise occur, then this process could be viewed as having a positive indirect effect, since recreational fishery interaction with protected species is minimal or non-existent. The ultimate impact of this administrative proposal, again, will depend on what management measures are adopted and how fishing effort responds.

7.3.1.2.6 Changes to the DAS Transfer and DAS Leasing Programs

The Council is considering several changes to the DAS transfer and leasing programs.

7.3.1.2.6.1 Option 2 – DAS Transfer Program Conservation Tax

This action proposes to eliminate the 20% conservation tax on DAS transfers. It will also leave in place any conservation tax applied to prior transfers (Option A). Only two DAS transfers have taken place under the existing rules, which suggests that more DAS transfers would occur if the tax is reduced or eliminated. This may not necessarily be the case, however, because any other permits associated with the vessel transferring its DAS would be retired. In terms of protected species impacts, therefore, this option has the potential to reduce overall effort (because of the retired other permits) which would be somewhat offset if the transferred DAS would otherwise have not been used. Nevertheless, it is impossible to predict with any reasonable degree of certainty if, and how many, vessels would avail themselves of the reduced or eliminated conservation tax, and whether any such transactions would be positive or neutral with respect to protected species impacts. There is also the possibility of an overall increase in effort, with potential negative effects on protected species, if a substantial number of DAS transfers take place involving DAS that would otherwise have been inactive.

7.3.1.2.7 Removal of the DAS Leasing Cap

The Proposed Action removes the cap on the number of DAS that can be leased by a vessel. The impacts on Protected Species are unclear. To the extent that removing the cap results in the exchange and use of more DAS than would occur under the No Action alternative (which would retain the cap), this measure could result in more DAS being used when compared to the No Action alternative. Whether this leads to more interactions with Protected Species depends on where the DAS are used, and by what type of vessels. In addition, other measures in this action reduce allocated DAS by 50 percent, so it is not clear that removal of the cap will result in more fishing effort than was used before Amendment 16.

7.3.1.2.8 Eligibility of CPH Permits to Participate in the Leasing Program

Under the Proposed Action, permits in the CPH category – that is, not assigned to an active vessel – will be allowed to lease DAS to other permits. This may increase the pool of available effort slightly. Given the magnitude of the effort reductions proposed in this action, this minor increase in effort is not expected to have substantial impacts on Protected Species when compared to the No Action alternative.

7.3.1.2.9 Special Management Programs

7.3.1.2.9.1 Incidental Catch TACs

The Council is considering modifications to the incidental catch TACs for some of the SAPs. These changes were necessitated by changes in stock status determined by GARM III. These new incidental catch TACs may further constrain fishing effort and may reduce interactions of the fishery with protected species by vessels that fish in the SAPs limited by these TACs.

7.3.1.2.9.2 Closed Area I Hook Gear Haddock SAP Revisions

The CAI Hook Gear Haddock SAP was adopted in 2004 in Framework 40A. The protected species impacts of the original program were described as follows:

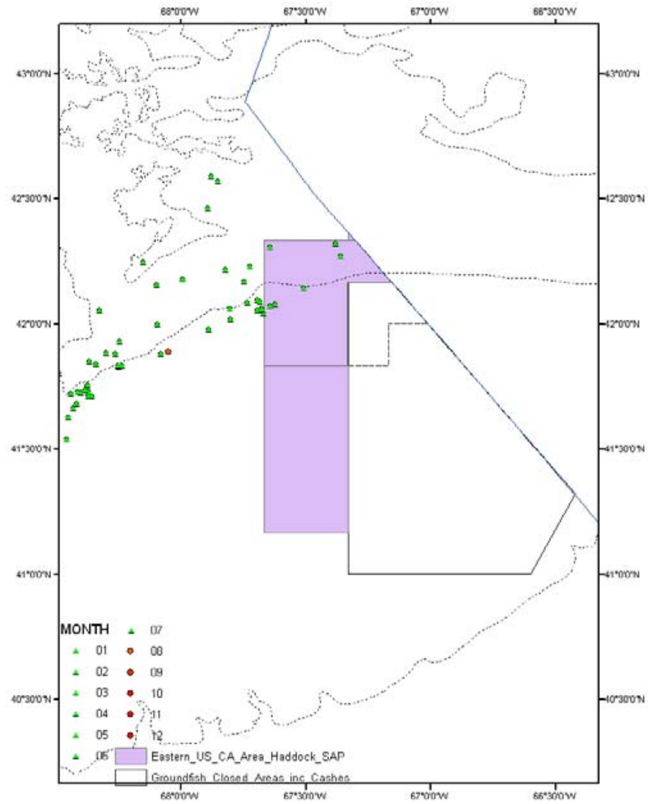
> *Hook gear has accounted for interactions with threatened and endangered sea turtles, although those species occur only rarely in CAI, making negative impacts an unlikely scenario. Additionally, this SAP is scheduled to operate from October through December, further reducing the likelihood of interactions with endangered turtles because of their water temperature preferences. While there is overlap with right whale critical habitat, hook gear is not implicated in entanglements with this species, which is most abundant in the area from April through June. Further, experimental fishery data that preceded the establishment of this SAP showed no interactions with any protected species.* (Framework 40A, p.201)

Under the Proposed Action in this amendment, the area would be expanded, and the season extended to the period May 1 – January 31. While extending the season of the fishery program into the summer months, when water temperature is higher, increases the potential that there could be sea turtle interactions, observed sea turtle interactions in this area are rare, especially compared to the Mid-Atlantic region. Therefore, the impact of the Proposed Action on sea turtles, is likely slightly negative compared to the No Action alternative.

7.3.1.2.9.3 Eastern U.S./Canada Haddock SAP Area

With the Proposed Action (Option 2), the SAP would be reauthorized and continued indefinitely, unless changed by a future Council action, or unless closed for the season by the Regional Administrator under the terms of the SAP regulations. While protected species interactions have not been documented in the SAP, Atlantic white-sided dolphins have been caught in trawl gear within the SAP area (Figure 150). None of these interactions have been documented during the months the SAP is open – all occurred in the spring months when the SAP is closed. Indeed, there has only been one documented interaction with a Atlantic white-sided dolphin east of 68-30W during months the SAP is open, and this interaction was nineteen miles west of the SAP boundary. Since there is no evidence of protected species interactions in the SAP area during the months the SAP is open, but trawl gear is capable of catching Atlantic white-sided dolphins, the impact of Option 2 is likely to be neutral or negative compared to No Action. This evaluation, however, ignores the possibility that if the SAP is not open vessels may shift effort into areas where interactions are more likely.

Figure 150 – Observed takes of Atlantic white-sided dolphins in the vicinity of the Eastern U.S./Canada Haddock SAP, 1992-2008



7.3.1.2.9.4 Closed Area II Yellowtail Flounder SAP

The Proposed Action modifies the CAII Yellowtail Flounder SAP to provide an opportunity to target GB haddock in the SAP area, even when the SAP is not opened for targeting of yellowtail flounder. The impact of the proposal on protected species is potentially negative based on the fact that some vessels (i.e., non-sector vessels) would be using Category B DAS that they would otherwise not have used, resulting in some net increase in trawl fishing effort. The magnitude of the impact, however, cannot be determined because it is uncertain how many vessels would or could participate in this program. Furthermore, under the terms of the proposal, if a vessel exceeds any applicable trip limits, it must flip to Category A DAS, which would result in no net increase in effort compared to no action.

7.3.1.2.9.5 SNE/MA Winter Flounder SAP

The SNE/MA winter flounder SAP described in 50 CFR 648.85(b)(4) is suspended until stock conditions warrant its re-implementation. This SAP allows landings of small amounts of winter flounder without using a groundfish DAS. It was primarily designed to reduce discards of winter flounder in the fluke fishery. With the adoption of a rebuilding program for winter flounder, and pending prohibitions on landing SNE/MA winter flounder, it is no longer appropriate to allow any increased effort on this stock outside of the groundfish plan. Because the SAP may enable limited targeting of winter flounder, the elimination of the Southern New England/Mid-Atlantic winter flounder SAP could be somewhat positive for protected species if it reduces effort that would otherwise occur as a result of vessels targeting winter flounder. More realistically, this measure merely prevents vessels from retaining winter flounder on fluke trips that will take place anyway, and there will be no benefits to protected species from suspending this SAP.

7.3.1.2.9.6 Category B DAS Revisions

This action allows vessels targeting certain species (GB haddock, GOM haddock and redfish) while on a Category B DAS with certain required net configurations to use 6-inch mesh, which will increase their catches of those target species. This action is not likely to have any impact of the fishery program on protected species because the net modification will not change the likelihood of protected species interactions compared to the No Action alternative.

7.3.1.2.10 Periodic Adjustment Process

This proposal would enable the Council to make changes via the framework adjustment procedure to the ACL and AM process or implementation, the sector administration policies, or reporting requirements, or other measures adopted by this action. While these are all administrative in nature, and not likely to have any protected species impacts, all framework adjustments must complete an environmental document that includes discussion of protected species impacts of the actions being proposed.

7.3.1.2.11 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

Under current FMP regulations, a limited access scallop vessel cannot also hold a limited access multispecies permit, unless that vessel qualified as a "combination vessel" under the original limited access permit program adopted in Amendment 5. While the proposal to allow additional vessels to hold both limited access multispecies and scallop permits is essentially an administrative change, there could be some impact on protected species, although, at this time, the magnitude of that change cannot be determined, since it is unknown how many vessels would avail themselves of this opportunity, and, relative to the current fishing activity, what type of gear the vessel would use, and where and when it would fish.

On the one hand, the impact on protected species could be positive, since one of any overlapping permits held by both vessels would be retired in the process of combining the multispecies and scallop permits on one vessel. For example, if a multispecies vessel that also has a limited access monkfish permit buys the permits of a scallop vessel that also holds a monkfish limited access permit, one of the two monkfish permits would be retired. In this example, since nearly all scallop vessels that hold monkfish limited access permits (185 vessels in 2007) do not use their monkfish DAS because of the requirement to also use a scallop DAS when on a monkfish DAS, the actual immediate effort reduction that would occur as a result of the retirement of the monkfish permit would be much less than the number of permits being retired.

On the other hand, the impact on protected species could be negative, if the acquiring vessel changes the pattern of effort such that the chances of interaction (with protected species) is greater than it was when the two vessels fished their permits separately. For example, if the scallop vessel currently fishes in times and areas where protected species interactions are minimal, and changes that pattern upon obtaining a multispecies permit to times when such interactions are more likely because it is now fishing for multispecies, then this provision would have a negative effect on protected species.

The final effect of this proposal on protected species, whether positive or negative, ultimately will depend on the number of vessels that avail themselves of this opportunity, the types of gears they use, and how their pattern of effort would change relative to the spatial or temporal presence of protected species. As such, the magnitude and direction of the impact of this proposal compared to the no action alternative cannot be predicted at this time.

7.3.1.2.12 Catch History

This measure prevents catch history from accruing after implementation of Amendment 16. This is an administrative measure and is not expected to have direct impacts on protected species.

7.3.1.3 Measures to Meet Mortality Objectives

This section discusses the potential impact of proposed effort-control option for common pool (non-sector) vessels. This section also discusses the protected species impacts of a haddock sink gillnet pilot program and a reduction in the haddock minimum size.

7.3.1.3.1 Common Pool Vessel Option 3A

The Proposed Action, Option 3A, eliminates differential DAS counting areas, reduces Category A DAS by 50 percent from the FW 42 allocations, and counts all DAS in 24-hour increments (i.e. 6 hours is counted as one DAS, 25 hours is counted as two DAS, etc.). The category A/Category B DAS split that results is 27.5%/72.5%. Most other current measures remain, including seasonal and rolling closures and gear requirements.

In terms of protected species impacts, the option will result in substantial reductions in groundfish fishing effort with an overall direct and positive impact on protected species. The magnitude of this impact, as well as the individual protected species that might be affected will depend on the number of vessels affected by these rules, i.e. those that do not elect to participate in a sector program, and on where, when, and with what type of gear those vessels fish. That number cannot be predicted at this time. The overall net effect will also depend on what fishing activities the affected vessels engage in, in response to the reductions in groundfish fishing effort. This indirect effect also cannot be predicted with any accuracy because individual fishermen will have a different range of options, depending on their permits, and will make individual choices for a variety of reasons.

In the existing 2:1 differential DAS counting areas in the inshore GOM and SNE, the impacts of the effort reduction program are driven primarily by the change in DAS counting methods. On the surface, reducing effort by 50 percent while eliminating 2:1 counting appears to result in an equal amount of effort. This ignores that DAS are counted differently under the Proposed Action and so any vessel that typically made trips of less than 12 hours in length will be forced to make fewer trips under the Proposed Action. In particular, this will affect sink gillnet vessels that will use a full 24 –hours of DAS time while setting nets. This should result in fewer trips in these areas, which could benefit protected species such as harbor porpoise.

On the whole, the effort reductions of this option are expected to benefit protected species when compared to the No Action alternative. They would likely be similar to the benefits expected under either Option 2A or 4, the other alternatives to No Action.

7.3.1.3.2 SNE/MA Small Mesh Fisheries Gear Requirement

The Proposed Action adopts the No Action alternative, and does not impose additional gear requirements for SNE/MA small mesh fisheries. This is not expected to have an impact on the amount or distribution of fishing effort, and is therefore neutral with respect to protected species impacts, compared to the alternative.

7.3.1.3.3 GOM Haddock Sink Gillnet Pilot Program

This action establishes a pilot program to evaluate the potential for using 6-inch mesh sink gillnets to target haddock in the Gulf of Maine. The program is restricted to January 1 – April 30, and participating vessels will be required to use their Category A DAS. Additional restrictions and requirements are described in Section 4.3.2.2. This proposal is of limited duration, FY2010-2012, and is designed to evaluate the effect of allowing smaller mesh nets to target haddock. Since vessels will be required to use their allocated Category A DAS, this program does not represent a potential increase in effort, and, therefore, is likely neutral with respect to impacts on protected species. It is unlikely that the smaller mesh size that will be evaluated in this program will alter the extent of protected species interactions, but the fishery will be monitored, and any changes to protected species interactions will be documented and evaluated when the pilot program ends. Participants will also be required to adhere to pinger and gear requirements as outlined in the Harbor Porpoise Take Reduction Plan, and must comply with the weak link, sinking/neutrally buoyant ground line requirements of the Atlantic Large Whale Take Reduction Plan.

7.3.1.3.4 Haddock Minimum Size

The Proposed Action would reduce the haddock minimum size on commercial and recreational vessels to 18 inches from 19 inches. Such a change is not likely to affect overall fishing effort, nor how that effort is distributed, and, consequently, will not impact protected species interactions, either positively or negatively.

7.3.1.3.5 Recreational Management Measures

This action proposes several changes to the regulations governing the recreational groundfish fishery, including the ability to land fillets with most of the skin removed, the restriction on multiple hooks, minimum fish sizes, and seasons. Since the recreational fishery does not have any known impact on protected species, these changes are not likely to have any impact on protected species.

7.3.1.3.6 Atlantic Halibut Minimum Size

This action increases the minimum size of Atlantic halibut on all vessels, both commercial and recreational. This action will not affect overall fishing effort, nor will it have any impact of the fishery on protected species. The impacts on Protected Species are not any different than the No Action alternative.

7.3.1.3.7 Prohibition on the Retention of Atlantic Wolffish

As noted above in Section 7.3.1.2, NMFS is reviewing a petition to list wolffish as either “endangered” or “threatened” under the ESA. This action incorporates wolffish into the Northeast

Multispecies management unit, and prohibits the retention of wolffish by commercial and recreational vessels either year-round (Option 1). Depending on the outcome of the status review, the impact of the prohibition option on protected species will either be neutral (if NMFS decides not to list), or positive (if the species is deemed threatened or endangered). The Council's management approach to wolffish (designate EFH and prohibit retention) is similar to the actions it has already taken with respect to another ESA-listed species under Council management, Atlantic salmon, and will be positive with respect to the impact on wolffish while neutral to other protected species.

7.3.1.3.8 Implementation of Additional Sectors/Modifications to Existing Sectors

This action proposes to implement 17 new sector programs, and modifications to the two existing sector programs. The impact of each sector on protected species depends on the gear used and the time and area in which the fishery occurs relative to the presence/absence of protected species. In addition, since sectors are primarily formed to realize efficiencies in the use of vessels out of the consolidation or redistribution of sector vessel effort, such efficiencies may result in reduced overall fishing effort. If that effort reduction actually occurs, there may be a positive impact on protected species, to the extent that those fisheries had a prior interaction with protected species, because fewer vessels will be fishing for less total time. In other words, if sector vessels are not constrained by trip limits, or realize other efficiencies, there will be less fishing for a given total catch, reducing the likelihood of protected species interaction. Neither factor contributing to the analysis of potential impact on protected species (either the gear/area/time changes, nor the efficiencies that will be realized) can be predicted at this time.

Furthermore, each sector proposal must be accompanied by its own Environmental Assessment (EA), wherein protected species impacts need to be analyzed and discussed. This EA will be tiered from the Amendment 16 EIS. That analysis should take into account the number of vessels involved, the gears used, where and when the vessels will be fishing, and other consequences of their becoming more efficient, including displacement of effort to other fisheries. Once those factors are established for each sector, then the likely impact on protected species can be determined.

7.3.1.3.9 Accountability Measures

Accountability measures are intended to ensure that ACLs are not exceeded, and, if they are, to implement a management response to prevent further excesses.

7.3.1.3.9.1 Common Pool Vessel Accountability Measures

The Proposed Action adopts a differential DAS AM for FY 2010 and FY 2011 and a hard TAC AM for subsequent fishing years for common pool vessels.

Under this proposal, in FY 2010 and 2011 NMFS would recalculate the differential DAS counting for the upcoming year based on estimated catches relative to the ACLs. Depending on those catches, the affected stocks (which will determine what areas the DAS will be adjusted), the number of common pool vessels, and other variables, the direction and magnitude of any DAS adjustment could vary from year to year. Therefore, the impact of this accountability measure on protected species cannot be predicted. If effort is further restricted in times and areas where protected species interactions occur, then the impact would be positive, and, conversely, if effort is increased (by a reduction in the differential DAS ratio applied) the impact could be negative.

In FY 2012, a quota (hard TAC) AM for commercial vessels that are not participating in a sector program would be implemented. Also excluded from this provision are vessels that have an incidental catch of groundfish in other fisheries, such as the yellowtail flounder catch in the scallop dredge fishery. The quota would be established for each stock on a trimester basis, based on recent landings patterns. The trimesters are: May-August, September-December, and January-April. In any trimester when it is projected that 90% of the TAC for a stock will be caught, NMFS will close the area where the stock is caught to all groundfish fishing with gear capable of catching that species. Uncaught portions of a quota may be moved to the next trimester, but uncaught portions of a stock quota will not be carried forward to the next year. Overages of the quota in the first two trimesters will be deducted from the third trimester quota, while annual overages will be deducted from the subsequent year's common-pool quota.

The purpose of using a trimester approach, rather than an annual quota, is to spread the fishery out over the year and avoid a prolonged closure at the end of the year. Whether this approach will be successful at preventing a derby-style fishery, where vessels race to catch the fish before a closure takes place, remains to be seen. If successful, fishing could continue at an acceptable and steady pace throughout the year. If unsuccessful, because fishermen modify their behavior in anticipation that the fishery could be closed, fishing effort would likely be more intense during the first part of the trimester, and be halted upon reaching the quota.

The impact on protected species will depend on the overlap in distribution of such species during times when the fishery is active versus times when it is closed (if that occurs). Being a trimester schedule, if a closure occurs it would be in the second part of each trimester, but if and when such closures are imposed, cannot be predicted. Furthermore, if vessels anticipate a closure, effort could be more intense during the early part of the trimester. Additionally, vessels may shift their effort to open areas in response to a closure, and the impact of such shifts on protected species cannot be predicted because it depends on where and when those shifts occur.

7.3.1.3.9.2 Recreational Fishery Accountability Measures

The recreational fishery has no measureable impact on protected species, and, therefore, the accountability measures would have no impact compared to taking no action. Pending the outcome of the current status review for Atlantic wolffish under the ESA, the impact of the recreational fishery on protected species may have to be reviewed in the future. As noted above, however, independent of that review, the Council is proposing to include wolffish in the management unit and to impose a year-round or seasonal prohibition on retention by recreational (and commercial) vessels

7.3.1.3.9.3 Multispecies Sector Accountability Measures

As noted in the discussion of sector programs under measures to meet mortality objectives, the impact on protected species of each sector, and, therefore, its accountability measures, will be analyzed and discussed in the Environmental Assessment prepared for each sector proposal. Sectors are required to stop fishing when they are projected to have caught their allocation for any groundfish stock, and if a sector exceeds its allocation in a given year, and cannot balance its catch and allocation through the trading of annual catch entitlements, then its allocation in the following year is reduced by the overage. Therefore, the impact of this accountability measure on protected species is positive since it ensures that fishing effort will not exceed the level analyzed and discussed in the EA for each sector proposal.

7.3.2 Protected Species Impacts of Alternatives to the Proposed Action

7.3.2.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

The only alternative to the Proposed Action was the No Action alternative for revised status determination criteria (section 5.1.1.1), ABC control rules (section 4.1.2), and revised mortality targets for formal rebuilding programs (section 5.1.3.1). If these alternatives would have been selected, they would not have a direct impact on protected species because they do not, in and of themselves, change fishing effort or behavior.

7.3.2.2 Fishery Program Administration Measures

7.3.2.2.1 Annual Catch Limits

The only alternative to the Proposed Action establishing a process for setting annual catch limits (ACLs) was the No Action alternative, which would not have adopted ACLs. ACLs are a purely administrative measure with no direct impact on protected species. The No Action alternative would not have any additional impacts on protected species.

7.3.2.2.2 Addition of Atlantic Wolffish to the Management Unit

On January 5, 2009, NMFS announced a 90-day finding for a petition, submitted on October 1, 2008, to list Atlantic wolffish (*Anarhichas lupus*) as endangered or threatened under the ESA, and to request information to determine if the petition action is warranted (74 *Federal Register* 249). The only alternative to the Proposed Action to add Atlantic wolffish to the management unit was the No Action alternative. If Atlantic wolffish was not added to the management unit, and the result of the NMFS review is to consider wolffish a "protected species, " the No Action alternative would mean that the only legal basis for providing regulatory protection to this stock would be the ESA. This would constrain the ability of managers to protect this stock absent a determination that the stock is a protected species.

7.3.2.2.3 Sector Administration Provisions

Failure to adopt the revised sector administration provisions – the No Action alternative – would not be likely to affect protected species since most of the measures are administrative in nature. One possible exception is that the No Action alternative would not adopt the changes to sector monitoring requirements. To the extent that these new requirements lead to enhanced monitoring of sectors' fishing activities through the use of at-sea observers, including the establishment of standards for service providers, the failure to adopt these requirements through the No Action alternative may lead to less information on protected species interactions when compared to the Proposed Action.

As noted in section 7.3.1.2.3, the Proposed Action would allow sector vessels access to some of the GOM rolling closures, and could have impacts on harbor porpoise if sink gillnet activity increases in those areas. The No Action alternative would not grant sectors access to those areas. Impacts on harbor porpoise are likely to be more consistent with the analysis in the HPTRP if access is not granted.

7.3.2.2.4 Reporting Requirements

The only alternative considered to the Proposed Action was the No Action alternative. The No Action alternative would not adopt the requirement for vessels to report if they were fishing in more than one reporting area on a trip. This proposal is purely administrative in nature, and as such, would not have a direct impact on protected species. It is possible that the No Action alternative would result in less accurate information on fishing activity than under the Proposed Action, which would limit the understanding of fishery interactions with protected species.

The No Action alternative would also not adopt a process for estimating discards during the year to track catches and compare them to ACLs. This measure would not have any impacts on Protected Species.

7.3.2.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

The No Action alternative to creating a commercial/recreational component allocation of certain groundfish stocks was the only alternative considered. If adopted, there would be no limits on the amount of catch that could be taken by either component; catch would only be limited by the ACL. It is possible that if, as a result, commercial fishing effort increased and harvested more of the available ACL, then interactions with protected species could increase. Conversely, if the commercial share were to shrink and recreational shares increase, then this process could be viewed as having a positive indirect effect, since recreational fishery interaction with protected species is minimal or non-existent.

7.3.2.2.6 Changes to the DAS Transfer and DAS Leasing Programs

The Council considered several changes to the DAS transfer and leasing programs.
Option 1 - No Action
Under the no action alternative, no conservation tax is assessed on leased DAS, while a 20% tax is applied under the DAS transfer program. Since this is the existing regime, the impact on protected species will be neutral.

The No Action alternative would have maintained a cap on the number of DAS that a vessel can lease. The impacts of this on Protected Species are unclear. The cap may limit the number of DAS that are exchanged through the leasing program, and as a result may leave some available DAS unused. But this does not appear likely as few, if any, vessels seem to have been constrained by the cap.

Option 3 – DAS Leasing Program Conservation Tax
The Council considered setting a conservation tax on leased DAS equivalent to any conservation tax applied to the DAS transfer program. A vessel that leases out its DAS does not lose any other permits, and, therefore, the current program represents a potential increase in effort, proportional to the number of otherwise inactive DAS that are leased out. In Framework 42 (April, 2006), the Council noted that DAS leasing may have increased fishing mortality, but it is not clear if this translated into increased risk to protected species. To the extent a DAS leasing conservation tax

would slow down or eliminate any effort increases that result from DAS leasing, the impact of this option on protected species could be positive, but such an outcome is uncertain and unpredictable.

Option 4 – DAS Transfer Program Conservation Tax Exemption Window
In a fourth option, the Council considered allowing the owner of multiple groundfish permits to consolidate (transfer) the DAS and catch history of those permits into a single permit while being exempt from any conservation tax that would otherwise apply. This exemption would be available for a limited time only, after which any conservation tax applied to other DAS transfers would also apply to single-owner transfers. Whether vessel owners will avail themselves of this opportunity depends in part on whether a DAS leasing conservation tax is applied, under Option 3. If no tax is applied to leased DAS, an owner would most likely lease those DAS to himself, so as not to lose the value of the other fishery permits that would be retired in a DAS transfer. Such may also be the case if the tax applied to leased DAS is equivalent to the transfer DAS, even if the transfer is done without a tax under this option, due to the residual value of the other permits. The impact of this option on protected species, therefore, is probably neutral or at least unpredictable at this time, since it is unclear whether and how many permit holders would avail themselves of this opportunity. It is also unpredictable what the net effect would be if transfers were done without a conservation tax, but all other associated fishing permits were retired in the transaction.

7.3.2.2.7 Special Management Programs

7.3.2.2.7.1 Incidental Catch TACs

The No Action alternative would not modify the incidental catch TACs for the SAPs to reflect changes in stock status. Most of these changes reduce available incidental catch TACs for stocks that were recently determined to be overfished. As a result, it is possible that no adopting these changes could lead to more effort used in the SAPs, and consequently could lead to more interactions with protected species when compared to the Proposed Action.

7.3.2.2.7.2 Closed Area I Hook Gear Haddock SAP Revisions

The CAI Hook Gear Haddock SAP was adopted in 2004 in Framework 40A. The protected species impacts of the original program were described as follows:

> *Hook gear has accounted for interactions with threatened and endangered sea turtles, although those species occur only rarely in CAI, making negative impacts an unlikely scenario. Additionally, this SAP is scheduled to operate from October through December, further reducing the likelihood of interactions with endangered turtles because of their water temperature preferences. While there is overlap with right whale critical habitat, hook gear is not implicated in entanglements with this species, which is most abundant in the area from April through June. Further, experimental fishery data that preceded the establishment of this SAP showed no interactions with any protected species.* (Framework 40A, p.201)

Under the Proposed Action in this amendment, the area would be expanded, and the season extended to the period May 1 – January 31. The No Action alternative would not extend the season or expand the area. Therefore, the impact of the Proposed Action on sea turtles, is likely slightly positive compared to the Proposed Action.

7.3.2.2.7.3 Eastern U.S./Canada Haddock SAP Area

Under the No Action alternative (Option 1), the Eastern U.S./Canada Haddock SAP would terminate on December 31, 2009 (it has been extended past 2008 by an interim action). While protected species interactions have not been documented in the SAP, Atlantic white-sided dolphins have been caught in trawl gear within the SAP area (Figure 150). If the SAP is allowed to expire, then the reductions in effort in this area might lead to fewer interactions with protected species. This evaluation, however, ignores the possibility that if the SAP is not open vessels may shift effort into areas where interactions are more likely.

7.3.2.2.7.4 Closed Area II Yellowtail Flounder SAP

Under the no action alternative, this SAP would only open when GB yellowtail flounder was available to support the SAP; additional opportunities would not be provided to enter the SAP area to target GB haddock. When compared to the Proposed Action, this would result in less fishing effort in the area and potentially fewer interactions with protected species . The magnitude of the impact, however, cannot be determined because it is uncertain how many vessels would or could participate in this program.

7.3.2.2.7.5 SNE/MA Winter Flounder SAP

If the No Action alternative was selected, the SNE/MA winter flounder SAP described in 50 CFR 648.85(b)(4) would not be suspended. This SAP allows landings of small amounts of winter flounder without using a groundfish DAS. It was primarily designed to reduce discards of winter flounder in the fluke fishery. It is unlikely that the SAP increases fishing effort because of the small amounts of winter flounder that can be landed. Allowing the SAP to continue might slightly increase interactions with protected species when compared to the Proposed Action if it results in an increase in the number of trips.

7.3.2.2.7.6 Category B DAS Revisions

The No Action alternative would not allow the use of a six-inch cod end while on a Category B DAS with certain required net configurations. This action is not likely to have any impact of the fishery program on protected species because the net modification will not change the likelihood of protected species interactions compared to the Proposed Action.

7.3.2.2.8 Periodic Adjustment Process

The No Action alternative would not adopt several administrative changes to the periodic adjustment process. Because these are administrative in nature, not adopting the changes is likely to have few protected species impacts.

7.3.2.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

The No Action alternative would keep the regulation that prevents a vessel from holding scallop and limited access multispecies permits at the same time (in most instances). When compared to the Proposed Action, continuing this regulation could have negative impacts on protected species

Under the Proposed Action, any overlapping permits held by both vessels would be retired in the process of combining the multispecies and scallop permits on one vessel. The effect may be to reduce the number of vessels participating in limited access fisheries, which may reduce effort and interactions with Protected Species. Under the No Action alternative, these permit combinations are less likely to occur.

7.3.2.2.10 Catch History

The No Action alternative would allow catch history to accrue to the vessel that lands the catch. This is an administrative measure and is not expected to have direct impacts on protected species.

7.3.2.3 Measures to Meet Mortality Objectives

This section discusses the potential impact of three effort-control options under consideration for common pool (non-sector) vessels, plus the no action alternative. This section also discusses the protected species impacts of SNE/MA small mesh fisheries gear change, a haddock sink gillnet pilot program, and a reduction in the haddock minimum size.

7.3.2.3.1 No-Action, Options 2A, and 4

Under the no action alternative, the effort controls adopted by Amendment 13 and subsequent frameworks would continue unchanged. These measures include a change in the Category A and Category B DAS split (45/55 or an 18 percent reduction in allocated Category A DAS) that is scheduled to occur in FY 2009 unless certain conditions are met: overfishing is not occurring on any stock and additional fishing mortality reductions are not needed to rebuild any stock. The additional fishing effort available under the No Action alternative would be expected to have negative impacts on Protected Species when compared to either the Proposed Action or Options 2A and 4.

Option 2A uses a combination of differential DAS and a trip limits on a few stocks to achieve mortality objectives; in addition, DAS reductions of 30 and 35 percent were also considered. Option 4 reduces Category A DAS by 40 percent from FW 42 allocations. This results in a Category A/Category B DAS split of 33/67. Most other current measures remain, including seasonal and rolling closures and gear requirements.

In terms of protected species impacts, both alternatives to No Action would result in substantial reductions in groundfish fishing effort with an overall direct and positive impact on protected species. The magnitude of this impact, as well as the individual protected species that might be affected will depend on the number of vessels affected by these rules, i.e. those that do not elect to participate in a sector program, and on where, when, and with what type of gear those vessels fish. That number cannot be predicted at this time. The overall net effect will also depend on what fishing activities the affected vessels engage in, in response to the reductions in groundfish fishing effort. This indirect effect also cannot be predicted with any accuracy because individual fishermen will have a different range of options, depending on their permits, and will make individual choices for a variety of reasons.

7.3.2.3.2 SNE/MA Small Mesh Fisheries Gear Requirement

This option would require the use of 12-inch drop chains by small mesh trawl vessels fishing in a portion of the SNE/MA winter flounder area. It will not have an effect on the level or distribution of fishing effort, and is therefore neutral with respect to protected species impacts, compared to taking no action (which was adopted as the Proposed Action).

7.3.2.3.3 GOM Haddock Sink Gillnet Pilot Program

The No Action alternative would not adopt a pilot program to evaluate the potential for using 6-inch mesh sink gillnets to target haddock in the Gulf of Maine. Because the Proposed Action is not expected to increase fishing effort, and does not exempts sink gillnet vessels from requirements designed to reduce protected species interactions, the No Action alternative is expected to have the same impacts on protected species as the Proposed Action.

7.3.2.3.4 Haddock Minimum Size

The No Action alternative would not reduce the haddock minimum size for commercial and recreational vessels to 18 inches. Since the size change is not expected to affect overall fishing effort, nor how that effort is distributed, the impacts on Protected Species of the No Action alternative are not expected to be any different than those of the Proposed Action.

7.3.2.3.5 Recreational Management Measures

This action proposes several changes to the regulations governing the recreational groundfish fishery, including the ability to land filets with some or all of the skin removed, the restriction on multiple hooks, minimum fish sizes, bag limits and seasons. The No Action alternative would not adopt these changes. Since the recreational fishery does not have any known impact on protected species, not adopting the changes is not likely to have any impact on protected species. As a result, the impacts of the Proposed Action and the No Action alternative on protected species are expected to be the same.

7.3.2.3.6 Atlantic Halibut Minimum Size

The No Action alternative would not increase the minimum size of Atlantic halibut on all vessels, both commercial and recreational. This action will not affect overall fishing effort, nor will it have any impact of the fishery on protected species.

7.3.2.3.7 Prohibition on the Retention of Atlantic Wolffish

As noted above in Section 7.3.1.2, NMFS is reviewing a petition to list wolffish as either “endangered” or “threatened” under the ESA. If possession of wolffish is not prohibited (the No Action alternative), no additional protection would be provided to this species unless the status determination results in it being classified as a protected species.

A second alternative that was considered was to ban retention of Atlantic wolffish for only part of the year (September 1 – March 31 (Option 2)). Option 2 would provide a mechanism for monitoring the status of wolffish by allowing some landings, while requiring those caught during the colder months when discard mortality appears to be much lower, be returned as quickly as possible. While the protection for wolffish would be greater than under No Action, it would be less than the protection afforded under the Proposed Action. .

7.3.2.3.8 Implementation of Additional Sectors/Modifications to Existing Sectors

The No Action alternative would not adopt 17 additional sectors, and would not modify the two existing sectors. The impact of each sector on protected species depends on the gear used and the time and area in which the fishery occurs relative to the presence/absence of protected species. In addition, since sectors are primarily formed to realize efficiencies in the use of vessels out of the consolidation or redistribution of sector vessel effort, such efficiencies may result in reduced overall fishing effort. If the sectors are not implemented, the expected reductions in fishing effort are unlikely to occur, and interactions with protected species would likely be higher than those from the Proposed Action.

7.3.2.3.9 Accountability Measures

7.3.2.3.9.1 Common Pool Vessel Accountability Measures

The No Action alternative would not adopt AMs for common pool commercial vessels. Ams are not expected to have direct impacts on protected species, but potentially limiting groundfish fishing effort they could reduce interactions with protected species. If AMs are not adopted, this potential reduction in effort may still occur but would have to be adopted via a management action - that is a framework adjustment or plan amendment.

7.3.2.3.9.2 Recreational Fishery Accountability Measures

The No Action alternative would not adopt recreational AMs. The recreational fishery has no measureable impact on protected species, and, therefore, not implementing the AMs would have no impact compared to taking the Proposed Action.

7.3.2.3.9.3 Multispecies Sector Accountability Measures

The No Action alternative for sector AMs is inextricably linked with the No Action alternative for implementing additional sectors. This is because sectors cannot be implemented without also adopting the provisions that require sectors to stop fishing after catching the ACE allocated to the sector. The impacts on protected species of the No Action alternative are described in section 7.3.2.3.8.

7.4 Essential Fish Habitat Impacts of the Alternatives

Essential Fish Habitat is defined for four life stages of all managed species in the NEFMCs Omnibus Habitat Amendment (Amendment 11 to the Northeast Multispecies FMP). Adverse effects from fishing under the Northeast Multispecies FMP are possible for any species with EFH overlapping the footprint of this fishery. Adverse effects from fishing under all other FMPs are also possible if the footprint of those fisheries overlaps with areas designated as EFH for the species in the management unit for this FMP. Sections 6.1.5 and 6.1.6of this document detail the species with EFH that are vulnerable to mobile bottom tending gears and discuss the effects of fishing on habitat.

7.4.1 Essential Fish Habitat Impacts of the Proposed Action

7.4.1.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

Status determination criteria and formal rebuilding programs are administrative requirements, but importantly they lay the groundwork for measures that alter fishing practices either through allowing or restricting additional fishing mortality. The impacts of such measures on EFH are addressed in response to the concrete measures that alter commercial and recreational fishing practices.

7.4.1.1.1 Revised Status Determination Criteria

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 13 adopted status determination criteria for regulated groundfish stocks. It also provided that these criteria would be reviewed in 2008. This amendment proposes new status determination criteria based on GARM III and the DPWG.

Habitat Impacts:
Status Determination Criteria are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.1.1.2 ABC Control Rules

The proposed changes in the ABC control rules do not result in significantly different fishing mortality rates over the long-term, and would not be expected to have any direct impact on habitats designated EFH.

7.4.1.1.3 Revised Mortality Targets for Formal Rebuilding Programs

Amendment 13 adopted formal rebuilding programs for overfished groundfish stocks. The amendment also called for an evaluation of rebuilding progress and an adjustment in mortality targets to achieve rebuilding, if necessary. Mortality targets are adjusted as necessary by this action to meet the rebuilding dates and probability of success adopted by Amendment 13 and Framework 42. This section assumes that there will not be any changes in the rebuilding time period or probability of success used to determine the target fishing mortality rates.

According to the GARM III assessments, the following stocks achieved their B_{MSY} level (or its proxy) prior to submission of this document, and this action acknowledges completion of the rebuilding programs in the year shown:

GB haddock (2006)
GOM haddock (2000)

Habitat Impacts:
Mortality targets are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.1.2 Fishery Program Administration

Similar to status determination criteria and formal rebuilding programs, program administration options are administrative requirements that also influence measures intended to alter fishing practices either through allowing or restricting additional fishing mortality. The impacts of such measures on EFH are addressed in response to the concrete measures proposed that may alter commercial and recreational fishing practices.

7.4.1.2.1 Annual Catch Limits

This action proposes to implement Annual Catch Limits (ACLs) as required by the M-S Act.

Habitat Impacts:
Annual Catch Limits are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.1.2.2 Addition of Atlantic Wolffish to the Management Unit

This action adds Atlantic wolffish (*Anarhichas lupus*) to the management unit for the Northeast Multispecies Fishery Management Plan. Adding another species to the multispecies management unit is administrative in nature and is not expected to have any direct impact on habitats designated EFH.

The EFH designation proposed adopts Option 2; it would designate the most area and includes the entire EEZ north of 41 N latitude and east of 71 W longitude. Potentially, larger areas can result in more EFH consultations than smaller areas because they make more area amenable to habitat protection from fishing and non-fishing activities. Also, designated EFH areas that include more coastal waters lead to more consultations because this is where the majority of non-fishing federal projects take place. However, because all of the wolfish EFH designation alternatives overlap entirely with existing EFH designations for other federally-managed species, the addition of wolfish would not affect the number or effectiveness of EFH consultations that are conducted for fishing or non-fishing activities. Fishing impacts on EFH are already being minimized by management actions implemented under Amendment 13 to the Multispecies FMP; adding Atlantic wolffish to the multispecies FMU, and designating EFH for this species, simply extends habitat protection to include wolffish. In conclusion, therefore, there would be no habitat impact of the Proposed Action or any of the EFH designation alternatives.

7.4.1.2.3 Sector administration provisions

The management measures proposed in this section relate to the process for establishing sector allocations in the multispecies fishery. This section is intended to **update Section 3.4.16.1** of the final Amendment 13 SEIS (Sector Allocation). All of the sector policy changes proposed in this section will be implemented at the beginning of fishing year 2010 (May 1, 2010).

A sector allocation system would apportion part or all of groundfish fishery resources (denominated in terms of catch) to various industry sectors. While vessels might be assigned to sectors based on factors such as gear used, permit category, vessel size, homeport, area fished, etc., this measure allows vessels to form sectors of their own choosing. Such self-selected sectors might be based on common fishing practices, vessel characteristics, community organization, or marketing arrangements, but this would not be required. Since self-selection of sector membership would not necessarily be based on any common vessel or gear characteristics this alternative offers a great deal of flexibility in the formation of sectors. A group of permit holders would simply agree to form a sector and submit a binding plan for management of that sector's allocation of catch or effort. Allocations to each sector may be based on catch (hard TACs) or effort (DAS) with target TACs specified for each sector. Vessels within the sector would be allowed to pool harvesting resources and consolidate operations in fewer vessels if they desired. One of the major benefits of self selecting sectors is that they provide incentives to self-govern, therefore, reducing the need for Council-mandated measures. They also provide a mechanism for capacity reduction through consolidation.

Habitat Impacts:
Sector administration provisions are administrative in nature and are not expected to have any direct impact on habitats designated EFH. It should be noted that sectors do not authorize additional fishing effort – they are merely a different way of allocating fishing privileges. Indeed, analysis of the biological impacts of sectors suggests that sectors may actually lead to less fishing effort as vessels operate more efficiently – if this occurs, then sectors might reduce the adverse effects of fishing on essential fish habitat, but there is limited data to determine if this will actually take place. Some concerns were raised during the public comment period that allowing ACE transfers might have impacts on EFH. The argument is ACE could be transferred from a sector that uses gear with few impacts to a sector that uses gear with more impacts. But the reality is that such shifts in gear are not precluded by the current management system which allows DAS to be transferred between any vessel of the appropriate size without regard to gear, and which allows almost any permit to use any type of gear at any time (the exceptions are handgear permits and Category D/longline permits). As a result, when compared to the No Action alternative of not allowing ACE transfers to take place, there are no differences in the possibility that catch will shift between gear types. Any changes in fishery regulations or fishing practices that may result on the basis of sector-based management will be addressed in the regulations that implement a particular sector, and in the EIS or EA corresponding to the creation or continuation of that sector. Such NEPA documents prepared by the sectors (an EA or EIS) will be tiered from the Amendment 16 EIS.

7.4.1.2.4 Reporting Requirements

This measure is proposed to add additional requirements for limited access groundfish vessels to facilitate the monitoring of Annual Catch Limits (ACLs) and sectors. Two elements are included in the Proposed Action: an area-specific reporting requirements option and an in-season method to account for discards by non-sector vessels.

Habitat Impacts:
Reporting requirements are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.1.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

The Proposed Action establishes an allocation of groundfish between the recreational groundfish fishery (private boat/party/charter) and the commercial groundfish fishery for GOM haddock and GOM cod.

Habitat Impacts:
This allocation may alter the distribution of fishing effort, and could potentially shift effort from commercial fisheries that are more likely to have an adverse effect on habitats (e.g. commercial trawling) to recreational fisheries with less overall impact on habitats (e.g. recreational hook/line). However, any such shift in fishing effort distribution will likely be very small, as the proposed allocation estimates are based on historical averages. Further, these will be focused only on areas where stocks in the allocation scheme (GOM cod, GOM haddock,) are actively fished. Allocating groundfish to the commercial and recreational groundfish fisheries are expected to have minimal, if any, notable effects on habitats designated EFH.

7.4.1.2.6 Changes to the DAS Transfer and DAS Leasing Programs

This action eliminates the conservation tax on DAS transfers, currently set at 20 percent. In addition, it removes the cap in the number of DAS that can be leased by a permit. It also allows permits in the CPH category to lease DAS to other permits.

Habitat Impacts:
Removing the DAS transfer tax could lead to consolidation of groundfish permits onto fewer vessels. This is unlikely to reduce groundfish fishing effort, but may reduce effort in other fisheries as duplicate permits are cancelled when a transfer takes place and two groundfish permits are combined. There may be some reduced fishing impacts in EFH as a result (not necessarily within the groundfish fishery), but it is difficult to evaluate this with certainty. It is always possible that the vessel with the combined permits may fish more frequently than the two separate permits, or may use a gear with more effects on EFH.

Removing the cap on the number of DAS that can be leased by a permit may increase the number of DAS that are exchanged in the DAS leasing program. This could lead to increased groundfish fishing effort relative to maintaining the cap (the No Action alternative). It could also lead to changes in the distribution of effort. Generally DAS transfers seem to shift effort to states adjacent to the GOM (see section 6.2.3.7). Removing the cap may allow for an increased flow of DAS to these areas, though it is not clear that any permits have been constrained by the existing cap. In light of the overall effort reductions expected in this amendment, these changes are likely minimal when compared to the alternatives not selected.

While at present there are few barriers that prevent a permit in the CPH category from being activated in order to lease their DAS, these barriers appear to deter some permit owners from doing so as there are vessels that remain in the CPH category. Allowing permits in the CPH category to participate in the DAS leasing program may increase the number of DAS that are available in the leasing market when compared to the No Action alternative, and could result in the use of more DAS as a result. If this occurs there may be additional adverse effects on EFH. These are likely to be minimal, as the number of permits and DAS that remain in the CPH category is small relative to the total permits and DAS in the fishery.

Ultimately, changes to the DAS transfer and leasing program taxes not expected to have more than a minimal effect on habitats designated EFH.

7.4.1.2.7 Special Management Programs

7.4.1.2.7.1 Incidental Catch TACs

Incidental catch TACs were first adopted in FW 40A in order to limit the catch of non-target stocks while vessels were using Category B DAS. As a result of groundfish assessments completed in August 2005 the incidental catch TACs were revised. TACs were added for GB yellowtail flounder and GB winter flounder. The TACs for GOM cod, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and SNE/MA winter flounder were reduced from two percent of the total target TAC to one percent of the total target TAC.

Because of changes in stock status, as well as the possible addition of additional SAP provisions, specific stocks subject to incidental catch TACs and the allocations to SAPs are proposed for revision.

Habitat Impacts:
Incidental catch TACs are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.1.2.7.2 Closed Area I Hook Gear Haddock SAP Revisions

The CAI Hook Gear Haddock SAP provides an opportunity to target GB haddock within the boundaries of CAI. The season is extended, and the area expanded, in this action.

Habitat Impacts:
SAP participants have not harvested the available catch. The extension of the season and area is intended to provide more opportunities to harvest haddock in this SAP. Effects of these provisions are not expected to increase fishery impact beyond the baseline, and because this measure regulates fishing by a gear type not determined to have an adverse effect on EFH, any realized increases in fishing effort and/or any expansion of the area fished under this SAP will not have an adverse effect on habitats designated EFH. There may be positive benefits if the expansion of the SAP results in vessels shifting from gear with more adverse effects in order to participate in the SAP.

7.4.1.2.7.3 Eastern U.S./Canada Haddock SAP

This SAP provides an opportunity to target GB haddock in the Eastern U.S./Canada area, including a small portion of CAII. The Proposed Action extends the SAP.

Habitat Impacts:
The No Action option would prevent the SAP from operating, resulting in a marginal decrease in fishing effort inside the SAP area. The Proposed Action extends the SAP but does not change the current administration of the SAP, and would therefore result in no change in adverse effects on habitats designated EFH from those effects noted under the baseline (No Action).

7.4.1.2.7.4 Closed Area II Yellowtail Flounder SAP

The Proposed Action modifies the SAP to allow an opportunity to target GB haddock in the SAP area even when the SAP is not opened to allow targeting of GB yellowtail flounder.

Habitat Impacts:
The option that allows for harvesting haddock specifies that the area will open only if the Eastern GB haddock TAC has not been caught. Over the past seven years, this TAC has not been caught in any one year, and it is logical to assume that this option, if implemented, would result in increased fishing effort within the SAP area. The impact of the proposal on habitats designated EFH is potentially negative based on the fact that some vessels (i.e., non-sector vessels) would be using Category B DAS that they would otherwise not have used, resulting in some net increase in trawl fishing effort. The magnitude of the impact, however, cannot be determined because it is uncertain how many vessels would or could participate in this program. Furthermore, under the terms of the proposal, if a vessel exceeds any applicable trip limits, it must flip to Category A DAS, which would result in no net increase in effort, and consequent effect on habitats designated EFH, compared to no action.

7.4.1.2.7.5 SNE/MA Winter Flounder SAP

This option suspends the current SAP for SNE/MA winter flounder until stock conditions warrant its re-implementation.

Habitat Impacts:
This option would prevent further landing winter flounder on trawl trips in the SNE area while participating in other fisheries without using a groundfish DAS. Given that this SAP did not allow for relatively large landings of winter flounder in the past, the magnitude of the reduction in trawling effort is not expected to be large. This program was designed to allow landings of small amounts of winter flounder while participating in other fisheries in order to reduce discards. It is not likely those trips will be avoided because of the inability to land winter flounder. As a result, there aren't expected to be any impacts on EFH as a result of this measure.

7.4.1.2.7.6 Category B DAS Program

This action changes the program to focus on GB haddock, GOM haddock and redfish.

Habitat Impacts:
This option contains a provision for reducing the minimum cod end mesh size to 6 inches when using approved gears to target haddock. This will increase catch rates, allowing participating vessels to catch more fish for a given unit of fishing effort. Overall, however, it is unclear if this measure will result in any overall change in the amount of effort used under a B DAS program. The total effort in this program remains constrained by a limit on the number of Category B DAS that can be used in the program (3,500 total, with 500 in the first quarter and 1,000 in each successive quarter). Recent activity has been a fraction of this total, with less than 1,000 Category B DAS used in any year. In addition, much of the recent activity has been to target pollock, which will no longer be allowed in this program due to the status of pollock. Another constraint is that incidental catch TACs for several stocks remain low, limiting the ability of fishermen to make use of this program. This action will not allow an increase in activity beyond that possible under No Action, but could result in an increase in effort above that seen in recent years. This would have minor or negligible impacts on EFH.

7.4.1.2.8 Periodic Adjustment Process

The periodic adjustment process is administrative in nature and is not expected to have any direct impact on habitats designated EFH.

7.4.1.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

At present, only those limited access scallop permit holders that qualified for a combination vessel limited access multispecies permit are permitted to hold a limited access scallop permit and a limited access multispecies permit at the same time. The Proposed Action would allow a vessel to possess a limited access multispecies permit and a limited access scallop permit at the same time, even if the scallop dredge vessel did not qualify for a limited access multispecies vessel combination permit.

Habitat Impacts:
Analysis in section 7.4.1.2.9 of this document highlights the fact that this measure may induce some groundfish permits to consolidate to vessels that currently fish primarily (or exclusively) for Atlantic sea scallops. Such consolidation will not result in a direct increase in fishing effort, and given that fishing mortality targets are achieved for both fisheries, it is not likely to result in any overall change in fishing effects on habitats designated EFH. However, there is no prohibition on the former groundfish vessel participating in other fisheries after the multispecies permit is transferred. If this provision results in effort increases in other fisheries that use mobile bottom tending gears (e.g. summer flounder), then there may be a consequent negative effect on habitats designated EFH that overlap with those fisheries. The potential for, and likely magnitude of, this outcome is unknown at this time.

7.4.1.2.10 Catch History

This measure prevents catch history from accruing after implementation of Amendment 16. This is an administrative measure and is not expected to have direct impacts on essential fish habitat.

7.4.1.3 Measures to Meet Mortality Objectives

Measures are proposed to meet mortality objectives previously specified in this document. In general, these mortality objectives will require a decrease, and often a substantial decrease, in fishing mortality on most groundfish stocks. In that regard, nearly all measures detailed below will result in less overall fishing effort and a consequent benefit to habitats designated EFH.

7.4.1.3.1 Commercial Fishery Measures

7.4.1.3.1.1 24 hour clock, Restricted Gear Areas

This Proposed Action eliminates differential DAS counting areas, reduces Category A DAS by 50 percent from the FW 42 allocations, and counts all DAS in 24-hour increments (i.e. 6 hours is counted as one DAS, 25 hours is counted as two DAS, etc.). The category A/Category B DAS split that results is 27.5%/72.5%. Most other current measures remain, including seasonal and rolling closures and gear requirements.

Habitat Impacts:
This measure will alter fishing practices by requiring specific approved fishing gears in the restricted gear areas. These gears are being required to minimize interactions with overfished species that have a tendency to remain closer to the bottom. Therefore, it may be inferred that these gears will have a reduced impact on the seabed. Additionally, this measure requires a dramatic decrease in overall DAS allocations. While fishing effort does not likely change linearly with DAS, such a substantial reduction in DAS will translate to a reduction in fishing effort and will have benefits to habitats designated as EFH throughout the range of the fishery.

7.4.1.3.1.2 SNE/MA Small Mesh Fisheries Gear Requirement

The Proposed Action adopts the No Action alternative for this measure; does not adopt a requirement for vessels participating in the small mesh fisheries in SNE to use gear that reduces bycatch of flounders.

Habitat Impacts:
The purpose of this requirement was to raise the footrope off the bottom and reduce catches of winter flounder. Since this requirement is not being adopted, the gear is not likely to be widely used and there would be no changes in the effects of fishing on EFH in this area from current levels.

7.4.1.3.1.3 GOM Haddock Sink Gillnet Pilot Program

This measure decreases the mesh size and places other restrictions on vessels fishing with gillnets and operating in the GOM. It creates an opportunity for these vessels to target haddock. There are no increases in effort – vessels must use allocated Category A DAS.

Habitat Impacts:
This measure is not expected to have any change in impact on habitats designated EFH relative to the baseline period.

7.4.1.3.2 Recreational Management Measures

These measures affect fishing for groundfish using hook and line gear, which has been shown to have no adverse effect on habitats designated as EFH. These measures are not expected to have any impact on such habitats relative to the baseline period.

7.4.1.3.3 Atlantic Halibut Minimum Size

This measure increases the minimum size of Atlantic halibut to 41 inches.

Habitat Impacts:
Because there is no directed fishery for Atlantic halibut using mobile bottom tending gears, this measure is not expected to have any impact on habitats designated EFH.

7.4.1.3.4 Prohibition on Retention of Atlantic Wolffish

This measure prohibits retaining Atlantic wolffish by vessels fishing under the northeast multispecies FMP.

Habitat Impacts:
Because there is no directed fishery for Atlantic wolffish at this time, this measure is not expected to have any impact on habitats designated EFH.

7.4.1.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

Sector administration provisions are administrative in nature and are not expected to have any direct impact on habitats designated EFH. Any changes in fishery regulations or fishing practices that may result on the basis of sector-based management will be addressed in the regulations that implement a particular sector, and in the EIS or EA corresponding to the creation or continuation of that sector.

Because in general vessels are expected to fish more efficiently within sectors, it is possible that there will be a reduction in groundfish fishing effort if numerous vessels join sectors. This may reduce adverse effects of fishing on EFH, but only if the goundfish vessels do not increase effort in other fisheries.

7.4.1.3.6 Accountability Measures

7.4.1.3.6.1 Commercial Groundfish Fishing Vessel Accountability Measures

The Proposed Action adopts two AMs for commercial groundfish fishing vessels that d not join sectors. For FY 2010 and FY 2011, the AM takes the form of DAS adjustments, either through the application of differential DAS or an overall DAS change. The AM is constructed so that changes can occur in either direction – effort could increase or decrease, depending on whether ACLs are not attained or are exceeded. If differential DAS are used, then the adjustment may be applied to specific stock areas rather than throughout the fishery. Impacts on the adverse effects of fishing to EFH will depend on the magnitude, location, and direction of any adjustments. Increased in effort (through an increase in DAS or a reduced DAS counting rate) would be expected to increase the adverse effects of fishing, will a decrease would do the opposite. It is impossible to predict in advance which change will occur. It is notable, however, that total DAS allocations (about 20,000 DAS if all permits remain in the common pool) will be less than the DAS used in recent years (about 33,000 DAS). It is doubtful that given the need to rebuild stocks any adjustment in the near future will result in more fishing effort than was used prior to implementation of Amendment 16.

Beginning in FY 2012, the AM is a hard TAC system that can result in closing specific areas to fishing activity. If closures are triggered because TACs will be exceeded, fishing activity could be constrained and there could be temporary benefits to habitat. Quotas are also carried forward within a fishing year if not exceeded in a trimester, so it is possible effort in some areas could temporarily increase to harvest a TAC. Impacts on habitat are uncertain and would not be permanent, since areas reopen in a following trimester.

With respect to sectors, the AM provisions are an integral part of sector operations. EFH impacts are not expected.

7.4.1.3.6.2 Recreational Fishing Vessel Ams

Because the gear used by recreational fishing vessels has minimal effect on EFH, no impacts are expected as a result of recreational AMs.

7.4.1.4 Summary of Essential Fish Habitat Impacts of the Proposed Action

The management measures that reduce DAS allocations for the common pool, and thus reduce fishing effort ant contact of gear with the bottom will provide additional protection to habitat. Similar reductions in groundfish fishing effort are expected to result from the implementation of additional commercial groundfish fishing sectors. These sectors will be able to operate more efficiently than vessels under the No Action common pool regulations. It is possible that while overall effort is reduced the reductions in allocated DAS and formation of sectors may result in distributional shifts in that effort – possibly into near shore areas – as vessel operators reduce travel time to maximize revenue for each DAS. As a result, benefits to EFH may not be evenly distributed. As noted above, other management measures could have impacts on EFH as well. The following table summarizes the expected impacts of the Proposed Action on EFH. Overall, the impacts on EFH from the Proposed Action are expected to be positive relative to the No Action alternative.

Table 204 – Expected Impacts of the Proposed Action Relative to the No Action Alternative

Proposed Measure	Expected Relative Habitat Impacts	Rationale
Revised status determination criteria	0	Administrative; not expected to have impact on EFH
Revised ABC control rules	0	Fishing mortality targets will not be significantly different over the long term; no impacts expected
Revised mortality targets	0	Administrative; not expected to have impact on EFH; measures to achieve targets may have impacts described below
Annual catch limits	0	Administrative; not expected to have impact on EFH
Addition of Atlantic Wolffish to the management unit	0	Administrative; not expected to have impact on EFH
Designation of Atlantic wolffish EFH	0	Not expected to have impacts due to overlap with existing EFH
Sector administration provisions	0	These provisions are administrative in nature. However, sectors formed under these provisions could have impacts. These possible impacts would be discussed in the NEPA document supporting the individual sector.
Reporting requirements	0	Administrative; not expected to have impact on EFH

Proposed Measure	Expected Relative Habitat Impacts	Rationale
Allocation of GOM cod and haddock to the commercial and recreational components	+	May result in shifts in effort from the commercial component to the recreational component; the recreational component generally has less effect on EFH. But since allocation is based on recent landings history, any benefits are expected to be minor when compared to No Action.
Changes to the DAS Transfer and Leasing Programs	+/0	Combined changes are expected to have minimal effect. Removing transfer tax expected to be neutral to positive as it may reduce effort in other fisheries. Removing DAS leasing cap may increase effort and have negative impacts on EFH. Allowing CPH permits to participate may be negative as some additional effort may enter fishery.
Special Management Programs		
Incidental Catch TACs	0	Administrative; not expected to have impact on EFH.
CAI Hook Gear Haddock SAP Revisions	0	While season and area increase, effort will not increase beyond baseline and gear used has minimal impact on EFH. Could be positive benefits if vessels switch from gear with more EFH impacts to participate in the SAP.
Eastern US/CA Haddock SAP	0	While SAP is extended, administration does not change and no effects expected that are different than when SAP was authorized.
CAII Yellowtail Flounder SAP	0/-	Changes will result in increased effort in the SAP area, and may increase effort through use of additional DAS.
Category B DAS Program Changes	0	Changes reduce species that can be targeted, but facilitated targeting haddock. Uncertain whether this will increase effort, but existing effort caps remain in place so potential effort is unchanged from the No Action alternative.
Periodic Adjustment Process	0	Administrative; not expected to have impact on EFH.

Proposed Measure	Expected Relative Habitat Impacts	Rationale
Simultaneous possession of a limited access scallop and multispecies permit	0/-	If the former groundfish vessel participates in other fisheries after the multispecies permit is transferred, and this results in effort increases in other fisheries that use mobile bottom tending gears (e.g. summer flounder), then there may be a consequent negative effect on habitats designated EFH that overlap with those fisheries. The potential for, and likely magnitude of, this outcome is unknown at this time.
Catch history	0	Administrative; not expected to have impact on EFH.
Commercial fishery effort control measures: 24 hour clock, restricted gear areas	+	Gears will likely have a reduced impact on the seabed since gears are required to minimize interactions with species that tend to remain close to the seabed floor. Additionally, the dramatic decrease in overall DAS allocations will translate to a reduction in fishing effort and will have benefits to habitats designated as EFH throughout the range of the fishery.
SNE/MA Small Mesh Fisheries Gear Requirement	0	The No Action alternative is adopted by the Proposed Action; since there are no new or different requirements, impacts will not change.
GOM Haddock Sink Gillnet Pilot Program	0	No impacts on EFH expected because no effort increases anticipated.
Recreational Management Measures	0	Recreational fishery uses hook and line gear that has no adverse effects on EFH. No impacts expected.
Atlantic halibut minimum size	0	No directed fishery for this stock that uses mobile bottom tending gear.
Prohibition on retention of Atlantic wolffish	0	No directed fishery for this stock; prohibition will not affect effort levels and is not expected to have impacts on EFH.
Implementation of Additional Sectors	+/0	Sector implementation is administrative in nature. Sector operations plans must describe fishing practices and impacts on EFH. Addition of sectors could lead to reductions in effort as sectors fish more efficiently which would be expected to benefit EFH.
Accountability Measures	0	Mixed/unknown – for commercial vessels, depends on implementation; for recreational vessels, no impact

7.4.2 Essential Fish Habitat Impacts of Alternatives to the Proposed Action

7.4.2.1 No Action Alternative

This alternative would not change any existing management measures. The management measures for the Northeast Multispecies Fishery would not be revised and the most recent measures adopted by Amendment 13, FW 40A, FW 40B, FW 41 and FW 42 would remain in effect as implemented. Current implementing regulations can be found at 50 CFR 648 Subpart F.

Habitat Impacts:
The impacts of continuing the measures adopted under Amendment 13, FW 40A, FW 40B, FW 41 and FW 42 have been summarized in the EIS's prepared with those documents. The most recent action, FW 42, concluded that:

"It is clear that most of the proposed measures in this action have neutral or positive impacts on habitat largely by reducing effort overall in the fishery. Specific to the Proposed Action, effort controls, differential DAS counting, the differential DAS counting area, effort controls and incidental catch TACs in the Category B (regular) DAS program, implementation of a George's Bank cod fixed gear sector and institutional use of a VMS system will likely have positive effects on EFH.

Commercial Fishery Measures Effort Controls: Positive habitat impacts by reducing DAS by 8.3% (Category A DAS) with limited opportunity to use the increased Category B DAS.

Differential DAS Counting: Positive habitat impacts, especially in areas that are sensitive to the impacts of trawling or dredging as described in Amendment 13, by reducing the amount of time the gear will be in contact with the bottom in GOM and SNE.

Differential DAS counting area: Positive habitat impacts, especially in areas that are sensitive to the impacts of trawling or dredging as described in Amendment 13, by reducing the amount of time the gear will be in contact with the bottom in GOM and SNE.

Category B (regular) DAS Program Effort Controls: Reduction of allocated DAS from 4,000 to 3,500 (a 12.5% reduction) with further evidence that it will be difficult to use the 3,500 DAS. Positive habitat impacts, especially in areas that are sensitive to the impacts of trawling or dredging as described in Amendment 13, by reducing the amount of time the gear will be in contact with the bottom in GOM and SNE.

Category B (regular) DAS Program Incidental Catch: Based on the size of the incidental catch TACs and the maximum catch allowed, the incidental catch TACs may constrain the number of DAS that can be used in this program.

GB Cod Fixed Gear Sector: No adverse impacts expected from jigs, non-automated demersal longline, hand gear, or sink gillnets as compared to bottom-tending mobile gear. May be positive to habitat if some traditionally bottom-tending gear vessels transition into the sector and change gears used to less impacting ones required by the Sector.

Vessel Monitoring System: Improved understanding of spatial distribution of fishing will improve the ability to assess and minimize habitat impacts over the long-term.

Conversely, only the combined trips to the Eastern US/Canada Resource Sharing Area may have negative impacts on EFH by making fishing in the area more attractive. However, impacts are hard to assess based on limited understanding of biological impacts. All other measures proposed will likely have neutral habitat impacts or the impacts on EFH cannot be assessed.

Combined Trips to Eastern US/Canada Area: May result in increased effort by making fishing in the area more attractive. Impacts are hard to assess based on limited understanding of biological impacts.

Overall, the proposed measure is expected to have positive impacts on EFH."

The impacts resulting from changes proposed in this document will be compared to the No Action Alternative to provide a relative assessment of impacts to EFH.

7.4.2.2 Updates to Status Determination Criteria and Formal Rebuilding Programs

7.4.2.2.1 Revised Status Determination Criteria

This action proposes new status determination criteria. The only alternative considered was the No Action alternative, which would have maintained the criteria adopted in Amendment 13.

Habitat Impacts:
Status Determination Criteria are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.2.2.2 ABC Control Rules

The No Action alternative would not adopt revised ABC control rules. In the long-term, fishing mortality rates would be similar to the Proposed Action and this alternative would not be expected to have any direct impacts on habitats designated EFH.

7.4.2.2.3 Revised Mortality Targets for Formal Rebuilding Programs

This action revises mortality targets as needed based on stock status and rebuilding requirements. The only alternative considered was the No Action alternative, which would have maintained the mortality targets adopted by Amendment 13 and FW 42.

Habitat Impacts:
Mortality targets are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.2.3 Fishery Program Administration

7.4.2.3.1 Annual Catch Limits

This action proposes to implement Annual Catch Limits (ACLs) as required by the M-S Act. The only alternative considered was the No Action alternative, which would not implement ACLs.

Habitat Impacts:
Annual Catch Limits are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

7.4.2.3.2 Addition of Atlantic Wolffish to the Management Unit

This action adds Atlantic wolffish (*Anarhichas lupus*) to the management unit for the Northeast Multispecies Fishery Management Plan. Adding another species to the multispecies management unit is administrative in nature and is not expected to have any direct impact on habitats designated EFH.

The alternatives to the Proposed Action for defining EFH include Option 3 and the No Action alternative. The four options included in Alternative 3 would designate progressively larger areas in the Gulf of Maine and on Georges Bank. Any of these alternatives would describe EFH for all four life stages of wolffish as being between 40 and 240 meters and in a range of substrate types. The No Action alternative would not designate EFH for Atlantic wolfish, and it but could only be selected if the Council decided not to include this species in the Multispecies FMU.

Because all of the wolfish EFH designation alternatives overlap entirely with existing EFH designations for other federally-managed species, the addition of wolfish would not affect the number or effectiveness of EFH consultations that are conducted for fishing or non-fishing activities. Fishing impacts on EFH are already being minimized by management actions implemented under Amendment 13 to the Multispecies FMP; adding Atlantic wolffish to the multispecies FMU, and designating EFH for this species, simply extends habitat protection to include wolffish. In conclusion, therefore, there would be no habitat impact of any of the EFH designation alternatives to the Proposed Action.

7.4.2.3.3 Sector administration provisions

The management measures proposed in this section relate to the process for establishing sector allocations in the multispecies fishery. This section is intended to **update Section 3.4.16.1** of the final Amendment 13 SEIS (Sector Allocation). All of the sector policy changes proposed in this section will be implemented at the beginning of fishing year 2010 (May 1, 2010).

While in some cases the sector administration provisions included various sub-options, the primary alternative to revising these provisions was to not make any changes (the No Action alternative). This alternative would have maintained the sector administration provisions adopted in Amendment 13.

Habitat Impacts:
Sector administration provisions are administrative in nature and are not expected to have any direct impact on habitats designated EFH. Any changes in fishery regulations or fishing practices that may result on the basis of sector-based management will be addressed in the regulations that implement a particular sector, and in the EIS or EA corresponding to the creation or continuation

of that sector. The impacts of the No Action option are not expected to differ from the Proposed Action.

7.4.2.3.4 Reporting Requirements

The No Action alternative would not adopt an area specific reporting requirement, nor a method to account for discards by non sector vessels.

Habitat Impacts:
Reporting requirements are administrative in nature and are not expected to have any direct impact on habitats designated EFH. The impacts of the No Action option are not expected to differ from the Proposed Action.

7.4.2.3.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

Several alternatives to the Proposed Action were considered. First, the No Action alternative would not define an allocation for any stock. Second, allocations were considered, but not adopted, for pollock, GB cod, SNE/MA/winter flounder, and GOM winter flounder. Third, different years were considered as the basis for the allocation.

Habitat Impacts:
An allocation could alter the distribution of fishing effort, and could potentially shift effort from commercial fisheries that are more likely to have an adverse effect on habitats (e.g. commercial trawling) to recreational fisheries with less overall impact on habitats (e.g. recreational hook/line). However, any such shift in fishing effort distribution will likely be very small, as discussed in section 7.4.1.2.5. Options for allocating groundfish to the commercial and recreational groundfish fisheries are expected to have minimal, if any, notable effects on habitats designated EFH.

7.4.2.3.6 Changes to the DAS Transfer and DAS Leasing Programs

In addition to the No Action alternative that would not have made any changes to the DAS leasing or transfer programs, the Council considered changing the conservation tax on DAS transfers, currently set at 20 percent. An additional option proposed eliminating the tax on transfers for a defined period. An option was considered that would have adopted a tax on DAS leasing that matched the transfer program tax. Finally, the Council considered keeping the cap on the number of DAS that can be leased by a permit.

Habitat Impacts:
The alternatives that were not adopted have one characteristic in common: they all would have made the DAS transfer and leasing programs more restrictive than the measures adopted by the Proposed Action. As a result, fewer DAS would be exchanged through either the leasing or transfer programs, and there would probably have been marginally fewer DAS used as a result when compared to the Proposed Action. These differences are likely dwarfed by other changes in the amendment, such as the effort reductions and implementation of additional sectors. Ultimately, changes to the DAS transfer and leasing program taxes not expected to have more than a minimal effect on habitats designated EFH.

7.4.2.3.7 Special Management Programs

7.4.2.3.7.1 Incidental Catch TACs

Because of changes in stock status, as well as the possible addition of additional SAP provisions, specific stocks subject to incidental catch TACs and the allocations to SAPs are proposed for revision. The only alternative to the Proposed Action considered was the No Action alternative.

Habitat Impacts:
Incidental catch TACs are administrative in nature and are not expected to have any direct impact on habitats designated EFH. No differences are expected between the Proposed Action and the No Action alternatives.

7.4.2.3.7.2 Closed Area I Hook Gear Haddock SAP Revisions

The No Action alternative would not have expanded the area and season for this SAP.

Habitat Impacts:
Because participants in this SAP used a gear type not determined to have an adverse effect on EFH, the effects of the Proposed Action are not expected to differ appreciably from the No Action alternative. With a smaller area and season, it is possible that the No Action alternative would have resulted in fewer SAP participants, but this is speculative because it is not certain expanding the SAP will result in vessels changing from gear with more adverse effects to a participate in the SAP.

7.4.2.3.7.3 Eastern U.S./Canada Haddock SAP

This SAP provides an opportunity to target GB haddock in the Eastern U.S./Canada area, including a small portion of CAII. The No Action alternative would result in the SAP ending in December, 2009 and would eliminate opportunities to participate in this SAP.

Habitat Impacts:
The No Action option would prevent the SAP from operating, resulting in a marginal decrease in fishing effort inside the SAP area.

7.4.2.3.7.4 Closed Area II Yellowtail Flounder SAP

The No Action alternative would not modify the existing SAP, and would not provide an opportunity to target GB haddock in the SAP area even when the SAP is not opened to allow targeting of GB yellowtail flounder.

Habitat Impacts:
The impact of the No Action alternative on habitats designated EFH is potentially positive based on the fact that there would be fewer opportunities for non-sector vessels to fish in the SAP area, some vessels (i.e., non-sector vessels) would be using Category B DAS that they would otherwise not have used, resulting in some net decrease in trawl fishing effort when compared to the Proposed Action. The magnitude of the impact, however, cannot be determined because it is uncertain how many vessels would or could participate in this program.

7.4.2.3.7.5 SNE/MA Winter Flounder SAP

The No Action alternative to the Proposed Action would allow this SAP to continue.

Habitat Impacts:
Given that this SAP did not allow for large landings of winter flounder, it is unlikely it resulted in an increase in the number of trips. The No Action alternative would not be expected to have adverse effects on EFH when compared to the Proposed Action.

7.4.2.3.7.6 Category B DAS Program

The No Action alternative would not adopt measures to change the program to focus on GB haddock, GOM haddock and redfish.

Habitat Impacts:
It is unclear if this option would have resulted in any overall change in the amount of effort used under a B DAS program. On one hand, the Proposed Action may encourage participation in the program to target haddock; some fishermen argue the smaller mesh size will make their vessels more efficient at catching haddock. But it is also possible the No Action alternative, by allowing vessels to continue to target pollock, might encourage the use of more Category B DAS in the program, increasing fishing effort and the adverse effects of trawling on EFH.

7.4.2.3.8 Periodic Adjustment Process

The periodic adjustment process is administrative in nature and is not expected to have any direct impact on habitats designated EFH. The No Action alternative effects would not differ from the Proposed Action.

7.4.2.3.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

At present, only those limited access scallop permit holders that qualified for a combination vessel limited access multispecies permit are permitted to hold a limited access scallop permit and a limited access multispecies permit at the same time. Under the No Action option, this restriction will continue.

Habitat Impacts:
Analysis in section 7.4.1.2.9 of this document highlights the fact that the Proposed Action may induce some groundfish permits to consolidate to vessels that currently fish primarily (or exclusively) for Atlantic sea scallops. This consolidation would not take place under the No Action alternative. As long as fishing mortality objectives are met for both fisheries, it is not likely to result in any overall change in fishing effects on habitats designated EFH. The potential for, and likely magnitude of, this outcome is unknown at this time.

7.4.2.3.10 Catch History

The No Action alternative would allow catch history to accrue to the vessel that lands the catch. This is an administrative measure and is not expected to have direct impacts on essential fish habitat.

7.4.2.4 Measures to Meet Mortality Objectives

Measures are proposed to meet mortality objectives previously specified in this document. In general, these mortality objectives will require a decrease, and often a substantial decrease, in fishing mortality on most groundfish stocks. In that regard, nearly all measures detailed below will result in less overall fishing effort and a consequent benefit to habitats designated EFH.

7.4.2.4.1 Commercial Fishery Measures

7.4.2.4.1.1 Differential DAS and Trip Limits (Option 2A)

This option uses a combination of differential DAS and a trip limits on a few stocks to achieve mortality objectives. It does not modify the existing year round, rolling, seasonal, or habitat closed areas. Gear requirements while fishing on a Category A DAS that were implemented by Amendment 13, as modified by subsequent framework actions, remain in effect. Two additional variations were considered in order to meet pollock rebuilding requirements – both versions modified the DAS counting and reduced allocated Category A DAS.

Habitat Impacts:

The provisions within this option that utilize increased differential DAS counting ratios, and the variations that reduce allocated DAS, will result in overall reductions in DAS used by the groundfish fleet. All fishery areas will see relative reductions in fishing effort, with the largest likely to be those outside of the offshore GOM. Additional restrictive trip limits may serve to mitigate some of the habitat benefits induced by the reduction in overall fishing effort by requiring more or longer tows to catch non-trip-limit-limited species, but this effect is expected to be minimal. Overall, the increased rate of differential DAS application, if enacted, will have a positive net benefit on habitats designated EFH.

7.4.2.4.1.2 DAS Reduction and restricted gear areas

This option reduces Category A DAS by 40 percent from FW 42 allocations. This results in a Category A/Category B DAS split of 33/67. Most other current measures remain, including seasonal and rolling closures and gear requirements.

Habitat Impacts:

This measure decreases overall DAS allocations by less than the 24 hour clock provisions (above) and instead relies on increased trip limits to achieve mortality targets. Such an approach will result in greater adverse effects from fishing on habitats designated EFH relative to the larger DAS reduction and less restrictive trip limits, as this measure will likely translate into increased bottom contact time by mobile bottom tending fishing gears. However, relative to the baseline period, this measure still results in a substantial decrease in fishing effort and will have a positive effect on habitat designated EFH.

7.4.2.4.1.3 SNE/MA Small Mesh Fisheries Gear Requirement

In a portion of the stock area for SNE/MA winter flounder, any vessel fishing for any species with gear using a cod-end, or cod-end liner, of less than five inches, and not fishing on a groundfish DAS, would be required to use 12-inch drop chains on the footrope, or large mesh panels in the front of the net.

Habitat Impacts:
The purpose of this requirement is to raise the footrope off the bottom and reduce catches of winter flounder. As such, there would have been a reduced impact from all such fisheries in this area. The magnitude of the reduced impact, and how it translates into a reduced effect of fishing on habitats designated EFH is not quantifiable at this time. However, in aggregate, this measure would likely have resulted in some benefit to habitats designated EFH that overlap with the portion of the SNE/MA winter flounder stock area subject to this requirement.

7.4.2.4.1.4 GOM Haddock Sink Gillnet Pilot Program

The No Action alternative would not modify sink gillnet requirements in order to create an opportunity to target haddock in the GOM. .

Habitat Impacts:
This measure is not expected to have any change in impact on habitats designated EFH relative to the baseline period. No differences are expected between the Proposed Action and the No Action alternatives.

7.4.2.4.2 Recreational Management Measures

These measures affect fishing for groundfish using hook and line gear, which has been shown to have no adverse effect on habitats designated as EFH. These measures are not expected to have any impact on such habitats relative to the baseline period. No differences are expected between the Proposed Action and the No Action alternatives.

7.4.2.4.3 Atlantic Halibut Minimum Size

This measure increases the minimum size of Atlantic halibut to 41 inches.

Habitat Impacts:
Because there is no directed fishery for Atlantic halibut using mobile bottom tending gears, the minimum size for Atlantic halibut is not expected to have any impact on habitats designated EFH. No differences are expected between the Proposed Action and the No Action alternative.

7.4.2.4.4 Prohibition on Retention of Atlantic Wolffish

The No Action alternative would allow commercial and recreational vessels to retain Atlantic wolffish.

Habitat Impacts:
Because there is no directed fishery for Atlantic wolffish at this time, the No Action alternative and the Proposed Action are not expected to have any impact on habitats designated EFH.

7.4.2.4.5 Implementation of Additional Sectors/Modifications to Existing Sectors

Under the No Action alternative, additional sectors would not be implemented and no changes would be made to the existing sectors. This is not expected to have any direct effects on EFH.

7.5 Economic Impacts

This section discusses the economic impacts of the measures under consideration.

7.5.1 Economic Impacts of the Proposed Action

7.5.1.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

7.5.1.1.1 Revised Status Determination Criteria

The Proposed Action (Option 2) changes the status determination criteria. Since these criteria place limits on the amount of fishing effort they may have economic impacts. One way to evaluate those impacts is to compare the MSY values between the No Action alternative and the proposed revisions. The revised MSY totals are 75 percent of the No Action MSY total. Revenues under the revised criteria would be expected to be less once stocks are rebuilt. The No Action MSY values, however, do not represent use of the best available science and may not be sustainable.

Table 205 – Comparisons of No Action and Revised Status Determination Criteria (MSY)

Species	Stock	Model	No Action	Proposed
Cod	GB	VPA	35,200	31,159
Cod	GOM	VPA	16,600	10,014
Haddock	GB	VPA	52,900	33,604
Haddock	GOM	VPA	5,100	1,360
Yellowtail Flounder	GB	VPA	12,900	9,400
Yellowtail Flounder	SNE/MA	VPA	14,200	6,100
Yellowtail Flounder	CC/GOM	VPA	2,300	1,720
American Plaice	GB/GOM	VPA	4,900	4,011
Witch Flounder		VPA	4,375	2,352
Winter Flounder	GB	VPA	3,000	3,500
Winter Flounder	GOM	VPA	1,500	917
Winter Flounder	SNE/MA	VPA	10,600	9,742
Redfish		ASAP	8,200	10,139
White Hake	GB/GOM	SCAA	4,200	5,800
Pollock	GB/GOM	AIM	17,600	11,320
Windowpane Flounder	GOM/GB	AIM	1,000	700
Windowpane Flounder	SNE/MA	AIM	900	500
Ocean Pout		Index Method	1,500	3,754
Atlantic Halibut		Replacement Yield	300	3,500
Atlantic Wolffish		SCALE		278 – 311 mt
Total			**197,275**	**149,742**

7.5.1.1.2 ABC Control Rules

The Proposed ABC control rules establish the fishing mortality rate used as the basis for setting ABCs. As such, they directly relate to the catch that can be harvested by the fishery, and thus have an impact on the revenues and economic benefits produced by the commercial and recreational components of the fishery. The ABC control rules do not differ significantly from the target fishing mortality rates adopted by Amendment 13. They do, however, limit the ability of the Council to set catches based on a fishing mortality between F_{MSY} and $75F_{MSY}$ when a stock is in good condition. Only if this status is accompanied by additional information on uncertainty will it be possible to base catches on a fishing mortality above $75F_{MSY}$. This may reduce yields from the fishery in some cases. Over the long-term, catches from most groundfish stocks are expected to be approximately 92 percent of the MSY. The increased stability of these yields that result from larger stock sizes may prove of more economic benefit than any short-term increase in catches.

7.5.1.1.3 Revised Mortality Targets for Formal Rebuilding Programs

The Proposed Action (Option 2) adopts revised mortality targets. While for some stocks this will result in reduced yield in the short-term, over the long-term the new targets are consistent with formal rebuilding programs and should lead to higher yields than the No Action alternative.

7.5.1.2 Fishery Program Administration

7.5.1.2.1 Annual Catch Limits

The Proposed Action (Option 2) adopts a process for implementing ACLs. The proposed process would set an overfishing level (OFL) and acceptable biological catch (ABC) and an annual catch limit (ACL). The Proposed Action has two facets that will have somewhat different economic consequences. These parts are the setting of the limits themselves and the setting of ACL sub-components.

The administrative process of setting an OFL, ABC, and ACL alone will introduce a substantial increase in the transaction costs of managing the groundfish resource. These costs include an involved administrative process and an increase in cost of the monitoring multiple sub-components of ACL. In addition to these costs proposed guidance suggests that setting the ACL in particular take into account both scientific and management uncertainties. Taking these uncertainties into account suggest a process whereby deductions from what may be the ABC to arrive at a final ACL. These deductions represent an opportunity cost in the form of potential foregone fishery yield where the magnitude of the opportunity cost would be greater as uncertainty over stock assessments and the effectiveness of the management program increases. Note that this opportunity cost may also be viewed as a measure of the benefits of research to reduce biological uncertainty as well as management opportunities such as improved monitoring. Conceptually, as these uncertainties are reduced the ACL would be set closer and closer to the ABC.

The proposed setting of ACL sub-components would include an explicit allocation to components for which accountability measures would be specified and other components for which accountability measures would not be. The latter includes an allocation to a number of fishing activities for which groundfish is a small bycatch. These fisheries are so diverse and levels of bycatch so small that the cost of monitoring a separate ACL for each of the 20 groundfish stocks in each fishery would likely be prohibitively large. Setting accountability measures for each of these fisheries would also administratively costly and problematic since vessels engaged in these fisheries may not possess a groundfish permit and may not be regulated through the groundfish plan. However, the absence of an accountability measure for these groundfish bycatch fisheries means that an overage in the total ACL from this sub-component may need to be made up by the component of the groundfish fishery that is subject at accountability measures. Although the likelihood of such an event occurring may be small, in effect, the groundfish fishery would be put in the position of being the residual claimant to the groundfish resource.

7.5.1.2.2 Addition of Atlantic Wolffish to the Management Unit

Option 1 (No Action) would not add Atlantic wolffish to the management unit. This is primarily an administrative decision and is not expected to have economic impacts.

The proposed addition of Atlantic wolffish (Option 2) to the management unit is primarily an administrative measure that facilitates management of this species through the FMP. Adding this species will incrementally increase the costs of administration and management when compared to No Action. It will increase the need for periodic assessments of this stock as well as efforts to meet other requirements of the M-S Act (specifying EFH, for example). This measure by itself is not expected to increase costs to the industry, but specific measures adopted to protect this resource might.

The wolffish EFH designation alternatives being considered in Amendment 16 would have no economic impacts on fishing or non-fishing activities in the Northeast region. Fishing activity would only be affected by management regulations designed to minimize the adverse EFH impacts of fishing (e.g., closed areas). These regulations are already in place. Changes in these regulations are being considered in Phase II of the NEFMC EFH Omnibus Amendment 2. They would be based on the vulnerability of habitats utilized by the entire suite of 27 species managed by the NEFMC which have EFH areas that, taken as a group, overlap with all of the candidate wolfish EFH designation alternatives. The addition of wolffish EFH would not affect the EFH protection provisions of the MSA: they would still apply to fishing and non-fishing activities that are conducted throughout the geographic extent of the existing EFH designations.

7.5.1.2.3 Sector Administration Provisions

7.5.1.2.3.1 Sector Formation, Operations Plans, and Annual Reports

The Proposed Action requirements to form a sector impose costs on the sector members. These include one-time costs such as the costs to organize, acquire office equipment and space, prepare and submit a proposal, prepare the initial supporting NEPA document, and prepare and submit annual reports. There are continuing costs to consider such as the day-to-day administration of the sector, monitoring requirements, and preparation of periodic updates to the operations plan and supporting NEPA document.

There is little information available that estimates the administrative costs for forming and operating a sector. The tax returns for the two existing sectors were examined for insights into the range of costs.

- The Fixed Gear Sector's first full year of operation was FY 2007 (May 1, 2007 – April 30, 2008). According to the IRS Form 990 filed for this sector (available at www.guidestar.org), for the fiscal year April 17, 2007 through December 31, 2007 the organization collected $100,849 in member dues and assessments. Total expenses for this period were $64,047. The largest single expense was $31,866 for legal fees, followed by $20,159 for contract labor. The contract labor expense may include sector monitoring costs. This report may not reflect all costs of forming the sector, as the sector's organizers began work in the sector prior to 2007.
- The GB Cod Hook Sector is an activity of the Cape Cod Commercial Hook Fishermen's Association (CCCHFA). Identifying specific sector costs is difficult because of the numerous other activities of this organization. For the 2006 fiscal year, the CCCHFA IRS Form 990 (www.guidestar.org) identifies the organization's total revenues as $1.2 million, with membership dues contributing $125,132. The organization's legal fees were $100,054, while an additional $100,519 was spent for contract services from Archipelago Marine Research, a provider of fishery data collection programs. It is not known what portion, if any, of these expenses were directly related to sector operations as the CCCHFA explored electronic logbooks as well as other fisheries related experiments. The report also identifies $88,000 in revenue from sector development activities.

The Fixed Gear Sector summary likely more representative of sector formation and operating costs as that is the sole program for the organization. Anecdotal reports suggest that preparation of an annual EA can cost as much as $100,000 if contracted through a consulting firm. Presumably these costs will decline over time as follow-on EA may only require minor adjustments and updating. Some of these initial costs may be offset by support from other organizations For example, the Gulf of Maine Research Institute received several grants to assist the organization of sectors. They have provided resources to sector organizers to assist the preparation of operations plans and EAs. This support included hiring personnel to prepare these EAs and the contracting of services to recommend catch reporting and monitoring systems. In 2009, NMFS also provided support to sector organizers; NMFS helped contract for preparation of sector EAs and reportedly will help fund other sector administrative costs. It is not clear that this level of support will continue to be available to new sectors.

In summary, sector formation and operating costs are likely to be at least $60,000 - $150,000 per sector. This does not include reporting expenses, which are discussed in section 7.5.1.2.3.4. Some of these costs may be offset by support from other organizations, but the duration and level of that external support is uncertain. It is possible that collaborative approaches between sectors will provide efficiencies that reduce the total costs per sector. For example, a group of sectors may be able to hire one contractor to prepare a set of similar operations plans or NEPA documents, or may share office space and other administrative expenses. The true costs of forming and operating sectors will be difficult to estimate until there is more experience with sectors.

The Proposed Action allows the permit to join a sector even if in CPH. This should result in reduced costs for permit holders. It may also increase the number of permits that choose to join sectors, bringing additional PSCs into the sectors and increasing allocations of ACE.

7.5.1.2.3.2 Allocation of Resources

The measures proposed that are grouped under this heading (see section 5.2.3.3) fall into four broad categories: general guidance for how resources are allocated and which permits receive a potential sector contribution, how resources are treated in after a sector overage if a sector disbands or vessel leaves a sector, treatment of U.S./Canada area resources, and options for calculating the PSC of each permit. Because of the implications of the PSC calculation for individual permit holders, most of the following discussion highlights the impacts of the different options.

7.5.1.2.3.2.1 General

The revisions to the general guidance make it clear that sectors can only be allocated resources in the form of hard TACs (not DAS) and removes the cap on TAC/ACE that can be allocated to a sector. Sectors must also request a hard TAC/ACE for all stocks that are caught (with four exceptions). Removing the cap on TAC/ACE will allow sectors of any size to form. It is possible that one sector could acquire sufficient ACE of a stock to constrain the activity of other sectors.

This section also adopts the concept that NMFS will withhold up to 20 percent of each sector's ACE at the beginning of the fishing year for a period of 61 days to allow time to process end of year transfers and resolve catch data. This could reduce revenues if prices are higher during this period, and may increase costs if sectors are unable to take advantage of higher catch rates during these months as a result.

7.5.1.2.3.2.2 Guidance on Sector Overages

The Proposed Action (Option 1) provides guidance for the treatment of sector overages and makes it clear that exiting or disbanding a sector is not an opportunity to avoid accountability for sector overages. Regardless which sub-option is selected, the overall impact of this measure is to increase the effectiveness of the sector concept by clearly defining responsibility for overages.

7.5.1.2.3.2.3 U.S./Canada Area

In the U.S./Canada area, fishing for EGB cod and haddock and GB yellowtail flounder is limited by a hard TAC for all vessels. AMs are triggered when the TAC of these stocks is caught, including closure of the eastern U.S./Canada area. With the expectation that additional sectors may be implemented in FY 2010, a concern was raised that fishing by common pool or sector vessels could affect the other component of the fishery.

The Proposed Action (Option 2) creates a specific allocation of U.S/Canada stocks for sectors. This reduces the incentive to race to catch the TACs in this area. Common pool vessels may still compete with each other but will not compete against sectors. Sectors will have more of an ability to plan their activities to maximize their returns without fear that common-pool fishing will lock them out of the area.

7.5.1.2.3.2.4 Sector Baseline Calculations

This section analyzes the impacts of the different options for establishing PSC for each permit.

7.5.1.2.3.2.5 Economic Impacts of Sector Share Allocations

The following sections compare the potential sector contributions (PSCs) for four different options considered by the Council. These values were calculated by the Groundfish PDT, and the results may differ from the final values determined by NMFS for each permit. The final NMFS values will take into account corrections to the data, challenges to the PSC determinations for individual permits, and possible differences in the tracking of the ownership of permits over time. The PDT analyses are believed sufficient to illustrate the differences between the options, but should not be viewed as a definitive determination of the allocation results from the different options. This summary also reflects impacts over a group of vessels, and the impacts for any individual vessel within that group may differ from those shown here.

Only one of the options analyzed in this section is included in the Proposed Action. Because it is easier to compare the options by keeping the tables in one location, the results for all options analyzed are included in this section of the document. If the tables for the options not selected were relocated to section 7.5.2.2.3.2.6, the reader would be forced to repeatedly page through the document to compare options.

The five options analyzed were:

- No Action Alternative (Status Quo/Amendment 13): Allocation of resources will be based on the accumulated catch histories *over the previous five years* for which data are available for each member of the self-selected sector, as described in Amendment 13. For example, for sectors beginning operations in FY 2009, the baseline period would be FY 2002 – FY 2006. Each permit's landings for the time period are divided by the total landings of the stock to determine each permit's share.

- Proposed Action (Option 1) - Landings History Only FY 1996 – FY 2006

- Option 2 - 50% Landings History and 50% Vessel Baseline Capacity for Landed Stocks FY 1996 – FY 2006: Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be calculated using the following formula:

  (10L + HP) x (allocated "A" DAS) = baseline capacity

  The portion allocated based on capacity applies *only* to stocks landed by the permit.

- Option 3 - 50% Landings History and 50% Vessel Baseline Capacity for All Stocks FY 1996 – FY 2006: Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be calculated using the following formula:

  (10L + HP) x (allocated "A" DAS) = baseline capacity

  The portion allocated based on capacity applies to *all* stocks for which ACE will be allocated.

- Option 4 - 50% Landings History and 50% A DAS for All Stocks FY 1996 – FY 2006: Under this alternative, landings history for each permit/stock will be calculated in the same manner described above for Alternative 1. Vessel baseline capacity will be represented by allocated "A" DAS for *all* stocks for which ACE will be allocated.
  The landings history share and the A DAS share for each permit will be averaged to obtain a value for each stock.

In addition, PSC Option 5 is analyzed in section 7.5.1.2.3.2.11.

For each permit, the PSC was calculated for each of the options for each of fifteen regulated groundfish stock. The results were then aggregated by homeport state and by three vessel size classes (large > 70 feet, medium 50-70 feet, and small under 50 feet). The results were also aggregated by broad stock areas fished by the permits. The differences between the alternatives are also compared and briefly discussed.

As suggested by the Groundfish PDT, in order to give a more concrete illustration of the differences between the alternatives, the shares were then applied to an estimated FY 2010 catch level to determine the weight of fish in each category of vessel size and homeport state. The catch levels are based on the median catch at the target fishing mortality and are adjusted to account for sub-components of an ACL, recreational harvest, and Canadian harvest. As one final illustration, the resulting amounts were multiplied by an average price per pound of live weight based on the available CY 2007 dealer data (not all data is entered in the database). These average prices are species, and not stock, specific, and may not reflect differences in value between stocks or seasonal variations in price. Live weight was used to calculate an average price since TTACs are based on lived weight. The weights and prices used are shown in Table 206. For GOM winter flounder, pollock, and white hake, the starting values for the catch area based on FY 2009 TTACs.

Table 206 – TACs and species values used to evaluate PSC options

	TAC	Price
GOM Cod	6,800	1.59

GB Cod	2,600	1.59
GOM Winter	340	2.07
GB Winter	2,000	2.07
SNEMA Winter	0	2.07
CCGOM YT	840	1.86
GB YT	1,700	1.86
SNEMA YT	340	1.86
GOM Haddock	860	1.53
GB Haddock	35,000	1.53
Witch	990	2.4
Plaice	3,700	1.61
Pollock	6,200	0.46
Redfish	9,100	0.57
White Hake	2,300	1.15

7.5.1.2.3.2.6 PSC Shares, ACE Allocations and Potential Value by Vessel Length Group

PSC shares calculated for eligible permits for the No Action option and Options 1-4 are shown in Table 207, aggregated by three vessel length classes. The resulting ACE that permits would bring to a sector, and an estimated value for that ACE, are shown in Table 208 through Table 212.

The No action option and Options 1 use landings history alone to calculate ACE and differ only in the time period used. In general, large vessels get a larger ACE for most GOM stocks under Option 1, reflecting the fact that in recent years large vessels have not fished as much in this area as they did over the entire time period. For medium–sized vessels there is little difference between these two history-based options. While small vessels gain GB cod ACE under Option 1, as a group they lose GOM cod and GOM haddock.

Options 2, 3, and 4 all add an additional capacity factor to the calculation of each permit's potential sector contribution. In general, adding this additional factor tends to move ACE away from the vessel size classes that had the majority of a stock under either the No Action option or Option 1. For example, GOM cod tends to move from the small vessels to large vessels; GB haddock moves from large vessels to small and medium vessels; SNE/MA yellowtail flounder moves from medium vessels to both large and small vessels.

In terms of ACE value (ignoring whether a vessel size class is capable of actually harvesting a particular stock) large vessels would receive the highest value under Option 1 and the value declines for each subsequent option. The value of ACE for medium vessels gains under each successive option, peaking at $57.9 million under Option 4. Small vessels do slightly better under the No Action option than Option 1, but do better under each successive option, peaking at $73.5 million under Option 4. Most of the increase for both small and medium vessels can be attributed to receiving a larger share of GB haddock under successive options.

7.5.1.2.3.2.7 PSC Shares, ACE Allocations and Potential Value by Homeport State

PSC shares aggregated by homeport state are shown in Table 213 through Table 217, with the resulting ACE allocations shown in Table 218 through Table 222 and values in Table 223 through Table 227.

Vessels that claim Massachusetts as homeport state would receive the largest ACE under the No Action option, with a very similar allocation under Option 1. The ACE for these vessels declines under each subsequent option. Vessels with homeports of Maine or New Hampshire would receive the least ACE under Option 1 increasing to a maximum under Option 4. Again, these changes are in large part due to changes in the distribution of GB haddock under the different alternatives. Rhode Island vessels would receive the largest ACE under the No Action option, followed by Option 3. Vessels with homeports of New Jersey or New York receive the largest ACE under Option 3 as well. Similar trends are seen for value, shows in Table 223 through Table 227.

7.5.1.2.3.2.8 PSC ACE Allocations and Potential Value by Area Fished

As seen in the preceding sections, the PSC options have different impacts on different stocks. This suggests that the areas fished by a permit may be important in defining the impacts of the alternatives. Using VTRs, permits were classified as to whether they fished in one or more broad fishing areas (GOM, GB, or SNE/MA). Again, no allowance is made for whether a permit is capable of catching fish from a particular stock. The resulting PSCs from each option were then aggregated for the areas fished. The results are summarized in Table 228 through Table 237.

In general, permits that have a history of fishing in all three areas receive more ACE (weight and value) under the No Action option and Option 1 – those options that rely on landings history alone. These permits receive the lease ACE under Option 4. Permits that fished only in the GOM receive their largest ACE under Option 4. The same is true for permits that fished only on GB or on both GB and in the GOM. Permits that fished only in the SNE/MA area do their best under either Option 3 or 4 in terms of total ACE and value. Permits that fished in SNE/MA and the GOM do their best under Option 4, while those that fished in SNE/MA and GB do their best under Option 3. As with the earlier aggregations by length and homeport state, many of the differences can be attributed to the different distribution of GB haddock under the different options.

These broad overviews do not capture the results for individual stocks. As an example, while permits that fished only in SNE/MA receive the largest total ACE under Option 3 or 4, under these options they receive smaller ACE for SNE/MA yellowtail flounder and SNE/MA winter flounder than with Option 1 or 2.

7.5.1.2.3.2.9 ACE Allocations by Sector

In order to provide information on the impacts of the different PSC options on individual sectors, the PSCs were aggregated by sector membership. Membership was as reported to NMFS by March 1, 2008 and may not represent membership once sectors are implemented. Since specific membership for Northeast Seafood Coalition sectors was not identified, all permits that signed up for these sectors were lumped together in the summary tables. *These tables should be viewed with caution and should not be used as the sole basis for business decisions.* Allocations of ACE to sectors depend on which permits join each sector. If membership differs from that used to construct these tables, then the allocations could prove to be very different than those shown here.

In addition, these tables are subject to all the caveats used in the previous analyses – PDT estimates are not likely to exactly match PSCs calculated by NMFS. To emphasize these caveats, all that is shown is the ACE, in metric tons and value, estimated for each sector.

Table 207 – Estimated potential sector contribution shares by vessel length group

	No Action			Proposed Action - Option 1			Option 2			Option 3			Option 4		
Stock	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**
Number of Vessels	311	288	769												
GOM Cod	9.20%	28.26%	62.54%	16.10%	29.97%	53.93%	27.97%	28.63%	43.40%	31.68%	27.38%	40.94%	24.81%	28.25%	46.94%
GB Cod	70.71%	11.85%	17.44%	60.63%	11.24%	28.13%	57.38%	17.95%	24.67%	53.94%	18.02%	28.04%	47.08%	18.89%	34.03%
GOM Winter	10.30%	48.73%	40.97%	11.99%	47.38%	40.64%	25.06%	38.41%	36.53%	29.62%	36.08%	34.29%	22.75%	36.96%	40.29%
GB Winter	94.84%	5.14%	0.02%	95.49%	4.47%	0.04%	88.67%	8.38%	2.95%	71.37%	14.63%	13.99%	64.51%	15.50%	19.99%
SNEMA Winter	65.59%	27.68%	6.73%	66.61%	25.03%	8.36%	63.27%	23.78%	12.95%	56.93%	24.91%	18.16%	50.07%	25.78%	24.15%
CCGOM YT	31.36%	37.44%	31.20%	32.90%	37.12%	29.98%	42.08%	30.35%	27.57%	40.08%	30.96%	28.96%	33.21%	31.83%	34.96%
GB YT	90.06%	9.94%	0.00%	90.03%	9.97%	0.00%	86.38%	11.66%	1.96%	68.64%	17.38%	13.98%	61.78%	18.25%	19.97%
SNEMA YT	44.39%	48.80%	6.80%	47.94%	44.46%	7.60%	57.95%	33.41%	8.64%	47.60%	34.63%	17.78%	40.73%	35.50%	23.77%
GOM Haddock	34.54%	25.97%	39.49%	47.87%	25.26%	26.87%	44.17%	26.56%	29.27%	47.56%	25.03%	27.41%	40.70%	25.90%	33.41%
GB Haddock	81.80%	9.55%	8.65%	82.86%	10.17%	6.97%	71.55%	16.30%	12.15%	65.06%	17.48%	17.46%	58.19%	18.35%	23.46%
Witch	51.74%	31.27%	16.99%	52.05%	32.65%	15.30%	50.59%	29.13%	20.28%	49.65%	28.72%	21.63%	42.79%	29.59%	27.62%
Plaice	55.11%	32.88%	12.01%	50.05%	34.39%	15.56%	49.94%	29.42%	20.64%	48.65%	29.59%	21.75%	41.79%	30.47%	27.75%
Pollock	41.40%	23.97%	34.63%	42.21%	25.10%	32.69%	45.22%	24.55%	30.23%	44.73%	24.94%	30.32%	37.87%	25.82%	36.32%
Redfish	67.41%	20.73%	11.86%	67.53%	21.94%	10.52%	57.09%	23.43%	19.48%	57.39%	23.37%	19.24%	50.53%	24.24%	25.23%
White Hake	49.00%	28.86%	22.14%	48.80%	29.93%	21.27%	48.78%	27.26%	23.96%	48.03%	27.36%	24.61%	41.16%	28.23%	30.60%

Table 208 – No Action allocation option: ACE (weight) and value of ACE by vessel length group

	ACE Allocations (metric tons)			Value of ACE Allocations			Average ACE Allocations per Vessel (pounds)			Average Value of ACE Allocations per Vessel		
Stock	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**	**Large**	**Medium**	**Small**
Number of Vessels	293	264	626									
GOM Cod	626	1,922	4,252	$2,194,066	$6,735,915	$14,906,154	4,710	16,047	14,976	$7,488	$25,515	$23,812
GB Cod	1,839	308	453	$6,444,675	$1,079,732	$1,589,410	13,834	2,572	1,597	$21,995	$4,090	$2,539
GOM Winter	35	166	139	$159,834	$756,090	$635,674	264	1,384	491	$546	$2,864	$1,015
GB Winter	1,897	103	0	$8,656,373	$469,211	$1,460	14,272	859	1	$29,544	$1,777	$2
SNEMA Winter	0	0	0	$0	$0	$0	0	0	0	$0	$0	$0
CCGOM YT	263	315	262	$1,080,174	$1,289,635	$1,074,659	1,982	2,626	923	$3,687	$4,885	$1,717
GB YT	1,531	169	0	$6,278,134	$692,728	$83	11,520	1,411	0	$21,427	$2,624	$0
SNEMA YT	151	166	23	$618,908	$680,433	$94,849	1,136	1,386	81	$2,112	$2,577	$152
GOM Haddock	297	223	340	$1,001,953	$753,374	$1,145,486	2,235	1,865	1,196	$3,420	$2,854	$1,830
GB Haddock	28,630	3,343	3,027	$96,569,288	$11,275,526	$10,211,516	215,417	27,915	10,662	$329,588	$42,710	$16,312
Witch	512	310	168	$2,710,205	$1,638,043	$889,882	3,854	2,585	592	$9,250	$6,205	$1,422
Plaice	2,039	1,217	444	$7,236,991	$4,318,497	$1,577,314	15,341	10,160	1,565	$24,700	$16,358	$2,520
Pollock	2,567	1,486	2,147	$2,603,169	$1,506,827	$2,177,523	19,314	12,408	7,562	$8,885	$5,708	$3,478
Redfish	6,134	1,886	1,080	$7,708,028	$2,370,486	$1,356,746	46,153	15,753	3,802	$26,307	$8,979	$2,167
White Hake	1,127	664	509	$2,857,008	$1,683,016	$1,291,143	8,479	5,544	1,794	$9,751	$6,375	$2,063
Total	47,647	12,276	12,846	$146,118,806	$35,249,511	$36,951,899	358,511	102,515	45,242	$498,699	$133,521	$59,029

Table 209 – Proposed Action - Option 1 allocation: ACE (weight) and value of ACE by vessel length group

	ACE Allocations (metric tons)			Value of ACE Allocations			Average ACE Allocations per Vessel (pounds)			Average Value of ACE Allocations per Vessel		
Stock	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
GOM Cod	1,095	2,038	3,667	$3,836,606	$7,143,860	$12,855,669	8,235	17,019	12,916	$13,094	$27,060	$20,536
GB Cod	1,576	292	731	$5,525,769	$1,024,641	$2,563,406	11,861	2,441	2,575	$18,859	$3,881	$4,095
GOM Winter	41	161	138	$185,975	$735,085	$630,537	307	1,345	487	$635	$2,784	$1,007
GB Winter	1,910	89	1	$8,715,340	$408,149	$3,555	14,370	747	3	$29,745	$1,546	$6
SNEMA Winter	0	0	0	$0	$0	$0	0	0	0	$0	$0	$0
CCGOM YT	276	312	252	$1,133,343	$1,278,619	$1,032,505	2,080	2,604	887	$3,868	$4,843	$1,649
GB YT	1,531	169	0	$6,276,033	$694,672	$240	11,516	1,415	0	$21,420	$2,631	$0
SNEMA YT	163	151	26	$668,315	$619,878	$105,996	1,226	1,262	91	$2,281	$2,348	$169
GOM Haddock	412	217	231	$1,388,526	$732,781	$779,505	3,097	1,814	814	$4,739	$2,776	$1,245
GB Haddock	29,000	3,560	2,440	$97,819,324	$12,007,118	$8,229,888	218,205	29,726	8,593	$333,854	$45,482	$13,147
Witch	515	323	152	$2,726,420	$1,710,023	$801,686	3,877	2,699	534	$9,305	$6,477	$1,281
Plaice	1,852	1,273	576	$6,572,688	$4,516,924	$2,043,189	13,933	10,627	2,027	$22,432	$17,110	$3,264
Pollock	2,617	1,556	2,027	$2,654,024	$1,578,009	$2,055,486	19,692	12,994	7,138	$9,058	$5,977	$3,284
Redfish	6,145	1,997	958	$7,722,392	$2,509,308	$1,203,561	46,239	16,675	3,373	$26,356	$9,505	$1,923
White Hake	1,123	688	489	$2,845,896	$1,744,989	$1,240,282	8,446	5,748	1,723	$9,713	$6,610	$1,981
Total	48,255	12,827	11,687	$148,070,653	$36,704,056	$33,545,506	363,085	107,117	41,160	$505,361	$139,031	$53,587

Table 210 – Option 2 allocation: ACE (weight) and value of ACE by vessel length group

	ACE Allocations (metric tons)			Value of ACE Allocations			Average ACE Allocations per Vessel (pounds)			Average Value of ACE Allocations per Vessel		
Stock	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
GOM Cod	1,902	1,947	2,951	$6,667,158	$6,823,566	$10,345,412	14,311	16,256	10,394	$22,755	$25,847	$16,526
GB Cod	1,492	467	641	$5,229,517	$1,636,170	$2,248,130	11,225	3,898	2,259	$17,848	$6,198	$3,591
GOM Winter	85	131	124	$388,798	$596,018	$566,782	641	1,091	437	$1,327	$2,258	$905
GB Winter	1,773	168	59	$8,092,974	$765,026	$269,044	13,344	1,400	208	$27,621	$2,898	$430
SNEMA Winter	0	0	0	$0	$0	$0	0	0	0	$0	$0	$0
CCGOM YT	353	255	232	$1,449,414	$1,045,372	$949,681	2,660	2,129	816	$4,947	$3,960	$1,517
GB YT	1,469	198	33	$6,021,816	$812,718	$136,411	11,050	1,655	117	$20,552	$3,078	$218
SNEMA YT	197	114	29	$807,893	$465,775	$120,520	1,482	949	104	$2,757	$1,764	$193
GOM Haddock	380	228	252	$1,281,315	$770,434	$849,064	2,858	1,907	886	$4,373	$2,918	$1,356
GB Haddock	25,043	5,705	4,253	$84,469,570	$19,242,095	$14,344,665	188,426	47,638	14,977	$288,292	$72,887	$22,915
Witch	501	288	201	$2,650,042	$1,526,037	$1,062,050	3,769	2,409	707	$9,045	$5,780	$1,697
Plaice	1,848	1,088	764	$6,559,091	$3,863,266	$2,710,445	13,904	9,089	2,689	$22,386	$14,634	$4,330
Pollock	2,804	1,522	1,874	$2,843,362	$1,543,502	$1,900,655	21,096	12,710	6,600	$9,704	$5,847	$3,036
Redfish	5,195	2,132	1,773	$6,527,938	$2,679,290	$2,228,033	39,087	17,805	6,244	$22,280	$10,149	$3,559
White Hake	1,122	627	551	$2,844,731	$1,589,554	$1,396,882	8,443	5,236	1,940	$9,709	$6,021	$2,231
Total	44,163	14,869	13,737	$135,833,617	$43,358,824	$39,127,774	332,296	124,171	48,378	$463,596	$164,238	$62,504

Table 211 – Option 3 allocation: ACE (weight) and value of ACE by vessel length group

	ACE Allocations (metric tons)			Value of ACE Allocations			Average ACE Allocations per Vessel (pounds)			Average Value of ACE Allocations per Vessel		
Stock	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
GOM Cod	2,154	1,862	2,784	$7,550,559	$6,526,565	$9,759,011	16,207	15,548	9,805	$25,770	$24,722	$15,589
GB Cod	1,403	468	729	$4,916,394	$1,642,034	$2,555,388	10,553	3,912	2,567	$16,780	$6,220	$4,082
GOM Winter	101	123	117	$459,616	$559,872	$532,109	758	1,025	411	$1,569	$2,121	$850
GB Winter	1,427	293	280	$6,514,305	$1,335,428	$1,277,311	10,741	2,444	986	$22,233	$5,058	$2,040
SNEMA Winter	0	0	0	$0	$0	$0	0	0	0	$0	$0	$0
CCGOM YT	337	260	243	$1,380,567	$1,066,272	$997,628	2,533	2,171	857	$4,712	$4,039	$1,594
GB YT	1,167	295	238	$4,785,186	$1,211,427	$974,332	8,780	2,467	837	$16,332	$4,589	$1,556
SNEMA YT	162	118	60	$663,591	$482,757	$247,840	1,218	983	213	$2,265	$1,829	$396
GOM Haddock	409	215	236	$1,379,698	$725,964	$795,150	3,078	1,797	830	$4,709	$2,750	$1,270
GB Haddock	22,770	6,118	6,111	$76,805,269	$20,637,366	$20,613,695	171,329	51,093	21,522	$262,134	$78,172	$32,929
Witch	492	284	214	$2,600,931	$1,504,310	$1,132,889	3,699	2,374	754	$8,877	$5,698	$1,810
Plaice	1,800	1,095	805	$6,389,503	$3,886,354	$2,856,946	13,545	9,144	2,835	$21,807	$14,721	$4,564
Pollock	2,774	1,547	1,880	$2,812,694	$1,568,381	$1,906,444	20,869	12,915	6,621	$9,600	$5,941	$3,045
Redfish	5,223	2,126	1,751	$6,563,241	$2,672,125	$2,199,895	39,298	17,757	6,165	$22,400	$10,122	$3,514
White Hake	1,105	629	566	$2,800,798	$1,595,303	$1,435,065	8,312	5,255	1,993	$9,559	$6,043	$2,292
Total	41,323	15,434	16,014	$125,622,352	$45,414,159	$47,283,705	310,921	128,885	56,395	$428,745	$172,023	$75,533

Table 212 – Option 4 allocation: ACE (weight) and value of ACE by vessel length group

	ACE Allocations (metric tons)			Value of ACE Allocations			Average ACE Allocations per Vessel (pounds)			Average Value of ACE Allocations per Vessel		
Stock	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
GOM Cod	1,687	1,921	3,192	$5,913,638	$6,734,660	$11,187,838	12,694	16,044	11,240	$20,183	$25,510	$17,872
GB Cod	1,224	491	885	$4,290,512	$1,721,600	$3,101,704	9,210	4,101	3,116	$14,643	$6,521	$4,955
GOM Winter	77	126	137	$353,061	$573,418	$625,118	582	1,049	482	$1,205	$2,172	$999
GB Winter	1,290	310	400	$5,887,515	$1,415,109	$1,824,420	9,707	2,589	1,408	$20,094	$5,360	$2,914
SNEMA Winter	0	0	0	$0	$0	$0	0	0	0	$0	$0	$0
CCGOM YT	279	267	294	$1,144,022	$1,096,343	$1,204,102	2,099	2,233	1,034	$3,905	$4,153	$1,923
GB YT	1,050	310	340	$4,306,464	$1,272,285	$1,392,196	7,902	2,591	1,196	$14,698	$4,819	$2,224
SNEMA YT	138	121	81	$567,847	$494,929	$331,413	1,042	1,008	285	$1,938	$1,875	$529
GOM Haddock	350	223	287	$1,180,488	$751,289	$969,036	2,633	1,860	1,012	$4,029	$2,846	$1,548
GB Haddock	20,367	6,424	8,209	$68,697,876	$21,668,022	$27,690,432	153,244	53,644	28,911	$234,464	$82,076	$44,234
Witch	424	293	273	$2,241,208	$1,550,040	$1,446,882	3,187	2,446	963	$7,649	$5,871	$2,311
Plaice	1,546	1,127	1,027	$5,487,621	$4,001,006	$3,644,175	11,633	9,413	3,616	$18,729	$15,155	$5,821
Pollock	2,348	1,601	2,252	$2,380,905	$1,623,273	$2,283,341	17,665	13,367	7,929	$8,126	$6,149	$3,648
Redfish	4,598	2,206	2,296	$5,777,937	$2,771,957	$2,885,367	34,596	18,421	8,086	$19,720	$10,500	$4,609
White Hake	947	649	704	$2,400,349	$1,646,211	$1,784,607	7,124	5,422	2,479	$8,192	$6,236	$2,851
Total	36,325	16,069	20,376	$110,629,443	$47,320,141	$60,370,632	273,319	134,190	71,758	$377,575	$179,243	$96,439

Table 213 - No Action Option Contribution Shares by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
Number of Vessels	18	716	202	22	87	79	112	112	9	11
GOM Cod	0.07%	61.33%	19.73%	0.00%	17.68%	0.06%	0.53%	0.29%	0.00%	0.31%
GB Cod	0.22%	80.43%	5.49%	0.63%	0.45%	0.25%	2.84%	9.27%	0.02%	0.41%
GOM Winter	0.04%	89.02%	4.13%	0.01%	2.37%	0.04%	2.26%	2.10%	0.00%	0.02%
GB Winter	0.17%	85.93%	1.01%	1.81%	0.00%	0.59%	2.08%	8.35%	0.05%	0.01%
SNEMA Winter	3.61%	58.86%	1.32%	0.19%	0.09%	7.95%	8.70%	19.17%	0.11%	0.00%
CCGOM YT	0.03%	86.90%	2.72%	0.25%	3.97%	0.07%	2.12%	3.93%	0.00%	0.00%
GB YT	0.64%	61.71%	0.86%	7.35%	0.00%	2.01%	6.11%	20.93%	0.25%	0.15%
SNEMA YT	6.48%	19.12%	4.18%	1.64%	0.00%	5.49%	17.08%	45.44%	0.57%	0.00%
GOM Haddock	0.02%	69.47%	21.57%	0.00%	6.95%	0.05%	0.29%	0.49%	0.00%	1.17%
GB Haddock	0.13%	72.53%	9.63%	1.34%	0.01%	0.40%	3.99%	11.80%	0.00%	0.17%
Witch	0.19%	63.37%	21.92%	0.81%	3.24%	1.07%	1.44%	7.09%	0.02%	0.84%
Plaice	0.17%	53.23%	32.45%	1.28%	2.26%	0.91%	1.68%	7.07%	0.01%	0.92%
Pollock	0.07%	53.02%	32.63%	0.03%	11.32%	0.03%	0.31%	1.14%	0.00%	1.45%
Redfish	0.22%	64.71%	28.43%	0.00%	2.62%	0.06%	0.58%	1.62%	0.00%	1.75%
White Hake	0.06%	40.52%	49.49%	0.00%	6.25%	0.13%	0.39%	1.57%	0.00%	1.59%

Table 214 - Proposed Action - Option 1 Contribution Shares by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	0.52%	59.38%	21.75%	0.00%	15.92%	0.74%	0.55%	0.68%	0.01%	0.46%
GB Cod	0.29%	82.80%	5.66%	0.58%	0.95%	0.44%	1.99%	6.75%	0.21%	0.33%
GOM Winter	0.05%	87.21%	6.53%	0.00%	2.91%	0.09%	1.36%	1.77%	0.05%	0.02%
GB Winter	0.15%	88.35%	1.32%	1.76%	0.00%	0.67%	1.57%	6.05%	0.11%	0.02%
SNEMA Winter	3.20%	64.04%	3.04%	0.21%	0.25%	5.99%	9.01%	13.99%	0.19%	0.06%
CCGOM YT	0.09%	85.88%	4.63%	0.32%	4.19%	0.07%	1.38%	3.40%	0.01%	0.03%
GB YT	0.50%	61.42%	2.22%	6.30%	0.00%	2.15%	5.73%	20.25%	1.27%	0.16%
SNEMA YT	3.32%	31.62%	4.83%	1.73%	0.00%	8.78%	18.93%	29.45%	1.10%	0.23%
GOM Haddock	0.10%	56.97%	34.67%	0.00%	4.87%	0.83%	0.20%	0.48%	0.00%	1.88%
GB Haddock	0.17%	72.39%	10.64%	1.35%	0.06%	0.40%	3.69%	10.64%	0.10%	0.56%
Witch	0.21%	61.22%	24.23%	0.67%	2.60%	1.33%	1.49%	7.30%	0.08%	0.87%
Plaice	0.32%	54.26%	31.72%	0.81%	2.73%	1.74%	1.44%	6.15%	0.12%	0.71%
Pollock	0.10%	52.63%	32.57%	0.02%	10.72%	0.41%	0.37%	1.32%	0.00%	1.85%
Redfish	0.18%	59.49%	30.30%	0.00%	3.34%	0.62%	0.79%	2.32%	0.00%	2.95%
White Hake	0.11%	42.98%	45.69%	0.00%	6.45%	0.74%	0.46%	1.94%	0.00%	1.63%

Table 215 - Option 2 Contribution Shares by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	0.56%	61.27%	22.24%	0.03%	11.27%	0.95%	1.25%	1.81%	0.02%	0.58%
GB Cod	0.78%	71.73%	10.22%	0.97%	1.84%	1.76%	3.41%	8.36%	0.34%	0.58%
GOM Winter	0.30%	75.85%	14.36%	0.12%	4.96%	0.69%	1.28%	1.97%	0.04%	0.43%
GB Winter	0.55%	76.47%	6.25%	1.98%	0.19%	1.49%	2.86%	9.30%	0.36%	0.54%
SNEMA Winter	2.24%	63.37%	6.76%	0.86%	1.00%	4.90%	7.53%	12.51%	0.35%	0.49%
CCGOM YT	0.34%	75.44%	10.85%	0.66%	4.75%	0.64%	1.98%	4.80%	0.21%	0.34%
GB YT	0.72%	62.30%	7.05%	4.23%	0.14%	2.42%	4.89%	16.55%	0.95%	0.76%
SNEMA YT	2.63%	43.80%	5.08%	1.93%	0.42%	7.15%	14.05%	23.66%	0.95%	0.34%
GOM Haddock	0.39%	59.20%	29.29%	0.00%	6.08%	0.95%	1.01%	1.76%	0.00%	1.32%
GB Haddock	0.59%	67.49%	12.93%	1.42%	1.30%	1.27%	3.78%	10.21%	0.26%	0.75%
Witch	0.66%	59.10%	20.94%	0.97%	3.84%	2.49%	2.96%	8.00%	0.24%	0.81%
Plaice	0.75%	56.46%	24.88%	1.01%	3.97%	2.15%	2.39%	7.41%	0.25%	0.74%
Pollock	0.62%	55.85%	24.90%	0.53%	7.90%	1.64%	2.08%	4.99%	0.20%	1.29%
Redfish	0.50%	57.92%	25.35%	0.20%	4.55%	1.50%	2.36%	5.62%	0.19%	1.79%
White Hake	0.63%	50.66%	31.75%	0.41%	5.79%	1.72%	2.32%	5.41%	0.12%	1.19%

Table 216 - Option 3 Contribution Shares by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	0.86%	58.61%	19.39%	0.60%	10.41%	2.14%	2.55%	4.65%	0.20%	0.58%
GB Cod	0.75%	70.32%	11.34%	0.89%	2.93%	1.99%	3.27%	7.68%	0.30%	0.52%
GOM Winter	0.63%	72.53%	11.78%	0.60%	3.91%	1.82%	2.95%	5.19%	0.22%	0.36%
GB Winter	0.68%	73.09%	9.17%	1.48%	2.45%	2.10%	3.06%	7.34%	0.25%	0.36%
SNEMA Winter	2.20%	60.94%	10.03%	0.71%	2.58%	4.77%	6.78%	11.31%	0.30%	0.39%
CCGOM YT	0.65%	71.86%	10.83%	0.76%	4.55%	1.81%	2.97%	6.01%	0.20%	0.37%
GB YT	0.85%	59.63%	9.63%	3.75%	2.45%	2.85%	5.14%	14.43%	0.83%	0.43%
SNEMA YT	2.26%	44.73%	10.93%	1.47%	2.45%	6.16%	11.74%	19.03%	0.75%	0.47%
GOM Haddock	0.65%	57.40%	25.85%	0.60%	4.89%	2.18%	2.37%	4.55%	0.20%	1.29%
GB Haddock	0.69%	65.12%	13.83%	1.27%	2.48%	1.97%	4.12%	9.63%	0.25%	0.63%
Witch	0.71%	59.53%	20.63%	0.94%	3.76%	2.44%	3.02%	7.96%	0.24%	0.79%
Plaice	0.76%	56.05%	24.37%	1.01%	3.82%	2.64%	2.99%	7.39%	0.26%	0.71%
Pollock	0.65%	55.23%	24.80%	0.61%	7.81%	1.98%	2.46%	4.97%	0.20%	1.28%
Redfish	0.69%	58.67%	23.67%	0.60%	4.12%	2.08%	2.67%	5.47%	0.20%	1.83%
White Hake	0.66%	50.41%	31.36%	0.60%	5.68%	2.14%	2.50%	5.28%	0.20%	1.17%

Table 217 - Option 4 Contribution Shares by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	0.87%	58.61%	19.76%	0.51%	11.15%	2.01%	2.39%	4.06%	0.18%	0.47%
GB Cod	0.76%	70.32%	11.71%	0.80%	3.67%	1.86%	3.10%	7.09%	0.28%	0.40%
GOM Winter	0.64%	72.53%	12.15%	0.51%	4.65%	1.68%	2.79%	4.60%	0.20%	0.25%
GB Winter	0.69%	73.09%	9.54%	1.39%	3.20%	1.97%	2.90%	6.74%	0.23%	0.25%
SNEMA Winter	2.22%	60.94%	10.40%	0.62%	3.32%	4.63%	6.62%	10.71%	0.27%	0.27%
CCGOM YT	0.66%	71.86%	11.20%	0.67%	5.29%	1.67%	2.80%	5.42%	0.18%	0.25%
GB YT	0.87%	59.63%	9.99%	3.66%	3.20%	2.71%	4.97%	13.84%	0.81%	0.32%
SNEMA YT	2.28%	44.73%	11.30%	1.37%	3.20%	6.03%	11.57%	18.44%	0.72%	0.35%
GOM Haddock	0.67%	57.40%	26.22%	0.51%	5.63%	2.05%	2.21%	3.96%	0.17%	1.18%
GB Haddock	0.70%	65.11%	14.20%	1.18%	3.22%	1.84%	3.96%	9.04%	0.23%	0.52%
Witch	0.72%	59.53%	21.00%	0.85%	4.50%	2.30%	2.85%	7.37%	0.21%	0.68%
Plaice	0.78%	56.05%	24.74%	0.91%	4.56%	2.51%	2.83%	6.79%	0.23%	0.59%
Pollock	0.67%	55.23%	25.17%	0.52%	8.56%	1.84%	2.29%	4.38%	0.18%	1.17%
Redfish	0.71%	58.66%	24.03%	0.51%	4.86%	1.95%	2.50%	4.88%	0.17%	1.71%
White Hake	0.67%	50.41%	31.73%	0.51%	6.42%	2.01%	2.34%	4.69%	0.17%	1.05%

Table 218 - No Action Alternative ACE Allocations (metric tons) by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
Number of Vessels	17	634	161	20	75	65	99	97	8.00	7
GOM Cod	5.02	4,170.24	1,341.44	0.00	1,202.32	4.11	35.90	19.80	0.09	21.06
GB Cod	5.74	2,091.06	142.77	16.29	11.61	6.61	73.75	241.04	0.48	10.66
GOM Winter	0.15	302.66	14.05	0.03	8.05	0.15	7.68	7.15	0.01	0.08
GB Winter	3.42	1,718.52	20.21	36.26	0.00	11.73	41.55	167.09	1.03	0.20
SNEMA Winter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CCGOM YT	0.29	729.92	22.86	2.09	33.37	0.56	17.84	33.03	0.03	0.00
GB YT	10.81	1,049.01	14.57	124.99	0.00	34.21	103.80	355.86	4.22	2.53
SNEMA YT	22.02	65.00	14.20	5.58	0.00	18.67	58.09	154.51	1.94	0.00
GOM Haddock	0.14	597.46	185.53	0.00	59.73	0.39	2.48	4.24	0.00	10.03
GB Haddock	46.98	25,386.29	3,368.98	470.31	4.11	140.05	1,394.95	4,129.02	0.64	58.68
Witch	1.90	627.32	216.97	8.07	32.09	10.63	14.24	70.21	0.23	8.34
Plaice	6.35	1,969.61	1,200.65	47.47	83.55	33.80	62.23	261.59	0.55	34.20
Pollock	4.65	3,287.48	2,022.76	2.14	701.85	1.65	18.97	70.46	0.03	90.01
Redfish	20.02	5,888.86	2,587.58	0.19	238.21	5.40	53.12	147.33	0.00	159.30
White Hake	1.41	931.94	1,138.23	0.01	143.80	3.02	9.06	36.06	0.01	36.46
Total	128.90	48,815.36	12,290.80	713.42	2,518.70	270.97	1,893.65	5,697.38	9.25	431.55

Table 219 – Proposed Action - Option 1 ACE Allocations (metric tons) by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	35.07	4,037.97	1,478.70	0.00	1,082.35	50.57	37.72	45.92	0.60	31.10
GB Cod	7.50	2,152.83	147.17	15.20	24.60	11.52	51.76	175.40	5.41	8.61
GOM Winter	0.18	296.53	22.20	0.01	9.89	0.32	4.63	6.01	0.16	0.07
GB Winter	3.08	1,766.94	26.31	35.20	0.01	13.34	31.49	121.06	2.18	0.40
SNEMA Winter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CCGOM YT	0.72	721.39	38.91	2.70	35.17	0.60	11.62	28.59	0.06	0.25
GB YT	8.46	1,044.16	37.80	107.18	0.00	36.56	97.39	344.22	21.54	2.70
SNEMA YT	11.29	107.51	16.43	5.88	0.01	29.87	64.35	100.13	3.74	0.79
GOM Haddock	0.86	489.92	298.20	0.00	41.91	7.11	1.72	4.14	0.00	16.15
GB Haddock	61.16	25,336.03	3,724.53	470.80	20.47	138.46	1,292.05	3,723.97	35.86	196.68
Witch	2.04	606.10	239.88	6.63	25.78	13.17	14.74	72.23	0.79	8.65
Plaice	11.94	2,007.67	1,173.51	29.89	100.90	64.53	53.10	227.64	4.47	26.34
Pollock	6.50	3,262.89	2,019.26	1.31	664.66	25.53	22.90	81.69	0.30	114.96
Redfish	16.79	5,413.85	2,757.64	0.21	303.66	56.63	71.62	211.29	0.04	268.26
White Hake	2.59	988.47	1,050.96	0.05	148.33	16.97	10.55	44.55	0.02	37.52
Total	168.18	48,232.24	13,031.48	675.08	2,457.74	465.16	1,765.63	5,186.83	75.17	712.48

Table 220 – Option 2 ACE Allocations (metric tons) by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	38.34	4,166.52	1,512.35	2.18	766.66	64.94	85.29	123.39	1.07	39.27
GB Cod	20.40	1,865.00	265.82	25.33	47.88	45.79	88.64	217.40	8.76	14.99
GOM Winter	1.03	257.90	48.81	0.40	16.85	2.34	4.36	6.70	0.13	1.48
GB Winter	11.09	1,529.40	124.99	39.59	3.74	29.84	57.30	186.09	7.12	10.85
SNEMA Winter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CCGOM YT	2.89	633.71	91.11	5.56	39.88	5.34	16.62	40.32	1.77	2.82
GB YT	12.16	1,059.09	119.83	71.85	2.39	41.17	83.20	281.29	16.16	12.87
SNEMA YT	8.95	148.93	17.26	6.56	1.44	24.29	47.75	80.44	3.21	1.16
GOM Haddock	3.32	509.11	251.91	0.00	52.28	8.16	8.71	15.14	0.00	11.37
GB Haddock	207.36	23,622.03	4,526.58	496.10	454.99	443.82	1,323.21	3,573.57	89.46	262.89
Witch	6.54	585.12	207.28	9.56	38.03	24.64	29.27	79.16	2.39	8.00
Plaice	27.68	2,088.94	920.47	37.30	146.97	79.58	88.30	274.32	9.16	27.28
Pollock	38.42	3,462.60	1,543.66	33.07	489.76	101.95	128.95	309.15	12.26	80.18
Redfish	45.57	5,271.13	2,307.06	18.61	414.44	136.78	214.34	511.84	17.54	162.69
White Hake	14.58	1,165.16	730.33	9.49	133.11	39.53	53.26	124.37	2.80	27.36
Total	438.33	46,364.62	12,667.46	755.59	2,608.42	1,048.17	2,229.21	5,823.17	171.83	663.20

Table 221 – Option 3 ACE Allocations (metric tons) by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	58.49	3,985.63	1,318.28	40.89	708.02	145.65	173.54	315.96	13.93	39.60
GB Cod	19.41	1,828.37	294.95	23.23	76.10	51.78	85.02	199.73	7.92	13.50
GOM Winter	2.14	246.60	40.05	2.05	13.29	6.18	10.05	17.66	0.76	1.24
GB Winter	13.59	1,461.89	183.43	29.63	49.08	42.07	61.24	146.70	5.10	7.27
SNEMA Winter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CCGOM YT	5.42	603.63	90.97	6.40	38.19	15.17	24.92	50.49	1.71	3.10
GB YT	14.47	1,013.74	163.63	63.81	41.71	48.37	87.36	245.36	14.18	7.36
SNEMA YT	7.69	152.09	37.16	4.98	8.35	20.95	39.91	64.72	2.55	1.60
GOM Haddock	5.61	493.68	222.32	5.17	42.06	18.78	20.42	39.12	1.72	11.12
GB Haddock	241.39	22,790.45	4,842.09	445.84	869.00	688.76	1,442.17	3,370.08	88.08	222.15
Witch	6.98	589.37	204.23	9.27	37.18	24.11	29.89	78.77	2.38	7.83
Plaice	28.26	2,073.92	901.76	37.19	141.24	97.76	110.72	273.25	9.65	26.26
Pollock	40.60	3,424.56	1,537.48	37.93	484.45	122.51	152.48	308.00	12.57	79.41
Redfish	63.21	5,338.76	2,153.57	54.82	375.11	189.40	242.81	497.75	18.26	166.32
White Hake	15.15	1,159.42	721.30	13.85	130.60	49.20	57.59	121.38	4.62	26.90
Total	522.39	45,162.11	12,711.21	775.07	3,014.36	1,520.68	2,538.11	5,728.97	183.43	613.66

Table 222 – Option 4 ACE Allocations (metric tons) by Home Port State

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	59.46	3,985.43	1,343.34	34.70	758.46	136.66	162.29	275.75	12.15	31.75
GB Cod	19.78	1,828.29	304.53	20.87	95.38	48.35	80.72	184.36	7.24	10.50
GOM Winter	2.19	246.59	41.30	1.74	15.81	5.73	9.48	15.65	0.67	0.85
GB Winter	13.87	1,461.83	190.80	27.81	63.91	39.43	57.93	134.88	4.58	4.96
SNEMA Winter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CCGOM YT	5.54	603.61	94.07	5.64	44.43	14.06	23.53	45.52	1.49	2.13
GB YT	14.71	1,013.69	169.90	62.26	54.32	46.12	84.55	235.31	13.73	5.40
SNEMA YT	7.74	152.08	38.41	4.67	10.87	20.50	39.35	62.71	2.46	1.21
GOM Haddock	5.73	493.65	225.49	4.39	48.44	17.64	19.00	34.04	1.50	10.13
GB Haddock	246.37	22,789.40	4,971.06	413.97	1,128.63	642.50	1,384.27	3,163.12	78.92	181.74
Witch	7.12	589.34	207.87	8.37	44.53	22.80	28.25	72.92	2.12	6.68
Plaice	28.78	2,073.81	915.40	33.83	168.68	92.87	104.60	251.37	8.68	21.99
Pollock	41.48	3,424.38	1,560.33	32.29	530.45	114.31	142.23	271.33	10.95	72.25
Redfish	64.50	5,338.48	2,187.11	46.54	442.61	177.37	227.76	443.94	15.88	155.82
White Hake	15.47	1,159.35	729.77	11.76	147.66	46.16	53.79	107.78	4.02	24.24
Total	532.74	45,159.93	12,979.38	708.83	3,554.18	1,424.50	2,417.74	5,298.67	164.39	529.64

Table 223 – No Action ACE value by homeport state

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
Number of Vessels	17	634	161	20	75	65	99	97	8	7
GOM Cod	$17,602	$14,618,009	$4,702,180	$0	$4,214,511	$14,416	$125,850	$69,415	$322	$73,829
GB Cod	$20,134	$7,329,820	$500,440	$57,101	$40,712	$23,159	$258,502	$844,919	$1,670	$37,360
GOM Winter	$683	$1,381,190	$64,130	$118	$36,733	$675	$35,032	$32,609	$48	$381
GB Winter	$15,619	$7,842,484	$92,251	$165,458	$0	$53,512	$189,624	$762,505	$4,681	$909
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$1,203	$2,993,087	$93,720	$8,589	$136,852	$2,287	$73,142	$135,458	$112	$17
GB YT	$44,331	$4,301,516	$59,762	$512,527	$0	$140,280	$425,627	$1,459,238	$17,291	$10,374
SNEMA YT	$90,309	$266,519	$58,240	$22,875	$0	$76,558	$238,189	$633,557	$7,942	$0
GOM Haddock	$462	$2,015,257	$625,796	$0	$201,479	$1,317	$8,372	$14,304	$7	$33,817
GB Haddock	$158,470	$85,628,905	$11,363,682	$1,586,376	$13,855	$472,396	$4,705,213	$13,927,327	$2,172	$197,933
Witch	$10,048	$3,319,187	$1,147,984	$42,690	$169,810	$56,255	$75,334	$371,465	$1,230	$44,125
Plaice	$22,528	$6,990,955	$4,261,583	$168,478	$296,570	$119,965	$220,887	$928,490	$1,960	$121,386
Pollock	$4,711	$3,333,888	$2,051,315	$2,171	$711,753	$1,673	$19,236	$71,454	$32	$91,285
Redfish	$25,153	$7,400,073	$3,251,616	$235	$299,337	$6,780	$66,753	$185,139	$0	$200,175
White Hake	$3,578	$2,362,729	$2,885,743	$34	$364,569	$7,665	$22,973	$91,431	$13	$92,432
Total	$414,832	$149,783,621	$31,158,442	$2,566,652	$6,486,181	$976,938	$6,464,734	$19,527,312	$37,480	$904,023

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Table 224 – Proposed Action - Option 1 ACE value by homeport state

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	$122,947	$14,154,352	$5,183,290	$12	$3,793,979	$177,265	$132,235	$160,947	$2,100	$109,009
GB Cod	$26,274	$7,546,338	$515,892	$53,285	$86,246	$40,381	$181,431	$614,833	$18,968	$30,167
GOM Winter	$831	$1,353,224	$101,303	$53	$45,141	$1,450	$21,109	$27,447	$716	$324
GB Winter	$14,064	$8,063,450	$120,049	$160,657	$26	$60,861	$143,723	$552,440	$9,956	$1,818
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$2,949	$2,958,083	$159,571	$11,068	$144,207	$2,462	$47,634	$117,234	$237	$1,022
GB YT	$34,684	$4,281,647	$154,989	$439,507	$0	$149,905	$399,338	$1,411,492	$88,322	$11,061
SNEMA YT	$46,292	$440,865	$67,360	$24,112	$29	$122,468	$263,882	$410,604	$15,334	$3,243
GOM Haddock	$2,886	$1,652,505	$1,005,836	$0	$141,365	$23,992	$5,785	$13,951	$3	$54,489
GB Haddock	$206,295	$85,459,382	$12,562,985	$1,588,014	$69,037	$467,017	$4,358,131	$12,561,077	$120,971	$663,420
Witch	$10,803	$3,206,877	$1,269,211	$35,092	$136,420	$69,665	$77,966	$382,151	$4,177	$45,766
Plaice	$42,382	$7,126,048	$4,165,260	$106,107	$358,147	$229,028	$188,489	$807,988	$15,868	$93,485
Pollock	$6,596	$3,308,947	$2,047,761	$1,333	$674,043	$25,885	$23,224	$82,846	$302	$116,582
Redfish	$21,100	$6,803,158	$3,465,309	$268	$381,582	$71,168	$90,001	$265,510	$56	$337,108
White Hake	$6,555	$2,506,056	$2,664,484	$116	$376,050	$43,034	$26,738	$112,956	$45	$95,132
Total	$544,661	$148,860,931	$33,483,301	$2,419,626	$6,206,273	$1,484,581	$5,959,687	$17,521,476	$277,055	$1,562,624

Table 225 – Option 2 ACE value by homeport state

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	$134,404	$14,604,946	$5,301,245	$7,652	$2,687,388	$227,623	$298,959	$432,519	$3,761	$137,639
GB Cod	$71,501	$6,537,401	$931,792	$88,788	$167,830	$160,505	$310,699	$762,052	$30,707	$52,542
GOM Winter	$4,712	$1,176,923	$222,768	$1,831	$76,904	$10,677	$19,900	$30,580	$572	$6,731
GB Winter	$50,603	$6,979,431	$570,388	$180,659	$17,084	$136,181	$261,468	$849,217	$32,504	$49,509
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$11,853	$2,598,554	$373,586	$22,785	$163,523	$21,881	$68,171	$165,317	$7,250	$11,546
GB YT	$49,856	$4,342,846	$491,363	$294,623	$9,795	$168,807	$341,160	$1,153,456	$66,252	$52,788
SNEMA YT	$36,707	$610,681	$70,780	$26,895	$5,915	$99,616	$195,821	$329,831	$13,177	$4,769
GOM Haddock	$11,194	$1,717,254	$849,696	$0	$176,357	$27,509	$29,370	$51,071	$2	$38,359
GB Haddock	$699,419	$79,677,994	$15,268,324	$1,673,355	$1,534,698	$1,497,019	$4,463,251	$12,053,777	$301,742	$886,750
Witch	$34,618	$3,095,890	$1,096,744	$50,594	$201,200	$130,392	$154,890	$418,818	$12,656	$42,327
Plaice	$98,230	$7,414,509	$3,267,108	$132,403	$521,641	$282,477	$313,422	$973,681	$32,503	$96,828
Pollock	$38,960	$3,511,480	$1,565,451	$33,537	$496,673	$103,388	$130,768	$313,515	$12,437	$81,308
Redfish	$57,268	$6,623,818	$2,899,103	$23,382	$520,796	$171,885	$269,340	$643,185	$22,047	$204,435
White Hake	$36,972	$2,954,012	$1,851,608	$24,055	$337,460	$100,225	$135,041	$315,327	$7,096	$69,371
Total	$1,336,296	$141,845,737	$34,759,957	$2,560,560	$6,917,264	$3,138,186	$6,992,261	$18,492,345	$542,705	$1,734,905

Table 226 – Option 3 ACE value by homeport state

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	$205,042	$13,970,882	$4,621,000	$143,321	$2,481,835	$510,556	$608,316	$1,107,538	$48,822	$138,824
GB Cod	$68,031	$6,408,998	$1,033,876	$81,440	$266,740	$181,514	$298,026	$700,118	$27,750	$47,323
GOM Winter	$9,761	$1,125,353	$182,751	$9,356	$60,641	$28,190	$45,849	$80,580	$3,467	$5,651
GB Winter	$62,005	$6,671,379	$837,081	$135,205	$223,955	$191,988	$279,474	$669,491	$23,270	$33,195
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$22,221	$2,475,224	$373,039	$26,244	$156,617	$62,201	$102,168	$207,034	$7,022	$12,696
GB YT	$59,329	$4,156,907	$670,985	$261,666	$171,040	$198,345	$358,236	$1,006,114	$58,132	$30,190
SNEMA YT	$31,544	$623,649	$152,378	$20,439	$34,222	$85,912	$163,655	$265,376	$10,461	$6,553
GOM Haddock	$18,915	$1,665,203	$749,887	$17,441	$141,857	$63,343	$68,877	$131,967	$5,815	$37,506
GB Haddock	$814,218	$76,873,048	$16,332,541	$1,503,823	$2,931,157	$2,323,223	$4,864,481	$11,367,417	$297,091	$749,329
Witch	$36,952	$3,118,371	$1,080,568	$49,040	$196,733	$127,553	$158,134	$416,779	$12,587	$41,413
Plaice	$100,292	$7,361,194	$3,200,727	$132,015	$501,301	$346,978	$392,975	$969,868	$34,254	$93,199
Pollock	$41,169	$3,472,902	$1,559,185	$38,470	$491,293	$124,238	$154,634	$312,343	$12,752	$80,533
Redfish	$79,426	$6,708,798	$2,706,227	$68,889	$471,367	$238,000	$305,117	$625,484	$22,946	$209,005
White Hake	$38,399	$2,939,474	$1,828,695	$35,118	$331,099	$124,734	$146,010	$307,734	$11,709	$68,193
Total	$1,587,306	$137,571,384	$35,328,938	$2,522,468	$8,459,857	$4,606,776	$7,945,951	$18,167,844	$576,080	$1,553,610

Table 227 – Option 4 ACE value by homeport state

Stock	CT	MA	ME	NC	NH	NJ	NY	RI	VA	Other
GOM Cod	$208,431	$13,970,168	$4,708,837	$121,622	$2,658,654	$479,052	$568,890	$966,591	$42,587	$111,303
GB Cod	$69,327	$6,408,725	$1,067,461	$73,143	$334,348	$169,469	$282,952	$646,226	$25,366	$36,801
GOM Winter	$9,982	$1,125,307	$188,469	$7,943	$72,150	$26,139	$43,282	$71,405	$3,062	$3,859
GB Winter	$63,303	$6,671,106	$870,714	$126,897	$291,661	$179,925	$264,377	$615,521	$20,883	$22,658
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$22,711	$2,475,121	$385,732	$23,109	$182,169	$57,649	$96,471	$186,667	$6,121	$8,719
GB YT	$60,320	$4,156,699	$696,673	$255,320	$222,751	$189,132	$346,706	$964,894	$56,308	$22,141
SNEMA YT	$31,742	$623,608	$157,516	$19,170	$44,565	$84,070	$161,349	$257,131	$10,096	$4,944
GOM Haddock	$19,328	$1,665,116	$760,576	$14,801	$163,376	$59,509	$64,079	$114,814	$5,057	$34,157
GB Haddock	$831,005	$76,869,509	$16,767,585	$1,396,353	$3,806,915	$2,167,187	$4,669,212	$10,669,329	$266,210	$613,024
Witch	$37,697	$3,118,214	$1,099,871	$44,272	$235,591	$120,629	$149,470	$385,805	$11,217	$35,365
Plaice	$102,159	$7,360,800	$3,249,122	$120,059	$598,722	$329,620	$371,253	$892,211	$30,819	$78,037
Pollock	$42,063	$3,472,714	$1,582,355	$32,747	$537,934	$115,928	$144,234	$275,164	$11,108	$73,273
Redfish	$81,052	$6,708,455	$2,748,366	$58,479	$556,196	$222,886	$286,203	$557,865	$19,955	$195,803
White Hake	$39,229	$2,939,299	$1,850,183	$29,810	$374,356	$117,027	$136,365	$273,254	$10,184	$61,461
Total	$1,618,350	$137,564,839	$36,133,460	$2,323,725	$10,079,386	$4,318,221	$7,584,842	$16,876,877	$518,970	$1,301,544

Table 228 – No Action ACE allocation (metric tons) by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA /GOM	SNEMA /GB	GOM/GB/ SNEMA	Unit Stocks Only
Number of Vessels	253	109	40	135	11	149	452	34
GOM Cod	2,091.5	0.0	0.0	1,208.4	117.3	0.0	3,382.8	0.0
GB Cod	0.0	39.8	0.0	74.8	0.0	103.8	2,381.6	0.0
GOM Winter	63.1	0.0	0.0	8.4	6.5	0.0	262.0	0.0
GB Winter	0.0	2.8	0.0	1.9	0.0	70.2	1,925.0	0.0
SNEMA Winter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM YT	84.9	0.0	0.0	25.5	8.0	0.0	721.5	0.0
GB YT	0.0	7.2	0.0	1.1	0.0	113.5	1,578.2	0.0
SNEMA YT	0.0	0.0	1.9	0.0	0.1	184.8	153.3	0.0
GOM Haddock	147.3	0.0	0.0	173.0	6.2	0.0	533.5	0.0
GB Haddock	0.0	178.8	0.0	437.0	0.0	1,474.4	32,909.7	0.0
Witch	94.9	0.5	3.8	126.3	4.2	23.8	736.3	0.1
Plaice	397.5	4.1	0.0	791.0	12.7	84.1	2,410.5	0.0
Pollock	794.0	12.6	0.0	1,548.6	83.1	24.1	3,731.7	5.9
Redfish	413.4	3.8	0.0	1,551.6	21.7	19.2	7,088.8	1.5
White Hake	225.4	1.3	0.1	858.2	6.8	8.5	1,197.0	2.8
Total	4,311.9	251.0	5.8	6,806.0	266.5	2,106.6	59,011.9	10.3

Table 229 – Proposed Action - Option 1 ACE allocation (metric tons) by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/ GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	1,850.9	0.0	0.0	1,407.0	113.0	0.0	3,429.0	0.0
GB Cod	0.0	70.5	0.0	128.4	0.0	125.3	2,275.8	0.0
GOM Winter	63.5	0.0	0.0	10.5	7.7	0.0	258.3	0.0
GB Winter	0.0	3.7	0.0	1.1	0.0	54.5	1,940.7	0.0
SNEMA Winter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM YT	88.6	0.0	0.0	25.4	5.0	0.0	721.0	0.0
GB YT	0.0	6.9	0.0	0.7	0.0	123.5	1,568.9	0.0
SNEMA YT	0.0	0.0	11.2	0.0	0.0	147.8	181.0	0.0
GOM Haddock	99.4	0.0	0.0	206.1	8.7	0.0	545.8	0.0
GB Haddock	0.0	126.7	0.0	501.9	0.0	1,177.0	33,194.3	0.0
Witch	95.7	1.1	2.3	156.8	4.6	24.1	705.0	0.5
Plaice	482.7	3.4	0.0	796.5	25.3	65.1	2,324.8	2.1
Pollock	615.8	15.9	3.2	1,764.7	68.5	27.5	3,694.9	9.4
Redfish	370.4	2.4	3.0	1,696.3	42.4	50.9	6,929.5	5.2
White Hake	207.0	1.5	5.1	847.6	9.1	11.1	1,214.6	3.9
Total	3,874.1	232.1	24.7	7,543.1	284.4	1,806.8	58,983.6	21.1

Table 230 – Option 2 ACE allocation (metric tons) by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNE/MA /GOM	SNEMA/ GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	1,501.8	0.0	0.0	1,264.6	89.9	0.0	3,943.7	0.0
GB Cod	0.0	60.6	0.0	244.5	0.0	211.3	2,083.6	0.0
GOM Winter	59.6	0.0	0.0	29.7	5.7	0.0	245.1	0.0
GB Winter	0.0	5.8	0.0	24.4	0.0	109.2	1,860.6	0.0
SNEMA Winter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM YT	91.8	0.0	0.0	56.0	6.0	0.0	686.2	0.0
GB YT	0.0	7.9	0.0	41.8	0.0	133.7	1,516.6	0.0
SNEMA YT	0.0	0.0	8.2	0.0	1.4	107.8	222.5	0.0
GOM Haddock	124.6	0.0	0.0	175.1	8.5	0.0	551.8	0.0
GB Haddock	0.0	315.9	0.0	2,527.8	0.0	1,991.0	30,165.3	0.0
Witch	106.1	2.7	4.6	134.9	5.9	61.0	674.1	0.6
Plaice	470.3	12.4	2.5	614.5	26.7	171.5	2,399.7	2.2
Pollock	690.4	58.1	12.0	1,263.7	56.9	272.6	3,837.5	8.8
Redfish	791.2	40.2	7.4	1,479.4	59.0	320.1	6,396.2	6.6
White Hake	244.6	8.9	5.5	560.8	13.1	112.0	1,351.6	3.5
Total	4,080.4	512.4	40.2	8,417.2	273.2	3,490.2	55,934.6	21.9

Table 231 – Option 3 ACE allocation (metric tons) by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/G OM	SNEMA/G B	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	1,339.5	57.2	27.2	1,109.4	80.5	338.7	3,843.2	4.4
GB Cod	158.3	57.1	10.4	219.4	9.2	192.1	1,951.8	1.7
GOM Winter	52.5	2.9	1.4	25.5	5.0	16.9	235.6	0.2
GB Winter	121.8	18.7	8.0	119.9	7.0	126.9	1,596.4	1.3
SNEMA Winter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM YT	95.4	7.1	3.4	62.8	5.5	41.8	623.5	0.5
GB YT	103.5	17.7	6.8	101.8	6.0	146.4	1,316.6	1.1
SNEMA YT	20.7	2.9	6.9	20.3	1.2	90.8	196.9	0.2
GOM Haddock	102.1	7.2	3.4	154.4	7.4	42.8	542.1	0.6
GB Haddock	2,131.2	357.6	140.1	2,339.8	123.4	2,331.8	27,553.6	22.5
Witch	108.2	8.9	5.1	137.5	5.8	61.4	662.4	0.9
Plaice	466.7	32.8	14.8	619.1	25.7	216.9	2,320.7	3.4
Pollock	685.4	60.1	26.4	1,252.4	56.1	322.6	3,788.3	8.7
Redfish	739.3	77.7	37.9	1,391.2	53.3	478.7	6,313.4	8.4
White Hake	243.6	20.1	11.8	561.1	12.6	120.1	1,327.3	3.4
	6,368.1	727.8	303.6	8,114.6	398.7	4,527.9	52,271.9	57.4

Table 232 – Option 4 ACE allocation (metric tons) by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/GOM	SNEMA/GB	GOM/GB/SNEMA	Unit Stocks Only
GOM Cod	1,495.5	77.4	27.7	1,174.4	87.3	323.6	3,609.2	4.9
GB Cod	217.9	64.8	10.6	244.3	11.8	186.4	1,862.4	1.9
GOM Winter	60.3	3.9	1.4	28.8	5.4	16.2	223.9	0.2
GB Winter	167.6	24.6	8.2	139.1	9.1	122.4	1,527.6	1.4
SNEMA Winter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM YT	114.7	9.6	3.4	70.9	6.3	40.0	594.6	0.6
GB YT	142.5	22.8	6.9	118.1	7.7	142.7	1,258.1	1.2
SNEMA YT	28.5	3.9	7.0	23.5	1.5	90.1	185.3	0.2
GOM Haddock	121.8	9.8	3.5	162.6	8.2	40.9	512.5	0.6
GB Haddock	2,933.8	461.6	142.7	2,674.8	158.4	2,254.2	26,349.4	25.0
Witch	130.9	11.8	5.2	147.0	6.8	59.2	628.3	1.0
Plaice	551.5	43.8	15.1	654.5	29.4	208.7	2,193.3	3.7
Pollock	827.6	78.5	26.9	1,311.7	62.3	308.8	3,575.0	9.2
Redfish	948.0	104.8	38.6	1,478.3	62.4	458.5	6,000.3	9.1
White Hake	296.3	26.9	11.9	583.1	14.9	115.0	1,248.2	3.6
	8,036.8	944.1	309.0	8,811.1	471.6	4,366.7	49,768.0	62.6

Table 233 – No Action estimated ACE value by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/GB	GOM/GB/ SNEMA	Unit Stocks Only
Number of Vessels								
GOM Cod	$7,331,413	$0	$0	$4,235,864	$411,159	$0	$11,857,699	$0
GB Cod	$0	$139,516	$0	$262,252	$0	$363,883	$8,348,166	$0
GOM Winter	$287,830	$0	$0	$38,462	$29,492	$0	$1,195,814	$0
GB Winter	$0	$13,001	$0	$8,737	$0	$320,517	$8,784,788	$0
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$348,214	$0	$0	$104,743	$32,909	$0	$2,958,601	$0
GB YT	$0	$29,463	$0	$4,515	$0	$465,611	$6,471,357	$0
SNEMA YT	$0	$0	$7,739	$0	$308	$757,712	$628,430	$0
GOM Haddock	$496,712	$0	$0	$583,666	$20,938	$0	$1,799,496	$0
GB Haddock	$0	$603,187	$0	$1,474,020	$0	$4,973,344	$111,005,778	$0
Witch	$501,974	$2,893	$20,055	$668,480	$22,320	$125,944	$3,895,959	$506
Plaice	$1,410,921	$14,588	$0	$2,807,729	$44,932	$298,566	$8,555,928	$138
Pollock	$805,234	$12,781	$14	$1,570,438	$84,242	$24,486	$3,784,384	$5,941
Redfish	$519,451	$4,811	$0	$1,949,765	$27,258	$24,103	$8,907,979	$1,893
White Hake	$571,467	$3,235	$281	$2,175,692	$17,195	$21,609	$3,034,705	$6,984
Total	$12,273,216	$823,475	$28,090	$15,884,362	$690,752	$7,375,774	$181,229,085	$15,461

Table 234 – Proposed Action - Option 1 estimated ACE value by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	$6,488,158	$0	$0	$4,932,098	$396,205	$0	$12,019,674	$0
GB Cod	$0	$246,981	$0	$450,219	$0	$439,080	$7,977,537	$0
GOM Winter	$289,931	$0	$0	$47,787	$34,961	$0	$1,178,919	$0
GB Winter	$0	$16,802	$0	$5,164	$0	$248,766	$8,856,312	$0
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$363,308	$0	$0	$103,978	$20,691	$0	$2,956,490	$0
GB YT	$0	$28,349	$0	$2,914	$0	$506,419	$6,433,263	$0
SNEMA YT	$0	$0	$45,785	$0	$60	$606,025	$742,320	$0
GOM Haddock	$335,203	$0	$0	$695,197	$29,384	$0	$1,841,029	$0
GB Haddock	$0	$427,444	$0	$1,692,987	$0	$3,970,110	$111,965,789	$0
Witch	$506,560	$5,646	$11,970	$829,552	$24,183	$127,523	$3,729,936	$2,760
Plaice	$1,713,340	$12,003	$77	$2,827,259	$89,959	$231,168	$8,251,666	$7,330
Pollock	$624,518	$16,166	$3,234	$1,789,616	$69,479	$27,925	$3,747,017	$9,565
Redfish	$465,408	$3,034	$3,714	$2,131,560	$53,314	$63,947	$8,707,787	$6,496
White Hake	$524,896	$3,821	$13,050	$2,149,030	$22,975	$28,058	$3,079,395	$9,942
Total	$11,311,322	$760,247	$77,830	$17,657,361	$741,208	$6,249,020	$181,487,133	$36,094

Table 235 – Option 2 estimated ACE values by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	$5,264,418	$0	$0	$4,432,740	$315,060	$0	$13,823,917	$0
GB Cod	$0	$212,505	$0	$857,093	$0	$740,589	$7,303,630	$0
GOM Winter	$271,772	$0	$0	$135,441	$25,963	$0	$1,118,422	$0
GB Winter	$0	$26,356	$0	$111,275	$0	$498,471	$8,490,941	$0
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$376,236	$0	$0	$229,715	$24,595	$0	$2,813,921	$0
GB YT	$0	$32,325	$0	$171,302	$0	$548,287	$6,219,032	$0
SNEMA YT	$0	$0	$33,594	$0	$5,912	$442,145	$912,539	$0
GOM Haddock	$420,400	$0	$0	$590,538	$28,659	$0	$1,861,216	$0
GB Haddock	$0	$1,065,634	$0	$8,526,393	$0	$6,715,568	$101,748,735	$0
Witch	$561,476	$14,266	$24,457	$713,718	$31,467	$322,604	$3,566,806	$3,334
Plaice	$1,669,427	$44,093	$8,881	$2,181,260	$94,888	$608,763	$8,517,574	$7,917
Pollock	$700,121	$58,877	$12,186	$1,281,535	$57,676	$276,478	$3,891,678	$8,969
Redfish	$994,212	$50,458	$9,301	$1,859,032	$74,177	$402,183	$8,037,558	$8,340
White Hake	$620,196	$22,457	$13,877	$1,421,842	$33,216	$283,973	$3,426,670	$8,936
Total	$10,878,258	$1,526,971	$102,296	$22,511,883	$691,612	$10,839,060	$171,732,638	$37,496

Table 236 – Option 3 estimated ACE values by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	$4,695,488	$200,370	$95,409	$3,888,638	$282,124	$1,187,219	$13,471,552	$15,334
GB Cod	$554,951	$200,103	$36,480	$769,040	$32,126	$673,477	$6,841,777	$5,863
GOM Winter	$239,444	$13,043	$6,211	$116,496	$22,950	$77,281	$1,075,175	$998
GB Winter	$555,756	$85,125	$36,533	$547,302	$32,173	$578,979	$7,285,305	$5,871
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$391,392	$28,955	$13,787	$257,562	$22,487	$171,560	$2,556,508	$2,216
GB YT	$424,469	$72,773	$27,903	$417,497	$24,572	$600,415	$5,398,831	$4,484
SNEMA YT	$84,894	$11,720	$28,473	$83,208	$4,944	$372,453	$807,600	$897
GOM Haddock	$344,235	$24,385	$11,611	$520,725	$24,917	$144,482	$1,828,591	$1,866
GB Haddock	$7,188,584	$1,206,123	$472,542	$7,892,333	$416,146	$7,865,152	$92,939,503	$75,946
Witch	$572,236	$46,856	$26,952	$727,398	$30,556	$324,660	$3,504,723	$4,750
Plaice	$1,656,341	$116,398	$52,605	$2,197,422	$91,272	$769,697	$8,236,954	$12,113
Pollock	$695,113	$60,937	$26,784	$1,270,060	$56,903	$327,128	$3,841,767	$8,828
Redfish	$929,010	$97,644	$47,629	$1,748,260	$66,966	$601,536	$7,933,612	$10,604
White Hake	$617,515	$50,928	$29,865	$1,422,531	$32,042	$304,465	$3,365,098	$8,722
Total	$18,949,428	$2,215,359	$912,782	$21,858,472	$1,140,179	$13,998,505	$159,086,998	$158,493

Table 237 – Option 4 estimated ACE values by stock area history

	GOM Only	GB Only	SNEMA Only	GOM/GB	SNEMA/ GOM	SNEMA/GB	GOM/GB/ SNEMA	Unit Stocks Only
GOM Cod	$5,242,090	$271,226	$97,165	$4,116,786	$306,006	$1,134,410	$12,651,395	$17,057
GB Cod	$763,945	$227,195	$37,151	$856,273	$41,257	$653,285	$6,528,188	$6,522
GOM Winter	$275,025	$17,655	$6,325	$131,347	$24,504	$73,844	$1,021,787	$1,110
GB Winter	$765,054	$112,256	$37,205	$634,662	$41,317	$558,758	$6,971,261	$6,531
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$470,379	$39,194	$14,041	$290,531	$25,938	$163,929	$2,437,990	$2,465
GB YT	$584,324	$93,495	$28,416	$484,219	$31,557	$584,971	$5,158,974	$4,989
SNEMA YT	$116,865	$15,864	$28,576	$96,553	$6,341	$369,365	$759,629	$998
GOM Haddock	$410,755	$33,008	$11,825	$548,490	$27,823	$138,056	$1,728,780	$2,076
GB Haddock	$9,895,808	$1,557,059	$481,242	$9,022,311	$534,427	$7,603,598	$88,877,403	$84,483
Witch	$692,355	$62,427	$27,338	$777,535	$35,804	$313,055	$3,324,489	$5,128
Plaice	$1,957,498	$155,436	$53,573	$2,323,123	$104,430	$740,601	$7,785,079	$13,063
Pollock	$839,296	$79,627	$27,247	$1,330,241	$63,202	$313,198	$3,625,425	$9,282
Redfish	$1,191,239	$131,636	$48,472	$1,857,712	$78,423	$576,201	$7,540,146	$11,431
White Hake	$751,233	$68,262	$30,295	$1,478,344	$37,884	$291,546	$3,164,459	$9,144
Total	$23,955,864	$2,864,340	$928,871	$23,948,125	$1,358,915	$13,514,816	$151,575,004	$174,280

Table 238 – No Action estimated ACE allocation by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	11	9	155	3	4,576	219	569	80	1,179
GB Cod	256	74	18	0	1,511	1	389	13	338
GOM Winter	0	0	2	1	234	7	5	19	72
GB Winter	0	0	2	0	1,643	0	141	0	214
SNEMA Winter	0	0	0	0	0	0	0	0	0
CCGOM YT	0	0	4	5	652	9	37	24	109
GB YT	0	0	4	11	1,303	0	111	0	270
SNEMA YT	2	0	3	4	220	3	14	0	94
GOM Haddock	0	21	28	0	464	13	147	8	179
GB Haddock	1,430	1,342	255	1	20,068	0	8,908	30	2,966
Witch	2	0	21	1	527	30	196	18	196
Plaice	5	1	58	0	1,454	210	1,003	43	925
Pollock	188	13	188	0	2,749	210	1,836	4	1,012
Redfish	112	18	356	0	3,424	215	3,504	1	1,470
White Hake	11	3	64	0	630	76	858	1	657

Table 239 – Proposed Action - Option 1 estimated ACE allocation by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	22	5	144	1	4,202	203	760	60	1,402
GB Cod	393	187	17	0	1,282	1	374	13	333
GOM Winter	1	0	3	1	220	6	11	22	76
GB Winter	0	0	3	1	1,660	0	127	0	208
SNEMA Winter	0	0	0	0	0	0	0	0	0
CCGOM YT	1	0	8	3	599	5	59	30	134
GB YT	0	0	5	14	1,315	0	98	0	269
SNEMA YT	3	0	2	1	227	1	50	1	55
GOM Haddock	1	10	36	0	366	10	226	5	206
GB Haddock	1,283	924	345	1	19,724	6	8,979	24	3,714
Witch	38	3	25	0	429	31	277	1	186
Plaice	37	5	117	0	1,395	65	1,370	0	711
Pollock	15	0	119	4	3,062	224	1,307	85	1,385
Redfish	24	1	140	1	3,605	442	2,114	106	2,667
White Hake	16	2	54	0	718	75	770	2	663

Table 240 – Option 2 estimated ACE allocations by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	78	34	129	6	3,740	200	966	80	1,568
GB Cod	234	116	27	2	1,318	12	380	20	491
GOM Winter	4	0	5	1	194	8	36	14	80
GB Winter	35	8	13	3	1,393	3	250	3	294
SNEMA Winter	0	0	0	0	0	0	0	0	0
CCGOM YT	13	3	10	2	532	10	94	21	157
GB YT	21	3	12	9	1,130	2	221	2	300
SNEMA YT	4	0	2	2	217	2	28	1	84
GOM Haddock	6	7	27	1	394	17	191	9	208
GB Haddock	1,198	778	447	25	19,107	132	7,315	172	5,826
Witch	14	4	16	1	503	29	174	12	237
Plaice	52	19	53	2	1,698	133	694	42	1,007
Pollock	203	57	123	3	2,945	166	1,290	36	1,376
Redfish	183	69	220	6	3,930	197	2,427	38	2,030
White Hake	39	15	44	1	958	64	547	13	619

Table 241 – Option 3 estimated ACE allocations by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	102	54	119	4	3,838	174	833	66	1,609
GB Cod	231	113	27	2	1,305	28	360	20	514
GOM Winter	5	3	4	1	208	5	35	8	72
GB Winter	27	15	17	9	1,284	21	191	11	425
SNEMA Winter	0	0	0	0	0	0	0	0	0
CCGOM YT	12	6	10	2	486	17	69	32	206
GB YT	23	13	13	1	1,140	18	168	9	316
SNEMA YT	6	3	3	0	200	4	47	2	73
GOM Haddock	12	12	24	0	402	14	171	7	218
GB Haddock	1,109	725	416	19	18,801	377	6,823	197	6,532
Witch	18	8	22	1	440	19	249	5	227
Plaice	54	28	61	3	1,859	106	637	45	907
Pollock	91	47	91	4	2,812	217	1,134	69	1,736
Redfish	153	72	171	5	3,745	246	2,129	52	2,527
White Hake	75	21	45	1	1,086	61	475	13	523

Table 242 – Option 4 estimated ACE allocations by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	129	78	124	4	3,788	199	717	73	1,687
GB Cod	242	122	29	2	1,286	38	316	23	544
GOM Winter	6	4	4	1	194	8	22	13	87
GB Winter	35	22	17	2	1,326	28	163	13	394
SNEMA Winter	0	0	0	0	0	0	0	0	0
CCGOM YT	15	9	11	2	508	15	71	20	189
GB YT	30	19	16	8	1,079	24	133	11	381
SNEMA YT	6	4	4	1	195	6	28	2	94
GOM Haddock	16	15	24	0	396	17	156	8	228
GB Haddock	1,251	850	441	19	18,544	501	6,227	231	6,935
Witch	18	11	17	1	490	32	154	13	254
Plaice	69	41	57	2	1,651	143	614	45	1,079
Pollock	227	78	126	3	2,882	185	1,176	40	1,482
Redfish	204	107	213	5	3,973	210	2,137	58	2,194
White Hake	48	26	45	1	930	70	499	15	665

Table 243 – No Action estimated ACE value by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	$38,423	$31,996	$542,957	$9,131	$16,041,101	$766,352	$1,993,559	$279,233	$4,133,382
GB Cod	$896,698	$259,638	$62,534	$890	$5,296,281	$2,835	$1,362,667	$47,201	$1,185,074
GOM Winter	$89	$0	$7,075	$6,047	$1,067,228	$33,157	$22,570	$88,052	$327,381
GB Winter	$336	$387	$7,715	$1,980	$7,498,030	$0	$643,271	$0	$975,326
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$967	$1	$16,080	$19,760	$2,674,210	$35,633	$151,903	$98,411	$447,502
GB YT	$4	$7	$14,782	$46,836	$5,343,334	$0	$457,093	$0	$1,108,890
SNEMA YT	$7,646	$0	$12,107	$17,619	$902,742	$10,640	$56,252	$109	$387,074
GOM Haddock	$759	$71,637	$93,237	$534	$1,563,864	$43,715	$494,529	$27,620	$604,918
GB Haddock	$4,824,557	$4,525,025	$861,782	$3,825	$67,689,116	$565	$30,046,457	$102,216	$10,002,786
Witch	$12,415	$173	$111,457	$2,728	$2,787,032	$159,150	$1,034,454	$92,939	$1,037,783
Plaice	$17,671	$2,628	$206,154	$1,514	$5,162,081	$745,405	$3,560,957	$153,913	$3,282,478
Pollock	$191,124	$13,410	$190,307	$1	$2,788,303	$212,686	$1,862,083	$3,559	$1,026,047
Redfish	$141,258	$22,169	$447,339	$0	$4,302,780	$270,065	$4,403,184	$1,119	$1,847,347
White Hake	$27,756	$7,156	$162,102	$0	$1,597,555	$193,679	$2,174,776	$1,659	$1,666,484

Table 244 – Proposed Action - Option 1 estimated ACE value by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	$77,093	$18,608	$505,408	$4,652	$14,730,412	$713,190	$2,663,124	$210,011	$4,913,637
GB Cod	$1,376,711	$654,146	$60,761	$953	$4,494,903	$4,676	$1,310,726	$44,803	$1,166,137
GOM Winter	$3,090	$0	$14,593	$4,014	$1,003,151	$29,408	$49,520	$101,268	$346,553
GB Winter	$2,186	$237	$13,028	$4,127	$7,574,926	$51	$581,830	$310	$950,347
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$3,121	$39	$34,497	$12,801	$2,455,697	$22,536	$242,714	$124,656	$548,406
GB YT	$26	$4	$21,163	$56,765	$5,390,238	$72	$401,106	$59	$1,101,511
SNEMA YT	$14,040	$362	$9,235	$2,446	$930,982	$2,644	$203,292	$5,530	$225,658
GOM Haddock	$4,756	$34,373	$120,647	$250	$1,233,061	$32,914	$763,597	$17,750	$693,464
GB Haddock	$4,328,251	$3,116,860	$1,163,685	$2,511	$66,530,295	$19,064	$30,285,987	$80,907	$12,528,769
Witch	$201,373	$14,966	$132,964	$3	$2,271,670	$163,748	$1,466,914	$2,806	$983,686
Plaice	$131,629	$16,880	$413,639	$42	$4,952,332	$231,812	$4,862,899	$1,712	$2,521,859
Pollock	$15,028	$164	$120,194	$4,069	$3,105,086	$226,936	$1,325,630	$85,697	$1,404,717
Redfish	$29,604	$1,339	$175,322	$1,798	$4,530,725	$555,438	$2,656,813	$133,303	$3,350,917
White Hake	$39,908	$4,435	$137,606	$20	$1,821,421	$190,526	$1,951,324	$5,473	$1,680,453

Table 245 – Option 2 estimated ACE values by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	$274,240	$120,659	$451,671	$20,111	$13,108,193	$701,461	$3,384,658	$280,187	$5,494,954
GB Cod	$821,416	$406,636	$95,459	$6,153	$4,619,468	$43,286	$1,332,942	$68,918	$1,719,537
GOM Winter	$16,272	$1,287	$21,643	$3,412	$883,569	$34,538	$164,033	$63,848	$362,995
GB Winter	$158,196	$36,930	$57,707	$11,660	$6,355,075	$12,075	$1,138,684	$13,258	$1,343,457
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$51,455	$10,604	$41,348	$8,761	$2,180,098	$39,190	$384,408	$84,524	$644,079
GB YT	$85,432	$12,680	$48,784	$35,544	$4,633,393	$9,028	$906,555	$9,808	$1,229,721
SNEMA YT	$16,351	$0	$9,098	$6,710	$890,775	$9,635	$114,697	$3,462	$343,462
GOM Haddock	$19,129	$25,275	$90,164	$2,503	$1,330,393	$56,529	$644,686	$29,861	$702,272
GB Haddock	$4,040,993	$2,623,860	$1,508,147	$85,362	$64,449,992	$443,603	$24,674,710	$579,721	$19,649,942
Witch	$74,034	$19,473	$87,042	$4,641	$2,663,477	$150,920	$918,713	$63,398	$1,256,432
Plaice	$185,961	$66,446	$188,487	$8,622	$6,025,827	$470,361	$2,463,410	$147,901	$3,575,787
Pollock	$205,924	$57,871	$125,147	$3,489	$2,986,703	$167,861	$1,308,626	$36,039	$1,395,858
Redfish	$229,748	$87,287	$276,419	$7,694	$4,938,226	$247,229	$3,049,828	$47,799	$2,551,029
White Hake	$98,618	$38,634	$111,762	$3,314	$2,428,559	$161,185	$1,386,703	$33,379	$1,569,014

Table 246 – Option 3 estimated ACE values by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	$356,870	$188,398	$418,820	$15,103	$13,453,220	$611,504	$2,920,996	$230,856	$5,640,368
GB Cod	$810,067	$395,550	$93,895	$5,362	$4,575,222	$99,803	$1,263,088	$70,521	$1,800,308
GOM Winter	$21,424	$11,667	$18,583	$3,715	$949,393	$21,669	$158,130	$36,269	$330,749
GB Winter	$121,906	$68,579	$77,462	$42,054	$5,859,863	$97,654	$871,191	$48,228	$1,940,109
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$49,430	$25,880	$40,202	$6,302	$1,993,227	$69,478	$284,649	$130,591	$844,708
GB YT	$93,930	$52,467	$53,556	$5,313	$4,673,201	$74,568	$687,026	$36,924	$1,293,961
SNEMA YT	$25,639	$10,656	$14,334	$1,970	$821,582	$16,232	$194,613	$10,126	$299,037
GOM Haddock	$41,117	$38,982	$80,540	$1,680	$1,357,431	$47,479	$575,230	$24,191	$734,164
GB Haddock	$3,740,729	$2,445,452	$1,404,585	$64,538	$63,418,048	$1,272,053	$23,015,190	$663,768	$22,031,966
Witch	$96,204	$42,723	$118,997	$2,816	$2,325,516	$102,248	$1,319,092	$27,998	$1,202,536
Plaice	$191,079	$98,845	$217,048	$11,289	$6,597,075	$377,447	$2,260,146	$158,836	$3,221,037
Pollock	$92,107	$47,610	$92,017	$3,865	$2,851,481	$219,940	$1,149,668	$69,844	$1,760,988
Redfish	$191,846	$90,268	$214,620	$6,149	$4,706,650	$309,108	$2,675,853	$65,742	$3,175,025
White Hake	$189,959	$52,143	$114,647	$3,127	$2,753,774	$153,503	$1,205,328	$32,349	$1,326,337

Table 247 – Option 4 estimated ACE values by sector membership

Stock	FGS	HOOK	Multiple	MV	NSC	Port Clyde	Sustainable Harvest	Tri-State	Common Pool
GOM Cod	$453,540	$273,321	$435,859	$15,130	$13,278,140	$696,115	$2,514,922	$254,301	$5,914,807
GB Cod	$847,029	$428,021	$100,410	$5,373	$4,508,279	$132,155	$1,107,824	$79,485	$1,905,240
GOM Winter	$28,559	$17,186	$19,219	$2,841	$886,474	$36,805	$101,790	$60,352	$398,372
GB Winter	$159,997	$101,213	$76,646	$6,966	$6,051,572	$130,031	$744,033	$57,321	$1,799,265
SNEMA Winter	$0	$0	$0	$0	$0	$0	$0	$0	$0
CCGOM YT	$61,530	$38,171	$43,716	$8,251	$2,082,304	$60,331	$292,360	$83,902	$773,904
GB YT	$121,379	$77,214	$64,146	$32,128	$4,424,373	$99,330	$546,630	$43,692	$1,562,054
SNEMA YT	$25,681	$15,442	$14,612	$5,824	$798,426	$24,681	$115,059	$9,020	$385,444
GOM Haddock	$52,882	$49,317	$82,613	$1,683	$1,336,124	$57,776	$525,811	$27,044	$767,563
GB Haddock	$4,219,519	$2,866,060	$1,488,976	$64,675	$62,550,903	$1,691,120	$21,003,975	$779,888	$23,391,214
Witch	$97,457	$58,087	$90,316	$4,509	$2,592,824	$169,142	$812,241	$68,505	$1,345,048
Plaice	$245,645	$146,232	$201,585	$8,088	$5,859,452	$506,009	$2,177,592	$158,802	$3,829,397
Pollock	$230,325	$78,625	$128,114	$3,379	$2,923,104	$187,835	$1,192,543	$41,065	$1,502,529
Redfish	$256,398	$134,010	$267,953	$6,161	$4,992,796	$263,807	$2,684,872	$72,369	$2,756,894
White Hake	$121,476	$66,805	$113,609	$3,142	$2,357,225	$178,322	$1,265,154	$39,259	$1,686,174

7.5.1.2.3.2.10 Comparing Sector Contribution Share Alternatives

Each of the sector contribution share alternatives would provide vessel owners with a different contribution share. Previous analyses identified the implications by vessel size, home port state, and area fished for each stock for which sector contribution shares would be calculated. The following compares allocation alternatives for combined contribution shares. The combined contribution share was estimated by multiplying the contribution share for each groundfish stock by the TACs shown in Table 206. The combined contribution share was then calculated as the sum of the individual allocation divided by the combined TAC for all stocks. This approach was necessary because the sum of all contribution shares actually sums to 15 since the sum the contribution share for each of 15 individual stocks sums to one.

To facilitate comparisons among alternatives the Proposed Action - Option 1 (landings history FY 1996 – FY2006) was used as a benchmark where the contribution shares for each vessel were sorted in ascending order. This procedure also retained the contribution shares by vessel. For example, when plotted, vessels with lowest to highest combined contribution shares appear in order from left to right on the x-axis (Figure 151). Plotting any given allocation option on the same chart illustrates differences between the two alternatives and highlights any associated systematic patterns. Figure 1 compares the No Action alternative to Proposed Action - Option 1. While there are differences between the two no discernible systematic pattern emerges in terms of whether vessels with small allocations under No Action would receive higher allocations under Proposed Action - Option 1 and vice versa. In part this is because both options use only one criterion – landings history – and differ only by the time period used.

Compared to Proposed Action - Option 1 the capacity adjusted options all result in a systematic pattern in which vessels with lower allocations under Proposed Action - Option 1 tend to receive higher allocations while vessels with higher allocations under Proposed Action - Option 1 tend to receive lower allocations (See Figures 2-4). This tendency to shift allocations from vessels with higher landings history-based allocations to vessels with lower history-based allocations appears to be progressively more pronounced under Option 2 (Figure 152), Option 3 (Figure 153), and Option 4 (Figure 154).

Figure 151 Combined Contribution Shares for No Action and Proposed Action - Option 1

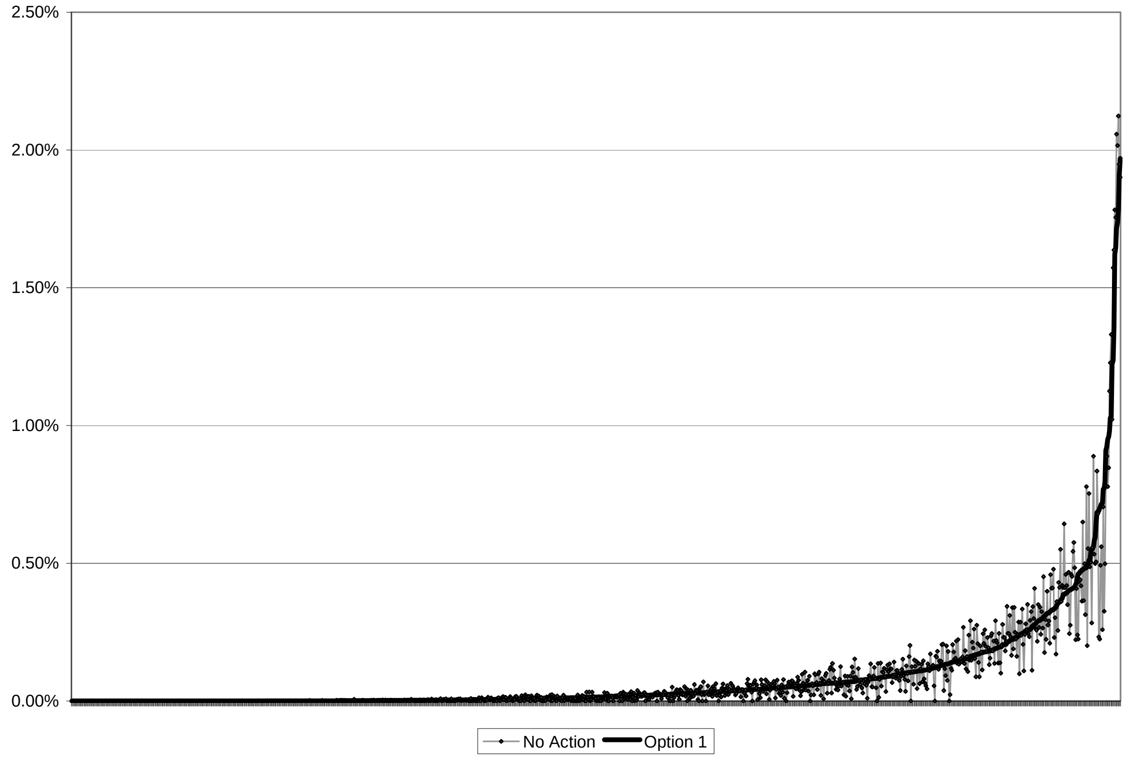


Figure 152 Combined Contribution Shares for Proposed Action - Option 1 and Option 2

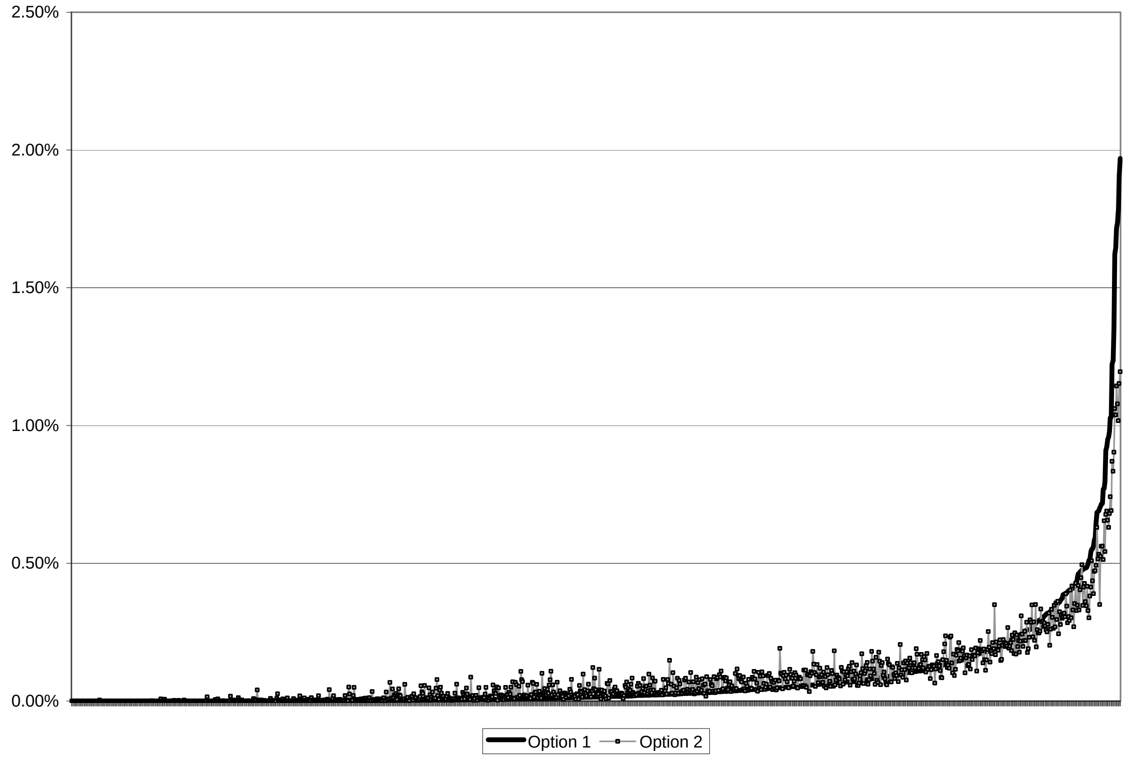


Figure 153 Combined Contribution Shares for Proposed Action - Option 1 and Option 3

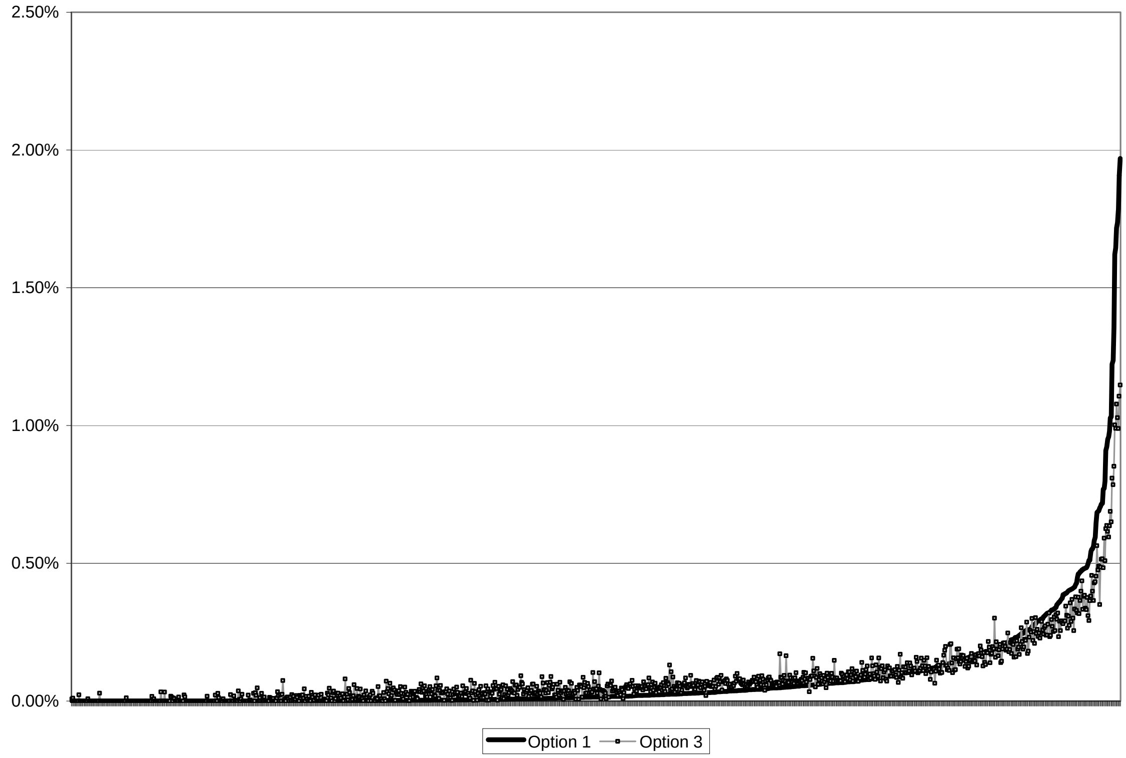
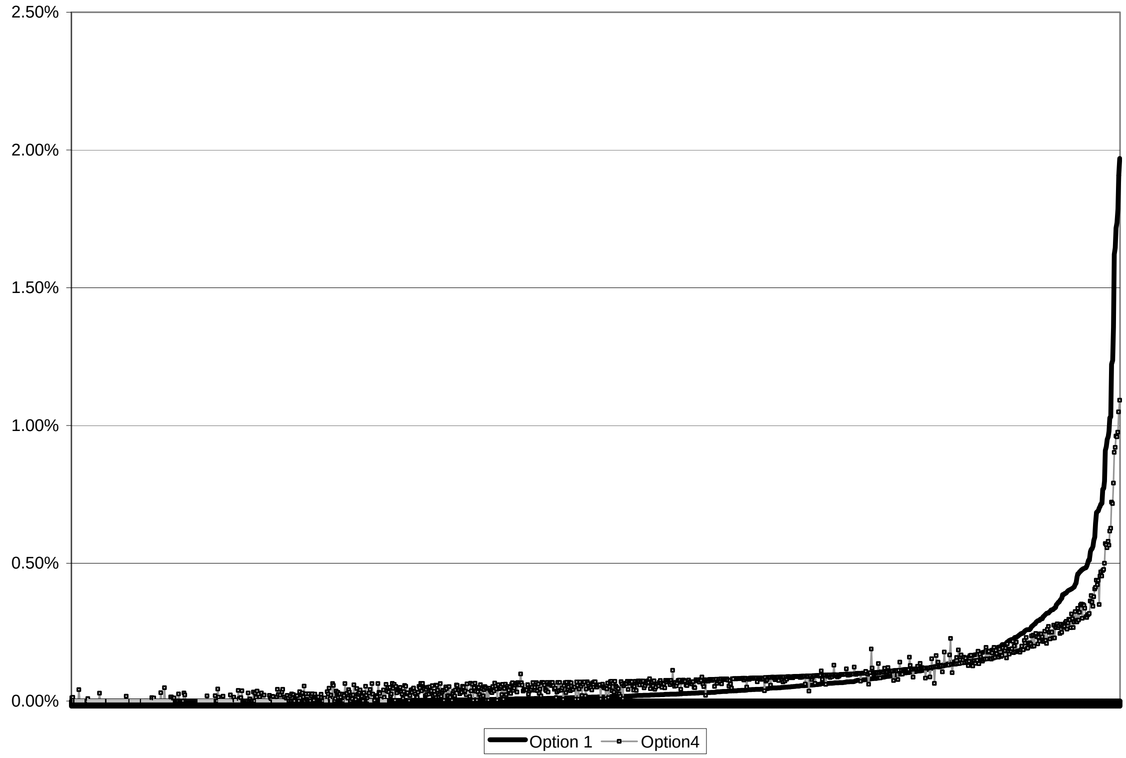


Figure 154 Combined Contribution Shares for Proposed Action – Option 1 and Option 4



7.5.1.2.3.2.11 Economic Impacts of Option 5

In addition to Option 1, the Proposed Action adopts PSC Option 5. For permits that committed to either the GB Cod Hook Sector or the Fixed Gear Sector prior to March 1, 2008, the PSC for GB cod is based on landings history alone for the period FY 96 – FY 2001. This option essentially adopts the No Action alternative for a specific group of permits, and maintains the PSC calculation method used when the sectors formed. This change, however, affects all sector–eligible permits. Approximate impacts were reviewed using permits that were in the sectors in FY 2007.

The impacts of this option on PSCs depend on which other option is selected. In general, permits committed to the existing sectors receive a larger allocation of GB cod if Option 5 is adopted than under any of the other options. As a result, the share of GB cod available for other permits declines with the adoption of Option 5. The magnitude of the changes differs among the options. Under the Proposed Action (combining Options 1 and 5), permits that are not committed to the two existing sectors have their GB cod allocation reduced by approximately 2.1 percent compared to the allocation if only Option 1 were adopted. The permits committed to the sectors have their GB cod allocation increased by about the same amount compared to Option 1 without Option 5. Comparisons are shown in Table 248 for the other options. Permits not committed to the sectors lose the most GB cod if either Option 2, 3, or 4 were adopted with Option 5.

Table 248 – Relative change in cumulative GB cod PSC under different PSC options. Change compares allocation with Option 5 to allocation without Option 5.

Option	Vessels Not In Existing Sector	Vessels In an Existing Sector in FY -07
No Action with Option 5	-6.5%	6.2%
Proposed Action with Option 5	-2.1%	2.1%
Option 2 with Option 5	-8.4%	8.5%
Option 3 with Option 5	-8.6%	8.6%
Option 4 with Option 5	-8.1%	8.1%

7.5.1.2.3.3 Other PSC Alternative Issues

The selection of a PSC alternative for sectors is viewed as a critical issue for fishermen. While this action makes it clear that the PSC alternative selected may not guide future allocation decisions of the Council, many permit owners believe that it will weigh heavily on any future discussions. A number of questions have been raised about differences between the alternatives. Many of these are difficult to evaluate quantitatively and are discussed briefly below.

Since sectors are self-selecting and voluntary in nature, some fishermen may be unwilling to join a sector or may not find a sector willing to accept them as a member. There is a concern that as sectors from permit holders may take permits with PSC into the sector and leave permits with DAS but little PSC in the non-sector common pool. The belief is this will create a disconnect between available effort and available catch in the common pool. Setting aside whether this is any different from the current situation where the level of effort available is enough to achieve catches higher than desired, the estimated sector ACE can be compared to the DAS allocations held by vessels in sectors. Using the information presented in earlier sections, the percentage of total catch that may be allocated to sector ACE is 87 percent under the No Action alternative, 84 percent under the Proposed Action - Option 1, 80 percent under Option 2, and 78 percent under Options 3 and 4. Vessels that announced their intention to join sectors account for 72 percent of the available DAS. In summary, Options 3 and 4 most closely align catch to available DAS while the No Action alternative results in the largest difference.

Since FY 1994 a key management measure used for groundfish has been DAS, which limited the fishing opportunities for limited access permits. With the adoption of the DAS leasing and transfer programs in FY 2004, vessel owners were able to acquire more DAS to mitigate the impacts of effort reductions in Amendment 13 and subsequent actions. While some permit holders leased available DAS from other permit holders, others acquired permits and then leased the DAS to themselves. Since DAS are not specific to any particular area, there was no reason to acquire a permit that represented fishing activity in any particular area. Key factors in acquiring a permit for these purposes was finding a permit with matching vessel replacement characteristics, a reasonable number of DAS, and the right price. As described in section 6.2.3.7.1, leased DAS tend to flow from the SNE/MA areas to the GOM/GB areas, presumably because opportunities to fish for groundfish in those areas are limited so permit holders are looking for an opportunity to profit from the DAS. The same dynamic may have influenced the purchase of permits for self-leasing. As a result, it is possible that some permit holders invested heavily in permits with allocated DAS but little or no landings history for the area owner fishers. PSC options that rely solely on landings history may devalue these investments should the permit holder choose to join a sector. If the vessel owner joins a sector that targets a stock in a specific area, PSC share for other stocks may not be valuable to the sector. If ACE transfers are authorized, some of these concerns may be mitigated as a sector may be able to transfer the ACE to other sectors. Permit holders could also choose not to take such permits into a sector but could leave them in the common pool and either fish or lease the DAS.

7.5.1.2.3.4 Monitoring and Enforcement

7.5.1.2.3.4.1 Enforcement

This measure clarifies several sector enforcement provisions. Two options were adopted by the Proposed Action.

Option 2 limits liability to only three categories of offenses (basically offenses related to accurate reporting of catch). This further limits the liability of permit holders, but also constrains the ability of NMFS to enforce sector provisions.

Option 3 merely restates the liability of sectors for catch overages and makes it clear every permit holder is responsible for any overage.

7.5.1.2.3.4.2 Sector Monitoring Requirements

Because of the necessity to accurately monitor sector catch – both landings and discards - this action adopts changes to sector monitoring requirements. These requirements are phased in over a three-year period. Initially sector landings will be inflated by an assumed discard rate, but ultimately the plan is for all sectors to implement an at-sea observer program that is adequate to monitor sector catches.

Section 7.2.1.2.3.3 discusses the assumed discard rates that may be applied to sector catches. If the rates are based on the most recent assessment, as is proposed, assumed discards will be based on a very different management program. By the implementation of this action, the most recent discard information from an assessment will be based on catches in calendar year 2007 and will be three years old. Many discards that result from the effort control system are a result of trip limits. Since sectors are exempt from trip limits, removing this cause for discard should result in lower discard rates than were previously observed. By using the assumed discard rates from a different management program, sectors will sacrifice yield and revenues. Additional losses in revenue could result from the very different stock conditions that were observed in 2007. For example, GB haddock discards in 2007 were observed at a very high rate due to the tremendous size and slow growth of the 2003 year class. This rate would be applied in 2010, even though these same conditions will probably not exist in the fishery. As a result, GB haddock yield could be sacrificed. Some improvements can be expected if the discard rates are based on actual observations of vessels in the sector in a more recent time period.

A key economic impact of sectors is that sector members are required to fund the costs for an enhanced monitoring program. The proposal in this document is that sectors will have to implement a dockside monitoring program in the first two years of operation, followed by an at-sea observer program in the third year. In the first year, dockside monitoring must cover 50 percent of trips, declining to 20 percent of trips in subsequent years. At-sea monitoring levels will be less than 100 percent of trips. This is an extensive expansion of the Amendment 13 requirement that sectors must accurately monitor and report their catch, and the costs described below can be viewed as a comparison to the No Action alternative.

The Council was provided two reports that examined the issues and costs associated with the proposed monitoring programs (Turris and McElderry 2008; McElderry and Turris 2008). With respect to costs, McElderry and Turris (2008) provided the estimates shown in Table 249. There are a number of assumptions that need to be noted when reviewing this table:

- The authors assumed that sectors would form with 50 percent of the active fleet and would harvest 80 percent of the available ACE;
- The number of sea days and trips is based on recent averages and does not take into account higher catch rates or other efficiencies that may be obtained under sector provisions;
- The cost estimates assume that all at-sea observer costs are borne by sectors
- Baseline data collection is included as an additional cost for sectors and common pool vessels even though many of these elements are collected through existing data systems.

At the high end, the total estimated costs to sector vessels for 100 percent dockside and at-sea monitoring is $11.1 million, or about $35,700 per vessel. The low end estimate is $8.7 million, or about $27,000 per vessel. These costs are probably high estimates. As described in section 7.2.1.2.3, the sea days for trawl vessels fishing in sectors will likely be less than recent observations because of the increased efficiencies for sectors. A rough estimate is that the sea days will be 60 percent of current values. A second factor that will reduce at-sea observer costs is the expectation that the NMFS federal observer program will continue at something approaching current levels. In recent years sea days observing groundfish trips have been on the order of 2,500 – 3,500 sea days. There is no anticipated requirement that sector observer programs will replace all of these sea days. When these two factors are taken into account, the number of needed at-sea days changes from 28,000 estimated by McElderry and Turris (2008) to about 14,000 days. If the levels of at-sea observer and electronic monitoring coverage remain in the same proportion as shown in Table 249 then at-sea observer costs could be half those estimated in the report and would average about $13,500 to $17,800 per vessel. Dockside monitoring costs would also be less than the report estimated, since the authors assume that the number of trips is roughly half the number of sea days. Cutting sea days by 60 percent should result in a similar reduction in dockside costs; in addition, when coverage declines to 20 percent, dockside costs should be 40 percent of the report's lowest estimate, or roughly $160,000 to $240,000.

One factor that could result in costs higher than these estimates is that McElderry and Turris (2008) assume that electronic monitoring will replace the need for at-sea observers on a large number of days. If this equipment is not adopted in this fishery, the number of days requiring at-sea observer coverage will increase and costs will be higher than they estimated.

The costs associated with the proposed revisions are clearly higher than those of No Action. Some of these costs may be deferred or avoided if funding is provided from other sources. NMFS announced that monitoring costs for sectors will be provided by the agency in FY 2010. It is unclear if this funding will remain available in future years. If it does, this will reduce sector operating costs but shifts the burden to taxpayers. If funding is not available in FY 2011, then the difficult decision sectors will face is whether the losses in yield caused by using an assumed discard rate are large enough to promote early adoption of an at-sea observer program funded at sector cost. By FY 2012, sectors will be required to provide an at-sea monitoring program; at that time, the issue facing vessel owners is whether sector operations can support the monitoring program expense.

Table 249 –Sector monitoring cost estimates from McElderry and Turris (2008b)

	Active Vessels	Trips (Landings)	Seadays	Cost per Unit Low	Cost per Unit High	Total Cost Low	Total Cost High
Option 1 - Baseline Data Collection							
Sector	325	15,200	28,000	25	45	380,000	684,000
Common Pool	325	3,800	7,000	25	45	95,000	171,000
						475,000	855,000
Option 2 - Dockside Monitoring Program							
2a - 50% DMP	325	7,600	14,000	60	80	456,000	608,000
2b 100% DMP	325	15,200	28,000	50	70	760,000	1,064,000
Surcharge for EM Based Monitoring							
2b w/ 50% EM	325	5,928	14,000	25	35	148,200	207,480
2b w/ 100%EM	325	11,856	28,000	25	35	296,400	414,960
Option 3 - At-Sea Monitoring (ASOP and EM)							
3a - 50% ASOP	75	760	4,200	800	1000	3,360,000	4,200,000
3a - 50% EM	250	6,840	9,800	180	200	1,764,000	1,960,000
3a Total						5,124,000	6,160,000
3b - 50% ASOP	75	760	4,200	800	1000	3,360,000	4,200,000
3b - 100% EM	245	13,680	19,600	150	170	2,940,000	3,332,000
3b Total						6,300,000	7,532,000
3c - 100% ASOP	75	1,520	8,400	600	800	5,040,000	6,720,000
3c - 100% EM	245	13,680	19,600	150	170	2,940,000	3,332,000
3c Total						7,980,000	10,052,000

7.5.1.2.3.5 Transfer of ACE

Two options are being considered which allow ACE to either be transferred between sectors or between time periods.

The Proposed Action (Option 2) allows sectors to carry forward a portion of unused ACE into the following fishing year and also allows transfers of ACE between sectors. Up to ten percent of a stock's ACE can be carried forward into the next fishing year. This reduces the risk that a sector will sacrifice yield in any given year the full ACE is not harvested as a limited opportunity exists for the sector to harvest the underage in the subsequent year. Similar provisions are common in fisheries that are managed through catch shares. In concept, allowing ACE carry-forwards are similar to the DAS provision that allows DAS vessels to carry-forward a percentage of the DAS allocation if not used.

Option 2 also allows sectors to transfer ACE to other sectors, or to acquire ACE. This provision will make for more efficient sector operations in several ways. First, if sectors are allocated ACE for stocks they cannot catch, they can transfer that ACE to other sectors and receive compensation for the ACE. The reverse is also true: they can acquire ACE from other sectors if there are stocks that they wish to target, or that are caught incidentally while targeting other stocks, and for which they did not receive ACE. Second, in those instances that the catch of a stock may result in a premature closing of the sector's fishery, this provision provides an opportunity for the sector to acquire additional ACE to allow them to keep fishing. Finally, this provision provides limited opportunities for quota balancing at the end of the fishing year, so that sectors may be able to avoid losing ACE in the following year should they inadvertently exceed an assigned ACE.

Sanchirico et al (2006) reviewed catch share systems in Iceland, New Zealand, Canada, and Australia for their approaches to quota balancing. While the exact mechanisms differed, they found most systems allowed for both the transfer of ACE or quota during the year, retrospective balancing by allowing transfers after the end of the year for a fixed period. Some systems also allowed carry-forward provisions for unused quota. The authors said "We find that a combination of incentives to match catches with leasing quota and limits on the level each mechanism can be used provides sufficient flexibility to the quota owner without fishery managers incurring excessive levels of overexploitation risk." They noted that carefully designed system can increase the ability of fishermen to react when allocated ACE is not aligned with catch rates.

These provisions do impose costs on sectors that wish to take advantage of them. They must search for available ACE or customers for ACE they wish to transfer. Sectors acquiring ACE will probably compensate the acquiring sector either by paying a fee or through an exchange of ACE of another stock. These costs will only be incurred if the sector chooses to participate, and presumably they will only do so if the exchange provides benefits to the sector. In order to make these provisions work, NMFS will withhold part of a sectors' ACE at the beginning of the fishing year to account for any overages or transfers. This could limit opportunities of sectors to fish at the beginning of the year.

7.5.1.2.3.6 Sector Participation in Special Management Programs

Options being considered guide sector participation in several special management programs, including the Eastern U.S./Canada Haddock SAP and the CAII Yellowtail Flounder SAP. Since sectors will not be required to use groundfish DAS, the primary benefits of these two SAPS is that they provide access to year-round closed areas. Catch rates in the areas may be higher, increasing profitability of sector trips. The specification of access rules provides an opportunity for sectors to increase revenues by taking advantage of these programs.

7.5.1.2.4 Reporting Requirements

This alternative would require daily reporting of any vessel that declares into more than one of four designated areas on a given trip. The designation must be made at the beginning of a trip. Vessels that declare only one area would not have to file a daily landing report, but would lose the flexibility to fish elsewhere if the conditions warranted. Vessels declaring into more than one area would be able to fish in any area but would have the added burden of daily reporting. With the exception of reporting area 2 (the inshore Georges Bank corresponding to statistical area 521) the reporting areas are large. This means that many vessels will not be subject to daily reporting. Most affected would be vessels that typically fish in statistical area 521 or in close proximity to it.

Filing these reports via VMS incurs costs to the vessel owner that would not be incurred under the No Action alternative. Depending on the specific VMS vendor and contract used by the vessel, these additional costs may or may not be included in the service package. Per character costs are on the order of $0.04 for each character submitted. More detailed cost estimates will be included in the PRA submission for this action.

7.5.1.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

The Proposed Action would make an explicit allocation between commercial and recreational user groups for stocks where the ACL was not fully harvested and where the recreational catches exceeded 5% of total catch. Based on available data these two criteria would be met for only GOM cod and for GOM haddock. The resulting ACL would depend on the selected years used to calculate commercial and recreational shares. The economic impacts of the proposed option are difficult to assess. For this reason, a qualitative assessment is offered below.

The proposal to create a specific allocation of groundfish for the recreational and commercial components of the groundfish fishery may prove to constrain catches of each of those user groups. The economic impacts, when compared to No Action, depend in larger measure on which time period is used to determine the allocations. If the period used is FY 1996 – 2006, the share for the commercial component is larger than if the period used is FY 2001 – 2006. Obviously, the reverse is true for the recreational fishery. Choosing the longer period means that recreational fishing harvest will need to be reduced when compared to recent activity, resulting in a decline in benefits (both monetary and otherwise) for this component when compared to No Action.

The economic impacts on the recreational groundfish fishery will depend on the likelihood that recreational catches will trigger accountability measures and on the nature of the accountability measures themselves. Given a set of management measures, the likelihood that an AM would be triggered would be lower the larger the ACL. Thus, economic benefits to the recreational fishery would be largest if the years selected for calculating the share are 2001-2006. These years would result in the largest recreational share which would also mean a higher ACL and a lower probability that accountability measures would be needed.

One advantage to choosing an allocation period – regardless which specific period is chosen – is that each component can be individually evaluated for compliance with catch limits. If a component exceeds its catch limit, appropriate measures can be introduced to control catch with less likelihood that the other component will also be subject to more restrictive measures. A disadvantage is that if a component does not catch its allocation the only benefit is the contribution of the uncaught catch to rebuilding as there are no provisions to transfer the uncaught catch between components. This would be difficult in any case because of the delays in catch reporting for recreational fishermen.

7.5.1.2.6 Changes to the DAS Transfer and DAS Leasing Programs

The Proposed Action would change or eliminate the conservation tax in the DAS transfer program either on a permanent basis or through a window of opportunity. It also eliminates the cap on the number of DAS that can be leased by a permit, and allows permits in the CPH category to participate in the DAS leasing program.

To date, relatively few vessels have participated in the DAS transfer program even though the conservation tax on transfers was reduced in Framework 40B while other provisions of the DAS transfer program were further modified in Framework 42 to make the transfer program more attractive. Neither of these actions has been successful in promoting the desired effect of increased consolidation in the groundfish fishery. The reasons for the lack of participation in the DAS transfer program are uncertain, but they may be tied into the design of the leasing program. Even with the proposed changes in the transfer program vessel owners may still be better off by purchasing an additional vessel with a groundfish permit outright rather than going through the

DAS transfer program. Under existing circumstances the vessel owner would be able to lease the acquired vessel's DAS to himself/herself and would have the added advantage of retaining all permits on each vessel. Under the DAS transfer program the vessel owner would have to pay the DAS transfer tax and would at least have to surrender any redundant permits. Changing or eliminating the conservation tax for DAS transfer would improve the financial gain to the owner, but may not be sufficient to offset the financial loss associated with having to give up permits. Note that this financial loss may be in terms of business equity rather than a loss in current fishing income or profitability since the value of retaining two vessels with a suite of permits may be larger than the value of a single vessel with the same number of DAS but fewer permits.

Removing the cap on the number of DAS a permit can lease may make fishing businesses more profitable. In some cases, the existing cap means a business owner may have to operate two vessels to fish the number of DAS desired. By removing the cap, one vessel can fish all of those DAS, reducing the fixed costs of maintaining two vessels.

Allowing CPH permits to participate in the leasing program may also reduce costs. It reduces the need for vessel owners to place the permit on a skiff in order to lease DAS, and may slightly increase the pool of available DAS for the leasing market.

7.5.1.2.7 Special Management Programs

The Proposed Action would revise the conditions for operating in the Closed Area I Hook Gear Haddock SAP and the closed Area II Yellowtail Flounder SAP. The Proposed Action would reauthorize the Eastern U.S./Canada Haddock SAP without making any changes. The changes to Closed Area I Hook Gear Haddock SAP would afford participating vessels greater fishing opportunities subject to the overall TAC for the SAP. The SAP season would be extended and the authorized area would be significantly increased. Additionally, the provision dividing the season and the TAC between sector and non-sector vessels would be removed. These changes would provide greater access to the SAP among sector and non-sector vessels alike. The overall TAC would still limit the total economic gain and potential removals from the SAP but since the TAC had not been reached in the past these changes increase the likelihood that the full benefit from the SAP will be realized.

The revisions to the Closed Area II Yellowtail SAP would provide additional opportunities to target haddock provided the Eastern GB Haddock TAC has not been reached. In order to participate in the revised SAP vessels must use specified gears designed to reduce bycatch of yellowtail flounder. Given its distance from shore vessels able to take advantage of this economic opportunity will be limited to larger vessels.

7.5.1.2.7.1 Closed Area I Hook Gear Haddock SAP Revisions

As proposed, the extension of the season and expansion of the area for the CA I Hook Gear Haddock SAP would be expected to increase landings and revenues of GB haddock when compared to the No Action alternative. Recent TACs in this SAP have ranged from 5 to 7 million pounds, while the maximum landings from this SAP have been just over 1 million pounds. The expanded SAP should result in landing a larger proportion of the TAC. There is also some evidence that haddock catch rates may be higher during summer months where the SAP is currently closed. Allowing fishing at these times may reduce costs to fishing vessels and improve profitability. These impacts will only benefit vessels that use longline gear. Many of these vessels are likely to be homeported on Cape Cod, and those communities would benefit most from this measure.

The proposed changes to this SAP also remove a provision whereby the SAP is open at different periods for the sector and non-sector vessels. This may create a possibility of conflicts between fishermen as the number of vessels fishing in the area at any one time may increase. It may create some elements of a derby fishery for non-sector vessels as they compete for the catch before the season is closed. These derby effects are not likely to be substantial given the size of the available TAC.

7.5.1.2.7.2 Eastern U.S./Canada Haddock SAP

Extending this SAP provides additional opportunities to harvest GB haddock and should increase revenues for the fishery when compared to the No Action alternative that allows the SAP to expire. This may become more important under the effort restrictions that are being considered in this action. Allowing the use of six-inch square mesh, coupled with a reduction in the minimum size of haddock to 18 inches, should also increase the efficiency of the vessels fishing in this SAP. There are additional costs, however - the required trawl gear is estimated to cost $13,000. Some vessels may already have this gear because they may have participated in the program in the past.

7.5.1.2.7.3 Closed Area II Yellowtail Flounder SAP Revisions

The proposed revisions to this SAP create an opportunity for the SAP to be open to target GB haddock even if the SAP is not open to target yellowtail flounder. When compared to No Action, these changes would be expected to increase revenues for the fishery, primarily through increased haddock landings. There will be some costs incurred to participate in this SAP as specific gear is required but these costs are likely to be incurred anyway as the vessels that fish in this SAP probably have obtained the gear already to fish in the Eastern U.S./Canada Haddock SAP.

7.5.1.2.7.4 SNE/MA Winter Flounder SAP

Amendment 13 adopted a SAP for SNE/MA winter flounder that allowed landing up to 200 pounds of winter flounder without using a DAS. All portions of the trip must take place west of 72-30W, fluke on board must equal or exceed the winter flounder, and there are a number of administrative requirements. This action proposes to eliminate this SAP to reduce fishing mortality on winter flounder. This will reduce revenues for vessels that participated in the SAP. These revenue losses may not be reflected in the CAM analysis for the other effort controls.

While participation in the SAP requires a letter of authorization, SAP trips are not specifically identified in the databases. To approximate the extent of participation in this program and the revenues that would be foregone, the area-allocated dealer database maintained by the NEFSC was queried for trips landing 200 pounds or less of winter flounder, fishing in SA 612, 613, 614, 615, 616, and 621), and not landing yellowtail flounder (vessels were prohibited from landing other groundfish in this SAP). Results are shown in Table 250. The number of trips that meet the criteria increased from 667 in CY 2003 (before the SAP was authorized) to 1,016 in CY 2006 before declining to 918 in CY 2007. Winter flounder accounted for between 3 and 7 percent of the landings on these trips, by weight, and between 4 and 10 percent of the trip revenues. Winter flounder revenues ranged from $51,048 in CY 2003 (before the program was adopted) to $157,076 in CY 2007. The ports landing the most winter flounder on these trips were Belford, NJ, Pt. Pleasant, NJ, Hampton Bay, NY, and Freeport, NY. Note some of these trips may have been fishing on a DAS and were not participating in the program, as the trips were not matched to the DAS database.

Based on these data, it is likely that the revenue losses from this change will not exceed $200,000 per year and are likely to be closer to $150,000. This is because not all of the trips identified here are likely to be SAP trips, since some trips in 2003 – before the SAP was implemented – met the criteria used to select the trips. The 2003 data may represent the level of trips using DAS that landed small amounts of winter flounder. If No Action is selected, these revenues would still be earned by the fishermen that exercise the option to use this SAP.

A possible response to this measure would be for the vessel to use a groundfish DAS and land the catch. In this case the losses would be any opportunities lost to lease those DAS to other vessels or to use them to target groundfish at other times of the year. Since several alternatives in this action propose to prohibit landing SNE/MA winter flounder, this option is unlikely to be available.

Table 250 – Landings and revenues on trips consistent with SNE/MA Winter Flounder SAP requirement

	2003	2004	2005	2006	2007
Trips	667	865	838	1,016	918
Pounds WFL	42,397	57,585	48,107	74,144	79,223
Revenues, WFL	51,048	77,535	75,878	142,057	157,076
Total Revenues	896,443	1,417,019	1,854,208	2,255,053	1,530,293
% WFL	6%	5%	4%	6%	10%
Total pounds	1,135,386	1,445,618	1,528,188	1,653,117	1,161,960
% WFL	4%	4%	3%	4%	7%

7.5.1.2.7.5 Category B DAS (Regular) Program

The proposed changes to the Category B (regular) DAS program are likely to reduce fishing vessel revenues when compared to the No Action alternative. The reason is that the changes will no longer allow vessels to target pollock in this program and as shown in section 6.2.3.5 pollock has become an important component of the catches in this program. Mitigating this loss in revenue to some extent may the proposal to allow the use of a six-inch cod end when targeting haddock using selective trawl gear. It is not clear whether this change will increase haddock revenues sufficiently to counter-act the loss in pollock revenues.

7.5.1.2.8 Periodic Adjustment Process

The changes proposed in this measure are administrative in nature and are not expected to have any economic impacts when compared to the No Action alternative.

7.5.1.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

The Proposed Action (Option 2) allows a vessel to hold limited access permits in both the scallop and multispecies fisheries. Both scallops and groundfish vessels are regulated by DAS. As allocated DAS have contracted in both fisheries vessel owners find themselves with idle capacity.

This alternative would enable vessels owners to make more efficient use of existing capital by allowing limited access scallop permit holders to acquire a limited access multispecies permit. From the perspective of the individual scallop permit holder acquisition of a multispecies permit would afford greater flexibility in the use of their vessel which should result in higher profitability. When compared to No Action, this alternative would also provide opportunities to shed redundant fishing capital resulting in a reduction in fishing capacity and the economic costs of an overcapitalized fishing fleet.

These economic gains would accrue to the Northeast region fishing fleet as a whole. However, some distributive effects may be anticipated. That is, this alternative could change the distribution of groundfish activity as well as the competitive position of groundfish vessels. The scallop fishery and the vessels engaged in the fishery are predominately located in Southern New England and Mid-Atlantic ports. As these vessels acquire groundfish permits it seems likely that groundfish fishing activity would not stray too far from their existing base of operations suggesting a probable concentration of effort on Georges Bank and Southern New England stocks. The extent of any change in the distribution of effort would depend on whether the scallop permit holders acquire groundfish permits that had historically fished in these areas or had fished in the Gulf of Maine.

Compared to the groundfish fishery the scallop fishery has experienced substantial increases in gross revenues. Even as fuel costs have increased for both fleets the difference in revenue generation in the scallop fishery suggests that the scallop fishery is more profitable than the groundfish fishery. This means that scallop permit holders are likely to have greater access to capital enabling them to out-compete groundfish permit holders that may also be looking to acquire additional vessels. Greater access to capital may also have some effects on the DAS leasing market as scallop permit holders would be better able to subsidize their groundfish fishing effort with scallop revenues.

There is a widespread belief that that vessel replacement restrictions will limit the number of limited access scallop permits that can be combined with limited access multispecies permits. Vessel replacement restrictions require that replacement vessels must be of a similar size, or smaller, than the baseline characteristics of the permit. The replacement vessel length, gross tonnage (GRT), and net tonnage (NT) must not be more than ten percent larger than the baseline characteristics, and the vessel horsepower (VHP) must not be more than twenty percent larger. There is a widespread belief that that vessel replacement restrictions will limit the number of limited access scallop permits that can be combined with limited access multispecies permits. This hypothesis was examined.

First, using multispecies and scallop limited access permits for FY 2006, the number of scallop permits that were a match for each multispecies permit was determined. This was done without regard to whether an individual scallop permit matches with more than one multispecies permit. The results can be viewed as an indication of how broad the market is for each multispecies permit, without regard to whether the permit holder is willing or able to acquire the scallop permit. A similar analysis was done in the opposite direction – the number of multispecies permits that are a match for each scallop permit were determined. In order to summarize the results, the permits were placed into quintiles of vessel horsepower groups. The analysis described did not use permits in the confirmation of permit history category.

For multispecies vessels, the results are shown in Table 251. For multispecies vessels in the four lower horsepower quintiles, each vessel has at least 50 possible scallop permit matches. It is only the highest horsepower quintile that only eight vessels do not match with any scallop permit.

Scallop vessel results are shown in Table 252. Scallop permits in the two lowest quintiles match with at least 25 groundfish permits. As scallop vessels increase in horsepower, the number of matches declines, but there are only two scallop permits that do not appear to match with any groundfish permits.

Table 251 – Number of scallop permits that match multispecies permits of a given horsepower group

	Number of Multispecies Permits in VHP Groups				
Number of Matching Scallop Permits	**0 - 251**	**251- 350**	**351 - 440**	**441 to 670**	**Over 671**
0	0	0	0	0	8
> 0 - 5	0	0	0	0	7
> 5 - 10	0	0	0	0	3
> 10 - 30	0	0	0	0	25
> 30 - 50	0	0	0	2	13
> 50 - 100	0	0	1	12	49
> 100 - 150	0	0	4	37	43
> 150 - 200	0	3	29	109	11
> 200 - 250	1	13	239	73	0
> 250 - 300	458	374	68	0	0
Over 300	0	0	0	0	0
Total	459	390	341	233	159

Table 252 - Number of multispecies permits that match scallop permits of a given horsepower group

	Number of Scallop Permits in VHP Groups				
Number of Matching Mults Permits	**0 - 524**	**524 - 735**	**735 - 900**	**900 - 1180**	**1180 and over**
0	0	0	1	0	1
> 0 to 5	0	0	0	0	11
> 5 to 10	0	0	1	2	8
> 10 to 25	0	0	3	21	10
> 25 to 50	0	2	20	12	0
> 50 to 100	2	12	42	9	0
> 100 to 200	24	40	6	0	0
> 200 to 300	31	8	0	0	0
> 300 to 400	20	0	0	0	0
> 400 to 500	4	0	0	0	0
Over 500	6	0	0	0	0
Total	87	62	73	44	30

These results suggest that almost all scallop and multispecies permits could acquire a permit in the other fishery that meets meet the vessel replacement criteria. As noted before, this does not take into account that some of these matches may represent permits that match up with the same permit. In addition, there may be some permits that only match with a few specific permits – if those permits have already been acquired by other permits, the number of matches of possible matches shown here may overstate the actual liquidity of the permit market. In order to examine this issue, a simple simulation model was developed for a permit market. In this model, scallop and multispecies permits were placed in a random order. Each scallop permit was consecutively matched with multispecies permits until a match was found. As matches were found, the multispecies permit was removed from the pool of possible permits and the next scallop permit was compared to multispecies permits. Since order matters, after all scallop permits were examined the results were summarized, permit order was randomized, and the same process was repeated fifty times. Each iteration thus represents one specific order of matching scallop permits to multispecies permits. The only criteria for determining whether a match existed were vessel characteristics – there was no attempt to incorporate financial considerations. Results were summarized not only to determine the number of matches (again, by scallop vessel horsepower group), but to examine how permit might move between principal port states. There were a total of 284 scallop permits in the model; confirmation of permit history permits and twelve permits with missing characteristic information were not included.

For the fifty iterations, the average number of scallop permits that successfully matched with a multispecies permit was 224 permits. Table 253 shows that for the three smallest scallop horsepower groups it is probable that all the scallop permits will be able to match with a multispecies permit. More than half the permits in the second largest group should be able to match with a groundfish permit. Only in the largest group is it likely that half or less of the permits will be able to match with a suitable groundfish permit.

Table 253 – Results of simulation matching scallop permits to multispecies permits based on permit baseline characteristics

	Number of Iterations by Scallop HP Group				
Number of Matches	**0 - 524**	**524 - 735**	**735 - 900**	**900 - 1180**	**1180 and over**
0	0	0	0	0	0
> 0 - 5	0	0	0	0	0
> 5 - 10	0	0	0	0	0
> 10 - 15	0	0	0	0	0
> 15 - 20	0	0	0	0	3
> 20 - 25	0	0	0	0	35
> 25 - 30	0	0	0	0	12
> 30 - 35	0	0	0	0	0
> 35 - 40	0	0	0	0	0
> 40 - 45	0	0	0	1	0
> 45 - 50	50	50	39	10	0
More	0	0	11	39	0
Total Permits in VHP Category	50	49	53	70	62

Based on principal port state, the simulation suggests that the major groundfish principal port states – Maine, New Hampshire, Massachusetts, and Rhode Island – are likely to experience a net loss in the number of groundfish permits through these exchanges, as will New York. Connecticut, New Jersey, and Virginia could see a net increase in the number of groundfish permits (Table 254).

Table 254 – Simulation model results for changes in the number of multispecies permits by principal port state

Principal Port State	Mults. Lost	Mults. Gained	Average Net Change
ME	25	3	-23
NH	2	0	-2
MA	63	40	-23
RI	31	3	-29
CT	4	5	1
NY	14	0	-14
NJ	16	56	40
VA		41	41

7.5.1.2.10 Catch History

This measure prevents catch history from accruing after implementation of Amendment 16. Adopting this provision may facilitate ACE transfers both within and between sectors. Permit holders expressed concerns that without this statement of Council intent they would be unwilling to transfer ACE. This is because of the possibility that a future allocation system could be adopted that would use a time period after implementation of Amendment 16 to allocate the resource. The current policy is that landings history accrues to the vessel that lands the catch, so if a permit holder or sector transfers ACE it would run the risk of disadvantaging itself in any future allocation process. This concern might inhibit transfers, reducing the benefits expected from sectors, increasing costs as more vessels continue fishing, and making the transfer market inefficient. By stating this policy, these problems are reduced. It is always possible a future Council could overturn this decision but this would require another action subject to public comment and debate.

For recreational vessels, the impacts are not as clear. Since the policy as adopted applies to all components of the fishery, the recreational component will not accrue history either. Since recreational access to some stocks may be hampered due to low stock sizes (e.g. SNE/MA winter flounder), the result is that any future allocation may not consider the benefits to recreational fishermen of stock rebuilding. This could result in reduced economic benefits for this component of the fishery; these impacts would need to be considered in any future allocation decision.

7.5.1.3 Measures to Meet Mortality Objectives

7.5.1.3.1 Commercial Fishery Management Measures

Amendment 16 would make a number of changes to existing regulations affecting qualification criteria and sector operations. These changes are expected to encourage much larger participation in sectors. In addition to the two sectors that currently exist, a total of 17 new sectors have been proposed. Vessel owners that do not choose to join a sector would be subject to effort controls. At this time, the number of vessels that may elect to remain under an effort control program and how many will join sectors is not known. If preliminary sector rosters submitted during 2008 are any indication, the number of sector participants could exceed two-thirds of the number of vessels with a category A DAS allocation and would account for about 80% of the federal commercial fishery ACL. Whether the number of participating vessel owners will be higher or lower is speculative especially since a number of key decisions have yet to be made that would affect whether any given vessel owner may choose to join a sector or remain in the common pool. This circumstance adds an additional layer of uncertainty to assessment of economic impacts of the effort control alternatives since the need for and effectiveness of any given measure may be sensitive to which vessels will remain in the common pool. Nevertheless, for purpose of analysis the effort control alternatives were modeled as if all vessel owners chose to remain in the common pool.

With some modifications, the economic impacts of the effort control alternatives were evaluated using methods similar to that used for Amendment 13 and subsequent management actions. Specifically, the closed area model (CAM) was modified to include revenues from non-groundfish species landed on groundfish trips. This means that changes in groundfish trip revenues were directly estimated within the CAM and did not have to be indirectly estimated as was the case for Amendment 13 and most recently for FW42. Since the CAM does not include non-groundfish trips, revenues from these trips still had to be indirectly estimated. The change in total fishing revenue was estimated by first calculating average groundfish trip and non-groundfish trip revenue from dealer data during FY 2005 – FY 2007 for each vessel included in the CAM. Second, groundfish trip revenue for a given alternative was calculated by applying the proportional change in groundfish trip revenue from the CAM to the FY 2005 – FY 2007 baseline. Third, total fishing revenue for the alternative was calculated by summing the result from the second step and FY 2005 – FY 2007 average revenue from non-groundfish trips. Last, the proportional change in total fishing revenue for each alternative was calculated by subtracting baseline total revenue for the alternative from baseline total revenue then dividing by baseline total revenue. A negative change is interpreted as a proportional reduction in total revenue whereas a positive change is indicative of an increase in total fishing revenue. This estimation procedure may overestimate the economic impacts of regulatory action. That is, in the Report to Congress on the economic impacts of FW42, realized fishing revenue upon implementation of A13 were compared to estimated impacts in the FSEIS. In most cases realized revenues were higher than predicted because of changes in ex-vessel prices and non-modeled changes in fishing strategies particularly in revenues received from non-groundfish species.

The effort control alternatives include no action as well as three alternatives two of which include restricted gear areas. The restricted gear areas would provide some fishing opportunities in areas that might otherwise be closed or subject to differential DAS. The biological and economic effects of these restricted gear areas were not modeled within the CAM. The realized effectiveness of these gears is uncertain which also compromises the reliability of comparisons across effort control alternatives.

The following analyses report the impacts of the alternatives on revenues for a subset of vessels in the groundfish fishery. Average groundfish trip revenue for all limited access permit holders was $114 million during FY 2005 – FY 2007 and average total revenue was $158 million. Average FY 2005 – FY 2007 groundfish trip revenues for the vessels included in the analysis was $101 million during FY 2005 to FY 2007 and average total revenue was $148.5 million. These revenues represent 88% and 94% respectively of total FY 2005-FY 2007 average revenue on groundfish trips and revenue from all trips by all limited access permit holders. Because such a high proportion of revenues are accounted for by the vessels in the analysis, the results are believed representative of the impacts on the fleet as a whole.

7.5.1.3.1.1 Economic Impacts of the Proposed Action: Alternative 3a: Differential DAS

Alternative 3a would achieve the conservation objectives of the Proposed Action using differential DAS as the primary management measure. This alternative would also include the default 18% reduction in DAS as well as the suite of modified trip limits described previously.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY 2005 to FY 2007 and average total revenue was $158 million. Under Alternative 3a the estimated groundfish trip revenue would decline by 15% to $86 million and total fishing revenue would decline by 10% to $142 million (Table 255). Among states the estimated change in groundfish trip revenue was highest in New York (-28.3%) but was at least 20% in Connecticut, New Jersey, and Rhode Island. The change in groundfish trip revenue was -9% in Maine while groundfish trip revenue was estimated to decline by more than 18% in New Hampshire and by 14% in Massachusetts.

Table 255 - Alternative 3a Change in Groundfish Trip and Total Trip Revenue by Home Port State

State	2005-2007 Average Total Revenue	Estimated Total Revenue	Change in Total Revenue	2005-2007 Average Groundfish Trip Revenue	Estimated Groundfish Trip Revenue	Change in Groundfish Trip Revenue
CT	$471,853	$420,017	-11.0%	$234,954	$183,118	-22.1%
MA	$76,335,101	$67,581,287	-11.5%	$61,075,061	$52,321,247	-14.3%
ME	$18,692,050	$17,178,266	-8.1%	$16,887,629	$15,373,845	-9.0%
NH	$5,260,523	$4,448,295	-15.4%	$4,381,575	$3,569,348	-18.5%
NJ	$6,897,309	$6,463,969	-6.3%	$1,874,151	$1,440,811	-23.1%
NY	$14,307,651	$13,165,671	-8.0%	$4,035,033	$2,893,053	-28.3%
RI	$31,466,190	$28,854,662	-8.3%	$11,430,282	$8,818,754	-22.8%
Other	$4,121,225	$4,008,864	-2.7%	$1,292,992	$1,180,630	-8.7%
Total	$157,551,903	$142,121,030	-9.8%	$101,211,678	$85,780,806	-15.2%

Vessel-Level Impacts

A total of 58 vessels were estimated to obtain at least some modest improvement in groundfish trip income due to the removal of the differential DAS counting areas and higher trip limits for GOM and GB cod. Almost all of these vessels were either from Maine (15), Massachusetts (35), or New Hampshire (8). The average increase in fishing revenue for these vessels was 8%; shown as a -8% in Table 1. Due to the small number of vessels that may experience improved fishing revenue the remaining discussion will focus on the vessels that are expected to be adversely affected by the Proposed Action.

Alternative 3a would have an adverse impact on 451 of the 509 vessels included in the analysis. The estimated adverse impact on fishing revenue for vessels up to the 20th percentile averaged 2% (Table 256). Above the 20th percentile, the estimated average adverse impact ranged from 8% between the 20th percentile and the median to 36% for vessels above the 80th percentile.

Table 256 - Alternative 3a Estimated Impact and Number of Affected Vessels by Impact Category

Impact Category	Number of Vessels	Average Adverse Impact
No Impact	58	-8%
Up to 20th Percentile	91	2%
20th Percentile to Median	135	8%
Median to 80th Percentile	135	15%
Above 80th Percentile	90	36%

Under Alternative 3a the 24 hour clock would have progressively larger adverse impacts based on vessel size at intervals above the 20th percentile. For example, the average impact on small vessels between the 20th percentile and the median was estimated to be 11% as compared to 7% for medium and 6% for large vessels (Table 257). This differential effect is more pronounced among vessels above the median. At the 80th percentile the estimated average adverse impact on small vessels was 42% while the adverse on medium and large vessels was estimated to be 32% and 19%, respectively.

Table 257 - Alternative 3a Estimated Adverse Impact and Affected Vessels by Vessel Length Class

Impact Category	Less than 50 feet		50 to 70 feet		Over 70 feet	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	41	2%	26	2%	25	2%
20th Percentile to Median	60	11%	38	7%	37	6%
Median to 80th Percentile	60	23%	38	14%	37	10%
Above 80th Percentile	40	42%	25	32%	24	19%

Among primary gears the relative distribution of adverse impact on total revenue varied. Since hook gear tend to have a high dependence on cod for both groundfish and total fishing revenue, the impact on hook gear was substantially lower than other gears at all percentiles primarily due to the higher trip limit for cod (Table 258). Among vessels using either gillnet or trawl gear, estimated adverse impacts on gillnet gear tended to be higher than that of vessels using trawl gear. This difference is likely due to the fact that gillnet vessels have proportionally more dayboat vessels that would be more affected by the 24 hour clock as compared to the proportion of dayboat vessels using trawl gear.

Table 258 - Alternative 3a Estimated Adverse Impact and Affected Vessels by Primary Gear

Impact Category	Gillnet		Hook		Trawl	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	22	2%	2	0%	68	2%
20th Percentile to Median	32	10%	1	1%	101	8%
Median to 80th Percentile	32	21%	2	1%	102	14%
Above 80th Percentile	21	37%	1	2%	67	36%

The estimated impact on vessels from New Hampshire were higher than vessels from other home port states, at least up to the 80^{th} percentile (Table 259). The estimated average impact on fishing revenue for New Hampshire vessels was at least twice that of any other home port state up to the 20^{th} percentile (8%) and was at least 60% higher than any other state between the 20^{th} percentile and the median (15%) and between the median and the 80^{th} percentile (27%). Above the 80^{th} percentile adverse impacts on total fishing revenue was highest for home port vessels from Massachusetts (41%) followed by vessels from New Hampshire (37%), and vessels from Rhode Island and Connecticut (34%).

Table 259 - Alternative 3a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Home Port State

Home Port State	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
MA	44	66	66	43
ME	11	17	16	11
NH	6	8	8	5
NJ - South	7	9	10	6
NY	10	13	14	9
RI & CT	15	21	22	14
		Average Adverse Affect on Total Revenue		
MA	3.0%	9.0%	17.0%	41.0%
ME	4.0%	8.0%	13.0%	29.0%
NH	8.0%	15.0%	27.0%	37.0%
NJ	0.0%	3.0%	7.0%	17.0%
NY	1.0%	4.0%	13.0%	28.0%
RI & CT	2.0%	6.0%	14.0%	34.0%

Vessels with high dependence on groundfish trip revenue may be expected to be more adversely affected by Alternative 3a than less dependent vessels. This effect is evident as the estimated average adverse impact of fishing revenue increases with dependence on groundfish trip revenue (Table 260). For example, the estimated impact on vessels that depend on groundfish trips for less than 20% of fishing revenue ranged from less than 0.5% up to the 20th percentile to 6% for vessels above the 80th percentile. By contrast, impacts on vessels that depend on groundfish for at least 80% of fishing revenue ranged from an average of 6% up to the 20th percentile and 46% above the 80th percentile.

Table 260 - Alternative 3a Estimated Impacts and Number of Affected Vessels by Dependence on Groundfish Trip Revenue

Dependence Category	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
0 to 19%	13	18	19	12
20 to 39%	16	23	24	15
40 to 59%	12	17	17	11
60 to 79%	13	18	18	12
80 to 100%	39	58	58	38
		Average Adverse Affect on Total Revenue		
0 to 19%	0.0%	1.0%	2.0%	6.0%
20 to 39%	2.0%	5.0%	9.0%	16.0%
40 to 59%	5.0%	10.0%	15.0%	22.0%
60 to 79%	6.0%	12.0%	21.0%	32.0%
80 to 100%	6.0%	11.0%	24.0%	46.0%

Unlike dependence on groundfish dependence the estimated average impact on total fishing revenue tended to be larger at lower levels of gross sales (Table 261). This tendency was more pronounced at sales intervals below $269 thousand compared to intervals above $269 thousand. For example, the estimated average adverse impact above the 80th percentile ranged from 48% to 38% for sales intervals of $269 thousand or less, but was 27% and 14% respectively for the two highest sales intervals. This difference between vessels with comparatively high and low levels of gross sales is likely to be correlated with vessel size which also displayed an inverse pattern of increasing adverse impact with vessel size.

Table 261 - Alternative 3a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Gross Sales Category

Gross Sales Category ($1,000)	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
Less than $90 k	15	22	23	14
$90 k to $159 k	17	25	26	16
$160k to $269 k	20	30	30	19
$270 k to $500 k	19	28	28	18
More then $500 k	21	30	30	20
	Average Adverse Affect on Total Revenue			
Less than $90 k	2.0%	10.0%	24.0%	48.0%
$90 k to $159 k	1.0%	10.0%	22.0%	43.0%
$160k to $269 k	2.0%	10.0%	19.0%	38.0%
$270 k to $500 k	2.0%	7.0%	12.0%	27.0%
More then $500 k	2.0%	6.0%	10.0%	14.0%

Among port groups the estimated adverse impacts tended to be largest on vessels with a Gloucester home port (Table 262). Impacts on the Gloucester port group ranged from 15% for vessels up to the 20th percentile to revenue losses of 51% for vessels above the 80th percentile. Among other port groups estimated reductions in fishing revenue above the 80th percentile exceeded 30% in Other Rhode Island (40%), Mid-Coast Maine (32%), North Shore, Massachusetts (38%), Point Judith (31%), and the Portsmouth Area port group (37%).

Table 262 - Alternative 3a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Port Groups

Port Group	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
Cape & Islands	5	8	7	5
Long Island, NY	10	13	14	9
Gloucester	15	22	22	14
Mid-Coast Maine	6	8	9	5
North Shore, Massachusetts	4	6	6	4
New Bedford	15	22	23	14
New Jersey	7	9	10	6
Other Rhode Island	6	8	9	5
Point Judith	9	13	14	8
Portsmouth Area	6	8	8	5
Scituate - Boston	6	8	8	5
Portland - So. Maine	6	8	8	5
		Average Adverse Affect on Total Revenue		
Cape & Islands	1.0%	7.0%	13.0%	24.0%
Long Island, NY	1.0%	4.0%	13.0%	28.0%
Gloucester	5.0%	17.0%	35.0%	51.0%
Mid-Coast Maine	4.0%	7.0%	12.0%	32.0%
North Shore, Massachusetts	4.0%	10.0%	20.0%	38.0%
New Bedford	3.0%	8.0%	11.0%	16.0%
New Jersey	0.0%	3.0%	7.0%	17.0%
Other Rhode Island	1.0%	4.0%	11.0%	40.0%
Point Judith	3.0%	7.0%	16.0%	31.0%
Portsmouth Area	8.0%	15.0%	27.0%	37.0%
Scituate - Boston	3.0%	9.0%	14.0%	29.0%
Portland - So. Maine	4.0%	9.0%	14.0%	29.0%

7.5.1.3.1.2 Analysis of Vessel Break-Even DAS in New England Groundfish

Evaluation of vessel break-even DAS in the New England groundfish fishery was conducted using data from several sources. Note that throughout this report break-even DAS are defined as being the number of Category A DAS needed to cover annual fixed costs. Fixed cost data were collected from a sample of permit holders surveyed during 2007 and 2008. In each survey year, cost data for the preceding fiscal year were collected including vessel improvements, maintenance and repairs, mooring fees, insurance, communication, business travel, business taxes, professional fees, handling fees, association fees, office expenses, permit renewal fees, interest on business loans, non-crew labor, vehicles, and miscellaneous expenses. Data on fishing revenues and days absent were obtained from a combination of dealer and vessel trip reports.

Based on a review of the fixed cost data received during 2007 and 2008 the cost burden varied widely with some vessels incurring higher costs than others. These costs also depended on the type of gear used and vessel size. These differences have implications for the minimum number of DAS that would be needed in order to break-even; i.e. to cover all fixed costs over and above operating costs. For this reason break-even DAS were estimated for the three primary gears used in the groundfish fishery (otter trawl, gillnet, and bottom longline). Limited access permit holders using these gears were further categorized by vessel size and by high, medium, and low levels of fixed costs resulting in a total of 21 estimates of break-even DAS based on gear, size, and level of fixed costs. The fixed cost intervals were based on breaking the distribution of total fixed costs by vessel into thirds where the first third was assigned to the low fixed costs category, the second third to medium fixed costs and the last third to high fixed costs. Fixed costs in each interval were determined by the average of all vessels in each cost category.

The number of DAS needed to break-even was estimated by dividing total fixed costs by the contribution margin per DAS where the contribution margin is the daily return to the vessel on a groundfish trip after deducting payments for trip costs and captain and crew. However, depending on lay system these trip costs may be paid for out of crew and captain share. Given uncertainty about different lay systems calculation of the contribution margin was simplified by assuming a 60/40 lay where 60% of gross stock goes to hired captain and crew and 40% goes to the vessel. Trip costs are paid out of the former while the latter is the daily contribution share. Daily gross stock on groundfish trips was estimated as the average revenue from all species landed on trips where groundfish comprised more than 50% of total trip revenue where average daily revenue was calculated for each gear/size combination.

Estimated break-even DAS where highest for otter trawl vessels more than 75 feet in length that also had high fixed costs (Table 263). Note that break-even DAS reported in Table 263 are most appropriate for vessels that fish exclusively for or have high dependence on groundfish for annual fishing income. For any given gear/size combination break-even DAS go down for vessels with lower fixed costs. For example, large trawl vessels with high fixed costs were estimated to require 253 DAS to break-even whereas large trawl vessels with low fixed costs would break-even at 55 DAS.

Table 263 - Estimated Break-Even DAS Needed for Full-Time Groundfish Vessels by Level of Fixed Cost and Gear/Size Combinations.

Gear/Size Combination	Average Fixed Costs	Average Gross Revenue per Day	Contribution Margin	Break-Even DAS
		High Fixed Costs		
Gillnet < 45'	$133,890	$1,971	$788	170
Gillnet >= 45'	$151,596	$2,449	$980	155
Longline < 35'	$84,837	$2,629	$1,052	81
Longline >= 35'	$246,109	$3,234	$1,294	190
Trawl < 50 '	$104,476	$2,827	$1,131	92
Trawl >= 50 and < 75	$259,928	$3,964	$1,586	164
Trawl > 75	$545,486	$5,400	$2,160	253
		Medium Fixed Costs		
Gillnet < 45'	$57,449	$1,971	$788	73
Gillnet >= 45'	$70,523	$2,449	$980	72
Longline < 35'	$43,380	$2,629	$1,052	41
Longline >= 35'	$76,755	$3,234	$1,294	59
Trawl < 50 '	$48,848	$2,827	$1,131	43
Trawl >= 50 and < 75	$102,579	$3,964	$1,586	65
Trawl > 75	$259,389	$5,400	$2,160	120
		Low Fixed Costs		
Gillnet < 45'	$29,287	$1,971	$788	37
Gillnet >= 45'	$39,395	$2,449	$980	40
Longline < 35'	$18,732	$2,629	$1,052	18
Longline >= 35'	$28,949	$3,234	$1,294	22
Trawl < 50 '	$24,478	$2,827	$1,131	22
Trawl >= 50 and < 75	$43,161	$3,964	$1,586	27
Trawl > 75	$119,762	$5,400	$2,160	55

Based on the estimates provided in Table 263 an estimate of total DAS needed for limited access vessels that participate in the groundfish fishery may be obtained by multiplying the break-even DAS by the number of vessels in each gear/size/fixed cost category. However, as noted above, the estimated break-even DAS are based on vessels that have high dependence on groundfish trips for total fishing revenue. To estimate total DAS needs the break-even DAS were prorated to vessel gear/size categories based on the proportion of groundfish trip revenue to total fishing revenue for limited access permit holders that participated in the groundfish fishery during FY 2007. During FY 2007 there were a total of 649 vessels that participated in the groundfish fishery (Table 264). Of these vessels 217 depended on groundfish trip revenues for 20% or less of total trip income while 191 vessels relied on groundfish trip revenue for more than 80% of total fishing revenue. Note that for reporting purposes the number of vessels by dependence on groundfish trip revenue that used either, gillnet or longline gear had to be combined into a single category because of confidentiality concerns in some dependence categories. These gear/size categories were retained in the estimate of aggregate break-even DAS.

Table 264 - Number of Limited Access Permits by Dependence on Groundfish Trip Revenue for Total Revenue by Gear/Size Combinations

	Groundfish Trip Dependence (no. of vessels)				
Gear/Size Combination	<= 20%	< 20% to <= 40%	< 40% to <= 60%	< 60% to <=80%	> 80% to 100%
Gillnet/Longline	88	13	10	17	92
Trawl < 50 '	24	15	11	21	46
Trawl >= 50 and < 75	71	37	23	45	35
Trawl > 75	34	12	8	29	18
Totals	217	77	52	112	191

To simplify estimation procedures proration of break-even DAS was based on the upper bound in each dependence interval shown in Table 264. For example, break-even DAS for vessels with 20% or less dependence on groundfish trips was estimated by multiplying the break-even DAS by 20%. Break-even DAS for vessels in the 20 to 40% dependence interval were estimated by multiplying break-even DAS by 40%, and so on. Using the same procedures used to estimate break-even DAS the number of vessels in each dependence category were further divided into thirds to reflect differences in break-even DAS among vessels with high, medium, and low levels of fixed costs.

Total DAS needed for all limited access permit holders that participated in the groundfish fishery to break-even were estimated to be 34,078 DAS. Almost half of these DAS (16,065) would be associated with vessels with high dependence on groundfish trip income (Table 265). Total allocated category A DAS during FY2008 were approximately 51,500 DAS. These allocated days include base allocations of 44,000 days plus carry over DAS of about 7,500. Thus, at least in aggregate, during FY2008 there are more than enough total allocated A DAS to meet the break-even DAS. However, median individual allocation including carry over was 45 DAS and ranged from a high of 155 DAS to fewer than 10. Thus many vessels cannot break-even on their DAS allocations alone and rely on the DAS leasing program to acquire the additional DAS needed to remain profitable.

Table 265 - Estimated Total Break-Even DAS for Limited Access Groundfish Vessels by Dependence on Groundfish and Gear/Size Combinations and Level of Fixed Costs

Gear/Size Combination	<= 20%	< 20% to <= 40%	< 40% to <= 60%	< 60% to <=80%	> 80% to 100%
			High Fixed Costs		
Gillnet/Longline	976	295	330	743	5,056
Trawl < 50 '	148	185	203	517	1,415
Trawl >= 50 and < 75	775	808	753	1,965	1,911
Trawl > 75	572	404	404	1,951	1,514
Sub-Total	2,471	1,691	1,690	5,176	9,896
			Medium Fixed Costs		
Gillnet/Longline	418	124	145	317	2,055
Trawl < 50 '	69	86	95	242	662
Trawl >= 50 and < 75	306	319	297	776	754
Trawl > 75	272	192	192	928	720
Sub-Total	1,065	721	729	2,263	4,191
			Low Fixed Costs		
Gillnet/Longline	215	63	76	161	997
Trawl < 50 '	35	43	48	121	332
Trawl >= 50 and < 75	129	134	125	326	317
Trawl > 75	126	89	89	428	332
Sub-Total	504	329	337	1,037	1,979
Total Break-Even DAS	4,040	2,741	2,757	8,475	16,065

Proposed Effort Control Alternatives

The proposed effort control alternatives will next be discussed in the context of the break-even analysis. As with the design of the measures, it will be assumed that all vessels choose to use effort controls and no vessels choose to join sectors. The break-even analysis presented was based on the contribution margin per DAS. The contribution margin is determined by the difference between revenues and trip costs (in this analysis trip costs include payments to crew and hired captains). Revenues per DAS were calculated from observed trips where groundfish revenue was more than 50 percent of the trip revenues. Since the existing management system constrains revenues per DAS through the use of trip limits for many stocks, as well as other measures that limit vessel efficiency, the analysis reflects the number of DAS necessary to break-even under the current regulatory regime – that is, prior to implementation of Amendment 16.

The effort control alternatives under consideration propose substantial changes to the management system. Not only do all the alternatives propose reductions in allocated DAS, but they modify trip limits, the way DAS are counted, and impose gear restricted areas. Measures that promote efficiency and increase revenues per DAS would be expected to reduce the number of break-even DAS, while those that promote inefficiency or reduce revenues per DAS would increase the number needed for the fleet to break-even. The proposed changes would be expected to affect the break-even analysis as follows:

- Counting DAS in 24-hour increments might increase the number of DAS needed to break-even if vessels do not change fishing behavior, but this is an unlikely result. This measure is expected to have the largest effects on fishing behavior for vessels that have been taking day trips charged less than 24 hours on the DAS clock. These vessels will probably increase trip length enough to maximize revenues for each 24-hour DAS increment they are charged. If they can increase revenues on these short trips enough to match the revenues per DAS earned in the past, the contribution margin per DAS may increase and the number of DAS necessary to break-even will decline.

- Increasing trip limits reduces the number of DAS necessary to break-even. Reducing trip limits or banning possession of stocks that are landed increases the number of DAS needed.
- Impacts of restricted gear areas are difficult to predict. If these areas increase trip costs by forcing vessels to travel farther to fishing areas, or if they shift vessels into areas with lower catch rates, they will increase the number of DAS needed to break-even. But if the areas cause vessels to shift into more productive areas, or relocate to ports that are closer to the fishing grounds, they may reduce the number of DAS needed to break-even.

Complicating application of the break-even analysis to the effort control alternatives being considered is that this action proposes changing several measures at once. For a simple example, consider a vessel making day trips that lands only GOM cod. A change in the GOM cod trip limit from 800 lbs./DAS to 2,000 lbs./DAS is proposed in Options 3A. Assuming stable prices, the change in the cod landing limit makes it possible for the vessel to increase its cod revenues per DAS by a factor of 2.5 (if the vessel can catch the new limit on every trip, or increase its average catch per trip in the same proportion as the change in the trip limit). Trip costs may also increase if the vessel fishes longer to catch the new limit so the contribution margin may not increase by the same proportion. Modify the example for a fleet of vessels fishing in multiple areas, on multiple stocks with some trip limits that increase and some that decrease and it becomes clear why the following discussion is qualitative.

Proposed Action/Option 3A

This option reduces Category A DAS by 50 percent and is expected to result in about 22,000 allocated baseline DAS. It also modifies the way DAS are counted: all DAS are counted in 24-hour increments, but the two differential DAS areas are eliminated. These two changes will have little impact on the break-even DAS needed for a vessel that has been making trips charged 24 hours or more on the DAS clock, but may increase the break-even DAS needed for vessels that have been making trips charged less than 24 hours on the DAS clock. This option also increases trip limits for cod to 2,000 lbs./DAS, eliminates trip limits for white hake and GB winter flounder, and bans landing SNE/MA winter flounder and windowpane flounder. These trip limit changes are likely to increase revenue per trip in the GOM and GB areas, but will reduce revenues per trip in the SNE area.

Under this option there are not enough DAS for the fleet to break-even unless contribution margins per DAS increase by about fifty-four percent (the difference between the DAS allocated and the DAS needed to break-even). While the trip limit changes may foster this increase for vessels that fish in the GOM and GB, it is unlikely that the same increase will occur in the SNE area. Because DAS cannot be freely exchanged across vessel size classes, there are likely to be vessels or groups of vessels that do not have access to enough DAS to break-even.

Mitigating Factors

The previous discussion focused on whether there are enough Category A DAS available for the active participants to break-even. The discussion focused on comparing the baseline allocation of DAS to the number of DAS needed. An additional source of Category A DAS is the number of carry-over DAS that are available. Based on recent DAS use, in the first year of implementation of Amendment 16 there are likely to be 6,000 – 7,000 carry-over DAS available. Under any alternative, this reduces the gap between the DAS allocated and the number needed to break-even. It makes it more likely that the number of DAS will be sufficient for active participants to break-even under the Proposed Action (Option 3A), as contribution margins will not need to increase as much as in the absence of carry-over DAS. It is not clear how many carry-over DAS will be available in the second-year of implementation, but any available carry-over DAS will increase the pool of DAS than can be leased and may allow additional vessels to break-even.

The other source of groundfish DAS is Category B DAS that can be used in special management programs. The issue here is not whether there are enough Category B DAS available – under all options there will be more Category B DAS available than Category A DAS – but whether there are opportunities to profitably use those DAS. For vessels that can access GB haddock in the CAI Hook Gear Haddock SAP, the Category B (regular) DAS Program, the Eastern US/CA Haddock SAP, or the modified CA II SAP, there may be enough opportunities to use Category B DAS that the vessels can break-even. For other vessels it is unlikely that this will be the case.

7.5.1.3.1.3 Comparison of Economic Impacts of Effort Control Options

Comparing the impacts on vessel revenues of the effort control options is difficult for the same reasons comparing biological impacts is difficult (see section 7.2.1.3.1.2). Options 2A and 4 would need further measures to meet the pollock rebuilding objective and there are measures that are difficult for the CAM to analyze in every alternative. These uncertainties need to be considered when comparing the options.

Table 266 and **Table 267** summarize changes in total revenue and groundfish revenue by homeport state. Not surprisingly, the No Action alternative has the least impact on both revenue streams for the fishery as a whole. This does not hold true for individual states: Maine vessels lose more groundfish revenue under No Action than under the Proposed Action - Option 3A; NJ and Other states lose more revenues under No Action than under Options 2A and Proposed Action - Option 3A respectively. For the fishery as a whole, Option 3A has the least impact on total and groundfish revenues. This is likely because the 24-hour clock has less impact on vessels that take multi-day trips and removing differential DAS counting counteracts the DAS reduction and 24-hour clock for those vessels that fished in the differential DAS area. Increasing trip limits probably benefits almost all vessels.

Table 266 - Change in Total Revenue

State	No Action	2A	Proposed Action - 3A	4
CT	-6.1%	-11.7%	-11.0%	-14.8%
MA	-9.7%	-19.6%	-11.5%	-23.1%
ME	-10.6%	-22.4%	-8.1%	-25.8%
NH	-9.6%	-10.3%	-15.4%	-22.0%
NJ	-3.3%	0.5%	-6.3%	-8.3%
NY	-3.6%	-5.5%	-8.0%	-8.8%
RI	-4.5%	-7.5%	-8.3%	-10.7%
Other	-3.2%	-7.3%	-2.7%	-7.9%
Total	-7.7%	-14.7%	-9.8%	-18.5%

Table 267 - Change in Groundfish Trip Revenue

State	No Action	2A	3A	4
CT	-12.3%	-23.4%	-22.1%	-29.7%
MA	-12.1%	-24.5%	-14.3%	-28.9%
ME	-11.8%	-24.8%	-9.0%	-28.6%
NH	-11.5%	-12.3%	-18.5%	-26.4%
NJ	-12.2%	1.8%	-23.1%	-30.4%
NY	-12.8%	-19.5%	-28.3%	-31.1%
RI	-12.4%	-20.8%	-22.8%	-29.5%
Other	-10.3%	-23.4%	-8.7%	-25.1%
Total	-12.1%	-22.9%	-15.2%	-28.9%

A difficulty in comparing vessel-level impacts is that the effort control alternatives will impact each individual vessel in different ways. Comparing alternatives based on average impacts does not provide information on the distribution of impacts across the fishery. For this reason the vessel level impacts are broken down into percentile groups, and the average impacts for each group are reported. Examining the impacts in this way reveals that the different alternatives affect fishermen in different ways; there is no single alternative that is best or worst for all vessel categories. The size of the percentile groups that suffer adverse impacts can change between alternatives because the number of vessels not affected changes. There are 509 vessels in the analysis, which represents most vessels that landed groundfish.

Table 268 summarizes vessel level impacts on gross revenues. Other than No Action, Option 2A has the most vessels that will not suffer adverse impacts: 69 vessels will have on average an 8 percent increase in revenues. Up to the median level of impact, Options 2A and Proposed Action - Option 3A are similar. Above this level there are slight differences between the options. Option 4 consistently has larger vessel level impacts than the other options, except above the 80th percentile. Proposed Action - Option 3A has the broadest range of average adverse impacts; one interpretation is that this option has very different impacts on different vessels while within the other options the impacts are more similar across different groups of vessels.

Table 268 – Comparison of vessel level impacts of gross revenues for effort control options

	No Action		Option 2A		Proposed Action - Option 3A		Option 4	
Impact Category	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
No Adverse Impact	34	0%	69	-8%	58	-8%	16	-2%
Up to 20th Percentile	95	2%	88	2%	91	2%	99	3%
20th Percentile to Median	143	6%	132	8%	135	8%	148	13%
Median to 80th Percentile	142	10%	132	19%	135	15%	148	24%
Above 80th Percentile	95	13%	88	30%	90	36%	98	31%

Vessel level impact differences between options were also examined based on dependence on groundfish revenue (Table 269). Comparing the options reveals that for vessels that are the most dependent on groundfish (80% - 100%), the distribution of impacts for Option 4 tends to be skewed to higher levels: even those vessels in the lowest category of impacts average an 18 percent reduction in revenues. Option 4 also seems to have the largest impacts for those vessels that were the least dependent on groundfish revenues but differs only slightly from the Proposed

Action - Option 3A. Proposed Action - Option 3A shows that for those most dependent on groundfish and most affected average a 46 percent decline. Option 2A tends to have the least impacts for vessels in the middle dependence on groundfish groups.

Table 269 – Vessel level adverse revenue impacts based on dependence on groundfish revenues

Dependence Category	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		No Action		
0 to 19%	0.0%	1.0%	1.0%	2.0%
20 to 39%	2.0%	4.0%	4.0%	5.0%
40 to 59%	4.0%	5.0%	7.0%	8.0%
60 to 79%	7.0%	8.0%	9.0%	10.0%
80 to 100%	9.0%	11.0%	12.0%	14.0%
		Option 2A		
0 to 19%	0.0%	1.0%	2.0%	4.0%
20 to 39%	2.0%	5.0%	7.0%	11.0%
40 to 59%	2.0%	8.0%	12.0%	16.0%
60 to 79%	4.0%	11.0%	18.0%	23.0%
80 to 100%	8.0%	19.0%	27.0%	33.0%
		Option 3A		
0 to 19%	0.0%	1.0%	2.0%	6.0%
20 to 39%	2.0%	5.0%	9.0%	16.0%
40 to 59%	5.0%	10.0%	15.0%	22.0%
60 to 79%	6.0%	12.0%	21.0%	32.0%
80 to 100%	6.0%	11.0%	24.0%	46.0%
		Option 4		
0 to 19%	0.0%	1.0%	3.0%	6.0%
20 to 39%	6.0%	8.0%	10.0%	12.0%
40 to 59%	9.0%	13.0%	15.0%	18.0%
60 to 79%	14.0%	19.0%	22.0%	24.0%
80 to 100%	18.0%	26.0%	29.0%	32.0%

7.5.1.3.1.4 GOM Haddock Sink Gillnet Pilot Program

The Proposed Action, Option 2, is designed to facilitate targeting of GOM haddock by sink gillnet vessels. The M-S Act requires that any recovery benefits be allocated fairly and equitably among commercial, recreational, and charter fishing sectors in the fishery. Other measures proposed in this action facilitate the targeting or retention of haddock by commercial trawl and longline vessels, and by recreational (including party/charter) vessels. Amendment 13 adopted a 6.5 inch minimum size for both gears in the GOM, continuing a measure that was first adopted through a court order in May, 2002.

Sink gillnet vessels accounted for 15 percent of commercial landings for GOM haddock from CY 1997 – CY 2002, but only 11 percent from CY 2003 through CY 2007. This change in percentage is partly attributed to the increase in mesh size that was adopted in 2002 as a result of a court order, and then incorporated into Amendment 13 (implemented May 1, 2004). The current mesh size is ineffective for targeting haddock (see Figure 132). By reducing the mesh size in a carefully controlled pilot program, sink gillnet fishermen will have an improved ability to target this stock and share in recovery benefits. This opportunity would not exist under the No Action option and sink gillnet vessels would not be provided an opportunity to benefit from the recovery of haddock. Under No Action, sink gillnet vessels would not have increased access to GOM haddock and haddock revenues would be expected to be lower.

Option 2 will increase revenues for gillnet fishermen but they will also incur additional costs. They will be required to purchase 6 inch gillnets that can be used only in this program.

7.5.1.3.1.5 Haddock Minimum Size

Lowering the haddock minimum size under the Proposed Action (Option 2) would increase the number of haddock that would be allowed to be retained. Reducing the minimum size for haddock will allow the landing of some undersized fish and increase fisheries revenues. The gains from this measure will fluctuate as year class size changes. When a large year class enters the fishery, as was the case with the 2003 year class in 2007 and 2008, this measure will have more of an impact on revenues than when average or below average year classes recruit to the fishery. If selectivity in the fishery does not change, the major impact will be an increase in revenues as fish that would otherwise be discarded are retained. If this measure results in a change in selectivity that leads to harvesting more small fish because of an accompanying gear change or changes in targeting behavior, then the economic impacts are less clear. If this occurs, the increase in revenue caused by landing smaller fish will be offset by yield lost because those fish will not be harvested at older ages and sizes.

7.5.1.3.2 Recreational Management Measures

7.5.1.3.2.1 Provisions for Landing Fillets

Current regulations for groundfish do not require recreational vessels to land whole fish but do require that fillets be landed with skin-on. This requirement facilitates enforcement of bag and size limits for specific species. Landing skin-on fish allows for species identification. Having skin-on fish available for voluntary inspection by MRIP staff provides verifiable species identification. Data collected through the MRIP are used in stock assessments and are used in analytical models to assess management alternatives such as bag and/or size limits.

The Proposed Action (Option 2) would require some portion of the skin to be left on the fillet to facilitate species verification. Fillets must be taken from legal-sized fish. The economic impact of Option 2 is uncertain. As noted in the discussion of non-selected Option 1, economic theory predicts that the economic value of recreational fishing would be enhanced for people that prefer to land filleted fish. As was the case for Option 1, landing fillets without skin may result in some unknown increase in biological and/or management uncertainty the effects of which could lead to lower ACLs or ABCs. However, in relative terms, these uncertainties may be expected to be lower under Option 2. The requirement to leave some skin on would reduce management uncertainty since species identification would be verifiable which would enhance both enforcement of regulations and monitoring of groundfish landings. The degree of biological uncertainty would also be less since most private boat anglers may choose to land their fish whole which would make these fish available for voluntary biological sampling under the MRIP. Note that under current protocols MRIP staff conduct biological sampling on board party vessels so even if fish are filleted the opportunity would still exist to obtain length and weight measurements prior to being filleted.

7.5.1.3.2.2 Removal of the Limit on Hooks

Recreational anglers fishing for groundfish are currently limited to no more than two hooks per line. This alternative would eliminate the limit on hooks per line which may be expected to increase the probability of catching groundfish resulting in higher catch rates. Higher catch rates may also increase the probability of catching a legal sized fish as well as increasing the number of fish that may be kept. This alternative would increase the economic benefits derived from recreational fishing for groundfish. The alternative would also provide additional economic gains to fishermen that may be fishing for other species that may catch incidental numbers of groundfish while using multiple hooks. Without removing the limit on numbers of hooks per line these fish would have had to been discarded. The magnitude of these economic benefits is uncertain as economic studies of the relationship between improved catch rates and improved recreational fishing values have yet to be conducted.

The economic benefits of improved catch rates may be offset by changes in management measures should the catch exceed the ACL, triggering accountability measures. That is, higher catch rates may be expected to increase harvested groundfish but would also lead to an increase in the number of fish that are discarded and subjected to potential discard mortality. Thus the economic gains from removing the limit on number of hooks per line would need to be weighed against the likelihood that an accountability measure may be triggered and the nature of the accountability measure itself.

7.5.1.3.2.3 Measures to Reduce Mortality

The Proposed Action changes current regulations for GOM cod and for GOM haddock. The regulations needed are dependent on the mortality targets for the amendment and the years chosen for the commercial/recreational allocation. Since the years 2001-2006 are used for the commercial/recreational allocation, and the SSC's recommended ABC control rule was adopted, the size limit for GOM haddock can be lowered to 18-inches and there is a fifteen-day change in the season for GOM cod.

Impacts on anglers are measured by the loss in economic surplus associated with being unable to engage in their preferred recreational fishing activity. Economic surplus is measured by the difference between what anglers would be willing and able to pay to engage in a recreational fishing activity and what they actually pay for that activity. Since recreational fishing is not a market-based good the economic surplus is not revealed through market transactions and must be inferred using non-market valuation techniques which require specialized studies including primary data collection. Such studies are not available for groundfish at this time so it is not possible to provide a quantitative estimate of the potential economic impacts on recreational anglers. Nevertheless, since economic value in the recreational groundfish fishery may be presumed to be primarily related to the expected number of fish that may be kept, a qualitative analysis may provide some information about the potential ordinal ranking among the recreational alternatives.

Since the 2001-2006 years for establishing a recreational/commercial allocation were selected, the recreational fishing value would be expected to increase for GOM haddock but may decline for GOM cod because the season is shorter.

7.5.1.3.3 Atlantic Halibut Minimum Size

The Proposed Action (Option 2) increases the minimum size for landing Atlantic halibut for both commercial and recreational vessels. For commercial vessels an increase in the minimum size is likely to result in a loss in revenue. This loss may prove temporary as some fish discarded due to the increased minimum size will survive and be harvested at a later date. The loss in revenue is likely to be a fraction of the recent revenues since some landings are above the proposed minimum size and some sub-legal landings are likely to continue.

The Proposed Action would increase the minimum size for Atlantic halibut to 41-inches. Recreational catches of Atlantic halibut are uncertain. The MRIP provides an estimate of recreational catch in only calendar year 2006 and that estimate has a very large standard error. According to available party/charter logbook data on all trips taken during CY 2000 to 2007, there were no more than a total of 2 Atlantic halibut that were retained in any year. The size of these fish is not known. These data indicate that recreational fishing encounter rates of Atlantic halibut are very low and the size distribution of the few fish that have been documented is not known. Even if the size distribution were known, given the infrequent harvest of Atlantic halibut the economic impact of raising the size limit to 41-inches is unlikely to have any measureable effect on either the angler value of recreational fishing or the demand for party/charter trips when compared to No Action. Therefore, the change in Atlantic halibut size limit may be expected to have negligible, if any, economic impacts on the recreational groundfish fishery.

7.5.1.3.4 Prohibition on Retention of Atlantic Wolffish

The Proposed Action (Option 2) prohibits retention of Atlantic wolffish in the commercial and recreational fisheries. This measure will reduce revenues for the commercial fishery. Given recent landings trends, this measure will reduce revenues by roughly $100,000 to $150,000 per calendar year for the duration of the prohibition. These lost revenues will not be replaced in the near future unless the stock rebuilds rapidly, which is not expected.

The proposed measure would also prohibit retention of Atlantic wolffish by recreational anglers. For this reason a prohibition would result in some reduction in economic value to recreational groundfish anglers although the magnitude of this reduction is uncertain. While the economic value for anglers that may target wolffish may be expected to be negative, these trips represent such a small proportion of total angler trips that the magnitude of total economic impact is likely to be small.

Although available data indicate that the number of recreational anglers that prefer to target wolffish is comparatively small, these anglers were associated with the party/charter mode. The strength of these preferences is not known but if being able to keep wolffish is important enough they may choose not to take a party/charter trip. During CY2001-2007 the number of party/charter trips that kept wolffish on at least one trip averaged about 1,100 trips. On average these trips retained 3 wolffish per trip and were kept at a rate of approximately one wolffish retained for every 34 groundfish (predominately cod and haddock) kept. These data suggest that wolffish are likely to be an incidental catch while on a groundfish trip and while some loss in economic value to party/charter anglers may be expected when compared to No Action, this loss may be unlikely to appreciably affect the demand for party/charter trips.

7.5.1.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

This action is considering modifications to the two existing sectors and implementation of seventeen additional sectors. Determining the economic impacts of these changes is difficult. Sectors were introduced to this fishery by Amendment 13 in FY 2004 as a mitigation measures for the expected impacts of the changes to the effort control system. It is widely recognized that the effort controls are blunt tools that can have impacts that are distributed differently across the fishery. For example, planned reductions in the GB cod trip limit that were considered in Amendment 13 were predicted to have more impacts on longline vessels than vessels using other gear because cod was the majority of their catch and longline vessels have relatively high trip costs because of the gear and bait used. The sector program provided an opportunity for longline vessels to fish without being subject to the low trip limit. It was also expected that with the ability to receive exemptions from some elements of the effort control program, sector vessels would be able to operate more efficiently and would be more profitable.

Amendment 13 authorized one sector in FY 2004, and FW 42 authorized a second sector that began full operations in FY 2007. Section 6.2.4 provides an overview of their performance. While informative, it is difficult to translate these experiences into predictions of the expected impacts of the proposed new sectors for several reasons. The two existing sectors are relatively homogenous. They primarily use fixed gear, consist of vessels that are roughly the same size, are homeported and land their catch in a defined geographic area, and both sectors include a number of participants active in an industry organization. While some of the proposed sectors are also geographically defined and consist of vessels that are of similar size and use similar gear, others include members from a number of ports, plan to use several gear types, and consist of vessels of varying sizes. For these reasons caution should be exercised before extending the experiences of the two existing sectors to the proposed new sectors. In addition, this action is considering many changes to the administration of sectors that could affect their economic performance in ways that are very different than the experiences of the past five years. Additional reporting and monitoring requirements and additional administrative requirements will impose additional costs on sectors that were, for the most part, not incurred by the two existing sectors.

Another difficulty with predicting the economic impacts of sectors is that the vessels that will participate in sectors is uncertain and will not be determined until after the amendment is submitted for review and approval by NMFS. Initial indications are that over 600 permits may be enrolled in sectors, and the potential sector contribution of those permits could approach nearly 80 percent of the ACL (see section 7.5.1.2.3.2.9). If this occurs, sectors will be the driving force for the economic performance of the fishery, for good or ill. But if the number of vessels/permits that actually commit to sectors is substantially less than this number, sectors may be a minor component of the fishery as has been the case the last few years. Finally, the economic impacts of sectors will depend on the specific operating rules within individual sectors. These will be identified in sector operations plans that are still in development.

With these caveats in mind, broad themes can be identified that are likely to result from the implementation of additional sectors. Because sectors automatically receive exemptions from specific effort control measures, and can request exemptions from other measures, sector vessels should be able to operate in a more efficient manner than vessels that fish outside of sectors that are subject to the complete effort control program. The performance of the Fixed Gear Sector may be an example of these improved efficiencies: freed from trip limit and gillnet net restrictions, they harvested more cod in FY 2007 than in the previous year. For example, as described in section 7.2.1.3.5, trawl vessels in sectors are likely to increase catch rates and fish fewer days, reducing trip costs and increasing profitability. This may also allow these vessels more opportunities to fish in other fisheries since they will likely spend less time fishing for groundfish. It may also allow sectors to operate in ways that allow members to fish more selectively and harvest a higher proportion of the ACE than would be the case if fishing under effort controls.

Counter-acting the increased revenues per trip will be increased reporting and monitoring costs. Estimates of these costs range vary depending on the exact requirements and fishing activity, but could be in the range of $13,500 - $27,000 per vessel per year (see section 7.5.1.2.4). This is large enough that it is a legitimate question whether sector vessels will be able to operate efficiently enough to cover these additional costs. Administrative costs must also be addressed. It is possible that external funding through grants or other sources may help fund these costs. For FY 2010, NMFS has announced it will fund sector monitoring costs and may assist with other administrative costs. While this may reduce costs in FY 2010, it is unclear whether this external funding will continue into the future.

If sector membership is similar to initial indications, then communities and states that are likely to benefit from new sectors can be identified. Twelve of the nineteen sectors that are proposed are affiliated with Massachusetts ports. Three sectors are primarily located on Cape Cod or the islands of Nantucket and Martha's Vineyard; three are associated with New Bedford, three with Gloucester, two with the Boston south shore area, and one with Boston. One sector is associated with the Port Clyde, Maine area, two are proposed from Rhode Island, and two from the New Hampshire coast. Two sectors have a wider geographic membership and are not as clearly affiliated with specific ports or states. There are no sectors proposed that appear closely linked to the states of Connecticut, New York, or New Jersey. While it is likely that some vessels that claim these states as homeport will join other sectors it does not appear the impacts of sectors will be as large for these states.

The economic benefits of sector formation also depend on ACE allocations. Several sectors propose to operate in the SNE or Great South Channel areas. These areas coincide with the stock area for SNE/MA winter flounder. The Council has targeted fishing mortality for this stock to be as close to 0 as possible. Landings are prohibited from this stock and there may not be an ACL for this stock. If this occurs, it creates a problem for sectors that wish to operate in the SNE/MA winter flounder stock area. Sectors cannot operate in a stock area if they do not have ACE for that stock (see section 5.2.3.3) unless they can describe in their operations plan the fishing techniques that will be used to avoid catching the stock. It will be difficult for sectors using trawl, and perhaps gillnet gear, to identify fishing techniques that can be used in the SNE/MA stock area without catching SNE/MA winter flounder – particularly if the vessels intend to target yellowtail flounder. For this reason, the Pt. Judith sectors, and the New Bedford SNE and New Bedford Channel sectors may receive limited economic benefits from implementation. Joining sectors may actually limit opportunities for vessels that fish in these areas.

7.5.1.3.6 Accountability Measures

The Proposed Action implements several types of AMs for the commercial and recreational components of the fishery. In addition, there are elements of the sector administration measures that are AMs; the impacts of these measures are indistinguishable from the general sector impacts and will not be discussed further on this section.

Over the long-term the implementation of effective AMs would be expected to contribute to rebuilding of groundfish stocks as biological objectives are achieved. This would be expected to increase the revenues for the commercial fishery and the recreational harvest as fishermen benefit from stock rebuilding. Specific AMs could have different economic impacts.

7.5.1.3.6.1 Common Pool Accountability Measures Alternative 2 – Differential DAS

For FY 2010 and FY 2011, this measure adjusts DAS counting based on whether ACLs are exceeded or not. The adjustment occurs in the year after catch is compared to the ACL. Adjustments are applied to a stock area rather than the fishery as a whole, and are based on the maximum overage of an ACL for stocks in the area. The mixed stock exception will be considered when determining the differential DAS adjustment. While AMs are usually considered solely in the context of overages of the ACL, this particular AM allows for the possibility that catches will fall short of the ACLs and allows for an increase in fishing effort as a result.

The economic impacts of this AM are difficult to predict. Generally, increasing the differential DAS rate throughout the fishery as a result of an ACL overage would reduce the number of DAS available to the fishery and make it more difficult for groundfish fishing vessels to recover fixed costs. If the differential DAS rate is reduced because catches are below ACLs for all stocks, the opposite occurs: more DAS become available and revenues and profits would be expected to increase. These broad impacts may not actually occur, however, as the measure is constructed so that it is possible differential DAS adjustments may occur in specific stock areas rather than throughout the fishery as a whole. Changes in differential DAS counting in one area and not another may result in effort shifts that not only modify the expected biological impacts of the measure but could alter the economic impacts. Increased fishing that results from changes in differential DAS counting might depress prices and reduce revenues. The only way to analyze these impacts would be to run the CAM for an infinite number of possible differential DAS changes, clearly an impossible task.

One advantage to this approach is that because it does not make in-season changes to management measures it helps facilitate business planning by fishermen. The measure is designed so that the differential DAS changes are expected to be announced prior to or at the start of a fishing year, which will allow fishermen at least some opportunity to plan activity for the year. This should minimize any race to fish that might result from in-season adjustments. A disadvantage is that adjusting DAS counting is, like many effort controls, a blunt instrument that cannot effectively target particular problem stocks. It is possible that an adjustment will be triggered by an ACL overage for a minor stock; this will reduce yields for all stocks caught in the area, even those that are healthy. Fishermen that may not even catch a stock may have DAS reduced for an overage that they did not contribute to. For example, an overage of a flounder stock will reduce fishing effort for longline gear that has little or no interaction with the stock.

This option also proposes that if an ACL is exceeded an analysis will be done to determine if the mixed stock exception is applicable and if so it will be applied. While not stated, the implication is that there may be instances where a differential DAS adjustment is not made or a smaller increase in DAS counting is made because overfishing is allowed to occur on a stock or stocks.

The justification for this provision is that it provides some flexibility to maximize overall yield from the fishery rather than hold the fishery hostage to the weakest stock. If invoked, this provision would be expected to increase revenues for non-sector vessels. Given recent changes to the NSGs which prohibit using this exception if a stock is overfished, it is likely rare that this provision will be invoked in the near future for groundfish stocks.

If non-sector vessels are allowed to exceed the ACL with reduced consequences this could have implications for sector participants and the recreational fishery. Sector catches are bound by the ACE allocated to the sector; if there is an overage remaining after any transfers of ACE between sectors, the sector is held accountable for the overage and must pay back the overage in the year immediately following. There are no provisions for sectors to invoke the mixed stock exception and reduce or eliminate the payback provision, as is being proposed for non-sector vessels. There is no provision for recreational fishing vessels to be exempt from an AM because of the mixed stock exception. Not only does this raise an equity concern, but it could create incentives for non-sector fishing vessels to be less concerned about remaining within the ACL. Over the long-term, if overfishing is allowed to continue by non-sector vessels it is possible that stock size will be smaller than if overfishing was ended and as a result the ACL will be smaller, reducing the ACE available to sector participants and the recreational fishery. This provision also seems to conflict with the ACL concept that to the extent possible an overage by one component should not affect the ACL available for other components.

7.5.1.3.6.2 Common Pool Accountability Measure Alternative 1 – Hard TAC

Beginning in FY 2012, this alternative overlays a hard TAC AM system over the effort controls for those vessels that do not choose to join sectors. The hard TAC system proposed is similar to one considered in Amendment 13. The ACL for each groundfish stock is distributed across trimesters. When approached, groundfish fishing is ended in much of the stock area with gear that catches that stock.

The ACL is not allocated to each individual vessel and in many respects can be considered a global TAC. Potential adverse economic impacts of global TAC systems have been well documented. Morgan (1997) summarized findings from several other studies and concluded that these systems often “produce excess capacity, poor stock conservation, and reduced profitability.” He identified the following reasons for these results:

- Increased competition among operators
- Difficulties of enforcement of the TACs, particularly in multispecies fisheries and if the management system is designed without consideration of harvesting practices
- Inappropriate TACs, a broad reason that includes adopting TACs in fisheries where they are not appropriate, setting TACs with inadequate data, political manipulation of proposed TACs, and lack of structure in recommended TACs.
- Inappropriate institutional arrangements that do not include industry support for management arrangements.

Of these four reasons, the two that are most likely to be applicable to this fishery are the first two. The increased competition between operators can result in a race to fish as individual fishermen attempt to catch as much of the TAC as possible before fishing is prohibited for a particular stock. This leads to the dissipation of profits, development of excess capacity in the fishery, and fluctuations in supply.

There are elements of the management plan that may slow this response, but they are unlikely to eliminate it. For example, the effort control systems proposed limit total effort (DAS) available to individual vessels, incorporate trip limit that limit what can be landed on each individual trip, and adopt closures that limit fishing opportunities in some of the time and places that catch rates are expected to be high. This might help slow the race to fish. The hard TAC system also includes some attempts to reduce the incentive for this activity. By splitting the TAC into three trimesters, fisherman are certain of at least a limited opportunity to fish over the course of the year and do not need to be as concerned that if they don't fish as hard as possible at the beginning of the year they will lose all opportunities. While it is often said that dividing the TAC into periods just creates multiple races to fish rather than just one, there may be some benefit in doing so to extend availability of fish to fishermen and the market.

The second reason that may apply is difficulty in enforcing the TACs. The possibility that a TAC may be approached and result in closing the fishery can lead to discarding and illegal unreported landings of catch. The AM proposed attempts to address these concerns by increasing the reporting and monitoring requirements. All landings must be witnessed through a weighmaster system in this option.

While there is no guarantee that TACs in this AM will be set at appropriate levels there are mechanisms in place that should prevent some of the problems in setting appropriate TACs that were identified by Morgan (1997). Recent M-S Act changes require that ACLs cannot be set higher than the ABC recommendation of the Council's SSC. This makes it unlikely that they will be set contrary to scientific advice, though it is possible that the TACs may be exceeded if they are not adequately monitored. It is not clear if there is industry support for this AM and that could lead to the problems cited by Morgan.

Stefansson and Rosenberg (2005), on the other hand, conducted a simulation study of the effectiveness of quota systems, effort control systems, and MPAs when used independently and when used in concert. Their study also considered how well these systems would work in the face of uncertainty. While the study focused on a theoretical single-species fishery, their conclusion was that there are clear economic benefits to combining systems to rebuild stocks. The economic benefits are a result of a greater likelihood of long-term sustainability. This is in essence what the effort control measures (which include both effort limits and closures that have some of the characteristics of MPAs) and this AM would do. This study did not explicitly model behavioral changes (such as the race to fish) that can result from the imposition of quotas.

One of the very practical economic impacts of this AM is that it creates additional uncertainty for fishermen attempting to develop a business plan. Fishermen will have difficulty evaluating if or when an area may be closed to groundfish fishing, particularly in the first year of implementation. The closures may disrupt the market and result in fluctuating prices. This system also imposes additional costs on common pool fishermen as they are responsible for dockside monitoring costs. Unlike sectors, they remain subject to the inefficiencies of the effort control system and thus are limited in their ability to modify behavior to increase profits and absorb the increased reporting costs.

This proposed AM also imposes a significant administrative burden on NMFS. There is the potential that trimester TACs will need to be monitored for all twenty groundfish stocks, though initially TACs will not be monitored for stocks that cannot be landed. Monitoring the TACs and announcing openings and closures of the fishery creates an extensive burden that is in addition to the considerable burden of monitoring the effort control system and sectors. This system may also increase the need for enforcement resources to prevent illegal or unreported landings.

7.5.1.3.6.3 Recreational Fishery Accountability Measures

The Proposed Action (Option 3) is a compromise between the other two alternatives to No Action that were considered. Recreational harvest is reviewed and potential AMs are selected from changes in season, bag limits, or minimize size limits. NMFS selects the AM after consultation with the Council. It is probable that AMs adopted in this option can be announced by January. NMFS can review harvest and select appropriate AMs without waiting for a Council recommendation, and can meet the consultation requirement without delaying the regulatory process needed to comply with the APA.

The imposition of AMs will have economic impacts on the recreational fishery. Changes in bag limits and minimum sizes will typically reduce the catch that can be landed. With respect to the party/charter fishery, groundfish fishing is primarily a meat fishery and customers may value a trip based on the potential landings rather than the likely landings. Large minimum sizes or low bag limits reduce the potential landings and devalue the trip. In a similar way, changes in season may deter customers from fishing if the perception is that the seasons with the best fishing opportunities are not available. There is however evidence that changes in regulations for one species can be compensated by increased targeting of a different species. As reported in section 6.2.5, there is evidence that regulatory restrictions on GOM cod resulted in increased targeting of GOM haddock. FW 42 adopted additional restrictions for GOM cod in FY 2006. While GOM cod harvested in 2006 was only 43 percent of the cod harvested in 2005, the number of party/charter trips declined by only 5.4 percent and the number of passengers declined by only 10 percent from recent averages. Catches of GOM cod in 2007 rebounded to 72 percent of the catch in 2005 and harvest increased to 53 percent. During the same two year period, the catch and harvest of GOM haddock changes about 10.5 percent, similar to the change in number of passengers.

7.5.2 Economic Impacts of Alternatives to the Proposed Action

7.5.2.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

7.5.2.1.1 Revised Status Determination Criteria

Option 1, the No Action alternative, is not expected to have any economic impacts. The No Action MSY values, however, do not represent use of the best available science and may not be sustainable.

7.5.2.1.2 ABC Control Rules

The No Action alternative would keep the Amendment 13 MSY control rules in effect. When compared to the Proposed Action, these control rules allow for a more explicit consideration of stock status. If a stock is I good condition and might rebuild at fishing mortality rate between $75F_{MSY}$ and F_{MSY}, these control rules would allow the use of that level as the basis for the ABC.

In these situations – which admittedly are rare with current groundfish stock status – the No Action alternative would potentially allow a higher ABC catch levels. This could produce larger economic benefits than the Proposed Action in these specific circumstances. But the increased risk of such an approach may lead to more variable catches, and the lack of consistency may outweigh any short-term economic gains.

7.5.2.1.3 Revised Mortality Targets for Formal Rebuilding Programs

Under Option 1, the fishing mortality targets used to guide development of management measures would not be revised as necessary to rebuild groundfish stocks. For some stocks the original Amendment 13 mortality targets are higher than the proposed revisions. Using these targets would produce higher landing streams in the short-term but at the expense of successful rebuilding programs. Future stock size would be less likely to increase to the levels associated with the revised mortality targets, sacrificing long-term yield. There are other stocks, however, where the revised targets are higher than the Amendment 13 targets and No Action would sacrifice available yield. In general, over the long-term it would be expected that the No Action alternative would lead to lower landing streams.

7.5.2.2 Fishery Program Administration

7.5.2.2.1 Annual Catch Limits

Option 1 (the No Action alternative) would not adopt ACLs. While this would result in lower administrative costs than under Option 2, it could increase the risk that mortality targets would not be achieved. This could lead to a less sustainable fishery and a failure to rebuild stocks. If this were to occur, over the long-term No Action would be expected to result in reduced yields and revenues from the fishery.

7.5.2.2.2 Addition of Atlantic Wolffish to the Management Unit

Option 1 (No Action) would not add Atlantic wolffish to the management unit. This is primarily an administrative decision and is not expected to have economic impacts.

7.5.2.2.3 Sector Administration Provisions

7.5.2.2.3.1 Sector Formation, Operations Plans, and Annual Reports

It is not clear how the No Action alternative (Option 1) and the Proposed Action revisions to sector formation requirements (Option 2) differ in economic impacts. Presumably the additional requirements imposed by Option 2 will lead to an incremental increase in costs but the magnitude of the difference cannot be determined. These costs will only be incurred by groups of vessels that choose to operate as a sector; presumably they will only choose to do so if sector benefits outweigh sector costs.

Option 1 (No Action) would not allow a permit in the CPH category to join a sector. For these permits to be eligible to join a sector, they must be taken out of this category and placed on a vessel. This incurs costs for the permit owner even if the permit is placed on a skiff. These costs are higher than under the Proposed Action.

7.5.2.2.3.2 Allocation of Resources

7.5.2.2.3.2.1 General

The No Action alternative maintains the Amendment 13 guidance on allocation of resources to sectors. Sectors would be able to request an allocation of either a hard TAC or a DAS allocation. This would increase the flexibility for fishermen forming a sector. Landings history for the allocation of a TAC would be based on a rolling five-year period, which would allow the future formation of sectors by vessels that may not have landings history for a stock or stock in the past. Sectors were limited to twenty percent of a stock's TAC, limiting the size of sectors. This could increase costs for sector proponents, as efficiencies of scale are limited.

7.5.2.2.3.2.2 Guidance on Sector Overages

The No Action option does not provide any guidance on how sector overages are addressed if a vessel leaves a sector, or a sector disbands, after n overage of ACE occurs. Failure to address this issue could reduce the effectiveness of sectors and could impose additional costs on those permit holders that choose to remain in the sector. It could lead to irresponsible permit holders ignoring sector limits on catch and then exiting the sector after an overage.

7.5.2.2.3.2.3 U.S./Canada Area

In the U.S./Canada area, fishing for EGB cod and haddock and GB yellowtail flounder is limited by a hard TAC for all vessels. AMs are triggered when the TAC of these stocks is caught, including closure of the eastern U.S./Canada area. With the expectation that additional sectors may be implemented in FY 2010, a concern was raised that fishing by common pool or sector vessels could affect the other component of the fishery.

Under the No Action alternative, separate allocations of U.S/Canada stocks are not made to sectors. All catches by any vessel are applied to the U.S./Canada TAC. There is an explicit risk that this will lead to a race to fish in this area. Since sectors are not subject to trip limits or several other effort controls, sector vessels could rapidly catch the TAC in the area and preclude fishing in the area by non-sector vessels. Alternatively, sectors would be unable to plan their operations to maximize returns from their TACs because of the risk that delaying fishing until later in the year might allow non-sector vessels to harvest the entire TAC in this area.

7.5.2.2.3.2.4 Sector Baseline Calculations

This section analyzes the impacts of the different options for establishing PSC for each permit.

7.5.2.2.3.2.5 Analysis of PSC Options for "Capacity" Factor

Three of the options to No Action for determining potential sector contributions (PSCs) included a factor that has been described as a "capacity" factor. This analysis examines whether the "capacity" components of the potential sector contribution options show a systematic relationship to output. The dependent variable (output measure) was the VTR-reported kept pounds of regulated groundfish. Independent variables used were length, horsepower, gross tonnage, and days absent (DA), calculated from the VTR and not the DAS database). Models were constructed for the three primary gear types: trawl, gillnet, and longline, and for FY 2001 through 2006.

The data were analyzed for their fit to two models: a linear model and a Cobb-Douglas production function. In each case, stepwise regression procedures were followed to fit the model. Parameters were included if they contributed significantly to the predictive power of the model.

The attached tables summarize the model results, showing the factors that were significant in each model and the contribution to R^2. In all models, DA (days absent) was significant and contributed most to the predictive power of the models. For otter trawl gear, length and horsepower were usually significant but contributed little to the model's predictive power. Tonnage was also significant in the linear model but again added little to the model's predictive power. For gillnet and longline gear, almost all the predictive power of the model is related to days absent. While length, horsepower, and tonnage were significant in some years, these factors contributed little to improving the predictive power of the model.

To summarize, for the factors considered, the results suggest that days absent provides most of the predictive power in determining the output of regulated groundfish for a groundfish permit. Vessel characteristics provide little to explaining output even in those cases where the parameters are statistically significant. This suggests that PSC Option 4 likely has the closest relationship to potential output for those options that include a "capacity" factor.

The No Action option does not include a "capacity" factor.

Table 270 - Stepwise Order for Cobb-Douglas Model

Trawl	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY2006
DAS	1	1	1	1	1	1
Length	2	3	3			
Horsepower		2	2	2	2	2
Tonnage						
Gillnet						
DAS	1	1	1	1	1	1
Length		2		2	2	2
Horsepower						
Tonnage						
Long Line						
DAS	1	1	1	1	1	1
Length		4	2	2	2	2
Horsepower		3	3	3	3	3
Tonnage		2				

Table 271 - Stepwise Order for Linear Model

Trawl	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY2006
DAS	1	1	1	1	1	1
Length		4	4			
Horsepower	3	2	2	2	2	2
Tonnage	2	3	3	3		3
Gillnet						
DAS	1	1	1	1	1	1
Length						
Horsepower						
Tonnage						2
Long Line						
DAS	1	1	1	1	1	1
Length			2			3
Horsepower	2	3	3	3	3	2
Tonnage		2		2	2	

Table 272 - Stepwise Marginal Contribution to R-Square for Cobb-Douglas Model

Trawl	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY2006
DAS	0.8226	0.8766	0.8128	0.8335	0.82	0.8634
Length	0.0245	0.002	0.0026			
Horsepower		0.0131	0.0255	0.0097	0.007	0.0143
Tonnage						
Gillnet						
DAS	0.7791	0.7826	0.797	0.8184	0.8438	0.7586
Length		0.007		0.0032	0.0025	0.0033
Horsepower						
Tonnage						
Long Line						
DAS	0.6315	0.7208	0.5701	0.6116	0.7607	0.7637
Length		0.014	0.0516	0.0126	0.0101	0.0084
Horsepower		0.0132	0.0521	0.0273	0.0289	0.0128
Tonnage		0.014				

Table 273 - Stepwise Marginal Contribution to R-Square for Linear Model

Trawl	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY2006
DAS	0.6837	0.702	0.6763	0.7505	0.759	0.6926
Length		0.0023	0.0029			
Horsepower	0.0058	0.0484	0.0585	0.0448	0.0296	0.0231
Tonnage	0.0552	0.0058	0.0081	0.0018		0.0034
Gillnet						
DAS	0.6366	0.6994	0.7768	0.8033	0.7347	0.6385
Length						
Horsepower						
Tonnage						0.0076
Long Line						
DAS	0.6937	0.6107	0.363	0.5717	0.6301	0.7077
Length			0.0527			0.0269
Horsepower	0.0139	0.0175	0.0824	0.0449	0.025	0.009
Tonnage		0.0132		0.0521	0.0088	

7.5.2.2.3.2.6 Economic Impacts of Sector Share Allocations

The analysis of the economic impacts of sector share allocations included an extensive comparison of the stock-specific allocations that result from each alternative. The information is presented in an extensive series of tables. In order to facilitate review of those tables by the reader, rather than relocate the tables that describe the impacts of the non-selected alternatives to this section, all tables were retained in one location. Please see sections 7.5.1.2.3.2.4 through 7.5.1.2.3.3 for a discussion of the economic impacts of the non-selected alternatives (including the No Action alternative).

7.5.2.2.3.3 Monitoring and Enforcement

7.5.2.2.3.3.1 Enforcement

This measure considered, but did not adopt, two alternatives to the Proposed Action.

Under No Action, no changes are made to existing sector enforcement provisions. Current regulations suggest a sector is responsible for a violation of any federal regulation by any sector member. This creates a liability for every permit holder in the sector that is uncontrollable. This liability has been raised as a concern by banks funding boat owners and if allowed to continue could inhibit sector formation.

Option 1 makes it clear that sector members are responsible only for violation of sector related regulations and sector operations plan requirements. As compared to No Action, this limits the liability of sector members. Compared to the Proposed Action, sectors members would remain jointly liable to a broader range of offenses, increasing enforcement risks for permits that join sectors.

7.5.2.2.3.3.2 Sector Monitoring Requirements

The No Action option has limited guidance on specific monitoring requirements. This option imposes fewer requirements and thus fewer costs on sectors, but at the expense of accurate catch monitoring.

7.5.2.2.3.4 Transfer of ACE

The only alternative to the Proposed Action that was considered was the No Action option (Option 1).

Under Option 1, ACE cannot be transferred and unused ACE cannot be carried into future time periods. This is the No Action option for this measure. There are two key impacts if this is adopted. First, the inability for sectors to carry forward any portion of unused ACE into a future time period means that sectors will lose yield (landings and revenue) for any stock that they are unable to harvest the complete ACE in the year assigned. An unwillingness to lose this revenue may lead to sector management decisions to be certain to harvest all ACE prior to the end of the fishing year. Depending on the sector’s confidence in controlling catch rates, this time buffer may be long enough that the sector loses opportunities that may yield higher returns to the sector. Another way a sector could lose ACE is if poor weather interferes with planned catches. A second possible impact is that the inability to transfer ACE – or to acquire ACE in a transfer – means that portions of the ACE could be unused. This could occur in several ways. Depending on the PSC allocation method selected, a sector could receive ACE that it cannot fish. For example, a sector operating strictly in the Gulf of Maine might receive ACE for SNE/MA species. Second, it is possible that a miscalculation of catch rates for one stock could lead to a premature closure of the sector’s fishery that cannot be rectified by acquiring ACE from another sector.

7.5.2.2.3.5 Sector Participation in Special Management Programs

The No Action alternative to the Proposed Action would leave it uncertain what rules apply to sectors, and as a result presumably general rules will have to be followed. These impose effort restrictions on sector operations in these programs, reducing efficient and the benefits expected to accrue from sectors.

7.5.2.2.4 Reporting Requirements

The No Action alternative would not require daily reporting of any vessel that declares into more than one of four designated areas on a given trip. Filing such reports via VMS incurs costs to the vessel owner that would not be incurred under the No Action alternative. Depending on the specific VMS vendor and contract used by the vessel, these additional costs may or may not be included in the service package. Per character costs are on the order of $0.04 for each character submitted.

7.5.2.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

Taking no action would not make any allocation of groundfish between the recreational and the commercial groundfish fishery. This means that both user groups would be subject to a combined ACL and an AM would not be triggered unless the estimated combined catch exceeds the ACL. Under the current effort control program adjustments to meet conservation objectives have typically required a proportional reduction in all sources of fishing mortality. This process does not necessarily consider whether the need for adjustment was triggered by a change in recreational or commercial catches.

7.5.2.2.6 Changes to the DAS Transfer and DAS Leasing Programs

The No Action alternative would not eliminate the DAS tax of the transfer program. This would result in less consolidation of permits (when compared to the Proposed Action), since few permits have used this program since it was adopted. The No Action alternative also would not have allowed permits in the CPH category to participate in the leasing program. This would increase costs by reducing the DAS available for the leasing program. In addition, permit holders would have to activate their permit by placing it on a vessel before leasing DAS, reducing the profit earned from leasing DAS.

The No Action alternative would not remove the DAS leasing cap. It is likely that compared to the Proposed Action this would result in increased costs for fishing business owners as they may choose to operate two vessels to fish a given number of DAS that could be fished on one vessel if not for the leasing cap.

Other alternatives that were not adopted included adopting a tax on DAS leasing that is equal to the tax on permit transfers. Assuming that the tax on transfers was not zero, this alternative would increase costs to permit owners when compared to No Action. Since a tax would reduce the number of useable DAS acquired in a transaction, permit owners would have to lease more DAS to acquire a given number of DAS that can be actually used. The Council also considered removing the tax on DAS transfers for a fixed period. This would also increase costs when compared to the Proposed Action, since the tax would not be permanently removed. In addition, it could distort the market for permit transfers. Sellers of permits would know that buyers were faced with a fixed period in which to execute a transfer, and so might attempt to negotiate a higher price during the window of opportunity.

7.5.2.2.7 Special Management Programs

7.5.2.2.7.1 Closed Area I Hook Gear Haddock SAP Revisions

The No Action option does not extend the CAI Hook Gear Haddock SAP in time or space. In recent years only a fraction of the haddock available to this SAP has been harvested. This is not likely to change under the No Action alternative, and compared to the Proposed Action, yield would be sacrificed. The No Action alternative would minimize the risk of conflicts between sector and non-sector vessels, since it would continue the practice of allowing each group access to the area at a different time.

7.5.2.2.7.2 Eastern U.S./Canada Haddock SAP

Under the No Action alternative, this SAP would be allowed to expire and opportunities to target haddock in this SAP would be lost.

7.5.2.2.7.3 Closed Area II Yellowtail Flounder SAP Revisions

Under the No Action alternative, this SAP would continue to be open only in the years when GB yellowtail flounder abundance is high enough to support the SAP. When compared to the Proposed Action, there would be fewer opportunities to target haddock.

7.5.2.2.7.4 SNE/MA Winter Flounder SAP

Amendment 13 adopted a SAP for SNE/MA winter flounder that allowed landing up to 200 pounds of winter flounder without using a DAS. The No Action alternative would allow this practice to continue. Fishing revenues would be slightly higher (on the order of $150,000 - $200,000; see section 7.5.1.2.7.4) when compared to the Proposed Action.

7.5.2.2.7.5 Category B DAS (Regular) Program

Of the No Action alternative were selected, fishing revenues may be higher than under the Proposed Action. This is because vessels could continue to use the Category B (regular) DAS Program to target pollock, which has become an important component of this program (see section 6.2.3.5).

7.5.2.2.8 Periodic Adjustment Process

The changes proposed in this measure are administrative in nature and are not expected to have any economic impacts when compared to the No Action alternative.

7.5.2.2.9 Simultaneous Possession of a Limited Access Multispecies and Scallop Permit

The No Action option continues the current restriction that prevents a vessel from holding a limited access permit in the multispecies and scallop fisheries unless the vessel qualifies for a multispecies combination permit. This provision restricts the flexibility of vessels to participate in more than one fishery and prevents the consolidation of fishing opportunities for two fisheries onto one vessel. As a result, there is less effective use of capital assets than would occur if the restriction were lifted.

7.5.2.2.10 Catch History

Under the No Action alternative, catch history would continue to accrue to the vessel or component that landed the catch. As discussed in section 7.5.1.2.10 this could inhibit use of the ACE transfer provisions, reducing the efficiency of sectors and increasing costs.

7.5.2.3 Measures to Meet Mortality Objectives

7.5.2.3.1 Commercial Fishery Management Measures

7.5.2.3.1.1 Economic Impacts of No Action

Taking No Action would leave all current management measures including the 2:1 differential DAS areas in the Gulf of Maine and Southern New England as well as adding the default 18% reduction in allocated Category A DAS prescribed by Amendment 13.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY 2005 to FY 2007 and average total revenue was $158 million. Under no action the estimated groundfish trip revenue would decline by 12.1% to $89 million and total fishing revenue would decline by 7.7% to $145 million (Table 274). The relative reduction in groundfish trip revenue varied little by home port state ranging from 10.3% to 12.8%. However, the change in total trip revenue varied among home port states primarily based on the relative contribution of groundfish trip revenue to total revenue. This is why trip revenue declined by approximately 10% in Maine, New Hampshire, and Massachusetts, but declined by no more than 6% in any other state.

In general, the estimated impacts are lower than what may have been expected given an 18% reduction in A DAS. However, even though Amendment 13 significantly reduced latent effort in the groundfish fishery latent effort was not eliminated. For example, in both FY 2005 and FY2006 only 63% of allocated DAS were used. Even when vessels that did not call in any DAS at all are removed, the DAS use rate increased to just 72%. Given these use rates, DAS would have to be reduced by more than 28% before total allocated DAS would become a binding constraint on all permitted vessels. Of course a reduction of this magnitude would have large impacts on vessels that have high DAS utilization rates. Under No Action, any vessel whose current DAS use rate was low would be unaffected since their allocated A DAS under no action would still be greater than the DAS they used.

Table 274 - Change in Groundfish Trip and Total Trip Revenue by Home Port State

State	2005-2007 Average Total Revenue	Estimated Total Revenue	Change in Total Revenue	2005-2007 Average Groundfish Trip Revenue	Estimated Groundfish Trip Revenue	Change in Groundfish Trip Revenue
CT	$471,853	$442,888	-6.1%	$234,954	$205,989	-12.3%
MA	$76,335,101	$68,953,330	-9.7%	$61,075,061	$53,693,291	-12.1%
ME	$18,692,050	$16,704,109	-10.6%	$16,887,629	$14,899,688	-11.8%
NH	$5,260,523	$4,754,542	-9.6%	$4,381,575	$3,875,595	-11.5%
NJ	$6,897,309	$6,668,471	-3.3%	$1,874,151	$1,645,313	-12.2%
NY	$14,307,651	$13,789,798	-3.6%	$4,035,033	$3,517,180	-12.8%
RI	$31,466,190	$30,046,466	-4.5%	$11,430,282	$10,010,558	-12.4%
Other	$4,121,225	$3,987,817	-3.2%	$1,292,992	$1,159,583	-10.3%
Total	$157,551,903	$145,347,419	-7.7%	$101,211,678	$89,007,195	-12.1%

Vessel-Level Impacts

The change in total fishing revenue ranged between no change and 18% reduction in total sales. Just where any given vessel fell within this range depended on DAS use rates as described above and the vessel owner's dependence on groundfish trip revenue for total fishing business income (see Figure 155). Figure 155 plots dependence on groundfish trip income for intervals of 10-percentage points on the horizontal x-axis with dependence increasing from left to right. Similarly, intervals of DAS use rates are plotted on the horizontal y-axis, also increasing from left to right. The resulting grid shows the possible combinations of dependence and DAS use rates where the cells of the grid are the calculated average reduction in total fishing revenue for all values that fall within the use rate/dependence grid. These averages (multiplied by -1 for purposes of exposition) are plotted on the vertical z-axis. As both dependence and DAS use rates increase the estimated impact on total revenues increases. The figure also shows that estimated impacts are very low even at high dependence on groundfish trip income for vessels with low DAS use rates. Similarly, estimated impacts are also low for vessels with high DAS use rates that have low dependence on groundfish trip income for total fishing business income.

Across all vessels gross revenues for 34 of the 509 included in the analysis would not change relative to status quo conditions (Table 275). For purposes of reporting, the remaining vessels were sorted into four different categories depending upon whether the estimated impact was at or below the 20th percentile, between the 20th percentile and the median, between the median and 80th percentile, or above the 80th percentile (Table 275). Based on these categories each of the first and fourth categories represent 20% of affected vessels while the second and third represent 30% of affected vessels. The average estimated adverse impact was then calculated for each category. Vessels in the 20% of least affected vessel may be expected to lose 2% of total fishing revenue while, on average, the 20% of most affected vessels may be expected to lose 13% of total revenue.

Figure 155 - Relationship between groundfish dependence, DAS use rate and average revenue impact.

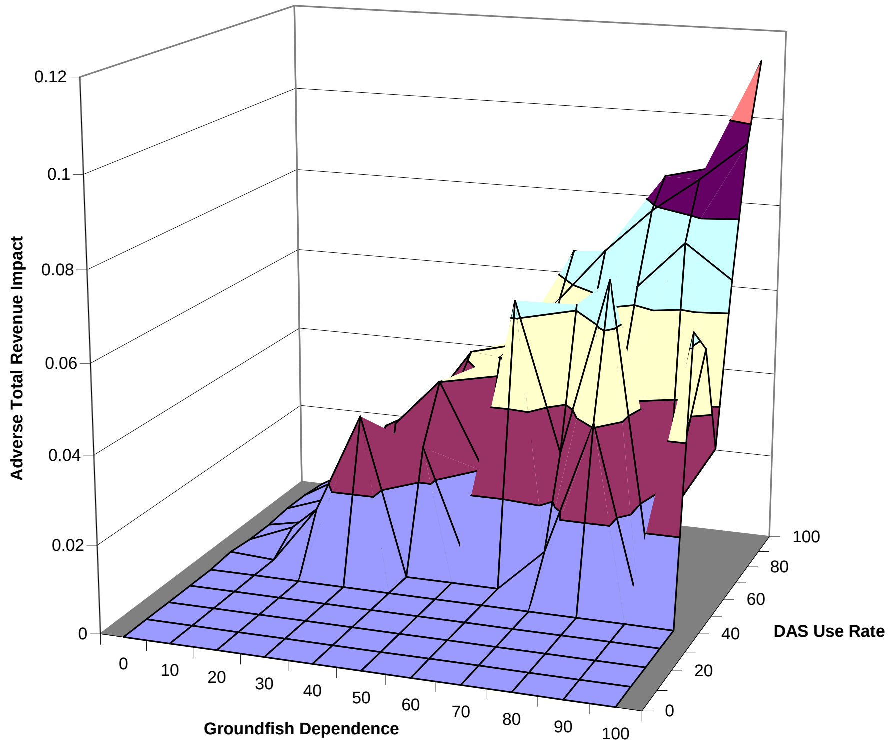


Table 275 - Estimated Impact and Number of Affected Vessels by Impact Category

Impact Category	Number of Vessels	Average Adverse Impact
No Impact	34	0%
Up to 20th Percentile	95	2%
20th Percentile to Median	143	6%
Median to 80th Percentile	142	10%
Above 80th Percentile	95	13%

In relative terms, the No Action alternative would have similar impacts among vessels of different sizes (Table 276). The average adverse impact on total fishing revenue was identical below the 20th percentile (2%) and above the 80th percentile (13%) for all vessels size classes. At other intervals the estimated impacts were similar by vessel size class.

Table 276 - Estimated Adverse Impact and Affected Vessels by Vessel Length Class

Impact Category	Less than 50 feet		50 to 70 feet		Over 70 feet	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	44	2%	28	2%	25	2%
20th Percentile to Median	65	6%	40	5%	36	6%
Median to 80th Percentile	65	10%	41	10%	37	12%
Above 80th Percentile	43	13%	27	13%	24	13%

Among primary gears the relative distribution of adverse impact on total revenue was nearly identical for vessels using gillnet or trawl gear. However, hook vessels between the 20^{th} percentile and the median may be expected to have lower revenue reductions (3%) compared to 6%, on average, for gillnet and trawl vessels. By contrast, the average adverse impact among the most affected hook vessels (above the 80^{th} percentile) was larger (16%) compared to either gillnet or trawl gear (13%) (Table 277).

Table 277 - Estimated Adverse Impact and Affected Vessels by Primary Gear

Impact Category	Gillnet		Hook		Trawl	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	24	1%	4	1%	69	2%
20th Percentile to Median	34	6%	4	3%	103	6%
Median to 80th Percentile	35	10%	5	10%	103	11%
Above 80th Percentile	23	13%	3	16%	68	13%

The relative distribution of adverse impacts differed between states that border the Gulf of Maine (Maine, New Hampshire, and Massachusetts) and those that do not (Table 278). At any given interval, the average adverse impact for vessels with a home port in these Gulf of Maine states was twice that for other states. For example, the impact for Maine, New Hampshire, and Massachusetts was between 3 and 5% up to the 20^{th} percentile compared to less than 0.5% to 2% in all other states. Similarly, home port vessels from Maine, New Hampshire, and Massachusetts were estimated to lose about 13% of total revenue among vessels above the 80^{th} percentile compared to an average of 8% for vessels from other home port states. Note that for confidentiality concerns, impacts on Connecticut home port vessels had to be combined with Rohde Island home port vessels. Home port state vessels south of New Jersey had to be combined with New Jersey home port vessels for the same reason.

Table 278 - Estimated Adverse Revenue Impacts and Number of Affected Vessels by Home Port State

Home Port State	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
MA	46	69	69	46
ME	13	19	20	12
NH	7	10	10	6
NJ – South	7	9	10	6
NY	9	13	14	8
RI & CT	15	21	22	14
	Average Adverse Affect on Total Revenue			
MA	3.0%	8.0%	12.0%	14.0%
ME	5.0%	9.0%	11.0%	13.0%
NH	5.0%	9.0%	11.0%	15.0%
NJ	0.0%	2.0%	4.0%	7.0%
NY	1.0%	2.0%	5.0%	9.0%
RI & CT	2.0%	4.0%	6.0%	9.0%

As noted previously, vessels with high dependence on groundfish trip revenue may be expected to be more adversely affected by the No Action alternative than less dependent vessels. This effect is evident as the estimated average adverse impact of fishing revenue increases with dependence on groundfish trip revenue (Table 279). For example, the estimated impact on vessels that depend on groundfish trips for less than 20% of fishing revenue ranged from less than 0.5% up to the 20th percentile to 2% for vessels above the 80th percentile. By contrast, impacts on vessels that depend on groundfish for at least 80% of fishing revenue ranged from an average of 9% up to the 20th percentile and 14% above the 80th percentile.

Unlike dependence on groundfish the estimated average impact on total fishing revenue was nearly identical for each percentile category regardless of the level of gross sales (Table 280). In each category of gross sales the estimated average adverse change in gross sales ranged from 1-2% for all vessels up to the 20th percentile to 13-14% for vessels above the 80th percentile.

Among port groups the estimated revenue impacts follow a pattern similar to that of home port states. That is, impacts on port groups in Maine, New Hampshire, and Massachusetts tended to be larger than the impacts on vessels from port groups in other states (Table 281). Overall, adverse impacts on the Portsmouth area and the Scituate-Boston port group were slightly higher for vessels above the 80th percentile than in other port groups. Note that in most instances the port groups listed in Table 281 consist of combined port groups due to confidentiality concerns.

Table 279 - Estimated Impacts and Number of Affected Vessels by Dependence on Groundfish Trip Revenue

Dependence Category	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
0 to 19%	13	18	18	12
20 to 39%	16	23	24	15
40 to 59%	12	18	18	11
60 to 79%	13	20	19	13
80 to 100%	43	63	64	42
		Average Adverse Affect on Total Revenue		
0 to 19%	0.0%	1.0%	1.0%	2.0%
20 to 39%	2.0%	4.0%	4.0%	5.0%
40 to 59%	4.0%	5.0%	7.0%	8.0%
60 to 79%	7.0%	8.0%	9.0%	10.0%
80 to 100%	9.0%	11.0%	12.0%	14.0%

Table 280 - Estimated Adverse Revenue Impacts and Number of Affected Vessels by Gross Sales Category

Gross Sales Category ($1,000)	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
Less than $90 k	16	24	24	16
$90 k to $159 k	19	28	28	18
$160k to $269 k	21	31	32	20
$270 k to $500 k	19	29	28	19
More than $500 k	21	31	31	20
		Average Adverse Affect on Total Revenue		
Less than $90 k	2.0%	6.0%	10.0%	14.0%
$90 k to $159 k	1.0%	6.0%	10.0%	13.0%
$160k to $269 k	2.0%	6.0%	10.0%	13.0%
$270 k to $500 k	2.0%	6.0%	11.0%	13.0%
More than $500 k	2.0%	6.0%	12.0%	13.0%

Table 281 - Estimated Adverse Revenue Impacts and Number of Affected Vessels by Port Groups

Port Group	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
Cape & Islands	5	7	7	4
Long Island, NY	9	13	14	8
Gloucester	17	25	25	16
Mid-Coast Maine	6	9	9	6
North Shore, Massachusetts	5	7	8	4
New Bedford	15	22	22	14
New Jersey	7	9	10	6
Other Rhode Island	6	8	9	5
Point Judith	9	13	14	8
Portsmouth Area	7	10	10	6
Scituate - Boston	6	8	8	5
Portland - So. Maine	7	10	11	6
		Average Adverse Affect on Total Revenue		
Cape & Islands	1.0%	3.0%	6.0%	11.0%
Long Island, NY	1.0%	2.0%	5.0%	9.0%
Gloucester	5.0%	10.0%	12.0%	14.0%
Mid-Coast Maine	5.0%	9.0%	11.0%	13.0%
North Shore, Massachusetts	2.0%	8.0%	11.0%	13.0%
New Bedford	3.0%	9.0%	12.0%	13.0%
New Jersey	0.0%	2.0%	4.0%	7.0%
Other Rhode Island	1.0%	4.0%	7.0%	9.0%
Point Judith	2.0%	5.0%	6.0%	10.0%
Portsmouth Area	5.0%	9.0%	11.0%	15.0%
Scituate - Boston	5.0%	10.0%	12.0%	15.0%
Portland - So. Maine	5.0%	9.0%	11.0%	13.0%

7.5.2.3.1.2 Economic Impacts of Alternative 2a: Differential DAS

Alternative 2a would achieve the conservation objectives of the Proposed Action using differential DAS and trip limits as the primary management measures. This alternative would also include the default 18% reduction in DAS as well as a suite of modified trip limits described previously.

Subsequent to completion of the draft amendment, the Council considered additional DAS reductions for this alternative in order to modify it to meet pollock rebuilding requirements. These alternatives modified differential DAS counting areas and considered reducing Category A DAS by 30 or 35 percent. The revenue impacts shown below do not include these additional reductions, and therefore understate the actual revenue reductions that would be expected if this alternative was modified to meet pollock rebuilding objectives.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY 2005 to FY 2007 and average total revenue was $158 million. Under Alternative 2a the estimated groundfish trip revenue would decline by 23% to $78 million and total fishing revenue would decline by 15% to $134 million (Table 282). Among states groundfish trip was estimated to increase by 1.8% whereas total fishing revenue may increase by 0.5%. This positive change results from a difference between the how the proposed differential DAS counting area in the SNE/MA area under Alternative 2a is configured as compared to the present configuration. That is, the proposed differential counting area no longer would include several high revenue blocks along the New Jersey coast. These areas are readily accessible to New York and New Jersey vessels in particular, and counting DAS in these blocks at a rate of 1:1 would more than offset the default 18% reduction in allocated DAS. In the majority of other states the estimated reduction in groundfish trip revenue was at least 20% and was nearly 25% in Maine and Massachusetts.

Table 282 - Alternative 2a Change in Groundfish Trip and Total Trip Revenue by Home Port State

State	2005-2007 Average Total Revenue	Estimated Total Revenue	Change in Total Revenue	2005-2007 Average Groundfish Trip Revenue	Estimated Groundfish Trip Revenue	Change in Groundfish Trip Revenue
CT	$471,853	$416,832	-11.7%	$234,954	$179,933	-23.4%
MA	$76,335,101	$61,396,189	-19.6%	$61,075,061	$46,136,150	-24.5%
ME	$18,692,050	$14,507,040	-22.4%	$16,887,629	$12,702,619	-24.8%
NH	$5,260,523	$4,720,298	-10.3%	$4,381,575	$3,841,350	-12.3%
NJ	$6,897,309	$6,930,208	0.5%	$1,874,151	$1,907,050	1.8%
NY	$14,307,651	$13,522,485	-5.5%	$4,035,033	$3,249,867	-19.5%
RI	$31,466,190	$29,092,247	-7.5%	$11,430,282	$9,056,339	-20.8%
Other	$4,121,225	$3,818,747	-7.3%	$1,292,992	$990,514	-23.4%
Total	$157,551,903	$134,404,045	-14.7%	$101,211,678	$78,063,821	-22.9%

Vessel-Level Impacts

A total of 69 vessels were estimated to obtain at least some modest improvement in groundfish trip income due to a combination of the more favorable change in the Southern New England/Mid-Atlantic closure area or the higher trip limits for cod in particular. Twenty-one of these vessels were from either a New Jersey (17) or New York (4) home port. These mid-Atlantic vessels are likely to have benefited from the reconfigured DAS counting area. The rest of the vessels having an estimated positive impact were from Massachusetts (35), Maine (7), and several other states (6). These vessels may have benefited from the higher trip limits for GOM and GB cod. Due to the small number of vessels that may experience improved fishing revenue, the remaining discussion will focus on the vessels that are expected to be adversely affected by the Proposed Action. The estimated increase in total revenue among vessels that may be expected to experience a positive change in total revenue averaged 8%. Note that this positive change is shown in Table 283 as a negative value since positive values denote an adverse affect.

Alternative 2a would have an adverse impact on 440 of the 509 vessels included in the analysis. Among adversely affected vessels Alternative 2a may be expected to have different impacts depending on where each vessel may fish and its relative dependence on groundfish trips for total fishing revenue. At the lower end of the spectrum adverse impacts average 2% for a total of 88 vessels up to the 20^{th} percentile (Table 283). Of the remaining vessels the estimated adverse impact of total revenue ranged from an average of 8% between the 20^{th} percentile and the median to 30% for vessels above the 80^{th} percentile.

Table 283 - Alternative 2a Estimated Impact and Number of Affected Vessels by Impact Category

Impact Category	Number of Vessels	Average Adverse Impact
No Impact	69	-8%
Up to 20th Percentile	88	2%
20th Percentile to Median	132	8%
Median to 80th Percentile	132	19%
Above 80th Percentile	88	30%

Impacts among vessels of differing sizes tended to be larger for vessels over 70 feet at percentiles above the 20^{th} (Table 284). For example, large vessels between the 20^{th} percentile and the median were estimated to lose 13% of fishing revenue compared to 7% and 8% for small (30 to 50 feet) and medium sized vessels (50 to 70 feet) respectively. At the 80^{th} percentile large vessels were estimated to lose an average of 33% compared to 29% for medium and 24% for small vessels.

Table 284 - Alternative 2a Estimated Adverse Impact and Affected Vessels by Vessel Length Class

	Less than 50 feet		50 to 70 feet		Over 70 feet	
Impact Category	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	40	2%	25	2%	24	2%
20th Percentile to Median	60	7%	36	8%	36	13%
Median to 80th Percentile	60	14%	36	20%	36	27%
Above 80th Percentile	39	24%	24	29%	24	33%

Among primary gears the relative distribution of adverse impact on total revenue varied. Due to the increased cod trip limits and their higher dependence on cod, adverse impacts on hook gear vessels may be expected to be lower than other gear types. Average adverse impacts on hook gear vessels were less than 1% up to the 20^{th} percentile and averaged 4% at the 80^{th} percentile (Table 285). Adverse impacts for gillnet and trawl gear were similar at least up to the median. However, above the median average adverse impacts on trawl vessels were higher than that of gillnet vessels.

Table 285 - Alternative 2a Estimated Adverse Impact and Affected Vessels by Primary Gear

Impact Category	Gillnet		Hook		Trawl	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	22	2%	3	0%	64	2%
20th Percentile to Median	33	8%	3	1%	96	9%
Median to 80th Percentile	33	13%	3	2%	96	23%
Above 80th Percentile	22	18%	2	4%	63	31%

The adverse impacts on vessels from New York and New Jersey homeports were lower at all intervals for reasons previously identified. That is, vessels from these home port states tend to be less dependent on groundfish trip income for total fishing sales and the adverse effect on total revenue was mitigated by the change in the configuration of the Southern New England/Mid-Atlantic closure area. For the remaining home port states the distribution of adverse impact on total revenue was similar in Maine and Massachusetts, although the impacts at intervals above the median were consistently higher for Massachusetts home port vessels (Table 282).

Table 286 - Alternative 2a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Home Port State

Home Port State	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
MA	44	64	65	43
ME	13	19	19	12
NH	7	9	10	6
NJ - South	3	5	4	3
NY	9	13	13	8
RI & CT	15	21	21	14
	Average Adverse Affect on Total Revenue			
MA	2.0%	11.0%	24.0%	31.0%
ME	7.0%	15.0%	22.0%	30.0%
NH	3.0%	8.0%	13.0%	20.0%
NJ	0.0%	1.0%	5.0%	16.0%
NY	1.0%	2.0%	7.0%	20.0%
RI & CT	3.0%	7.0%	12.0%	22.0%

Vessels with high dependence on groundfish trip revenue may be expected to be more adversely affected by Alternative 2a than less dependent vessels. This effect is evident as the estimated average adverse impact of fishing revenue increases with dependence on groundfish trip revenue (Table 287). For example, the estimated impact on vessels that depend on groundfish trips for less than 20% of fishing revenue ranged from less than 0.5% up to the 20th percentile to 4% for vessels above the 80th percentile. By contrast, impacts on vessels that depend on groundfish for at least 80% of fishing revenue ranged from an average of 8% up to the 20th percentile and 33% above the 80th percentile.

Table 287 - Alternative 2a Estimated Impacts and Number of Affected Vessels by Dependence on Groundfish Trip Revenue

Dependence Category	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
0 to 19%	11	17	16	11
20 to 39%	14	19	20	13
40 to 59%	11	17	16	11
60 to 79%	12	18	18	11
80 to 100%	41	62	61	41
	Average Adverse Affect on Total Revenue			
0 to 19%	0.0%	1.0%	2.0%	4.0%
20 to 39%	2.0%	5.0%	7.0%	11.0%
40 to 59%	2.0%	8.0%	12.0%	16.0%
60 to 79%	4.0%	11.0%	18.0%	23.0%
80 to 100%	8.0%	19.0%	27.0%	33.0%

Unlike dependence on groundfish dependence the estimated average impact on total fishing revenue was similar in most instances for each percentile category regardless of gross sales (Table 288). In each category of gross sales the estimated average adverse change in gross sales ranged from 1-3% for all vessels up to the 20th percentile to 25-33% for vessels above the 80th percentile.

Table 288 - Alternative 2a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Gross Sales Category

Gross Sales Category ($1,000)	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
Less than $90 k	16	23	24	15
$90 k to $159 k	16	24	24	15
$160k to $269 k	19	27	27	18
$270 k to $500 k	18	27	27	18
More then $500 k	21	30	31	20
	Average Adverse Affect on Total Revenue			
Less than $90 k	2.0%	6.0%	15.0%	28.0%
$90 k to $159 k	1.0%	7.0%	16.0%	25.0%
$160k to $269 k	2.0%	8.0%	16.0%	26.0%
$270 k to $500 k	3.0%	10.0%	22.0%	30.0%
More then $500 k	3.0%	10.0%	26.0%	33.0%

Among port groups the estimated revenue impacts follow a pattern similar to that of home port states. That is, impacts on port groups in Maine, New Hampshire, and Massachusetts tended to be larger than the impacts on vessels from port groups in other states (Table 289). Overall, adverse impacts at percentile intervals below the median were highest in the Mid-Coast Maine port group. Impacts up to the 20th percentile averaged (8%), while adverse impact on total fishing revenue averaged 17% between the 20th percentile and the median. At higher percentiles the adverse impact on the Mid-Coast Maine port group was similar to that of the Gloucester, New Bedford, Scituate-Boston, and Portland-So Maine port groups.

Table 289 - Alternative 2a Estimated Adverse Revenue Impacts and Number of Affected Vessels by Port Groups

Port Group	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
Cape & Islands	5	6	7	4
Long Island, NY	9	13	13	8
Gloucester	16	24	24	15
Mid-Coast Maine	6	9	9	6
North Shore, Massachusetts	5	6	7	4
New Bedford	15	21	21	14
New Jersey	3	5	4	3
Other Rhode Island	6	8	9	5
Point Judith	9	13	13	8
Portsmouth Area	7	9	10	6
Scituate - Boston	5	6	7	4
Portland - So. Maine	7	10	10	6
	Average Adverse Affect on Total Revenue			
Cape & Islands	1.0%	8.0%	16.0%	28.0%
Long Island, NY	1.0%	2.0%	7.0%	20.0%
Gloucester	2.0%	11.0%	23.0%	30.0%
Mid-Coast Maine	8.0%	17.0%	22.0%	30.0%
North Shore, Massachusetts	1.0%	4.0%	8.0%	20.0%
New Bedford	4.0%	20.0%	28.0%	33.0%
New Jersey	0.0%	1.0%	5.0%	16.0%
Other Rhode Island	2.0%	6.0%	11.0%	27.0%
Point Judith	3.0%	7.0%	12.0%	20.0%
Portsmouth Area	3.0%	8.0%	13.0%	20.0%
Scituate - Boston	4.0%	15.0%	26.0%	34.0%
Portland - So. Maine	7.0%	14.0%	21.0%	30.0%

7.5.2.3.1.3 Economic Impacts of Alternative 4: DAS Reduction and Restricted Gear Areas

Alternative 4 reduces category A DAS by 40% from FW42 levels. Most existing regulations would remain in place with adjustments to many of the present trip limits. Alternative 4 would also implement a set of gear restricted areas that would prohibit gears that catch either yellowtail or winter flounders.

As constructed, this alternative would not meet rebuilding objectives for pollock. The revenue impacts shown below thus understate declines in revenue should the option be modified to meet pollock rebuilding objectives.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY 2005 to FY 2007 and average total revenue was $158 million. Under Alternative 4 the estimated groundfish trip revenue would decline by 28.9% to $72 million and total fishing revenue would decline by 18.5% to $128 million (Table 290). The relative reduction in groundfish trip revenue did not vary substantially among home port states, ranging from less than 26% in New Hampshire to 31% in New York. Reflecting differences in the contribution of groundfish trip revenue to total revenues on all trips the estimated reduction in total revenue was at least 22% in Maine, Massachusetts, and New Hampshire, but was 14.8% in Connecticut and less than 11% in all other states.

Table 290 - Alternative 4 Change in Groundfish Trip and Total Trip Revenue by Home Port State

State	2005-2007 Average Total Revenue	Estimated Total Revenue	Change in Total Revenue	2005-2007 Average Groundfish Trip Revenue	Estimated Groundfish Trip Revenue	Change in Groundfish Trip Revenue
CT	$471,853	$402,111	-14.8%	$234,954	$165,213	-29.7%
MA	$76,335,101	$58,697,416	-23.1%	$61,075,061	$43,437,377	-28.9%
ME	$18,692,050	$13,862,348	-25.8%	$16,887,629	$12,057,927	-28.6%
NH	$5,260,523	$4,103,253	-22.0%	$4,381,575	$3,224,305	-26.4%
NJ	$6,897,309	$6,328,106	-8.3%	$1,874,151	$1,304,948	-30.4%
NY	$14,307,651	$13,054,370	-8.8%	$4,035,033	$2,781,752	-31.1%
RI	$31,466,190	$28,098,049	-10.7%	$11,430,282	$8,062,141	-29.5%
Other	$4,121,225	$3,796,153	-7.9%	$1,292,992	$967,920	-25.1%
Total	$157,551,903	$128,341,808	-18.5%	$101,211,678	$72,001,583	-28.9%

Vessel-Level Impacts

Alternative 4 would have an adverse impact on 493 of the 509 vessels included in the analysis. A total of 3 vessels were estimated to be unaffected due to low DAS use rates which more than offset the DAS reduction and the differential DAS counting areas (Table 291). Estimated revenues would actually increase for 13 vessels from Maine (3) and Massachusetts (10) home port states by an average of 2%. Note that an increase in revenue shows up as a negative change in Table 2. For these 13 vessels either the DAS use during the baseline was still less than the modeled DAS changes and/or the trip limit changes more than offset the reductions in DAS. Of the 493 vessels that may be expected to experience an adverse impact on total revenue, the estimated adverse effect ranged from an average of 3% up to the 20th percentile to 31% for vessels above the 80th percentile. Note that the remaining discussion will focus only on the majority of vessels that may be expected to be adversely affected by Alternative 4.

Table 291 - Alternative 4 Estimated Impacts and Number of Affected Vessels by Impact Category

Impact Category	Number of Vessels	Average Adverse Impact
No Impact	16	-2%
Up to 20th Percentile	99	3%
20th Percentile to Median	148	13%
Median to 80th Percentile	148	24%
Above 80th Percentile	98	31%

With a few exceptions, Alternative 4 would have similar impacts among vessels of different sizes (Table 292). The average impact up to the 20th percentile for vessels under 50 feet was higher (4%) compared to either medium (3%) or large (3%) vessels, but was similar to that of large vessels or medium vessels at all other intervals. For the most adversely affected vessels (above the 80th percentile) there was little difference in estimated impact between small (29%), medium (30%), or large (32%) vessels.

Table 292 - Alternative 4 Estimated Adverse Impact and Affected Vessels by Vessel Length Class

Impact Category	Less than 50 feet		50 to 70 feet		Over 70 feet	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	45	4%	30	3%	25	3%
20th Percentile to Median	67	14%	43	11%	37	15%
Median to 80th Percentile	67	22%	44	23%	38	29%
Above 80th Percentile	44	29%	29	30%	24	32%

Among primary gears the relative distribution of adverse impacts on total revenue was similar in most instances. Up to the 20th percentile average impacts ranged between reductions of 2% for hook gear to 4% for trawl gear (Table 293). Between the 20th percentile and the median hook gear impacts were about half as much (7%) compared to either gillnet (13%) or trawl gear impacts (14%). Above the median, gear impacts tended to be larger on trawl vessels than either hook or gillnet gear.

Table 293 - Alternative 4 Estimated Adverse Impact and Affected Vessels by Primary Gear

Impact Category	Gillnet		Hook		Trawl	
	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact	Number of Vessels	Average Adverse Impact
Up to 20th Percentile	24	3%	4	2%	73	4%
20th Percentile to Median	34	13%	4	7%	108	14%
Median to 80th Percentile	35	22%	5	19%	108	26%
Above 80th Percentile	23	27%	3	30%	72	31%

The adverse impacts on vessels from New York and New Jersey homeports were lower at all intervals for reasons previously identified. That is, vessels from these home port states tend to be less dependent on groundfish trip income for total fishing sales. For the remaining home port states the distribution of adverse impact on total revenue was similar in Maine, Massachusetts and New Hampshire, although the impacts at intervals below the median were consistently higher for Maine home port vessels (Table 294). Compared to all other states adverse impact on fishing revenue for Maine home port vessels was much higher for vessels up to the 20th percentile (12%), and was higher for vessels between the 20th percentile and the median (21%). At intervals above the median, the impacts on Maine home port vessels were similar to that of Massachusetts home port vessels.

Table 294 - Alternative 4 Estimated Adverse Revenue Impacts and Number of Affected Vessels by Home Port State

Home Port State	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
MA	48	72	72	48
ME	13	20	19	13
NH	7	11	10	7
NJ - South	7	10	10	6
NY	10	14	14	9
RI & CT	15	22	22	14
		Average Adverse Affect on Total Revenue		
MA	5.0%	18.0%	27.0%	32.0%
ME	12.0%	21.0%	26.0%	31.0%
NH	7.0%	20.0%	24.0%	32.0%
NJ	1.0%	5.0%	10.0%	18.0%
NY	1.0%	5.0%	11.0%	22.0%
RI & CT	4.0%	10.0%	16.0%	24.0%

Vessels with high dependence on groundfish trip revenue may be expected to be more adversely affected by Alternative 4 than less dependent vessels. This effect is evident as the estimated average adverse impact of fishing revenue increases with dependence on groundfish trip revenue (Table 295). For example, the estimated impact on vessels that depend on groundfish trips for less than 20% of fishing revenue ranged from less than 0.5% up to the 20th percentile to 6% for vessels above the 80th percentile. By contrast, impacts on vessels that depend on groundfish for at least 80% of fishing revenue ranged from an average of 18% up to the 20th percentile and 32% above the 80th percentile.

Table 295 - Alternative 4 Estimated Impacts and Number of Affected Vessels by Dependence on Groundfish Trip Revenue

Dependence Category	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
0 to 19%	14	19	20	13
20 to 39%	16	24	24	15
40 to 59%	13	18	19	12
60 to 79%	14	20	20	13
80 to 100%	44	66	66	43
		Average Adverse Affect on Total Revenue		
0 to 19%	0.0%	1.0%	3.0%	6.0%
20 to 39%	6.0%	8.0%	10.0%	12.0%
40 to 59%	9.0%	13.0%	15.0%	18.0%
60 to 79%	14.0%	19.0%	22.0%	24.0%
80 to 100%	18.0%	26.0%	29.0%	32.0%

Unlike dependence on groundfish dependence the estimated average impact on total fishing revenue was similar in most instances for each percentile category regardless of gross sales (Table 296). In each category of gross sales the estimated average adverse change in gross sales ranged from 3-5% for all vessels up to the 20th percentile to 29-32% for vessels above the 80th percentile.

Table 296 - Alternative 4 Estimated Adverse Revenue Impacts and Number of Affected Vessels by Gross Sales Category

Gross Sales Category ($1,000)	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
		Number of Vessels		
Less than $90 k	18	27	27	17
$90 k to $159 k	19	29	28	19
$160k to $269 k	22	32	33	21
$270 k to $500 k	20	29	29	19
More then $500 k	21	31	32	20
	Average Adverse Affect on Total Revenue			
Less than $90 k	3.0%	13.0%	23.0%	32.0%
$90 k to $159 k	3.0%	13.0%	23.0%	29.0%
$160k to $269 k	3.0%	13.0%	22.0%	28.0%
$270 k to $500 k	4.0%	14.0%	26.0%	31.0%
More then $500 k	5.0%	13.0%	28.0%	32.0%

Among port groups the estimated revenue impacts follow a pattern similar to that of home port states. That is, impacts on port groups in Maine, New Hampshire, and Massachusetts tended to be larger than the impacts on vessels from port groups in other states (Table 297). Overall, adverse impacts at percentile intervals below the median were highest in the port groups of Gloucester, New Bedford, Scituate-Boston, Portsmouth, Portland, and Mid-Coast Maine port group. In these port groups, impacts up to the 20th percentile ranged from 7-13%, while average adverse impact on total fishing revenue ranged from 20-22% between the 20th percentile and the median. Above the 80th percentile average revenue losses exceeded 30% in the port groups of Gloucester, Mid-Coast Maine, New Bedford, Portsmouth, Portland, and Scituate-Boston.

Table 297 - Alternative 4 Estimated Adverse Revenue Impacts and Number of Affected Vessels by Port Groups

Port Group	Up to 20th Percentile	20th Percentile to Median	Median to 80th Percentile	Above 80th Percentile
	Number of Vessels			
Cape & Islands	6	9	9	5
Long Island, NY	10	14	14	9
Gloucester	17	25	25	16
Mid-Coast Maine	6	9	9	6
North Shore, Massachusetts	5	8	7	5
New Bedford	15	23	22	15
New Jersey	7	10	10	6
Other Rhode Island	6	8	9	5
Point Judith	9	14	13	9
Portsmouth Area	7	11	10	7
Scituate - Boston	6	8	9	5
Portland - So. Maine	7	11	10	7
	Average Adverse Affect on Total Revenue			
Cape & Islands	2.0%	8.0%	13.0%	26.0%
Long Island, NY	1.0%	5.0%	11.0%	22.0%
Gloucester	10.0%	22.0%	28.0%	32.0%
Mid-Coast Maine	13.0%	22.0%	26.0%	31.0%
North Shore, Massachusetts	3.0%	14.0%	23.0%	29.0%
New Bedford	5.0%	21.0%	29.0%	31.0%
New Jersey	1.0%	5.0%	10.0%	18.0%
Other Rhode Island	3.0%	8.0%	16.0%	27.0%
Point Judith	4.0%	11.0%	15.0%	23.0%
Portsmouth Area	7.0%	20.0%	24.0%	32.0%
Scituate - Boston	7.0%	22.0%	30.0%	33.0%
Portland - So. Maine	11.0%	21.0%	26.0%	31.0%

7.5.2.3.1.4 Analysis of Vessel Break-Even DAS in New England Groundfish

Evaluation of vessel break-even DAS in the New England groundfish fishery was conducted using data from several sources. A complete description is provided in section 7.5.1.3.1.2.

Alternatives to the Proposed Action
The proposed effort control alternatives will next be discussed in the context of the break-even analysis. As with the design of the measures, it will be assumed that all vessels choose to use effort controls and no vessels choose to join sectors.

No Action
The No Action alternative reduces the number of Category A DAS by 18 percent. The expected baseline allocation of DAS to the fleet is expected to be approximately 36,000 DAS. There are no changes to trip limits, differential DAS counting areas, or other management measures. Under this alternative the number of DAS available to the fleet exceeds the number necessary for the

fleet to break-even. Because DAS cannot be freely exchanged across vessel size classes, there may still be vessels or groups of vessels that do not have access to enough DAS to break-even.

Option 2A
This option reduces Category A DAS by 18 percent, which should result in a baseline DAS allocation of about 36,000 DAS. Unlike the No Action alternative, this option expands the use of differential DAS into almost all areas and increases the differential DAS counting rate in the inshore GOM and SNE areas. Landing SNE/MA winter flounder is prohibited, as is landing windowpane flounder. These changes all increase the number of DAS necessary to break-even. Counter-acting these changes, however, are increases in the trip limits for both cod stocks from 800 lbs./DAS to 2,000 lbs./DAS, increases in the trip limit for CC/GOM yellowtail flounder, and removal of trip limits for white hake and GB winter flounder. These changes are expected to increase revenue per DAS and would be expected to reduce the number of DAS necessary to break-even. Given the interactions between these measures, it is difficult to determine if this option will have sufficient DAS available for all vessels to break-even. Because DAS cannot be freely exchanged across vessel size classes, even though there may be enough DAS for the active vessels as a whole to break even, there are likely to be vessels or groups of vessels that do not have access to enough DAS to break-even.

Option 4
This option reduces Category A DAS by 40 percent and is expected to result in about 26,400 allocated baseline DAS. There are no modifications to the differential DAS counting areas. The GOM cod trip limit increases to 2,000 lbs./DAS, while the GB cod trip limit remains at 1,000 lbs./DAS. Trip limits for GB winter flounder and white hake are eliminated, the initial GB yellowtail flounder trip limit is set at 10,000 lbs./trip, and the landing of SNE/MA winter flounder and windowpane flounders are prohibited. The trip limit changes may increase the contribution margin per DAS for vessels fishing in the GOM and GB but not in SNE. Two restricted gear areas are adopted but the impacts on break-even requirements are uncertain.

Under this option there are not enough DAS for the fleet to break-even unless contribution margins per DAS increase by about twenty-nine percent (the difference between the DAS allocated and the DAS needed to break-even). While the trip limit changes may foster this increase for vessels that fish in the GOM and GB, it is unlikely that the same increase will occur in the SNE area. Because DAS cannot be freely exchanged across vessel size classes, there are likely to be vessels or groups of vessels that do not have access to enough DAS to break-even.

Mitigating Factors
As discussed in section 7.5.1.3.1.2, there are at least two mitigating factors. Carry-over DAS in the first year of implementation of Amendment 16 there are likely reduce the gap between DAS allocated and the number needed to break-even by 6,000 – 7,000 DAS. The other source of groundfish DAS is Category B DAS that can be used in special management programs.

7.5.2.3.1.5 GOM Haddock Sink Gillnet Pilot Program

The Proposed Action, Option 2, is designed to facilitate targeting of GOM haddock by sink gillnet vessels. This opportunity would not exist under the No Action option and sink gillnet vessels would not be provided an opportunity to benefit from the recovery of haddock. Under No Action, sink gillnet vessels would not have increased access to GOM haddock and haddock revenues would be expected to be lower.

7.5.2.3.1.6 Haddock Minimum Size

The No Action option maintains the 19 inch minimum size for haddock. Recent reductions in haddock growth rates mean that it has been taking longer for recruits to grow into a legal size, particularly for the 2003 year class of GB haddock. In the meantime these under-sized fish are subject to natural mortality (as well as discard mortality) that would otherwise have been marketable fish. As a result yield is lost

7.5.2.3.2 Recreational Management Measures

7.5.2.3.2.1 Provisions for Landing Fillets

Option 1 – This option would allow anglers to land groundfish as fillets with the skin off. Many recreational anglers may prefer to be able to fillet fish at-sea. This may be particularly advantageous to party/charter passengers because many passengers may not know how to fillet fish themselves and the filleting of fish is a paid service provided by crew. Filleting fish at-sea also enables passengers to disembark and return home immediately without having to wait for fish to be filleted at the dock. Private boat anglers may also prefer to fillet fish at-sea because fillets are easier to store and it eases disposal of carcasses and waste.

To the extent anglers do prefer the ability to fillet fish at sea the recreational experience would be enhanced. This would result in an increase in the economic value of recreational fishing for groundfish. The magnitude of any such increase in economic value is unknown, but would depend on the strength of preference for at-sea filleting of groundfish.

All other things being equal, as long as anglers prefer to fillet fish at-sea then removal of this prohibition would enhance the economic value of the recreational fishing experience. However, filleting fish at-sea does not make the fish available for biological sampling or species verification through the MRIP, and would complicate enforcement of existing size and bag limit regulations. The former may contribute to elevated biological uncertainty for stocks that include recreational catch in assessments, while the latter may lead to elevated management uncertainty. Under the proposed process for setting ABCs and ACLs any source of elevated biological uncertainty may result in lower ABCs and any source of management uncertainty may result in lower ACL. The extent to which changing the prohibition on filleting groundfish at sea may affect either biological or management uncertainty is unknown, but may be presumed to depend on the relative contribution of recreational and commercial sources of fishing mortality.

If removing the prohibition on landing fillets with skin-off does result in some increased biological or management uncertainty then the increase in economic value associated with being able to fillet fish at sea would need to be weighed against the forgone economic value associated with lower ACL. The economic implications of this tradeoff would also need to consider angler preferences for accountability measures such as changes to bag limits, size limits, or seasonal closures.

Option 3 (No Action) would maintain the requirement that fillets be landed with skin-on. To the extent recreational anglers prefer to fillet fish at-sea, this measure would reduce the benefits of the recreational fishing experience compared to the other alternatives. It may also result in lower incomes for crew on party-charter vessels since they would not be able to charge for filleting fish at-sea and some passengers may be reluctant to wait at the dock for this service at the end of a trip.

7.5.2.3.2.2 Removal of the Limit on Hooks

Under the No Action alternative, the limit on the number of hooks that can be used by recreational anglers would remain in place. There may be some lowered economic benefits when compared to the Proposed Action, since catch rates may be lower and some trips targeting other species may be forced to discard groundfish caught incidentally.

7.5.2.3.2.3 Measures to Reduce Mortality

GOM Cod - Based on the evaluation of biological impacts the economic impacts may greatest for Option 3, followed by Option 1, then by Option 2. This ordering of impacts is strictly based on the magnitude of the estimated reductions of harvested GOM cod. However, this assumes that recreational anglers are indifferent between the types of management measures that may be available. As noted above, groundfish recreational fishing value may depend primarily on the expectation for keeping fish. If this is the case, then recreational anglers may prefer a change in the size limit to a change in the bag limit since even though the former may reduce the probability that enough fish will be caught to meet the bag limit, there is always the possibility that they will. By contrast, lowering the bag limit reduces the number of fish that may be retained which lowers trip expectations even though on the bag limit may not be reached on a majority of trips. If this preference ordering does reflect groundfish anglers' valuation then the ordinal ranking economic impacts of recreational options for GOM cod may be reversed for Option 1 and Option 2.

GOM Haddock – Harvested GOM haddock would be reduced most under Option 3 followed by Option 2 and Option 3. Based on estimated reductions in harvest alone, the ordinal ranking in terms of economic impacts would match that of the biological impacts. Whether this would reflect recreational fishing preferences is uncertain. As suggested above, anglers may place higher value on increasing the size limit since Option 1 would not include a bag limit. However, haddock do not get as large as cod so the probability of catching and being able to keep a legal sized fish would go down so much that anglers may prefer a bag limit to a higher size limit. That is, recreational fishing preferences are not likely to be strictly hierarchical. There are more likely to be tradeoffs between bag and size limits that complicate assessment of economic impacts in the absence of specialized surveys to elicit these tradeoffs.

7.5.2.3.3 Atlantic Halibut Minimum Size

Option 1 (No Action) maintains the current minimum size for halibut. Total U.S. commercial halibut landings in recent years have been between 11 and 22 mt and the landed value ranged from about $96,000 in CY 2004 to $232,000 in CY 2007. Not all landings have been above the minimum size; GARM III estimated that the mean length of landings was 90.5 cm, less than the minimum legal size of 91 cm.

7.5.2.3.4 Prohibition on Retention of Atlantic Wolffish

Option 1 (No Action) will continue to allow the landing of Atlantic wolffish in the commercial and recreational fisheries. Atlantic wolffish commercial landings steadily increased throughout the 19702 and early 1980s, peaking at 1,100 mt in CY 1983. Landings declined through the mid and late 1980s and 1990s and were 243 mt in 1999. Landings continued to decline through CY 2007, reaching a time series low of 63 mt. Landed revenues were less than $150,000 since CY 2004, with a recent low of only $101,000 in CY 2007. Unlike Atlantic halibut, wolffish is targeted to some extent by recreational anglers. During 2006 – 2007 a total of 56 anglers intercepted through the MRIP at fishing sites in Massachusetts and New Hampshire reported wolffish as a target species. All of these anglers were intercepted on party/charter trips and no private boat anglers reported targeting wolffish. Based on MRIP statistical procedures these data result in an expanded estimate of 1,644 targeted of nearly one million total trips. Under No Action, this level of recreational activity would be expected to continue.

7.5.2.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

This action proposes modifying the two existing sectors and implementing seventeen additional sectors. Determining the economic impacts of these changes is difficult. If the No Action alternative is selected and additional sectors are not implemented, the benefits described above (see section 7.5.1.3.5) will not accrue to the vessels interested in joining sectors. At the same time, the costs of increased reporting and administrative requirements will not be incurred. It is likely that the inefficiencies of the effort control system would continue to restrain the profitability of the fishery.

7.5.2.3.6 Accountability Measures

There are several options for implementing AMs for the commercial and recreational components of the fishery. In addition, there are elements of the sector administration measures that are AMs; the impacts of these measures are indistinguishable from the general sector impacts and ill not be discussed further on this section.

Over the long-term the implementation of effective AMs would be expected to contribute to rebuilding of groundfish stocks as biological objectives are achieved. This would be expected to increase the revenues for the commercial fishery and the recreational harvest as fishermen benefit from stock rebuilding. Specific AMs could have different economic impacts.

7.5.2.3.6.1 Common Pool Accountability Measure Alternative 1 – Hard TAC

This alternative overlays a hard TAC AM system over the effort controls for those vessels that do not choose to join sectors. The hard TAC system proposed is similar to one considered in Amendment 13. The ACL for each groundfish stock is distributed across trimesters. When approached, groundfish fishing is ended in much of the stock area with gear that catches that stock.

The ACL is not allocated to each individual vessel and in many respects can be considered a global TAC. Potential adverse economic impacts of global TAC systems have been well documented. Morgan (1997) summarized findings from several other studies and concluded that these systems often "produce excess capacity, poor stock conservation, and reduced profitability." He identified the following reasons for these results:

- Increased competition among operators

- Difficulties of enforcement of the TACs, particularly in multispecies fisheries and if the management system is designed without consideration of harvesting practices
- Inappropriate TACs, a broad reason that includes adopting TACs in fisheries where they are not appropriate, setting TACs with inadequate data, political manipulation of proposed TACs, and lack of structure in recommended TACs.
- Inappropriate institutional arrangements that do not include industry support for management arrangements.

Of these four reasons, the two that are most likely to be applicable to this fishery are the first two. The increased competition between operators can result in a race to fish as individual fishermen attempt to catch as much of the TAC as possible before fishing is prohibited for a particular stock. This leads to the dissipation of profits, development of excess capacity in the fishery, and fluctuations in supply

There are elements of the management plan that may slow this response, but they are unlikely to eliminate it. For example, the effort control systems proposed limit total effort (DAS) available to individual vessels, incorporate trip limit that limit what can be landed on each individual trip, and adopt closures that limit fishing opportunities in some of the time and places that catch rates are expected to be high. This might help slow the race to fish. The hard TAC system also includes some attempts to reduce the incentive for this activity. By splitting the TAC into three trimesters, fisherman are certain of at least a limited opportunity to fish over the course of the year and do not need to be as concerned that if they don't fish as hard as possible at the beginning of the year they will lose all opportunities. While it is often said that dividing the TAC into periods just creates multiple races to fish rather than just one, there may be some benefit in doing so to extend availability of fish to fishermen and the market.

The second reason that may apply is difficulty in enforcing the TACs. The possibility that a TAC may be approached and result in closing the fishery can lead to discarding and illegal unreported landings of catch. The AM proposed attempts to address these concerns by increasing the reporting and monitoring requirements. All landings must be witnessed through a weighmaster system in this option.

While there is no guarantee that TACs in this AM will be set at appropriate levels there are mechanisms in place that should prevent some of the problems in setting appropriate TACs that were identified by Morgan (1997). Recent M-S Act changes require that ACLs cannot be set higher than the ABC recommendation of the Council's SSC. This makes it unlikely that they will be set contrary to scientific advice, though it is possible that the TACs may be exceeded if they are not adequately monitored. It is not clear if there is industry support for this AM and that could lead to the problems cited by Morgan.

Stefansson and Rosenberg (2005), on the other hand, conducted a simulation study of the effectiveness of quota systems, effort control systems, and MPAs when used independently and when used in concert. Their study also considered how well these systems would work in the face of uncertainty. While the study focused on a theoretical single-species fishery, their conclusion was that there are clear economic benefits to combining systems to rebuild stocks. The economic benefits are a result of a greater likelihood of long-term sustainability. This is in essence what the effort control measures (which include both effort limits and closures that have some of the characteristics of MPAs) and this AM would do. This study did not explicitly model behavioral changes (such as the race to fish) that can result from the imposition of quotas.

One of the very practical economic impacts of this AM is that it creates additional uncertainty for fishermen attempting to develop a business plan. Fishermen will have difficulty evaluating if or when an area may be closed to groundfish fishing, particularly in the first year of implementation. The closures may disrupt the market and result in fluctuating prices. This system also imposes additional costs on common pool fishermen as they are responsible for dockside monitoring costs. Unlike sectors, they remain subject to the inefficiencies of the effort control system and thus are limited in their ability to modify behavior to increase profits and absorb the increased reporting costs.

This proposed AM also imposes a significant administrative burden on NMFS. There is the potential that trimester TACs will need to be monitored for all twenty groundfish stocks, though initially TACs will not be monitored for stocks that cannot be landed. Monitoring the TACs and announcing openings and closures of the fishery creates an extensive burden that is in addition to the considerable burden of monitoring the effort control system and sectors. This system may also increase the need for enforcement resources to prevent illegal or unreported landings.

7.5.2.3.6.2 Common Pool Accountability Measures Alternative 2 – Differential DAS

This alternative adjusts DAS counting based on whether ACLs are exceeded or not. The adjustment occurs in the year after catch is compared to the ACL. Adjustments are applied to a stock area rather than the fishery as a whole, and are based on the maximum overage of an ACL for stocks in the area. The mixed stock exception will be considered when determining the differential DAS adjustment. While AMs are usually considered solely in the context of overages of the ACL, this particular AM allows for the possibility that catches will fall short of the ACLs and allows for an increase in fishing effort as a result.

The economic impacts of this AM are difficult to predict. Generally, increasing the differential DAS rate throughout the fishery as a result of an ACL overage would reduce the number of DAS available to the fishery and make it more difficult for groundfish fishing vessels to recover fixed costs. If the differential DAS rate is reduced because catches are below ACLs for all stocks, the opposite occurs: more DAS become available and revenues and profits would be expected to increase. These broad impacts may not actually occur, however, as the measure is constructed so that it is possible differential DAS adjustments may occur in specific stock areas rather than throughout the fishery as a whole. Changes in differential DAS counting in one area and not another may result in effort shifts that not only modify the expected biological impacts of the measure but could alter the economic impacts. Increased fishing that results from changes in differential DAS counting might depress prices and reduce revenues. The only way to analyze these impacts would be to run the CAM for an infinite number of possible differential DAS changes, clearly an impossible task.

One advantage to this approach is that because it does not make in-season changes to management measures it helps facilitate business planning by fishermen. The measure is designed so that the differential DAS changes are expected to be announced prior to or at the start of a fishing year, which will allow fishermen at least some opportunity to plan activity for the year. This should minimize any race to fish that might result from in-season adjustments. A disadvantage is that adjusting DAS counting is, like many effort controls, a blunt instrument that cannot effectively target particular problem stocks. It is possible that an adjustment will be triggered by an ACL overage for a minor stock; this will reduce yields for all stocks caught in the area, even those that are healthy. Fishermen that may not even catch a stock may have DAS reduced for an overage that they did not contribute to. For example, an overage of a flounder stock will reduce fishing effort for longline gear that has little or no interaction with the stock.

This option also proposes that if an ACL is exceeded an analysis will be done to determine if the mixed stock exception is applicable and if so it will be applied. While not stated, the implication is that there may be instances where a differential DAS adjustment is not made or a smaller increase in DAS counting is made because overfishing is allowed to occur on a stock or stocks. The justification for this provision is that it provides some flexibility to maximize overall yield from the fishery rather than hold the fishery hostage to the weakest stock. If invoked, this provision would be expected to increase revenues for non-sector vessels.

If non-sector vessels are allowed to exceed the ACL with reduced consequences this could have implications for sector participants and the recreational fishery. Sector catches are bound by the ACE allocated to the sector; if there is an overage remaining after any transfers of ACE between sectors, the sector is held accountable for the overage and must pay back the overage in the year immediately following. There are no provisions for sectors to invoke the mixed stock exception and reduce or eliminate the payback provision, as is being proposed for non-sector vessels. There is no provision for recreational fishing vessels to be exempt from an AM because of the mixed stock exception. Not only does this raise an equity concern, but it could create incentives for non-sector fishing vessels to be less concerned about remaining within the ACL. Over the long-term, if overfishing is allowed to continue by non-sector vessels it is possible that stock size will be smaller than if overfishing was ended and as a result the ACL will be smaller, reducing the ACE available to sector participants and the recreational fishery. This provision also seems to conflict with the ACL concept that to the extent possible an overage by one component should not affect the ACL available for other components.

7.5.2.3.6.3 Recreational Fishery Accountability Measures

There are three options to the Proposed Action for recreational fishery accountability measures. The options are similar in design and differ primarily in the process for implementation and the precedence given in the selection of AMs.

Option 1 requires the Council to review recreational harvest and provide recommendations to NMFS for AMs. This provides an opportunity for any AMs to be coordinated with the state directors whose recreational industries are affected by the changes. AMs will be either change in seasons, minimum size limits, or bag limits, and may be different for the recreational and party/charter components of the fishery. The measure proposes that if there is an overage in fishing year 1 (which ends in April), the adjustment will be announced approximately nine months later in January. This was designed so that any regulatory changes are known before party/charter operators begin booking reservations for the season that starts in spring. It also allows for correction of any overage to begin at the end of the year following the year of the overage.

The requirement for the Council to review harvests and develop a recommendation to NMFS calls into question whether the AMs can be announced by January. The Council typically does not meet in July and August. This means a recommendation will not be provided to NMFS prior to late September. APA requirements create doubt whether the NMFS can make a decision on the AM and publish the change prior to January. This means that party/charter operators may begin accepting reservations without knowing the regulations. Customers may be less willing to pay in advance for reservations if they are uncertain what will be in place. Part of this problem could be mitigated if NMFS were certain to accept Council recommendations: since much recreational enforcement is performed by state agencies, states could announce and implement the changes even if the federal process had not been completed. But it is not certain that this will occur, as NMFS must determine the Council's recommendations comply with applicable law. States will no doubt be reluctant to modify their regulations before knowing the final NMFS decision.

Generally, minimum size limits and bag limits a less effective at adjusting recreational fishing mortality than changes in season. These two measures affect what can be retained but do little to change what is caught. In addition, there is evidence that compliance with these regulations is imperfect. As a result, these measures will probably need to be in place for an extended period to account for overages of the ACL. Relatively short changes in season can rapidly modify harvest but party/charter operators fear that these changes are more damaging to their businesses.

Option 2 is similar to Option 1 but removes the requirement that the Council provide a recommendation to NMFS. It also gives precedence to a change in season as the preferred AM. By removing the requirement that the Council provide a recommendation to NMFS, it is more likely that the AMs will be announced before party/charter operators begin accepting reservations in late winter. This should facilitate their marketing operations and customers will be bale to make an informed decision when booking trips. Using a change in season as the preferred AM means that the AM will probably be in place for a shorter period of time.

Regardless which option was selected, the imposition of AMs would have economic impacts on the recreational fishery. Changes in bag limits and minimum sizes typically reduce the catch that can be landed. With respect to the party/charter fishery, groundfish fishing is primarily a meat fishery and customers may value a trip based on the potential landings rather than the likely landings. Large minimum sizes or low bag limits reduce the potential landings and devalue the trip. In a similar way, changes in season may deter customers from fishing if the perception is that the seasons with the best fishing opportunities are not available. There is however evidence that changes in regulations for one species can be compensated by increased targeting of a different species.

Under the No Action alternative, AMs would not be adopted. While this avoids the economic impacts of AMs in the short –term, this may make it less likely that mortality objectives are achieved and could result in more stringent measures in the future.

7.6 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 Amendment 16.

It is important to note that the current interpretation of National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. *Sustained participation* is interpreted as continued access to the fishery within the constraints of the condition of the resource. The long-term conservation and rebuilding of stocks often require that limits be placed on particular gears and/or the harvest of specific stocks. Thus, the law interprets National Standard 8 only as a consideration of continued overall access to fishery resources and not as a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in attributing social change to specific factors such as management regulations when communities or other societal groups are constantly evolving in response to numerous additional external factors, such as market conditions and technology. Increasingly important influences in coastal communities include demands for recreational uses of the waterfront and tourism (these influences are referred to as *gentrification* in the MARFIN Report). Certainly, management regulations influence the direction and magnitude of social change, but attribution is difficult with the tools and data available. Attribution is particularly difficult considering the dynamic and fluid nature of fishing communities. As a result, while this assessment focuses generally on the social impacts of the proposed fishing regulations, it is recognized that external factors are also influencing change, both positive and negative, in the affected communities. In many cases, these factors contribute to a community's *vulnerability* and ability to adapt to new or different fishing regulations.

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, if any, will be discussed below.

Amendment 13 also identified primary and secondary port groups that are most affected by changes in groundfish management. 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.

7.6.1 Scale of Assessment – Fishing Communities

Section 316 of Magnuson-Stevens Act defines a fishing community as: a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.

As discussed in the Affected Human Environment, there are a number of issues involved in whether a port meets National Standard 8's legal definition of a fishing community. But fishery impact statements, such as the social impact analysis, must examine the impacts to all the participants, including all communities and other groups that participate in the fishery. Thus for the purposes of this social and community impact assessment, the primary and secondary port groups identified and described in the Affected Human Environment (section 9.4.5) will serve as the primary scale of measurement. ***Primary groups*** are those communities that are currently most substantially engaged in the groundfish fishery. For the most part, primary groups are fishing communities that are likely to be the most significantly and directly impacted by Amendment 13 management measures, and the analysis of impacts on them speaks to the analytical requirements of National Standard 8. However, the impacts of Amendment 13 are predicted to be large in scale, affecting most ports engaged in the groundfish fishery. This assessment, therefore, has sought to gain a wide perspective on the magnitude and extent of the impacts of the alternatives under consideration. Thus the analysis also considers ***Secondary groups***, which are those ports that currently may not be substantially involved in or dependent on the groundfish fishery but have demonstrated some participation in the groundfish fishery since the 1994 fishing year (FY94). They also may consist of places that were historically more involved in the groundfish fishery, but are not recently for many reasons (loss of nearshore fishery, concentration of fishery in larger ports, external factors, etc.).

Current guidance on National Standard 8 defines a community as a town or city, a geographic unit which might fit the Census Bureau's definition of a "place." But it is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond their geographic boundaries and often into other communities in the region. The grouping of communities in this assessment and the socioeconomic context provided by the IMPLAN model allows for some consideration of the interconnected nature of ports and communities when predicting the impacts of Amendment 16. Moreover, because the size and diversity of the groundfish fishery makes it impractical to consider impacts on each secondary port individually, their grouping with other secondary ports in the same county or geographically adjacent counties has been done consistently with the regions analyzed using the IMPLAN model (see section 5.4.6), so that it can be used to better characterize the impacts on these community groups.

When predicting social impacts of management measures, it is important to consider impacts on the following, which will be discussed to the extent possible in the following sections:

- the fishing fleet (vessels grouped by fishery, primary gear type, and/or size);
- boat owners and captains;
- crew;
- fish buyers (dealers);
- seafood markets;
- community cooperatives;
- fishing industry associations;
- cultural components of the community;
- fishing families.

7.6.2 Communities of Interest

The communities that are likely to experience significant impacts from the alternatives under consideration include those with at least one of the following characteristics:

- an active and large multispecies fishing fleet,
- vessels and shoreside facilities that currently depend on groundfish for a substantial portion of their business,
- geographically close to areas proposed for additional seasonal or year-round closure, and
- vessels that hold a substantial amount of latent effort (inactive DAS).

The above criteria probably qualify nearly 40 primary community and secondary port groups throughout the management area. Because it is not practical to identify all of these groups as *communities of interest* for this assessment, the following groups have been chosen to represent the diversity, scale, and extent of those involved in the groundfish fishery. Inferences can be drawn about social impacts on other port groups based on the information presented in the Affected Human Environment and the likely distribution of other predicted impacts. All primary community groups have been identified as *communities of interest* for this assessment.

Primary Community Groups
1. Portland, Maine
2. Portsmouth, New Hampshire
3. Gloucester, Massachusetts
4. Boston, Massachusetts
5. Chatham/Harwichport, Massachusetts
6. New Bedford/Fairhaven, Massachusetts
7. Point Judith, Rhode Island
8. Eastern Long Island, New York

Secondary Community Groups
9. Upper Mid-Coast 1, Maine
10. Lower Mid-Coast 1, Maine
11. NH Seacoast
12. South Shore, Massachusetts
13. Provincetown, Massachusetts
14. Eastern Rhode Island
15. Northern Coastal New Jersey

It is important, however, to consider the impacts of the proposed alternatives across all communities. Social impacts can be defined as the changes that a fisheries management action may create in people's way of life (how they live, work, play, and interact), people's cultural traditions (shared beliefs, customs, and values), and people's community (population structure, cohesion, stability, and character). As such, social impacts may result from changes in flexibility, opportunity, stability, certainty, safety, and other factors that are not specific to any community, but oftentimes to any individual or entity experiencing changes resulting from a fishing regulation.

It is possible that the social impacts of some measures under consideration will not be experienced solely by one community group or another; rather, it is likely that some impacts will be experienced across communities, gear sectors, and vessel size classes. An example of this would be a reduction in allocated DAS if it is applied to all multispecies permit holders. Another example would be a mesh restriction for otter trawl vessels. While extra consideration is given to

the *communities of interest* for this framework, the potential social impacts of the measures under consideration are discussed generally in this assessment so that their impacts across communities can be understood more clearly.
Brief descriptions of the communities of interest are in the Affected Environment (section 6.2.8).

7.6.3 Social Impact Analysis Factors

To the extent possible, the social impact factors described in the following subsections will be considered relative to the management alternatives under consideration and will be used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is discussed in Burdge's *Conceptual Approach to Social Impact Assessment* (Burdge 1998).

A significant amount of information relating to the factors described below was collected during the Council's Social Impact Informational Meetings during the development of Amendment 13, and can be found in the Report from those meetings. The information collected at these meetings formed the basis for selecting the following factors. While this assessment does not quantify the impacts of the management measures relative to the individual factors, qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts. Assessment of the potential changes to the social impact assessment factors also should be considered in the following context:

1. *Size and demographic characteristics of the fishery workforce in the community* –changes in these factors reflect demographic, income, and employment impacts in relation to the community's available fishery workforce
2. *Cultural issues* – attitudes, beliefs, values of fishermen, their families, and their communities
3. *Social structure and organization* – the ability of communities to provide necessary social support and services to families
4. *Non-economic social aspects* – lifestyle, health, and safety issues
5. *Historical dependence on fishery* – reflected in the structure of fishing practices and income distribution

The following five social impact factors are described below: regulatory discarding; safety; disruption in daily living; changes in occupational opportunities and community infrastructure; and formation of attitudes. Discussion of these factors below also includes important information related to cumulative impacts and the social impacts of the alternatives under consideration in this amendment. The discussions also highlight comments received at the Amendment 13 informational meetings. When reviewing these comments, it must be remembered that the meetings occurred before Amendment 13 and FW 42 under a different management regime and some concerns raised at the meetings may not have been realized.

7.6.3.1 Regulatory Discarding

Description: forced discarding of marketable and oftentimes dead fish as a direct result of management measures; usually a byproduct of trip limits, quotas, and minimum fish sizes

Regulatory discarding is an important social problem, just as it is an ecological problem. Low trip limits resulting in excessive discarding leave fishermen feeling demoralized and disgusted with fishing, which is more than just a job to most fishermen. Fishermen recognize that discarding marketable and oftentimes dead fish does nothing to benefit them or their families, the health of the resource, their disappearing hold on local fresh fish markets, or seafood consumers. Fishing is a family business, so the impacts of this are felt throughout the entire family and the entire community involved in groundfish harvesting.

Discussion: Although regulatory discarding has been identified as a social problem in most communities involved in groundfish fishing throughout the region, the inshore Gulf of Maine groundfish fleet in particular has struggled with low Gulf of Maine cod daily trip limits and the negative social impacts of regulatory discarding since the 1999 fishing year. At the groundfish Social Impact Informational Meetings, many residents of Portsmouth NH, the NH Seacoast, Gloucester, and South Shore MA communities cited low Gulf of Maine cod trip limits as having resulted in the most significant social impacts for their respective communities since the implementation of Amendment 5. Fishing fleets in these communities consist primarily of smaller and mid-size vessels that fish short trips (<2 days) in inshore areas. Many of these vessels do not have the capability to travel safely to other areas to fish. They are therefore limited to areas that unfortunately contain concentrations of codfish, so they sometimes encounter significant amounts of cod even when fishing for other species.

The multispecies nature of the groundfish fishery and the physical limitations of the inshore fleet have exacerbated the problems associated with regulatory discarding in these areas. Some of the affected boats have reported that this problem is further worsened by the timing of the inshore rolling closures and the pulses of concentrated effort in the inshore areas during the limited opportunities in the spring and early summer for smaller vessels to fish. In addition, the cumulative effect of regulatory discarding resulting from management measures in other fisheries has increased related social impacts. For years, both commercial and recreational fishermen have testified that they are being forced to throw overboard thousands of pounds of spiny dogfish due to the very low trip limits and annual quota. This problem has continued and may even be exacerbated by recent increases in stock size for GOM cod and CC/GOM yellowtail flounder.

Alternatives that propose to increase the Gulf of Maine cod trip limit may reduce regulatory discarding and consequently, the negative social impacts resulting from regulatory discarding in the most affected Gulf of Maine communities involved in groundfish harvesting. Industry testimony from the inshore Gulf of Maine fleet suggests that a higher trip limit could convert at least some discards to landings and may result in even more positive impacts than can be predicted. By increasing the trip limit to a level that allows inshore boats to “make a day’s pay,” the industry maintains that the Council could indirectly encourage some vessels to end their trips without fishing through cod (and continuing to discard it) for other species. This could reduce regulatory discarding not only on Gulf of Maine cod, but also on other species that may be caught while fishing on a multispecies trip. While these impacts are difficult to predict, it is without question that the social impacts of an increased Gulf of Maine cod trip limit would be positive for the inshore groundfish fleet and their respective communities.

One caveat is that while short-term negative impacts may be reduced and short-term positive impacts may result from an increase in the Gulf of Maine cod trip limit, long-term negative impacts could be more severe if a higher trip limit increases fishing mortality on Gulf of Maine cod and consequently compromises the objectives of this amendment. Fishermen’s behavior cannot be predicted definitively, and there is some concern that increasing the trip limit could increase directed fishing on Gulf of Maine cod. There is a fine line that cannot be identified between allowing vessels to make a day’s pay and encouraging them to increase their directed trips on Gulf of Maine cod, especially in the inshore areas where the resource may be more easily accessible for short, directed trips. It must be acknowledged and understood that if an increased trip limit results in increased fishing mortality on Gulf of Maine cod, additional and perhaps more severe restrictions may be required in the future. Some sectors of the fleet that claim that they are not experiencing problems with regulatory discarding at this time are particularly concerned about this potential outcome. Most alternatives under consideration in this amendment address these concerns by proposing very modest increases in the trip limit, only seasonal increases in the trip limit, and/or additional measures to reduce Gulf of Maine cod fishing mortality.

Alternatives that propose higher trip limits on species like Southern New England yellowtail flounder, Cape Cod yellowtail flounder, and Georges Bank cod affect regulatory discarding positively for other communities south of the Gulf of Maine. To minimize this, trip limits should be set at the most reasonable level to affect behavior on the target stock without compromising the intent by simply converting landings to discards. The Council should consider past history with Gulf of Maine cod when selecting new trip limits for other groundfish species.

Measurement: The best tools for measuring this factor include surveys, focus groups, and key informant interviews to gain more perspective on individual perceptions about regulatory discarding and its effects on stress, morale, job satisfaction, and quality of life. For this assessment, information about this factor was obtained primarily from the Social Impact Informational Meeting Report, summarizing a series of ten focus group meetings throughout the region. Additional information relative to this factor was gained from the Council's Advisory Panels, scoping meetings, public hearings, and discussions with other community groups and panels.

Assessment of this factor should address the following questions:

- Is the Proposed Action likely to force fishermen to throw marketable fish overboard?
- Is the level of regulatory discarding under the Proposed Action likely to be higher than that under the no action alternative?
- Is the difference between regulatory discarding under the Proposed Action and the no action alternative likely to be high enough to generate significant negative social impacts?

7.6.3.2 Safety

Description: the ability of fishermen to maintain safe operations at sea; this factor can be compromised by various adaptations to additional regulations and decreased fishing opportunities; usually a result of closed areas and DAS modifications

The safety of fishermen and fishing operations at sea is an extremely important social impact factor, as decreased safety often increases stress at the individual and family level, which can exacerbate many other family and societal problems. In addition, the impacts of fishing-related casualties can be felt throughout communities involved in fishing, many of which are close-knit groups with longstanding family and social networks.

Discussion: National Standard 10 requires that the impact of proposed management measures on the safety of life at sea be considered during the development of an FMP. There is little empirical data with which to evaluate the types of management measures that improve or threaten the safety of fishing vessel operators. The emotional response resulting from any casualty or loss of life makes it difficult to objectively discuss the types of regulatory decisions that influence behavior or the ultimate responsibility for decisions made with respect to the operation of vessels.

One study attempted to identify factors that contributed to serious vessel accidents in the Northeast Region. Di Jin and Thunberg (2005) examined fishing vessel accidents in the

Northeastern United States from 1981 through 2000, updating an earlier report. They modeled fishing vessel accident probability using logit regression and daily data. Date on accidents were obtained from the U.S. Coast Guard, while fishing vessel activity was obtained from NMFS databases. The data are for all fisheries and the results are thus not specific to groundfish vessels or management. Three different models were constructed representing three different time periods: 1981-2000, 1981-1993, and 1995-2000. The study focused on ten types of accidents: allision, capsize, collision, equipment failure, explosion, fire, flooding, grounding, missing, and sinking. Relevant factors examined for the impact on vessel safety included economic factors (e.g. revenue), regulatory effects, weather (e/g/ wind speed), season, distance from shore, vessel size, and broad fishing area (SNE/MA, GB, GOM). The model developed parameters coefficients for the different factors and tests for the statistical significance of each. In all cases, the model shows that increasing wind speed and decreasing distance to shore result in an increase in accident rates. Compared to fishing in the winter, fishing in the spring and fall reduced accident rates, but not all model results were statistically significant. For the period 1981 -2000 and 1981-1993, an increase in revenues resulted in a decrease in accident rates. In all three models, accident rates declined over time. Vessel ton class was a significant factor in some model runs and for some size classes, with ton class 2 and or 3 vessels having higher accident rates than larger vessels.

Measures implemented in this amendment may affect the safety of fishermen and fishing operations, and to the extent possible, the Council should strive to implement measures that maximize the safety of human life at sea. To the extent that the Council can maximize safety at sea, negative social impacts resulting from the Amendment 16 management measures and related to concerns about safety can be minimized. For Amendment 16, changes to area closures have the potential to affect safety at sea to the extent that they force, directly or indirectly, small vessels to fish farther from shore.

Proposed DAS modifications also could affect safety. For example, it was speculated that counting DAS at a 2:1 rate in some areas (adopted in FW 42) may lead fishermen to travel to areas further from home that have more permissive DAS counting, leading them to conditions that may be unsuitable for their vessels. It is difficult to find evidence that this occurred (see section 6.2.3.8). During the Social Impact Informational Meetings, these kinds of adaptations to DAS reductions were noted to have occurred throughout the region after Amendments 5 and 7. It is therefore likely that additional negative social impacts related to safety occurred as a result Amendment 13 and will occur in Amendment 16 if DAS are further reduced.

Measurement: The best tools for measuring this factor include surveys, focus groups, and key informant interviews to gain more perspective on individual perceptions about safety and its effects on stress, families, and overall quality of life. For measurement in this assessment, information was obtained primarily from the Social Impact Informational Meeting Report, the MARFIN Report, and McCay and Cieri 2000. Additional information relative to this factor was gained from the Council's Advisory Panels, scoping meetings, public hearings, and discussions with other community groups and panels. GIS-based technologies are also useful to assess the potential impacts on this factor by examining the need for vessels to fish farther from shore as a result of the proposed management measures.

Assessment of this factor should address the following questions:

- Is the Proposed Action likely to compromise the safety of fishermen and/or fishing operations more than the no action alternative?

- Will fishermen need to travel to new fishing grounds or fishing grounds further away from their homes as a result of the Proposed Action?
- Is it likely that fishermen will make adaptations to the proposed management action that could compromise their safety (taking less crew, fishing in bad weather)?

7.6.3.3 Disruption in Daily Living

Description: changes in the routine living and work activities of affected fishery participants, including the potential for alteration in their regular social and work patterns to adapt to new management measures

Consideration of this factor includes vessel flexibility and the ability of fishermen to switch between fisheries, areas, and gears seasonally and/or in response to market conditions. Year-round and seasonal fishing opportunities are important to consider. These opportunities also relate to fishermen's chances to successfully adapt to new regulations. Impacts on this factor are associated with the ability of affected industry members to develop both short-term and long-term business plans. Another related impact can be experienced through the loss of crew and/or the inability to retain reliable crew members on a year-round basis.

Discussion: Changes in established daily patterns – patterns that, in the case of communities involved in fishing, are often internally-generated and regulated and highly-regimented – can provide a key component to social impact assessment. Although the existence, nature, and evolution of these patterns in communities involved in fishing is well-documented by marine anthropologists, the effects of changes to them have often been overlooked in conducting social impact assessments for fisheries management. Ideally, measurement of disruption in daily living should include an assessment of the outcomes of any periods of inactivity, including changes in social stress and stress-related health problems, job satisfaction, crime rates, and family cohesion.

The most obvious impacts related to this factor occur when fishermen lose the ability to fish for some period of time; negative impacts increase as the time during which the fishermen cannot fish increases. Periods of inactivity disrupt daily living patterns and increase stress that can affect the entire family. In addition, if these periods of inactivity are experienced by many residents within a community, negative social impacts can be experienced throughout the community. Shoreside businesses may find it difficult to maintain year-round income without a functional local fleet, so over the long-term, significant impacts can result from disruptions in daily living that ultimately change occupational opportunities and community infrastructure. Impacts related to these factors are discussed in more detail in following sections of this assessment.

The following summarizes some of the discussion relative to disruption in daily living patterns from the groundfish Social Impact Informational Meetings. Note that these meetings occurred prior to Amendment 13 and these perceived impacts may not have been realized. For example, groundfish fishing activity in Boston actually increased in recent years.

- Because of increased regulations in many fisheries, small vessels have lost much of their flexibility to move from one fishery to another. In Chatham, meeting participants felt that regulations have "boxed them in" to particular fisheries, making it difficult or impossible for them to maximize their opportunities and/or adjust to changing conditions. When combined with the inherent limitations of small vessels, the regulations have reduced fishing opportunities to the point that many fishermen cannot guarantee a year-round income from fishing for themselves or for their crew.

- Uncertainty about the regulations and the future of the groundfish fishery in New Bedford has made both business and family planning difficult, if not impossible. Uncertainty has contributed to the lack of new entrants in the fishery as well as family stresses associated with long-term finances and planning for the future.
- Some meeting participants in Portland discussed the loss of flexibility resulting from the groundfish regulations. They reported that historically, groundfish fishing used to be a fishery that the Portland fleet would use to "fill in" seasonally and/or with fluctuations in other fisheries. Ironically, groundfish regulations have limited some of these other fishing opportunities and made much of the fleet almost entirely dependent on groundfish.
- Increased regulations in many fisheries have limited the flexibility of the Long Island fishing fleet and made it more difficult to make a year-round income from fishing. Long Island vessels have depended on the diversity and flexibility of switching target species (squid, whiting, scup, and others including groundfish) as stocks fluctuate, the mix of species in an area changes, and/or market conditions change. Seasonal quotas and other management measures have decreased fishing opportunities and limited the flexibility of this fleet, particularly smaller vessels.
- The core of Boston's fishing fleet has diminished significantly; in addition, fewer transient vessels are landing in Boston and taking advantage of the convenient services the pier has to offer (proximity to transportation, processing facilities, ice, etc.). Landings are down, and overall activity in the port has decreased. Meeting participants estimated that the number of vessels landing at the Boston Fish Pier fell from more than 30 in 1995 to less than 12 in the past year. Most of the remaining vessels maximize their DAS usage in the winter to capitalize on better prices and then tie-up for several months at a time. This adaptation has exacerbated financial and employment problems for shoreside support services.

The implementation of expanded differential DAS counting areas is likely to negatively affect this factor. Some fishermen may be forced to seek alternative employment opportunities to support their families. These fishermen often lose their crew members and face additional problems during the time when they can fish. They also encounter more difficulty maintaining their fishing operations due to the loss of a reliable income. For vessels that can travel to other areas to fish, the expanded differential DAS areas still result in disruption in daily living patterns and negative social impacts, as most of these vessels end up traveling farther from shore to fish, potentially compromising their safety and increasing stress at the family level because fishermen are forced to spend more time away from home and fish longer days.

DAS modifications, particularly reductions, can also cause significant disruption in daily living and fishing patterns. In communities with vessels that rely on the groundfish fishery and use the majority of their DAS, additional DAS reductions can cause major alterations in fishing practices. Some larger boats will be forced to maximize their remaining groundfish opportunities by fishing only during times when market conditions are best, which can be during winter when weather is less predictable and more extreme. In order to reduce their fishing-related expenses, some vessels may fish their remaining DAS during one time of the year and tie up their vessels during another time. This causes disruptions for related shoreside businesses and can ultimately result in further social and economic dislocation.

Measurement: The best tools for measuring this factor include surveys, focus groups, and key informant interviews to gain more information about daily living patterns and the impacts of changes to these patterns on stress, families, and overall quality of life. For measurement in this assessment, information was obtained primarily from the Social Impact Informational Meeting Report, the MARFIN Report, McCay and Cieri 2000, and the ME DMR Groundfish Regulation Impact Survey in 2002. Additional information relative to this factor was gained from the Council's Advisory Panels, scoping meetings, public hearings, and discussions with other community groups and panels.

Assessment of this factor should address the following questions:

- How could the Proposed Action alter the daily living and work patterns of fishing families in the affected communities?
- Will fishermen need to travel to new fishing grounds or fishing grounds farther away from their homes as a result of the Proposed Action? Will fishermen be spending more time away from home as a result of the Proposed Action?
- Will fishermen experience longer periods of inactivity as a result of the Proposed Action?
- Compared to the no action alternative, could the Proposed Action increase stress at the family level as a result of disruptions in daily living patterns?

7.6.3.4 Changes in Occupational Opportunities and Community Infrastructure

Description

Changes in Occupational Opportunities: the degree to which the implementation of the management measures in this amendment could alter the occupational profile of the affected communities.

Changes in occupational opportunities can lead to changes in household/family income, classes, and lifestyles. In assessing this variable, both the short-and long-term shifts in job opportunities should be considered. This includes changes to year-round and seasonal fishing opportunities, short-term and long-term dislocation from the fishery, employment opportunities, and the ability to find and keep crew. Flexibility for the fishing fleet and the ability to plan business ventures over the short-term and long-term also are related factors. Changes in occupational opportunities are not only important to consider for the commercial fishing fleet, but also the recreational and party/charter fleet.

External forces (status of economy, community shifts away from fishing and towards tourism, etc.) can influence the magnitude and direction of changes in occupational opportunities. Emphasis should be placed on identifying potential changes in the unique social and family arrangements that characterize the communities under consideration, particularly on changes in household employment patterns, trends in family-run fishing businesses, and participation in job retraining programs. Special consideration should also be given to social and cultural values and norms that may be affected by changes in opportunity, such as long-term family involvement in the fishery, job satisfaction, and respect for fishing as an occupation and a way of life.

Changes in Community Infrastructure – the increase or decrease in the demand and supply of basic infrastructure services and facilities essential to fishing in the affected communities, including processors, seafood markets, boat and equipment repair shops, bait and ice providers, display auctions, cooperatives, creditors, legal services, etc.

The cost, quality, availability, and location of fishing-related services can affect community members' business practices, satisfaction with their community, and overall well-being. Additionally, these service industries provide alternative fishing-related employment opportunities in communities and can contribute significant revenues to the city and county in which the community involved in fishing is located. Impacts on this social impact factor are directly connected to disruptions in daily living patterns and other factors. They are also more long-term in nature.

Discussion

Changes in Occupational Opportunities: Over time, many groundfish regulations have affected occupational opportunities for communities involved in fishing throughout the region. The following summarizes some of the discussion relative to changes in occupational opportunities from the groundfish Social Impact Informational Meetings:

- In Gloucester, community residents feel that the rolling closures have severely reduced the flexibility of the fleet and have precluded fishermen from making a year-round income from fishing. Fishermen have difficulty taking advantage of seasonal fluctuations in stocks, markets, and/or fisheries and fishing accordingly. In addition, they report that the western Gulf of Maine closure has precluded many vessels from seeking viable alternative fisheries (pollock, some flatfish) and thus further limits their flexibility and ability to adapt to regulations.
- In Portsmouth, some people reported that they have had a very difficult time keeping up with the changing regulations, and it has become impossible to plan ahead and develop financial and other mechanisms to adapt to new or different regulations. In addition, meeting participants cited problems keeping year-round crew, loss of employment stability, and resultant increased stress at the individual and family level as direct consequences of the inshore Gulf of Maine rolling closures.
- In Portland, residents reported that with increasing regulations and uncertainty about the future, fishermen are more reluctant to invest in alternative fisheries. As a result, the fleet has adapted by relying less on the flexibility to switch between fisheries as they did historically, and more on maximizing their limited opportunities in the groundfish fishery. Vessel owners also are finding it increasingly difficult to employ reliable and experienced crew members on a year-round basis. Eighty eight groundfish days-at-sea alone does not offer enough opportunity to maintain an adequate crew on a large dragger, and some of these boats have few alternatives (some fish for shrimp and/or herring seasonally).
- DAS reductions were cited as having precluded year-round fishing opportunities in Boston; now, most vessels from Boston fish most or all of their DAS during the winter and tie-up their vessels for 3-5 months.
- Several meeting participants from the South Shore agreed that the six-month rolling closures (Blocks 124 and 125 in particular) represent a 100% groundfish closure for them. Currently, October, November, and January – April are closed to gear capable of catching multispecies; in December, 400 pounds of cod cannot cover trip expenses. The other five months (May – September) are historically when most of the South Shore fleet would shift their effort from groundfish to dogfish. Dogfish is no longer a viable fishery for federal permit holders, so many

> of these vessels are experiencing great difficulty maintaining occupational opportunities on a year-round basis.

Some measures under consideration may reduce opportunities for recreational and party/charter vessels that currently may be able to access offshore areas. Long-term occupational opportunities in some communities could be impacted by this action to the extent that these measures would reduce employment in the recreational sector and overall community revenues generated from recreational fishing.

Some measures implemented in this amendment could intensify negative social problems associated with changes in occupational opportunities over the long-term. Examples include modifications that reduce DAS and/or make DAS less efficient or productive. Depending on the economic costs, gear restrictions and new mesh regulations could also contribute to reductions in occupational opportunities to the extent that marginal vessels are not able to absorb the costs of the new gear. DAS reductions (including the expansion of the differential DAS counting areas), however, are likely to be most responsible for the changes in occupational opportunities that may occur in communities involved in fishing over time as a direct result of fisheries management actions. Changes in occupational opportunities are important to consider in relation to the alternatives under consideration to address capacity.

Changes in Community Infrastructure: Increasing restrictions in groundfish and almost all fisheries are reducing opportunities throughout the industry and resulting in a significant downsizing of commercial fleets in most communities. For example, industry members in Boston estimated that the number of vessels landing at the Boston Fish Pier fell from more than 30 in 1995 to less than 12 in the year 2000. There has been a recent rebound in the number of vessels landing in Boston as vessels have relocated from other ports. Downeast Maine and other community groups in Maine also have experienced significant fleet downsizing as Maine's groundfish fleet has concentrated around Portland prior to FW 42, and shows evidence of leaving even Portland since the adopt of FW 42.

While groundfish regulations have contributed to difficulty finding and keeping experienced crew, the industry reports that it also is quickly losing its shoreside labor pool due to more attractive alternative employment opportunities. The fleet and industry have downsized, and so have remaining shoreside support services. The industry reported the loss of cutting houses, processing plants, and ice houses throughout coastal communities. This has eliminated job opportunities and caused qualified laborers who rely on year-round employment to seek jobs elsewhere. Many people worry that this trend is irreversible given uncertainty in the fishing industry and the benefits and stability that many other shoreside labor industries are able to offer their employees.

Competition for commercial and residential waterfront property has increased and resulted in higher real estate prices and taxes, as residents of most communities involved in fishing are witnessing a long-term shift towards recreational and tourist-oriented uses of the waterfront. Downeast Maine residents described transitions in their own communities, still very dependent on fisheries, as local tackle and supply businesses are replaced with art galleries and bookstores. The industry is finding it more difficult to afford to live in their communities and maintain the shoreside infrastructure necessary to support their fisheries. Many people worry about whether their community will be able to support increased activity as stocks continue to recover and yields continue to increase.

Related to these problems is the loss of new and young entrants to the fishery. Uncertainty, instability, and loss of opportunity are discouraging the younger generation from pursuing fishing as a way of life. According to meeting participants, parents are no longer encouraging their children to carry on the family tradition of fishing; instead, they are encouraging them to seek higher education and enter a more promising and stable career. Unfortunately, this sometimes requires the children to leave the community because employment opportunities outside of fishing and similar industries are scarce.

The groundfish measures most likely to impact this factor over the long-term may be those that generate the most significant economic impacts, as economic impacts can affect business opportunities and the ability for the industry to diversify over the short-term. Some examples of the measures to consider in this framework adjustment include DAS reductions, mesh changes (if they are costly and affect a large number of groundfish-dependent vessels), and area closures.

Measurement

Measurement of this factor is the most complex and involves many sources of information. This factor relates most directly to economic aspects of the fishery; therefore, the analysis of economic impacts provided in this amendment helps most to predict changes to occupational opportunities and community infrastructure as well as resulting social impacts. Predictions about the impacts of the alternatives on gross revenues and the results of the IMPLAN I-O model are primary sources of information to measure this factor and provide a basis to quantify the social impacts related to this factor.

Social and demographic data including Census data and information from regional retraining centers is helpful to assess this factor. In addition, measurement tools like surveys, focus groups, and key informant interviews often provide information related to occupational opportunities for the fishing industry and specific aspects of community infrastructure. For this information, the Social Impact Informational Meeting Report, MARFIN Report, McCay and Cieri 2000, and the ME DMR Groundfish Regulation Impact Survey were referenced. Additional information relative to this factor was gained from the Council's Advisory Panels, scoping meetings, public hearings, and discussions with other community groups and panels.

Assessment of this factor should address the following questions:

- Could the Proposed Action change the structure and/or composition of New England's fishing fleets?
- Is the Proposed Action likely to result in a significant loss of employment opportunities within the affected communities?
- Will affected fishermen have alternative fishing opportunities under the Proposed Action?
- Compared to the no action alternative, will the Proposed Action significantly affect the ability of shoreside infrastructure to maintain year-round business opportunities?

7.6.3.5 Formation of Attitudes

Description: positive or negative feelings, beliefs, or positions expressed by impacted members of communities involved in fishing regarding the Proposed Action

This factor provides information about the community climate that prevails and can help to assess the potential for success with Amendment 16 and the need for mitigation in some circumstances. Consideration of this factor can provide for a better understanding of how changes induced by the

Proposed Action could influence the affected communities. In addition, management measures that are more preferred or supported by the fishing industry generally encounter more success over the long-term than measures that are opposed or that the industry feels are forced upon them. Some support the notion that compliance with regulations is directly related to the degree of support for the regulations or faith that they will be effective in achieving their objectives.

Discussion: It is difficult to predict which measures in Amendment 16 will affect this variable the most. On one hand, the formation of attitudes towards regulatory discarding in the recent past has been so negative that any measure reducing regulatory discarding should generate positive impacts. On the other hand, proposals to further reduce DAS or change the way that DAS are counted have already been met with strong opposition by fishermen throughout the region. While some measures may improve attitudes towards groundfish management measures (those that decrease regulatory discarding and improve safety at sea), others may worsen negative feelings (those that decrease occupational opportunities and flexibility).

In general, current industry perceptions about the effectiveness and direction of groundfish management are negative. Constantly changing groundfish regulations and layers of confusing management measures and their disproportional impacts have resulted in a loss of credibility for the Council and NMFS and a loss of faith in the federal fisheries management process. Some industry members are bitter because they feel that regulations are never given time to work before additional ones are implemented. In addition, analyses for numerous actions that the Council has taken since Amendment 5 projected that objectives would be met and that the industry would begin to reap the benefits of its sacrifices. Much of the industry feels that they are still waiting for the opportunity to reap these benefits, yet additional management measures continue to be proposed.

Another development that has affected the industry’s faith in the management process is the new assessment models proposed for many stocks. The GARM III adopted new modeling assumptions for assessing the resource and as a result the perception of stock status for several stocks changed dramatically. These negative perceptions are coupled with increases in fish abundance and catch rates that the industry reports to be experiencing in many areas and recent discoveries about errors associated with the NEFSC trawl survey.

Measurement: The best tools for measuring this factor include surveys, focus groups, and key informant interviews to gain more information about perceptions about the current management process, management regulations, and the entities involved in the management process. For measurement in this assessment, information was obtained primarily from the Social Impact Informational Meeting Report, the MARFIN Report, McCay and Cieri 2000, and the ME DMR Groundfish Regulation Impact Survey in 2002. Additional information relative to this factor was gained from the Council’s Advisory Panels, scoping meetings, public hearings, Committee and Council meetings, and discussions with other community groups and panels.

Assessment of this factor should address the following questions:

- In comparison to the no action alternative, is the Proposed Action likely to result in the formation of negative attitudes by affected parties?
- If negative attitudes are predicted to result, are they likely to compromise the effectiveness of the Proposed Action?

7.6.4 General Impacts of Effort Control Measures under Consideration

This section provides a discussion of the social impacts that are most likely to result from DAS modifications, area closures, trip limits, gear restrictions, hard total allowable catches (TACs), and special access programs, six of the management tools that form the basis for most of the alternatives under consideration in this amendment. The unique aspects of each of the alternatives are discussed in subsequent sections of this assessment.

7.6.4.1 DAS Modifications

In comparison to the status quo alternative, Alternatives 2A, 3A, and 4 specifically propose modifications to DAS. Changes in the way that DAS are counted can sometimes equate to DAS reductions. If DAS are counted at a 2.25:1 rate year-round in the inshore Gulf of Maine area, for example, vessels that are able to fish only in that area effectively receive a further reduction in the DAS available for them to use. For vessels that may be able to access other areas to fish at a 1:1 DAS counting rate, it is likely that they will move to those areas where the regulation may not impact them. This could be farther from shore, possibly compromising their safety.

Social impacts of DAS reductions tend to be more far-reaching and long-term in nature than social impacts from other management measures like trip limits, gear restrictions, and seasonal area closures. They tend to have the most significant impacts on *disruption in daily living* and *changes in occupational opportunities and community infrastructure*, although they also can affect *safety*. They result from direct reductions in groundfish fishing opportunities and revenues for vessels that are most active in the fishery. Reductions in groundfish fishing opportunities through the loss of DAS also 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. Other impacts of DAS reductions include 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.

Indirect negative social impacts resulting from DAS reductions relate to adaptations that vessels make to compensate for reduced opportunity and reduce income, which can oftentimes increase their risk-taking and compromise their safety at sea. As income is reduced, some fishermen will try to minimize their operating costs in order to stay viable, sometimes reducing or eliminating crew, especially on smaller vessels. More owners of smaller vessels could be forced to fish alone for some or all of the year. Vessels may also try to maximize their remaining DAS by fishing during the winter when prices are usually better. Winter weather is more extreme and less predictable, increasing dangers that fishermen may encounter.

In addition, the disproportionate impacts of DAS reductions or differential DAS counting areas can create perceptions of inequity, which often exacerbate social impacts occurring in communities involved in groundfish fishing harvesting. Some people think that DAS allocations from Amendments 5 and 7 were unfair and created inequities and tensions between sectors involved in the fishery. Those who switched from groundfish to other fisheries with the decline of the groundfish stocks feel that they were punished by not receiving their true historical allocation of DAS. Many fishermen feel that they have sacrificed more than their share to rebuild the resource and are concerned about their future ability to realize the benefits of their sacrifices.

Reductions in allocated DAS proposed in the capacity alternatives have the potential to exacerbate problems associated with the disproportionate impacts of DAS reductions. Vessels that stand to lose the most allocated DAS in this amendment are those that currently have the highest levels of latent DAS. Some proportion of latent DAS in the fishery can be attributable to vessels that are still active, but have shifted their effort from groundfish to other fisheries for many reasons, including groundfish stock declines, market conditions, and opportunities and encouragement to pursue alternative fisheries. As a result, some vessels may feel unfairly treated and disproportionately impacted by the capacity alternatives.

One concern about the long-term impacts of DAS reductions is that once allocated or used DAS are reduced, the DAS that are eliminated from the fishery will never be returned to the vessels. Whether or not this is the case cannot be predicted at this time, but it should be noted as a serious concern relative to long-term social and community impacts of DAS reductions. Certainly recent management actions have steadily reduced DAS (or increased differential DAS counting rates); the sole exception appears to be the steaming time credit given to vessels to encourage fishing in the Eastern U.S./Canada area. As noted in the report from the social impact informational meetings, losses of shoreside support infrastructure like cutting houses, ice facilities, processing facilities, and other important services have been experienced in communities throughout the region. While these losses may be due in part to external factors, additional losses will be experienced in some communities that depend on the groundfish fishery if DAS are further reduced by large amounts in this amendment. The long-term concerns relate to the ability of the community to remain actively involved in the groundfish fishery and the ability of the community to support increased participation in the fishery as the stocks continue to recover and support larger yields. This is a significant concern for communities that are marginally involved in the fishery at this time (northern Maine and southern New England communities).

Another important concern is the potential for increased conflicts between user groups resulting from DAS reductions. If DAS are reduced significantly in this amendment or if this amendment changes the way that DAS are counted, it is possible that vessels that historically fished offshore will fish closer to shore to minimize steam time and maximize their DAS usage. This could mean that larger vessels from Gulf of Maine ports that may traditionally fish on Georges Bank will instead fish in the Gulf of Maine to save the DAS that they lose from their steam time to Georges Bank. Conflicts between user groups were identified during the social impact informational meetings (i.e. large boats/small boats) and could intensify as a result of adaptations that vessels make to DAS modifications. Conflicts between user groups can exacerbate intra- and inter-community conflicts, create additional perceptions of inequity, and weaken overall cohesion within communities involved in groundfish harvesting.

The economic impacts of DAS reductions that are being considered in this amendment are discussed in the economic impacts section. Certainly the most significantly impacted vessels from an economic perspective will be those that currently use most or all of their DAS. Similarly, the most significantly impacted communities will be those that currently depend on vessels that use most or all of their DAS.

Portland, Boston, New Bedford, Chatham/Harwichport, Provincetown, Gloucester, the NH Seacoast, and Portsmouth, exhibit a relatively high dependence on the multispecies fishery, use more of their allocated DAS, and will be most impacted by large-scale reductions in DAS. Communities like Eastern Long Island, Point Judith, Eastern RI, and Northern Coastal NJ are currently less dependent on the groundfish fishery and are likely to be impacted by the DAS allocations through the loss of flexibility and the opportunity to pursue the groundfish fishery as an alternative to other fisheries.

7.6.4.2 Trip Limits

Trip Limits are most likely to affect *regulatory discarding* and *formation of attitudes*. In general, trip limits can affect the structure of a fishery. If the trip limit is set very low, the inshore sector of the fleet can sometimes manage to fish economically, while the offshore sector of the fleet cannot cover trip expenses to direct fishing effort on the species managed by the trip limit. This can change the structure of revenues generated in the fishery and can ultimately change the long-term structure of the fishery itself. These types of outcomes, however, have not been evident to a large extent in the GOM cod fishery because trip limits have been set too low for most vessels to target GOM cod. This action considers increasing many trip limits (at the cost of reduced DAS), so these alternatives may have positive social impacts. An exception is for SNE/MA winter flounder and several other stocks where possession is prohibited. This is likely to be a particular problem for SNE/MA winter flounder as the stock rebuilds. The stock area extends east of Cape Cod and throughout the SNE/MA area. There is considerable fishing activity in these areas, both as part of the multispecies FMP and other FMPs, and discards will increase as the stock rebuilds. While the plan proposes some gear requirements to reduce these discards they will no doubt become problematic if rebuilding is successful. AS fishermen more frequently encounter the stock they will become frustrated with a management measure that does not allow retention. Nevertheless, from the fishermen's point of view, this may be preferable to a complete closure of the area to all fishing activity that catches the species.

Social impacts have resulted because the trip limits themselves hold a socially-undesirable characteristic – *regulatory discarding*. The impacts of regulatory discarding are discussed *infra*.

In the past, different trip limits for cod on Georges Bank and in the Gulf of Maine also have created perceptions of inequity between some sectors of the fishery. Although they are separate stocks of cod and there are many reasons for different trip limits, codfish are marketed similarly no matter where they are caught (sometimes prices may vary depending on how they are caught). Fishermen in the Gulf of Maine may be disadvantaged in terms of the fresh fish market for cod. Moreover, larger vessels from Gulf of Maine ports may be able to fish on Georges Bank and land more cod, increasing perceptions of inequity in some communities. This often exacerbates conflicts between sectors of the industry, which create social impacts in the form of intra-community conflicts and loss of community cohesion.

7.6.4.3 Gear Restrictions

In comparison to the no action alternative, several gear restrictions are being proposed in the alternatives under consideration. In terms of the SIA factors, gear restrictions affect *changes in occupational opportunities and community infrastructure* and *formation of attitudes* the most, although they can also affect *regulatory discarding* and *disruption in daily living* to a lesser extent. Gear restrictions can compromise business planning for shoreside support services and impose an economic burden on a large number of vessels. The social impacts likely to result from changes to gear restrictions are related to the cost for vessels to comply with and the ability of gear suppliers to adapt to the new gear restrictions.

If a new mesh size is required by the Proposed Action and not readily available, gear suppliers must order the twine well in advance of the effective date of the new regulation. Gear suppliers have indicated that ordering enough new mesh for the groundfish fleet could take between 3-6 months. In addition, new mesh requirements can sometimes leave gear suppliers with a significant amount of the "old mesh" that may no longer be marketable if it cannot be used in the fishery anymore (or in other fisheries). This results in a more significant loss of income for the gear suppliers.

Gear changes can affect short-term and long-term business planning for gear suppliers and related support services. The uncertainty associated with the implementation of new groundfish regulations necessitates gear suppliers to wait until it is definite that a new gear will be required. It is too risky and too expensive to order new twine or other gear prior to an official announcement of a new regulation. Quite often, this leaves gear suppliers uncertain about the short-term future needs for their business and makes it impossible for them to plan accordingly when developing longer-term business strategies. It is rare that a supplier can plan his/her business needs annually if gear restrictions change on as frequent a basis.

Gear restrictions place an additional economic burden on all affected fishing vessels. The ability to adapt to the new gear regulations will depend on vessels' current economic situation and ability to cover the short-term costs of the gear. If the new gear requirement is significantly different from current gear requirements, it is likely that the most marginal vessels will not be able to cover the costs of the new gear and will be forced to seek alternative fisheries or stop fishing altogether. For the vessels that can cover the short-term costs of the gear, long-term impacts are related more to the loss of revenues from fishing that may occur because of the new gear. For example, vessels are likely to lose some of their catch of species other than groundfish if they are required to fish for groundfish with a larger mesh. Over the long-term, this may result in more significant economic impacts and, ultimately, more severe dislocation of vessels in the fishery.

The magnitude and nature of the impacts of the gear restrictions under consideration in Amendment 16 will depend on the cost of the new gear, the current availability of the new gear, and vessels' choices as to whether or not to fish in the areas where the new gear is required. Some additional discussion of specific gear restrictions proposed in this amendment is provided within the discussion of the various alternatives.

7.6.4.4 Special Access Programs

Special access programs are being considered in combination with the alternatives proposed in this amendment. In concept, Amendment 16 endorses the concept of a Special Access Program (SAP) to allow for the establishment of groundfish fisheries that target stocks that can support increased fishing mortality, while avoiding stocks that require reductions in mortality. The positive impacts of these access programs would be from increased groundfish fishing opportunities for vessels that are able to participate in them. Participation could generate additional revenues and help to provide year-round fishing income. Over the long-term SAPs could mitigate some of the negative social impacts resulting from the broader management measures that affect mortality on all stocks like DAS modifications. SAPs are most likely to positively affect *changes in occupational opportunities and community infrastructure*, *disruption in daily living*, and *formation of attitudes*.

There are three SAPs that are modified in Amendment 16. All have the purpose of allowing effort to target Georges Bank haddock. The CAII Yellowtail flounder SAP is not likely to be used by small vessels, since they do not have the range to participate safely there. The SAP for hook gear vessels in CAI may provide limited opportunities for small vessels, primarily from Cape Cod and other Massachusetts ports.

The identification of programs to use Category B DAS is intended to help mitigate the social and economic impacts of the measures needed to rebuild overfished stocks. The use of Category B DAS distinguishes between B reserve DAS - only used in special access programs (SAP) (e.g., closed areas) - and regular B DAS used to target healthy stocks. Two of the proposed SAPs are located offshore and target resources in CAII. Smaller vessels are less likely to have the capacity to steam such a distance and may not find the use of DAS coupled with operating costs and safety risks worth the effort. Conversely, the CAI SAP for hook gear is closer to shore and may provide an opportunity for smaller, selective hook gear to use Category B (reserve) DAS. Massachusetts vessels have easier access to this SAP.

Future programs to use Category B (regular) DAS will be limited to targeting healthy stocks. Present stock conditions suggest that there may be more opportunities for these programs on Georges Bank, given the status of GB haddock in particular. There are no opportunities for these programs in the southern New England area given the status of SNE/MA yellowtail flounder and SNE/MA winter flounder. Within the Gulf of Maine, there may be limited opportunities for programs to target GOM haddock and redfish.

7.6.4.5 Category B (regular) DAS Program

The Category B (regular) DAS Program provides limited opportunities for fishermen to use Category B DAS outside of SAPs. As such, it helps mitigate the impacts of changes to other effort controls, such as the reduction in Category A DAS that can be used and differential DAS counting. While these elements would be expected to result in positive attitudes for the management program, their effect is limited by the other constraints on this program. The likely stock that will be targeted is GB haddock, so vessels that are not able to access this resource will not benefit. This includes many of the vessels that are most effected by the effort controls that are adopted - the inshore GOM dayboat fleet that fishes from the port groups located from Southern Maine to Provincetown, MA. These fishermen will see little benefit from this program and may resent the opportunities it provides to vessels that they perceive as less affected by the other Amendment 16 measures. The requirement to use a haddock separator or Ruhle trawl, the inability to target monkfish in this program due to low monkfish trip limits, and the reduction in DAS available for this program are all elements that may frustrate many who support the programs concept but not the details of its implementation. There are likely some positive social impacts from this measure for those vessels and communities that can take advantage of the program, but these benefits are likely to accrue to the larger vessels that fish on Georges Bank and not the vessels that are most affected by the restrictions in the inshore GOM differential DAS area. These larger vessels typically sail from the ports of Portland, Gloucester, Boston, and New Bedford. Of these four ports, Gloucester alone has a large dayboat fleet that will be affected by the Proposed Action but will receive little benefit from the Category B (regular) DAS Program.

7.6.5 Social Impacts of the Proposed t Action

A significant amount of discussion about social impacts already has been presented in this assessment. Discussion of the alternatives in the subsections below is brief and refers to previous sections of this assessment where appropriate.

7.6.5.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

Adoption of the updated status determination criteria and ACB control rules for groundfish stocks is a routine process and is not likely to have any direct social impacts. Many biomass targets have declined from the values adopted by Amendment 13. While on the surface this might be viewed by fishermen as a positive development, it also means that MSY values have declined and the value of the rebuilt fishery is not as high as predicted earlier. The GARM process was contentious, and members of the fishing industry dispute the results of the most recent assessments, which may have helped to foster distrust between fishermen and scientists. The revised mortality targets, while increasing on a few stocks, have decreased overall from previous levels and will thus require a decrease in fishing effort. Social impacts of specific effort control reduction alternatives are discussed *infra.*

7.6.5.2 Impacts of Fishery Program Administration

There are several measures proposed within the administration of the fishery management program that may generate some social impacts. These measures and their likely impacts are discussed below.

7.6.5.2.1 Annual Catch Limits

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.

The adoption of the ABC control rules may lead to concerns that the fishery is being managed in an overly conservative manner. This is not likely to occur until after stocks are rebuilt. Fishermen may view fishing at 75% of F_{MSY} on a rebuilt stock as limiting their ability to benefit from rebuilding. This could affect attitudes towards the management program since it will be viewed as limiting occupational opportunities unnecessarily.

7.6.5.2.2 Addition of Atlantic Wolffish to the Management Unit

The addition of Atlantic Wolffish to the management unit contained in the groundfish FMP is a purely administrative measure unlikely to have any measurable social impacts.

The wolffish EFH designation alternatives being considered in Amendment 16 would have no social impacts on fishing or non-fishing activities in the Northeast region. Changes in fishing activity that reduce accessibility to fishing grounds by vessels using certain ports which could have differential geographic impacts on local communities would only be affected by management regulations which minimize the adverse EFH impacts of fishing (e.g., closed areas, area-based reductions in effort). These regulations are already in place. Changes in these regulations are being considered in Phase II of the NEFMC EFH Omnibus Amendment 2. They would be based on the vulnerability of habitats utilized by the entire suite of 27 species managed by the NEFMC which have EFH areas that, taken as a group, overlap with all of the candidate wolfish EFH designation alternatives. The addition of wolffish EFH would not affect the EFH protection provisions of the MSA: they would still apply to fishing and non-fishing activities that are conducted throughout the geographic extent of the existing EFH designations

7.6.5.2.3 Sector Administration Provisions

Sector administration provisions are likely to have social impacts on individual fishermen and fishing communities. Sector formation proposals are cumbersome to draft and could increase operating costs. They also need to be drafted in consultation with the NMFS, which could lead to disruptions in daily living and frustration with fisheries managers. The formation of sectors will also necessarily change relationships between members of fishing communities. Participants will have to work closely together to create proposals that will satisfy the interests of each person involved. While this process could be contentious and cause rifts among community members, it may also be an opportunity for relationship-building and lead to increased social capital and infrastructure within communities and regions.

The allocation of resources to sectors is likely to have significant impacts on some members of the industry. Depending on which allocation method is chosen, individual fishermen will be allocated comparatively more or less landings history to bring into the sector. The amount of landings history will determine future allocations and economic benefits, which will have pervasive effects for individuals and communities. Many fishermen will perceive allocations as inequitable if they do not receive the portion they feel they have earned.

Impacts associated with the actual implementation of sectors and the results of specific administrative measures will be discussed *infra* in the section on sector implementation.

7.6.5.2.4 Reporting Requirements

The adoption of additional reporting requirements may slightly add to the amount of time fishery participants spend on administrative matters, but is not expected to have significant social impacts. While the requirement to declare whether a vessel will fish in multiple reporting areas on a trip may lead to negative attitudes for some fishermen, more accurate catch reporting could improve assessments in the future and may lead to acceptance of the requirement.

7.6.5.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

Allocation between the commercial and recreational groundfish fisheries could impact the capacity of each group to catch some stocks in the future, but the social impacts of this measure are difficult to determine. The proposed allocations seek to maintain the catch ratios currently in place, so their adoption should not unduly burden either fishery. There is disagreement about the years used to determine the allocation, however. Some commercial fishermen believe the selected years unfairly benefit recreation fishermen. Such beliefs will lead to the formation of negative attitudes towards the management program among commercial fishermen affected by the allocation.

7.6.5.2.6 Changes to the DAS Leasing and Transfer Programs

The extension of the DAS leasing program by FW 42 was designed to help mitigate the effort restrictions providing a mechanism for vessel operators to increase the DAS that are available to their vessels. In addition, it provides a means for vessels that may have too few DAS to be profitable to earn a return DAS by leasing them to other vessels, which provides the vessel owner with some revenue while avoiding operating costs. In general, the leasing program has been viewed as a positive development. However, leasing has not been without its detractors. Some fishermen believe that leasing helped contribute to increased mortality on GOM cod and other groundfish stocks, and may do the same in the future. They are concerned that the leasing program makes it more difficult to meet mortality objectives and in the long run will result in additional effort restrictions. From this point of view, the leasing program will ultimately prove costly to the fishery. While those vessel operators that have sufficient financial resources to acquire DAS through leasing may be able to absorb future effort reductions, other vessel operators may be forced out of business.

This action proposes several changes to the DAS leasing program. One that may have positive social impacts will allow DAS to be leased from permits that are in the CPH category. This will allow fishermen to lease DAS from permits that are not attached to vessels. At present, the only purpose served by the prohibition to lease DAS from permits in CPH is to create an administrative burden as fishermen take the permits out of CPH and put them on skiffs so they can use the DAS. Simplifying access to the DAS on those permits will have positive benefits.

The proposed changes also remove the cap on the number of DAS that can be leased. This may help some permit holders acquire sufficient DAS to break-even, and can be expected to improve attitudes and increase occupational opportunities as a result.

The proposed changes to the DAS transfer program will improve the attitudes of fishermen towards the regulations. The current program is unattractive and has rarely been used by any vessel. By making this program easier to use fishermen will benefit from the availability of an additional way to mitigate the effort reductions adopted by Amendment 16.

7.6.5.2.7 Special Management Programs

The expansion of the U.S. /CA haddock SAP, the opening of the CAII yellowtail SAP for targeting haddock, and the expansion of the hook gear haddock SAP will have positive impacts. All will create opportunity for increased catch and revenue, leading to increased occupational opportunities. Also, regulatory discarding may be reduced by fishing in those areas. Increasing fishing opportunities in those areas may help to offset losses brought on by a reduction in DAS throughout the fishery.

Negative social impacts associated with changes in the special management programs include a loss of opportunity for targeting pollock with the change in Category B DAS regulations and possible safety concerns. Industry members that have been heavily dependent on pollock catch will suffer as a result of decreased catches and less opportunity for fishing on the stock. Also, the existence of the SAPs may cause effort to shift to their location that would otherwise be directed closer to land. Boats could be led further afield than they are equipped to handle. As discussed above, there could be safety concerns associated with an effort shift offshore.

7.6.5.3 Impacts of Management Alternatives to Meet Mortality Objectives

7.6.5.3.1 Commercial Fishery Management Measures

The measures already addressed include DAS reduction, trip limits, restricted gear areas, and differential DAS counting. The 24 hour clock is one additional component of Option 3A with the potential to create social impacts.

The 24 hour clock is a system in which DAS are counted in increments such that any portion of a day fished counts as an entire twenty-four hours. This effort control method affects the way that people plan the duration and scope of their fishing trips. It has been disfavored in the past due to the belief that vessels may stay out at sea longer than is advisable in order to fully utilize all the hours that will be counted. If vessels do not come to port based on the need to maximize their catch, safety issues can arise due to inclement weather or understaffed vessels. Recent developments in the fishery have led some fishermen to fish with smaller crews than in the past, or in the case of some smaller vessels to fish without any crew other than the vessel captain. It is argued that with a 24-hour clock the vessel operators will remain at sea longer than is advisable in order to catch fish during as much of the 24 –hour period as is possible, leading to increased fatigue and a risk of vessel accidents. There is little empirical evidence to support or refute this concern. Comments by Coast Guard representatives during consideration of FW 42 noted that crew fatigue is a concern for vessel operation and as a result Coast Guard boat crews are subject to operating hour limits to reduce the possibility of accidents. Another concern raised is the suggestion that fishermen will keep fishing the full 24 hours and discard species limited by a trip limit. There is also the concern that if surprised by adverse weather the tendency will be to keep fishing rather than return to port in order to maximize use of the fishing time charged.

Although these concerns were underscored during public comment for Framework 42 and appeared to sway the opinions of some Council members when choosing the Proposed Action, many fishermen claim that the 24 hour clock is no more responsible for safety issues than are differential DAS alternatives that shift effort into other areas. These alternative views point out that catches of many species are limited by trip limits and it makes little sense to continue fishing and incur operating costs if the additional catch cannot be landed, particularly in the case of high-value species like cod. They note that for those species that are not subject to a trip limit, vessel operators will realize that they cannot handle the volume of fish that can be caught when fishing a full day without additional crew, mitigating to some extent the concerns over fatigue. As support for this argument they point to day gillnet fishermen who have been subject to a mandatory DAS charge of fifteen hours, yet many continue to fish less than the maximum charge to save on operating costs. Choosing to keep fishing in the face of adverse weather is just one possible response – fishermen may also choose to be more cautious when considering weather before departing on a trip in order to reduce the risk of having to end a trip early.

The GOM haddock sink gillnet pilot program, if successful, will allow a greater catch of haddock to be retained and thus increase efficiency and revenue in the fishery. Other positive impacts will be improved attitudes as more fish are able to be caught, and the continuing fostering of innovation in the industry

The proposed decrease in the haddock minimum size should have positive social impacts. It will reduce discards and improve attitudes toward management by allowing more of the catch to be retained. It should also lead to greater revenue and the ability to land more of the allocated ACL for the stock.

7.6.5.3.2 Recreational Fishery Management Measures

The social impacts of the proposed recreational measures are difficult to discern, in part because many participants are not associated with a primary or secondary port group: passengers on party/charter vessels come from a wide area and are often not specifically associated with a fishing community. For the party/charter operators that participated in the development of the management program, there was resentment that any measures were contemplated. According to these personnel, they view the need to reduce mortality as a problem for the commercial fleet and not the responsibility of the recreational industry (including party/charter vessels). Nevertheless, the proposed measures were developed by the Recreational Advisory Panel and have the support of that panel given that the Council had decided to reduce recreational mortality by an amount similar to commercial mortality. When compared to the No Action alternative attitudes are likely to be negative, but the Proposed Action is an improvement over other alternatives that were considered.

The area of recreational fisheries management with the largest potential for social impacts is the determination of accountability measures. Those are discussed in the appropriate section below.

The economic impacts of the proposed recreational measures are discussed in a previous section. Social impacts from recreational measures are related to economic impacts to the extent that the economic impacts reduce the value or satisfaction derived from taking a recreational trip. For the most part, it is assumed that recreational groundfish fishermen derive more satisfaction from keeping fish than from the sport of catching them. As a result, the social impacts associated with the measures that reduce the ability to keep fish are expected to be more significant than they would in other recreational fisheries where catching fish for sport is more important. These measures include minimum fish sizes and recreational possession limits.

7.6.5.3.3 Atlantic Halibut Minimum Size

The increase in minimum size for halibut may increase regulatory discarding, and may negatively affect fishermen's attitudes toward management. The new size was selected to match the median length for maturity for female fish, which is a rationale the industry seemed to support. However, more fish than before will be caught that are smaller than the minimum size and will need to be discarded. Because Atlantic halibut are rarely caught in either the commercial or recreational fishery, some fishermen believe the increased minimum size is merely a nuisance regulation with little benefit.

7.6.5.3.4 Prohibition of Retention of Atlantic Wolffish

Prohibiting the retention of wolffish is unlikely to have significant social impacts. Fishermen have stated that the fish are rarely caught, and therefore do not economically rely on them. There is a slight potential safety issue in that the fish are dangerous to handle due to a poor temperament. Fishermen may be slightly inconvenienced devising strategies to return them to the water, but will not likely suffer any major difficulties.

7.6.5.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

In general, the implementation of sectors is seen as an opportunity to mitigate some of the harsh effects of the effort control alternatives by allowing participants to fish under a TAC in exchange for relief from many of the regulations. The impact to particular individuals and communities will depend on whether they choose to join a sector and whether a community has a large proportion of individuals in sectors in comparison with the common pool.

Sectors have the potential to be relationship-building or to breed disputes and strife, depending on the success of the individual organization. Participants in a sector become responsible for sharing resources and dividing shares of catch and profits amongst themselves. If relationships are good between members, a sense of community and partnership could flourish. However, the opposite could happen if sector members have bad interactions or do not cooperate. While sectors are a form of catch shares that has extensive support among government agencies (including NOAA) and some environmental organizations, their application in the multispecies fishery has received a mixed reception from fishermen. There are those who welcome this opportunity to move away from the effort control system, but others are concerned that sectors will lead to further industry consolidation and make it more difficult for independent small vessel owners to remain in the industry.

The three factors which are most likely to be influenced by the implementation of sectors are *regulatory discarding*, *changes in occupational opportunities and community infrastructure*, and *formation of attitudes.* One of the guiding principles behind sectors is that discards will be reduced when participants fish under a quota. The elimination of trip limits and the knowledge of how much of each species is allocated should lead sectors to make wise decisions that greatly reduce or end discarding. Reduced discarding, in turn, will lead to more positive attitudes about management. The relief from many burdensome and complicated regulatory requirements will also improve attitudes toward management, and reduce the negative social impacts of other measures in the amendment. Occupational opportunities may arise from the emergence of sectors, including monitoring and administrative jobs. The opportunities for fishermen, too, will likely change as they must coordinate with others in their sector to maximize efficiency. If sectors become popular enough, community infrastructure could increase as more relationships are built and decisions are made communally regarding business operations. Fishing industry infrastructure might decline, however, if sector vessels fish more efficiently and make fewer trips. There could be reduced needs for gear suppliers, ice, maintenance personnel, etc.

Fishermen who are not in a sector, however, may have a different view towards sector formation. Allocations between sector and common pool vessels are likely to be a contentious issue. Since the sub-component of ACL allocated to the common pool will be influenced by how many people join sectors, there may be questions of fairness and legitimacy raised.

One negative impact that may result from sector management measures is related to the treatment of windowpane flounders, ocean pout, and SNE/MA winter flounder. Sector vessels cannot retain these stocks, but the sectors do not receive an allocation for them. As a result, there is no incentive for sector vessels to limit their catches of these stocks. Any excessive catches of these stocks will lead to overages f the ACL and will trigger AMs for non-sector vessels. This is likely to lead to negative attitudes among those fishermen who either choose not to join a sector or who are not welcomed into a sector.

It is difficult to predict how these conflicting reactions will develop over time. It is likely that communities with large numbers of sector participants will benefit from the increased flexibility, and ability to tailor regulations that should result from sector formation. Other communities may resent sector success in these areas. If the sectors are successful, it may encourage other fishermen to form a sector and could lead to improved attitudes towards fishery management. If sectors cause additional management challenges, the opposite reaction may develop.

Sector TACs/ACE

Sector TACs, or quotas, have the potential to significantly impact all five SIA factors that have been identified in this assessment: *regulatory discarding*, *safety*, *disruption in daily living, changes in occupational opportunities and community infrastructure,* and *formation of attitudes*.

Management that uses TACs does have some potential social benefits. It can provide some stability to the fishing regulations, at least on an annual basis. This can allow for better business planning over the short-term. The use of TACs also creates the potential to generate long-term positive social impacts resulting from the ability to meet the conservation objectives of the management program. If TACs are set appropriately and enforced adequately, biological objectives should be met, eliminating the need to increase restrictions on the fishery in the future.

Meeting biological objectives ensures an improved revenues stream over the long-term as well. Furthermore, the adoption of a TAC management program for sectors would eliminate nearshore seasonal area closures in order to provide all vessels with equal access to the resource, unlike some other proposed measures that impact small or remote vessels more harshly. This would likely improve safety, especially for smaller fishing operations that are pursuing the quota.

Interaction with Common Pool Vessels/Universal Exemptions
The Proposed Action attempts to further define the general principle that sectors are not responsible for overfishing by other components of the fishery. While this is expected to benefit fishermen who join sectors, and the communities within which they reside, it could lead to friction between sector members and common-pool fishermen. It is possible that in the future additional restrictions could be imposed on one component while the other component continues fishing, causing resentment within communities. Nevertheless, many fishermen likely welcome the concept that they are responsible for the consequences of their own fishing actions and are not to be penalized by the overfishing of others. While this section modifies language adopted by Amendment 13, it does not substantially alter the concept adopted in that amendment and the impacts are unlikely to be much different than if the No Action alternative was adopted.

This section also defines and expands the effort control measures that do not apply to sector vessels. The expanded list allows sector vessels to access some part of the GOM rolling closures. This will be welcomed by sector participants who will have increased opportunities to target their ACE. They may also benefit by reduced competition since vessels in the common pool will still be restricted by the closures. Communities with sector vessels may benefit from a more regular supply of groundfish to markets with the increased access to fishing grounds afforded sector vessels. This could lead to more reliable employment and a gradual expansion of access to markets as customers take advantage of a more regular supply of groundfish. On the whole, this should benefit fishing communities.

Movement Between Sectors
The Proposed Action does not modify provisions adopted in Amendment 13 that allow sectors to establish their own rules for movement between sectors (the No Action alternative was the only alternative considered and was adopted). This measure is administrative in nature and no noticeable impacts are expected beyond the general benefits expected from sectors.

7.6.5.3.6 Accountability Measures

Commercial Accountability Measures – Non Sector Vessels
The Proposed Action adopts a differential DAS AM for FY 2010 and FY 2011 for non-sector vessels, and then implements a hard TAC AM in FY 2012. As a result, the social impacts of the AMs for these vessels will change over time.

The effects of proposed differential DAS counting and DAS reductions have been thoroughly described in the previous section under general impacts of effort control measures (see section 7.6.4.1). The same analysis would apply if such measures were adopted as AMs. The other proposed AM that uses a “hard” TAC backstop would lead to different impacts.

Especially in a multispecies fishery, social impacts of hard TACs can be a byproduct of several changes in fishing behavior, including derby-style fishing, high grading, and regulatory discarding. If a TAC is set low enough on a commercially valuable species, it can create a derby or a race for the fish. Derby-style fishing can negatively affect the price for the species and the revenues from the fishery if too much product is put on the market at one time. These negative economic impacts can affect occupational opportunities in the fishery and may impact community infrastructure over the long-term. In addition, derby-style fishing can create unsafe conditions for a vessel or a fleet depending on how competitive the race is and what time of year the fleet is catching the fish.

Once a quota is reached, further landings of the species are usually prohibited. This can create a regulatory discard problem, worsened by the race to fish and a consequently shorter period of time during which the species can be landed. In a multispecies fishery like the groundfish fishery, it is likely that some TACs will be reached, while others will not, allowing some groundfish species to continue to be landed. Depending on the time of year and stock area in question, this could exacerbate problems with regulatory discarding, as the race to fish for the other quota-managed species may force most vessels to continue to fish while discarding the species for which the quota has already been reached.

This outcome is very likely if hard TACs are implemented as AMs in a year following an ACL overage and combined with other measures in Amendment 16. This also can lead to high grading: discarding that occurs when fishermen select only the highest-valued fish to land. For example, if large cod are worth the most, fishermen may discard other marketable sizes to keep only the largest cod, especially if the total quota is low and their opportunities to fish for groundfish are further restricted.

Commercial Accountability Measures –Sector Vessels

AMs for sector vessels are an inherent part of the sector program. The key AM is that sector vessels are limited to a hard TAC for each sector and must stop fishing when it is projected the TAC will be reached. Unlike the hard TAC AM for non-sector vessels, because the sector has an individual TAC it is less likely that derby fishing will occur because a sector can organize its activity to prevent such a response by individual vessels. As a result, there are expected to be positive social impacts from sector management that will not be affected by the AM for sectors.

Recreational Accountability Measures

Recreational AMs being considered are adjustments to season, adjustments to minimum size, or adjustments to bag limits. As noted *supra*, it is difficult to measure social impacts of any recreational fishing measures. Of these actions, adjustment to season seems to carry the most significant impacts, particularly among the party/charter boat segment of the fishery. Many vessel operators book fishing trips in advance, and last-minute changes to their season, or any closure at all during certain months of the year, could paralyze the industry. Since most recreational fishermen other than party/charter boat captains do not depend on the fishery for livelihood, changes to bag limits, adjustments to minimum size, and even reasonable adjustments to season may affect attitudes towards fisheries management or increase discarding, but the effects are not likely to be as pervasive as with certain commercial fisheries measures. Other impacts of changes to regulations for the recreational fishery are likely to include loss of tradition and leisure activities.

7.6.6 Summary and Conclusions

Overall, the alternatives being considered are likely to have a negative effect on the important social factors identified by Amendment 13. The further reductions in DAS and twenty-four hour clock, revised trip limits, and restricted gear areas will make it more difficult for fishermen to maintain daily routines, operate in a safe manner, and maintain a positive attitude towards the management program. Landings and revenues have generally been declining for several years; there should be gradual increases in the next few years if stocks rebuild as expected. The economic impacts of this action on those communities are expected to be severe and in some cases may threaten the existence of fishing businesses in those communities. Social impacts will be primarily the result of commercial effort control measures and formation of sectors. There are different impacts between the alternatives, however. The impacts will fall most heavily on vessels and communities that are most dependent on groundfish. These tend to be the Maine, New Hampshire, and Massachusetts ports adjacent to the Gulf of Maine, though New Bedford is also a port that will be adversely affected.

There are some communities where the impacts may not be as severe due to elements of the action that attempt to mitigate impacts. The implementation of sectors, the elimination of the DAS transfer tax, and changes to SAPs may help some vessels and their communities adapt to the restrictions in this action. These benefits may prove localized to small groups of vessels, however, and are unlikely to change the overall perception that the social impacts of this action, in the short term, are largely negative. In part, the extent to which fishery participants will join sectors will be determinative of overall impacts. Successful rebuilding of groundfish stocks should lead to future benefits for fishermen and their communities but, as noted in previous amendments, it is not clear that current fishery participants will reap those benefits.

7.6.7 Social Impacts Analysis of Alternatives to the Proposed Action

7.6.7.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

Under the No Action alternative, the updated status determination criteria and ABC control rules for groundfish stocks would not be adopted. Adopting new criteria is a routine process and is not likely to have any direct social impacts. Keeping the old criteria could lead to complaints that the management measures are not developed using the best available scientific information.

7.6.7.2 Impacts of Fishery Program Administration

7.6.7.2.1 Annual Catch Limits

The No Action alternative would not implement ACLs, which are required by the Magnuson-Stevens Act. Failure to adopt ACLs may have social impacts that are difficult to define. While fishermen might initially welcome the lack of an ACL process, in the long-term the lack of ACLs may make rebuilding progress less certain, limiting opportunities.

7.6.7.2.2 Addition of Atlantic Wolffish to the Management Unit

The No Action alternative would not add Atlantic wolffish to the management unit, and as a result EFH would not be specified and management measures to rebuild wolffish could not be adopted in this action. In the short term fishermen might welcome fewer regulations and continued opportunities to land this stock (even though it is but a small component of catch). Over a longer period, failure to manage wolffish could lead to more drastic measures in the future that would further limit opportunities for fishermen. Other interested parties that believe wolffish are in need of additional protection would likely form negative attitudes about the management process if the No Action alternative were selected.

7.6.7.2.3 Sector Administration Provisions

The No Action alternative would not adopt the wide range of revised sector administration provisions included in the Proposed Action. Many of these changes are considered essential to expanding the use of sectors in this fishery. Failure to adopt these changes could lead to reduced opportunities for fishermen and as a result lead to negative attitudes about the management program. While there are some who oppose the expansion of sectors, and they may prefer that changes not be made, the lack of clarity in sector policies that would continue under No Action would be detrimental to the fishery as a whole. For example, the lack of an effective sector monitoring program could lead to uncertain catch information, leading to inaccurate assessments that would limit opportunities for all fishermen.

7.6.7.2.4 Reporting Requirements

If the No Action alternative were selected, reporting requirements would not change and there would be no method adopted for estimating discards in-season. While this might slightly ease reporting burdens, it is unlikely to have significant social impacts.

7.6.7.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

If an allocation is not made between these two groups (the No Action alternative), then there may be a mix of reactions. Recreational fishermen often complained that they are forced to accept additional restrictions when catches by commercial fishermen lead to exceeding mortality targets. As a result, recreational fishermen have negative attitudes about the management program. An allocation is viewed as one way to avoid these situations, since recreational fishermen will be responsible for their own catches. The reality is that commercial measures were frequently changed between 1996 and 2004, while recreational measures were not. Commercial fishermen might prefer not having an allocation because many object to the years selected by the Proposed Action.

Other alternative to the Proposed Action included using different years for the basis. Again, recreational fishermen would likely have negative attitudes if different years were used, while commercial fishermen might prefer the different period (1996-2006). This is easily traced to which group gets more fish under the different periods.

7.6.7.2.6 Changes to the DAS Leasing and Transfer Programs

The No Action alternative would not remove the tax on DAS transfers, would keep in place the cap on the number of DAS that can be leased by a permit, and would not allow CPH permits to participate in the leasing program. All of these provisions are intended to make these programs easier to use; not adopting them can be expected to result in negative attitudes and reduced occupational opportunities for fishermen.

In addition to the No Action alternative, the Council considered adopting a tax on DAS leases that is equivalent to the transfer tax. Such a change would make the DAS leasing program more costly and would reduce occupational opportunities. The Council also considered removing the transfer tax for a fixed period; this would be expected to have similar effects.

7.6.7.2.7 Special Management Programs

The No Action alternative would not extend the Eastern U.S./Canada Haddock SAP, resulting in negative social impacts as this would reduce occupational opportunities. Similar impacts would be expected if the proposed changes to the CAI Hook Gear Haddock SAP and the CAII Yellowtail SAP were not adopted. If the changes to the Category B DAS program were not adopted, it may lead to positive social impacts as this program could be used to target pollock.

7.6.7.3 Impacts of Management Alternatives to Meet Mortality Objectives

7.6.7.3.1 Commercial Fishery Management Measures

The No Action alternative would not adopt revised management measures for common-pool vessels. When compared to the Proposed Action, this would result in positive social benefits because the opportunities to fish would be far greater: there are fewer DAS reductions and fewer limits on fishing opportunities. While it is true trip limits would remain low, which may lead to higher regulatory discards and resulting negative attitudes than under the Proposed Action, the greater number of DAS available would likely outweigh this concern. The two other alternatives (Options 2A and 4) would likely have similar negative social impacts as the Proposed Action.

Adopting the drop chain requirement for SNE/MA small mesh fisheries would likely to have mixed social impacts. It should ultimately lead to less discarding, improved attitudes, and more occupational opportunities as an effectively selective multispecies fishery can sustain greater effort. The problem is that this measure is imposed on fishermen participating in other fisheries and they may or may not benefit from improved groundfish stock status. Fishermen in other fisheries may also be concerned that the requirement will reduce their ability to effectively target species such as summer flounder, scup, black sea bass, and squid. These fishermen will have to pay for revised net configuration with no real expectation that it will increase revenues in these fisheries in the future, which may lead to frustration and cause some disruption in daily living during acquisition and installation of the gear.

Not implementing the GOM haddock sink gillnet pilot program would limit opportunities for gillnet gear to target GOM haddock. These reduced opportunities would add to the negative social impacts of the management program.

Retaining the current haddock minimum size would have negative social impacts. Discards might increase and fewer fish would be retained.

7.6.7.3.2 Recreational Fishery Management Measures

The social impacts of the proposed recreational measures are difficult to discern, in part because many participants are not associated with a primary or secondary port group: passengers on party/charter vessels come from a wide area and are often not specifically associated with a fishing community. For the party/charter operators that participated in the development of the management program, there was resentment that any measures were contemplated. When compared to the No Action alternative attitudes are likely to be negative, but the Proposed Action is an improvement over other alternatives that were considered.

7.6.7.3.3 Atlantic Halibut Minimum Size

The No Action alternative would not increase the minimum size for halibut. When compared to the Proposed Action this may result in a small positive social impact, as some fishermen think increasing the size is a nuisance regulation. Given the relative unimportance of the halibut catch, these impacts would be minor.

7.6.7.3.4 Prohibition of Retention of Atlantic Wolffish

Allowing the retention of Atlantic wolffish (the No Action alternative) is not likely to have noticeable social impacts given the small catches of this stock.

7.6.7.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

The No Action alternative would not adopt additional sectors or modify the existing sectors. The social impacts of this alternative are likely to be mixed and reflect each individual's personal philosophy about sectors and catch share management. The three factors which are most likely to be influenced by the implementation of sectors are *regulatory discarding*, *changes in occupational opportunities and community infrastructure*, and *formation of attitudes.* Regulatory discards would only be affected by changes in effort controls if new sectors are not adopted, and would likely be higher than under the Proposed Action. It is not clear how occupational opportunities would be affected: some fishermen think sectors will reduce opportunities because of consolidation; while others think sectors are the best chance to preserve community access. And attitudes to the management system depend on whether sectors are viewed as desirable or not.

7.6.7.3.6 Accountability Measures

Commercial Accountability Measures – Non-sector Vessels

The Council considered a No Action alternative that would not have adopted AMs. In the short-term this may have resulted in positive social impacts. AMs have the potential to affect attitudes and occupational opportunities in negative ways, as discussed in section 7.6.5.3.1. Without AMs, these negative impacts would not occur. Over the long term, however, the lack of AMs could lead to exceeding mortality targets, which would result in additional restrictions in the future. This could also lead to negative social impacts as occupational opportunities would be decreased.

The Council also considered adopting either differential DAS as an AM, or a hard TAC AM (the Proposed Action uses both forms, starting with differential DAS for two years and then adopting the hard TAC AM). Choosing one alternative might have slightly less negative social impacts. The use of two different AMs over a three-year period increase uncertainty about the management plan and future measures. If only one AM is selected, some of this uncertainty is removed.

Recreational Accountability Measures

The alternatives to the Proposed Action for recreational AMs differ primarily in how the AMs are implemented. Option 1 would have allowed NMFS to choose the AM without any Council input; this likely would lead to more negative attitudes than under either the Proposed Action or Option 2 because fishermen would feel they were not consulted about the AM. But the reality is that the specific AMs chosen will have more impacts on attitudes and opportunities than the process used to adopt the AMs, and any differences between the Proposed Action and the alternatives are probably minor.

7.7 Impacts on Other Fisheries

7.7.1 Overview

The M-S Act requires that management actions evaluate the impacts of proposed measures on participants in the fisheries and fishing communities affected by the plan, participants in the fisheries conducted in adjacent areas under the authority of another Council, and the safety of human life at sea. Economic and community impacts of the alternatives being considered on groundfish fishermen and their communities are detailed in sections 7.5 and 7.6. Impacts on safety are also described in section 7.6. This section summarizes the possible impacts of the alternatives under consideration on other fisheries, including those in areas adjacent to the authority of this Council. These impacts are discussed in a general nature given the complexity of the alternatives under consideration and the difficulty in predicting behavioral reactions to those measures.

While many of the alternatives under consideration are administrative in nature and will likely have little direct impact on other fisheries, the requirements to reduce fishing mortality and the measures necessary to achieve those reductions could shift fishing effort into other fisheries as fishermen attempt to mitigate losses in groundfish revenues. This might occur whether most fishermen choose to remain under the effort control program or choose to participate in sectors. In either case, the amount of time spent fishing for groundfish is likely to decrease. This is because vessels will be subject either because of restrictive limits on DAS use (including DAS reductions and counting DAS in 24-hour increments) or because of the efficiencies associated with fishing within sectors. If fishing within sectors proves to be efficient the profitability of groundfish vessels should increase. Whether this will reduce the incentive to participate in other fisheries or will in fact encourage expanding investments to participate in those fisheries is difficult to predict.

Designation of EFH for Atlantic wolffish, under any of the alternatives being considered in this amendment, would not have any impact on other fisheries conducted in areas adjacent to the area under the authority of the NEFMC. Habitat management measures that might be implemented in the Mid-Atlantic region in the future to minimize the impacts of fishing, or to conserve marine habitats that are determined to be affected by non-fishing activities, would be based on EFH designations for other species and life stages.

The ability to move between fisheries is constrained in part by the permits held by individual vessels and in part by the fisheries that are available in the area that the vessel typically fishes. While vessels operators could choose to relocate to take advantage of other fishing opportunities there are disincentives to do so: difficulty arranging dock space, unfamiliarity with fishing grounds, etc.

summarizes the permits in other plans that were held by vessels holding a northeast multispecies permit in permit year 2008. This action will have the most impact on limited access multispecies permit holders (Categories A, C, D, F).

The management plans in the Northeast Region of NMFS are a combination of limited access and open-access fisheries. In general, when a fishery has both types of permits, the limited access permit categories in a fishery tend to provide more opportunities to harvest another species and the open access categories are more constrained (often to an incidental catch limit). Examining the table shows that groundfish limited access permit holders have the most limited access permits in the following FMPs: summer flounder (470), monkfish (461), scup (424), black sea bass (347), lobster trap fisheries (over 320), and squid/mackerel/butterfish (273). Three of these fisheries are managed by the Mid-Atlantic Fishery Management Council (MAFMC), one is jointly managed by the NEFMC and the MAFMC, and one is managed by NMFS in federal waters under ACFCMA. In terms of open access fisheries that do not have any limited access permits, multispecies permit holders have the most overlap with the small-mesh multispecies fisheries (all limited access permit holders are eligible to participate), spiny dogfish (911), and the skate fishery (898). Spiny dogfish is jointly managed by the NEFMC and the MAFMC while the skate fishery is managed by the NEFMC. The possible impacts on the summer flounder, scup, black sea bass, squid/mackerel/butterfish, monkfish, and skate fisheries will be discussed in more detail in the following sections. Impacts on the spiny dogfish, small mesh multispecies, and lobster trap fisheries will also be briefly discussed.

In addition to these fisheries that may be affected by specific regulations or displacement of effort, this action modifies two SAPs and a permitting restriction. These changes may have impacts on the herring and scallop fisheries that are also discussed below.

Table 298 – Other permits held by vessels with a Northeast Multispecies FMP permit for permit year 2008. Permit categories that are underlined in bold italics are limited access, moratorium, or restricted eligibility permits

		MULTISPECIES PERMIT CATEGORY									
PLAN	CAT	***A***	***C***	***D***	***E***	***F***	***HA***	HB	I	***J***	K
MULTISPECIES PERMITS		1,058	12	72	47	31	129	1,124	721	275	939
BLUEFISH	1	932	12	60	42	32	103	924	331	253	835
	2	64	3	18			26	305	662		171
BLACK SEA BASS	***1***	347	4	10	18	10	6	163	32	109	180
	2	57	2	13			18	275	612		167
DOGFISH	1	911	8	49	45	31	66	806	423	263	798
SUMMER FLOUNDER	***1***	470	3	6	40	9	2	57	8	230	203
	2	62	3	14		1	22	301	634		176
HERRING	***A***	11			1		1	11		4	19
	B	4									
	C	37			2			2		8	9
	D	773	9	39	33	20	56	687	341	219	728
LA GEN CAT SCALLOPS	***A***	123			4	4		42		34	80
	B	56		3	3	1		11	1	14	23
	C	112			12			14	2	71	72
LOBSTER	***1***	681	2	3	40	16	3	48	15	165	166
	2	4	2	1				15	22		10
	A1	320	2	11		5	21	224	32	7	133
	A2	158	2	6	1	10	1	90	12	11	61
	A3	25		1		4	4	35		1	35
	A4	17		1		1		24	1	1	32
	A5	3				2		15	3		18
	A5W	7						2		1	6
	A6	26		1				16	6	1	12
	AOC	85	2	4	1	4	1	22	5	4	21
MONKFISH	***A***		1					6			8
	B						2	14	2		16
	C	166			26	8		5		128	84
	D	294			13	21		2		5	4
	E	524	8	48	7	3	52	721	355	136	684
	F	1									
	H										1
OCEAN QUAHOG	6	347		9	41	9	2	83	2	221	247
	7	3						10		1	7
RED CRAB	A	607	2	20	38	14	27	457	120	213	611
	B	1						1			1
SCALLOPs	***2***				34			7		201	129
	3				1					1	
	4									1	
	5				9			2		43	30
	6				3			5		20	10
	7	1								9	2
SCUP	***1***	424	2	9	17	11	7	110	22	100	140
	2	61	3	12		1	20	266	575		160

		MULTISPECIES PERMIT CATEGORY									
PLAN	CAT	***A***	***C***	***D***	***E***	***F***	***HA***	HB	I	***J***	K
SURF CLAM	1	357		9	40	11	2	83	2	225	251
SKATES	1	898	9	41	43	28	45	641	294	244	747
SQUID MACKEREL BUTTERFISH	***1***	273			12	3	2	5		55	49
	2	55	2	13			27	282	604		162
	3	664	7	36	39	23	50	637	201	218	723
	4	811	8	44	43	27	76	759	259	234	776
	5	44			3			2		21	22
TILEFISH	***A***	1		1				1			
	B	2								1	1
	C	9		1				3		1	2
	D	723	7	33	40	22	37	615	360	240	714

7.7.2 Summer Flounder

The summer flounder (fluke) fishery is managed by the MAFMC. The primary commercial fishery management measure is a quota that is distributed to individual states. Other federal regulations include minimum mesh size and a minimum fish size. States typically restrict harvest to their quota using seasons and trip limits. The stock is currently under a rebuilding program with a deadline of January 1, 2013. The summer flounder stock was last assessed in 2008 (SAW 47). The assessment determined the stock was not overfished and overfishing was not occurring in 2007. Fishing mortality in 2008 (0.288) was slightly above the fishing mortality needed to meet the rebuilding target (0.274). The fishery occurs primarily in southern New England and the Mid-Atlantic area but there is some indication that the stock is expanding to the north and east.

The following proposed measures are not expected to directly affect the summer flounder fishery:

- Revisions to status determination criteria and formal rebuilding programs
- Annual Catch Limits: Option 2 takes into account the catch of groundfish species in other fisheries. This action does not propose a specific ACL for the summer flounder fishery but it is possible a specific ACL may be considered in the future.
- Addition of Atlantic Wolffish to the Management unit
- Sector administration provisions: these options will not have direct impacts on the summer flounder fishery, but the formation of additional sectors may and will be discussed below.
- Reporting requirements
- Allocation of groundfish to the commercial and recreational groundfish fisheries
- Special management programs
- Periodic Adjustment Process
- Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel
- Recreational Management measures
- Atlantic halibut minimum size
- Prohibition on retention of Atlantic wolffish
- Accountability measures

The action proposes several changes to the DAS leasing and transfer programs (see section 5.2.6). This action eliminates the DAS transfer program conservation tax. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 528 limited access summer flounder permits held by vessels with limited access multispecies permits. At least some of the transfers that take place are likely to be between two groundfish permits that each hold a limited access summer flounder permit. In the process, one summer flounder limited access permit will be eliminated. As a result, it is likely that the total number of summer flounder permits will decline. It is difficult to predict the number of permits or whether the remaining permits will be more active in the fishery. Fishing activity could increase several ways in spite of the reduced number of permits. If the eliminated permit did not use its permit but the remaining permit does then summer flounder catches might increase. Since the groundfish vessel will have more DAS available it may catch more summer flounder while using those DAS than occurred when the permits were on different vessels if fished in an area with a greater abundance of summer flounder.

This action also removes the cap on number of DAS that can be leased, and allows permits in the CPH category to participate in the DAS leasing program. These two changes may increase the number of DAS that are leased. This could result in more groundfish vessels leasing away their DAS to other vessels, and then participating in other fisheries.

Four alternatives were considered to reduce fishing mortality by groundfish vessels that choose not to join sectors. The first alternative is the No Action alternative; this alternative includes an 18 percent DAS reduction for all groundfish DAS vessels. The other three alternatives include measures that reduce groundfish fishing opportunities on the order of fifty percent but use different measures to do so. All three of the alternatives are designed to achieve large reductions in fishing mortality for SNE/MA yellowtail flounder and SNE/MA winter flounder. Vessel operators that rely on these stocks for revenue would be expected to look for other opportunities in the SNE/MA area, and the summer flounder fishery is a likely candidate.

Option 2A adopts the 18 percent DAS reduction and imposes additional differential DAS counting areas. In the SNE/MA area DAS will be counted at a 3:1 rate. While this is likely to reduce any bycatch of summer flounder by groundfish vessels as this will reduce effort used in the area, these severe restrictions may shift fishing effort into the summer flounder fishery.

The Proposed Action, Option 3A reduces DAS by 50 percent and counts all DAS in 24-hour increments. There is no differential DAS counting in this area but groundfish vessels would be required to use gear that reduces the catch of flounders in an area of SNE. This measure would likely reduce bycatch of summer flounder by groundfish fishing vessels but might also shift effort onto the summer flounder stock. This might occur since opportunities to target regulated groundfish in the SNE and MA areas would be severely constrained, forcing fishermen to look for other opportunities.

Option 4 reduces DAS by 40 percent and implements large restricted gear area in SNE. This option would likely reduce bycatch the least since it might allow more groundfish fishing effort in the Mid-Atlantic area that the other two options. This option might also shift effort into the summer flounder fishery.

Because the summer flounder fishery is managed using a quota, it is not likely that the shifts in effort described here would result in overfishing. It is possible that an increased number of fishing trips might have adverse impacts on the economic performance of the fishery as the quota is distributed among more vessels or among more trips. This could lead to a need for even smaller trip limits in this fishery which might increase discards.

This action considered, but did not adopt, a requirement that vessels fishing with cod end mesh smaller than 6.5 inches must use a net equipped with drop chains or large mesh panels in the front of the net. The minimum cod end mesh size for the summer flounder fishery is 5.5 inch diamond or 6.0 square mesh. No experimental data is available to indicate if using these types of net will affect catches of summer flounder, but since the nets are designed to reduce flounder catches it is not unreasonable to assume that if this measure were adopted summer flounder fishermen will choose to use 6.5 inch mesh to avoid fishing for flounders with a net that cannot catch flounders. The impacts of this requirement on the fishery are unclear.

This action is considering implementing seventeen additional sectors, including several that propose to operate in the SNE/MA area. The operation of sectors in this area will be severely constrained by the lack of available catch for SNE/MA winter flounder. Sector regulations will prevent these vessels from fishing for groundfish unless they can demonstrate they can do so without catching this stock. As a result, vessels that choose to participate in these sectors may be forced to look for other opportunities, such as the summer flounder fishery. If effort shifts into this fishery as a result of sector formation the impacts would be similar to those resulting from the restrictions on DAS in the other options.

7.7.3 Scup

The scup fishery is managed by the MAFMC. The primary commercial fishery management measure is a quota that is distributed to three trimester periods and to individual states. Other federal regulations include minimum mesh size, gear restricted areas, and a minimum fish size. States typically restrict harvest to their quota using seasons and trip limits. The scup stock was last assessed in 2008 (DPWG 2009). The assessment determined the stock was not overfished and overfishing was not occurring in 2007. The fishery occurs primarily in southern New England and the Mid-Atlantic area.

The same measures not expected to impact the summer flounder fishery are not expected to impact the scup fishery. The impacts of the effort control measures to control mortality and the addition of sectors are also expected to be similar to those on the summer flounder fishery. The SNE/MA Small Mesh Gear Requirement – which was not adopted – would have had different impacts. While there are no experiments using the exact net design proposed in this action Pol (2001) summarized the results of an experiment in Nantucket Sound that compared the catch rates using a raised footrope trawl for eleven pairs of comparison tows on two different vessels. Scup catch rates were highly variable, ranging from zero to 1,382 lbs/hr for the raised footrope trawl and zero to 9,735 lbs/hr for the chain sweep tows. Because of the limited number of tows and the highly variable catch rates, the rates observed were not statistically different. If the results of this small experiment reflect the experiences in the commercial fishery, scup fishermen may choose to use the drop-chain net rather than use a larger minimum mesh size. The minimum mesh size for scup is five inches.

The action proposes several changes to the DAS leasing and transfer programs (see section 5.2.6). This action eliminates the DAS transfer program conservation tax. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 463 limited access scup permits held by vessels with limited access multispecies permits. At least some of the transfers that take place are likely to be between two groundfish permits that each hold a limited access scup permit. In the process, one scup limited access permit will be eliminated. As a result, it is likely that the total number of scup permits will decline. It is difficult to predict the number of permits or whether the remaining permits will be more active in the fishery. Fishing activity could increase several ways in spite of the reduced number of permits. If the eliminated permit did not use its permit but the remaining permit does then scup catches might increase. Since the groundfish vessel will have more DAS available it may catch more scup while using those DAS than occurred when the permits were on different vessels if fished in an area with a greater abundance of scup.

7.7.4 Black Sea Bass

The black sea bass fishery is managed by the MAFMC. The primary commercial fishery management measure is a quota that is distributed to individual states. Other federal regulations include minimum mesh size and a minimum fish size. States typically restrict harvest to their quota using seasons and trip limits. The stock was last assessed in 2008 (DPWG 2009). The assessment determined the stock was not overfished and overfishing was not occurring in 2007. The fishery occurs primarily in southern New England and the Mid-Atlantic area. This determination is a change in stock status – the previous assessment used an index-based model that estimated the stock was overfished.

The same measures not expected to impact the summer flounder fishery are not expected to impact the black sea bass fishery. The impacts of the effort control measures to control mortality and the addition of sectors are also expected to be similar to those on the summer flounder fishery. The SNE/MA Small Mesh Gear Requirement – which was not adopted – would have had different impacts. The minimum mesh size for black sea bass is 4.5 inches. There are no experiments using the exact net design proposed in this action, and the work of Pol (2001) did not extend to black sea bass. The impacts of this measure on this fishery cannot be estimated.

The action proposes several changes to the DAS leasing and transfer programs (see section 5.2.6). This action eliminates the DAS transfer program conservation tax. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 389 limited access black sea bass permits held by vessels with limited access multispecies permits. At least some of the transfers that take place are likely to be between two groundfish permits that each holds a limited access black sea bass permit. In the process, one black sea bass limited access permit will be eliminated. As a result of these two options, it is likely that the total number of black sea bass permits will decline. It is difficult to predict the number of permits or whether the remaining permits will be more active in the fishery. Fishing activity could increase several ways in spite of the reduced number of permits. If the eliminated permit did not use its permit but the remaining permit does then black sea bass catches might increase. Since the groundfish vessel will have more DAS available it may catch more black sea bass while using those DAS than occurred when the permits were on different vessels if fished in an area with a greater abundance of black sea bass.

7.7.5 Squid/Mackerel/Butterfish

The squid/mackerel/butterfish fisheries are managed by the MAFMC. The primary commercial fishery management measure is quotas. Other federal regulations include minimum mesh sizes that differ for the three fisheries. *Loligo* squid was last assessed in 2001 (SAW 34), butterfish was last assessed in 2003 (SAW 38), and mackerel and *illex* squid were last assessed in 2005 (SAW 42). Overfishing was not occurring on *loligo* but there was no biomass reference point. Overfishing was not occurring on butterfish but the stock was overfished. Mackerel was not subject to overfishing and was not overfished. It was not possible to evaluate the status of *illex* squid.

The same measures not expected to impact the summer flounder fishery are not expected to impact the squid/mackerel/butterfish fisheries. The impacts of the effort control measures to control mortality and the addition of sectors are also expected to be similar to those on the summer flounder fishery. The SNE/MA Small Mesh Gear Requirement – which was not adopted – would have different impacts. While there are no experiments using the exact net design proposed in this action Pol (2001) summarized the results of an experiment in Nantucket Sound that compared the *loligo* squid catch rates using a raised footrope trawl for eleven pairs of comparison tows on two different vessels. There was no significant difference in catch rates between the raised footrope trawl tested and the same net using a chain sweep. The size of squid caught, however, was smaller in the raised footrope net. No explanation was offered for this difference but it was remarkably consistent for the two different vessels and the two different time periods for the tows. Fishermen speculated that the larger squid remain closer to the bottom and as a result the raised footrope trawl is less effective at catching them, but there were no video observations to support this hypothesis. This result suggests that the drop-chain net requirement could affect *loligo* squid catches and may result in catching larger numbers of squid for a given quota weight since the net appears to catch smaller individuals.

The action proposes several changes to the DAS leasing and transfer programs (see section 5.2.6). This action eliminates the DAS transfer program conservation tax. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 288 limited access squid/mackerel/butterfish permits held by vessels with limited access multispecies permits. At least some of the transfers that take place are likely to be between two groundfish permits that each holds a limited access squid/mackerel/butterfish permit. In the process, one squid/mackerel/butterfish limited access permit will be eliminated. As a result of these two options, it is likely that the total number of squid/mackerel/butterfish permits will decline. It is difficult to predict the number of permits or whether the remaining permits will be more active in the fishery. Fishing activity could increase several ways in spite of the reduced number of permits. If the eliminated permit did not use its permit but the remaining permit does then squid/mackerel/butterfish catches might increase. Since the groundfish vessel will have more DAS available it may catch more squid/mackerel/butterfish while using those DAS than occurred when the permits were on different vessels if fished in an area with a greater abundance of squid/mackerel/butterfish.

7.7.6 Monkfish

The monkfish fishery is jointly managed by the NEFMC and the MAFMC. The directed fishery is managed through an effort control system that includes DAS limits and possession limits. A substantial portion of monkfish is landed as incidental catch in other fisheries; this catch is controlled by incidental catch limits. Monkfish was last assessed in 2007 (DPWG 2007). The assessment developed new status determination criteria for both the northern and southern stocks of monkfish and concluded that neither stock was overfished nor subject to overfishing.

There is extensive overlap between the management of this fishery and the management of the multispecies and scallop fisheries. For this reason, more of the measures being proposed are likely to have an impact on the monkfish fishery. In the past the monkfish plan has relied in part on DAS limits in the groundfish and scallop plans to limit monkfish fishing effort. Vessels that possess a limited access monkfish permit and a limited access groundfish permit are required to use both a monkfish and a groundfish DAS when fishing for monkfish except in some circumstances. Monkfish is often caught on scallop and groundfish fishing trips and given its value is a key component of revenue for groundfish trips – less so for scallops given the high value of scallops. The following measures are not expected to directly impact the monkfish fishery:

- Revisions to status determination criteria and formal rebuilding programs
- Annual Catch Limits: Option 2 takes into account the catch of groundfish species in other fisheries. This action does not propose a specific ACL for the monkfish fishery but it is possible a specific ACL may be considered in the future.
- Addition of Atlantic Wolffish to the Management Unit
- Sector administration provisions: these options will not have direct impacts on the monkfish fishery, but the formation of additional sectors may and will be discussed below.
- Reporting requirements
- Allocation of groundfish to the commercial and recreational groundfish fisheries
- Periodic Adjustment Process
- Recreational management measures
- Atlantic halibut minimum size
- Prohibition on retention of Atlantic wolffish

The action proposes several changes to the DAS leasing and transfer programs (see section 5.2.6). This action eliminates the DAS transfer program conservation tax. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 461 groundfish individual DAS permits that have a limited access monkfish permit, and 524 permits that have an open access monkfish permit. At least some of the transfers that take place are likely to be between two groundfish permits that each hold a limited access monkfish permit. In the process, one monkfish limited access permit will be eliminated. Similarly, some transfers may take place between two vessels when only one has a limited access monkfish permit – in this case an open access monkfish permit will be eliminated. As a result of these two options, it is likely that the total number of monkfish permits will decline. It is difficult to predict the number of permits or whether the remaining permits will be more active in the monkfish fishery. Monkfish fishing activity could increase several ways in spite of the reduced number of permits. The impacts will depend on the monkfish DAS used by the eliminated permit. If the eliminated permit did not use its monkfish DAS but the remaining permit does then monkfish catches might increase. Since the groundfish vessel will have more DAS available it may retain more monkfish while using those DAS than occurred when the permits were on different vessels. Because the remaining permit will have more groundfish DAS, the combined permit will have fewer monkfish only DAS that can only be used in exempted fishing areas.

Option 5 proposes to allow vessels in the CPH category to lease DAS. This might increase the number of DAS available for leasing or the number of permits that are combined in the DAS transfer program. Either result might increase the groundfish DAS available to be used to target monkfish in conjunction with a monkfish DAS.

This action adopts a number of changes to Special Management Programs (see section 4.2.7). The proposed expansion of the CA I Hook Gear Haddock SAP is not expected to impact the monkfish fishery. The proposed reauthorization of the Eastern U.S./Canada Haddock SAP (section 4.2.7.3) provides an opportunity to use Category B DAS. The landing of monkfish on those DAS is constrained to the applicable incidental catch limit and trawl gear used in the program is designed to minimize the catch of bottom-tending species such as monkfish. For this reason this proposal is not expect to impact the monkfish fishery. Changes are also proposed to the CAII Yellowtail Flounder SAP which will allow vessels access to CAII to target haddock. The trawl gear requirements for this expanded program are designed to reduce catches of bottom-tending species such as monkfish. For this reason this proposal is not expected to impact the monkfish fishery. The proposed changes to the Category B (regular) DAS program and suspension of the SNE/MA Winter Flounder SAP are not expected to impact the monkfish fishery as these changes do not revise opportunities to catch monkfish.

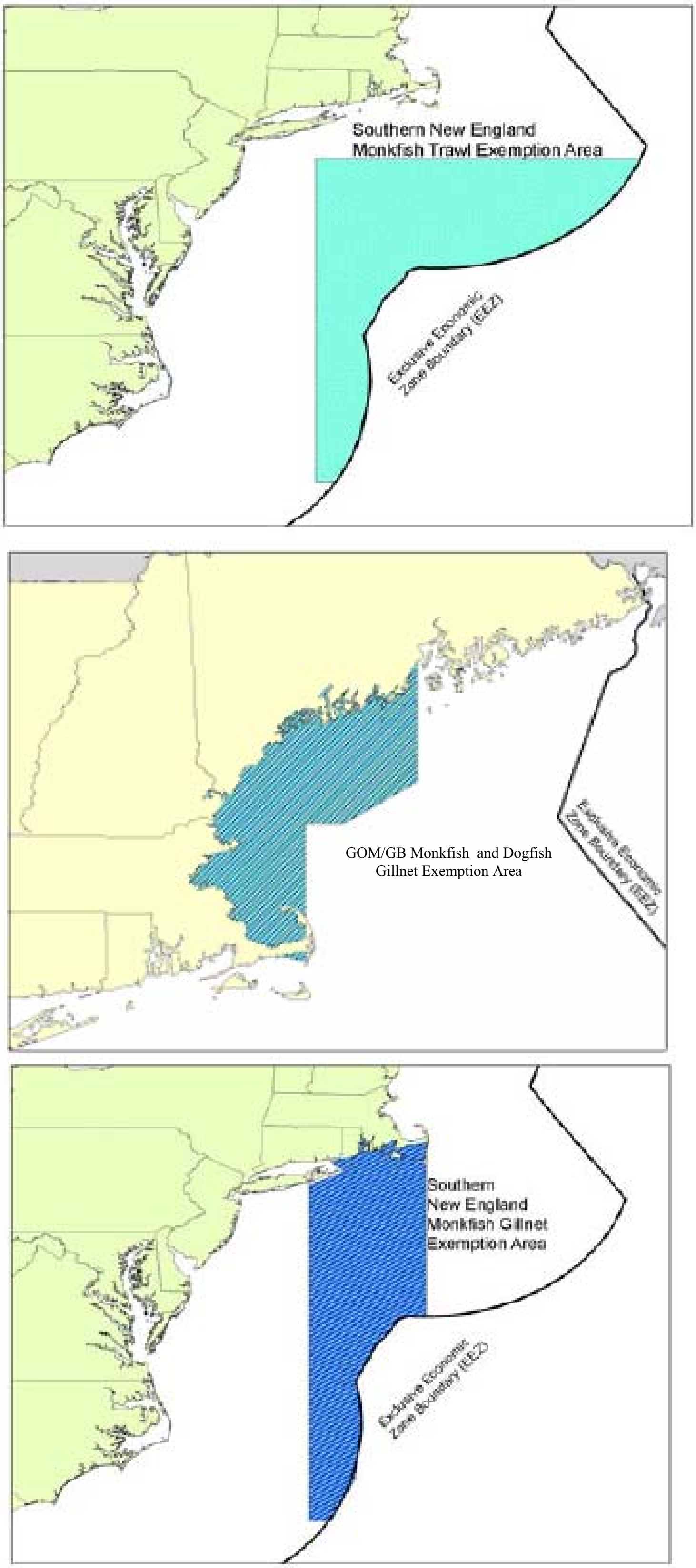
This action allows a vessel to possess a limited access multispecies and scallop permit at the same time (section 4.2.9). The impacts of this proposal may be similar to the proposed changes to the DAS transfer program. If multispecies and scallop permits are combined on one vessel, any duplicate permits expire. If both permits hold a limited access monkfish permit then one of the monkfish permits will be cancelled and the net result will be a reduction in the number of monkfish permits. Similar to the analysis of the DAS transfer program, it is possible that monkfish activity might increase if the vessel with the combined permits chooses to fish harder for monkfish than the original permit holder but this is impossible to predict.

The measures most likely to have the largest impacts on the monkfish fishery are those adopted to control groundfish mortality that results from commercial fishing. These measures include the effort control options for vessels that do not form sectors, the implementation of additional sectors, and the accountability measures being considered for commercial vessels.

In addition to the No Action alternative, there are three effort control options that were considered to reduce fishing mortality by vessels that do not join sectors. All three options – as well as the No Action option – include a reduction in allocated groundfish Category A DAS, though the size of the reduction differs among options. The reduction in available groundfish DAS will impact vessels with a monkfish category C or D permit that are required (for the most part) to use a groundfish DAS while fishing for monkfish. This will reduce the opportunities to fish for monkfish by these vessels. It is likely that additional vessels will have more monkfish DAS allocated than groundfish DAS. Under current rules, the difference between the two allocations can be used as monkfish only DAS but they must be fished as monkfish only DAS under the requirements for monkfish A and B permits. This limits the areas that can be fished since monkfish-only DAS can only be used in exempted fisheries. There are no monkfish trawl exempted fisheries in the GOM and GB areas, so these options may shift trawl effort into the Southern Monkfish Management Area (see Figure 156). There are two monkfish gillnet exemption areas – one in the GOM and one in SNE – so the DAS reductions may not result in a shift in monkfish gillnet effort.

Two of the effort control options would have changed either the differential DAS counting areas or the way DAS are counted. Option 2A expands the use of differential DAS to almost the entire GOM and GB areas and modifies the differential DAS counting areas in SNE. An additional change in this option will affect the way differential DAS are counted. Under FW 42, a vessel could declare that it was fishing outside the GOM differential DAS area and would not be charged differential DAS when transiting the area. Under this option vessels will be charged the differential DAS rate for the area they are in, including transit time. As a result of expanding the differential DAS areas and changing the ways differential DAS are counted, vessels with a Category C or D permit and fishing in these areas for monkfish will use groundfish DAS at different rate than their monkfish DAS. This makes it likely that the vessel will use up its groundfish DAS before it has used all its monkfish DAS. Unlike when where there is a difference between groundfish and monkfish DAS allocations, the fact that a vessel uses its groundfish DAS at a faster rate than its monkfish DAS does not entitle the permit holder to use monkfish only DAS. The impacts on individual monkfish permit Category C and D vessels will be proportional to their groundfish DAS allocation. A monkfish Category C and D permit holder with 10 groundfish DAS that fishes in a 2:1 area uses 10 groundfish DAS while using 5 monkfish DAS and 5 monkfish DAS are lost; a permit holder with only 2 groundfish DAS uses those two DAS while using one monkfish DAS and only one monkfish DAS is lost. There will be additional monkfish DAS that cannot be used by monkfish fishermen with monkfish C and D permits, reducing their income and likely reducing monkfish catches. This may lead to adjustments within the monkfish plan to account for these differences.

Figure 156 - Monkfish exempted fishing areas



The impacts of the Proposed Action, Option 3A, are similar in nature but may not be as large as the impact of Option 2A. Option 3A will count groundfish DAS in 24-hour increments, but monkfish DAS will continue to be counted in minutes. While this results in a difference in DAS counting between the two plans monkfish fishermen will have a greater ability to adapt to the difference. The difference between groundfish and monkfish DAS charged on a trip are greatest when a monkfish vessel fishes a partial day. By modifying trip length to fish for whole days – or as close to a whole day as possible – the difference between the groundfish and monkfish DAS are reduced. This is an imperfect response, however. Since a vessel earns a day's worth of a trip limit for a partial DAS, some monkfish fishermen prefer to fish slightly more than an even day in order to earn the additional day's worth of a trip limit. Vessel operators will need to choose between the value of this additional trip limit and having a closer match between the monkfish and groundfish DAS charged.

Options 3A and 4 propose restricted gear areas that require the use of gear that does not catch flounders. These areas overlap areas used by monkfish vessels and requiring the use of specific gear while on a groundfish DAS may reduce the ability of monkfish C and D permit holders to target monkfish.

While the effort control measures are likely to reduce the amount of effort available to target monkfish – particularly for those vessels with a monkfish Category C or D permit - the creation of additional sectors may have the opposite effect. Groundfish vessels participating in sectors will not be required to use a groundfish DAS while targeting groundfish stocks, but will still have their groundfish DAS allocation. These groundfish DAS can be used to target monkfish subject to the regulations that are adopted for effort controls. If the vessels target monkfish and groundfish on the same trips- as is often done in the GOM and north of GB - then there is no real benefit to joining a groundfish sector as far as monkfish fishing is concerned. If the vessel is able to selectively target groundfish and monkfish on different trips, then the vessel in a sector can "save" its groundfish DAS for dedicated monkfish trips. This might increase the number of groundfish DAS that are used for monkfish trips. A complicating factor is that once a sector's groundfish ACE for a stock is harvested, the sector cannot fish in that stock area with gear capable of catching that stock. This means that sectors will have to plan groundfish fishing activities carefully to make sure they do not limit monkfish opportunities.

The final measures that may impact the monkfish fishery are the accountability measures being implemented for non-sector vessels. For FY 20110 and FY 2011, the AM under proposed adjusts DAS counting rates based on whether an ACL is exceeded or not. This may exacerbate the differences between monkfish and groundfish DAS that were described earlier if ACLs are exceeded. If catches fall short of ACLs, then DAS counting is adjusted upward and the differences between groundfish and monkfish DAS may be reduced. For FY 2012 and beyond, the amendment overlays the effort control program with a hard TAC AM. Most stocks have a trimester TAC which, when caught, results in a prohibition on fishing for groundfish in the majority of the stock area for the rest of the quarter. If this AM is triggered for a particular stock, vessels with a monkfish Category C or D permit would be unable to fish in the stock area until the following quarter begins. In essence, monkfish fishing activity by these vessels becomes constrained by the groundfish fishery AM. Not only does this reduce opportunities for these monkfish vessels but it also creates a fairness issue since other monkfish vessels with category A and B permits are allowed to continue fishing. It is not likely that NMFS will allow the monkfish C and D vessels to continue to fish on monkfish only DAS in this situation.

7.7.7 Skates

The Skate Fishery is managed by the NEFMC. There are seven species of skates managed through this plan. At present the management of this fishery is closely tied to the multispecies, groundfish, and scallop fisheries. Except for specific exempted or experimental fisheries, vessels must be on a multispecies, monkfish, or scallop DAS to fish for skates. There are also various gear requirements and possession limits, and vessels may also retain and land skates in certain multispecies exempted fisheries without being on a DAS. The Council recently adopted Amendment 3 to the skate FMP that modifies the management measures; the amendment has not yet been reviewed and implemented by NMFS. The amendment modifies skate status determination criteria, which may modify status determinations, but the current stock status for the seven species is shown in Table 299. The revised SDC will determine that winter and smooth skate would not be overfished and overfishing would not have occurred. Thorny skate would be overfished and overfishing had been occurring (as of 2007). Other elements of Amendment 3 include the adoption of ACLs and AMs for the skate fishery, revisions to trip limits for the bait and skate wing fisheries, and trip limits for vessels using a Category B DAS to fish for skates regardless of gear used.

Table 299 – Current skate status. See text for pending updates.

BARNDOOR	CLEARNOSE	LITTLE	ROSETTE	SMOOTH	THORNY	WINTER
Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Overfished Overfishing is Not Occurring	Overfished Overfishing is Occurring	Overfished Overfishing is Not Occurring

The following comments provide a general view of the likely impacts. The following alternatives under consideration are not expected to directly affect the skate fishery:

- Revisions to status determination criteria and formal rebuilding programs
- Annual Catch Limits: Option 2 takes into account the catch of groundfish species in other fisheries. This action does not propose a specific ACL for the skate fishery but it is possible a specific ACL may be considered in the future.
- Addition of Atlantic Wolffish to the Management unit
- Sector administration provisions: these options will not have direct impacts on the skate fishery, but the formation of additional sectors may and will be discussed below.
- Reporting requirements
- Allocation of groundfish to the commercial and recreational groundfish fisheries
- Changes to the DAS transfer and leasing programs
- Periodic adjustment process
- Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel
- Recreational management measures
- Atlantic halibut minimum size
- Prohibition on retention of Atlantic wolffish

The two primary skate fisheries, a wing fishery and a lobster bait fishery, are interwoven with the multispecies fishery. The regulations require that vessels must be fishing on a multispecies, monkfish, or scallop DAS, or fish in an exempted fishery in order to possess skates. Winter skate is the major component of the skate wing fishery, and little skate is the major component of the whole/bait fishery. Despite prohibitions on possession since 2003, thorny, barndoor, and smooth skates are still caught and discarded in the groundfish fishery. The vast majority of skate landings are landed on Multispecies Category A DAS (Table 94). Changes to DAS regulations, therefore, will directly impact skate catch. While there appears to be an increase in the landings of skates on multispecies B DAS in 2007, it is not clear from the table if these were combined multispecies/monkfish DAS. If they were, then the catch of skates on monkfish/multispecies DAS did not increase from 2006 to 2007.

Table 300 - Total skate landings (lb live weight) by DAS program, 2000-2007.

Calender Year	MUL A	MUL B	MNK	MNK/MUL	SC
2000	16,673,711	NA	1,037,993	2,817,080	66,012
2001	15,320,262	NA	764,437	3,037,382	6,405
2002	17,538,086	NA	665,661	3,845,897	2,796
2003	22,205,726	NA	601,063	4,123,343	63
2004	19,760,823	547,717	1,271,352	1,991,829	0
2005	17,715,403	967,069	1,911,588	2,754,418	10,835
2006	19,083,200	64,956	1,358,881	5,652,650	4,629
2007	20,349,972	1,715,633	1,087,857	2,571,196	0

Source: NMFS, Fisheries Statistics Office

Little, clearnose, and rosette skates are not overfished or experiencing overfishing. Thorny and smooth skates are predominantly distributed in the Gulf of Maine, whereas winter, little, and barndoor skates are mainly distributed on Georges Bank and in Southern New England waters. Clearnose and rosette skates have a more Mid-Atlantic distribution. Due to the different ranges of these species, area-based management measures may differentially impact each species.

As noted, four options (including the No Action alternative) were considered to reduce fishing mortality that results from vessels that choose not to join groundfish sectors. All four options reduce the number of Category A DAS available to fish for groundfish, with the No Action option and Option 2A reducing DAS by 18 percent (or more if revised to meet pollock mortality objectives), the Proposed Action (Option 3A) by 50 percent, and Option 4 by 40 percent. In addition, Options 2A and 3A either extended differential DAS counting areas or modified the ways DAS are counted. Both of these options further reduce groundfish fishing opportunities. Since at present much skate fishing is required to use either a scallop, monkfish, or scallop DAS, all of these options would reduce the number of groundfish DAS available to use while fishing for skates. This would be expected to reduce skate landings. A side effect of reduced opportunities to fish for skates while using groundfish DAS might be that vessels choose to participate more frequently in the skate exempted fisheries programs.

Relative to No Action, all of the proposed alternatives to control fishing mortality were anticipated to have positive biological impacts on skate stocks. The Proposed Action reduces DAS by 50 percent and adopts a 24-hour clock. Reductions in bottom fishing effort in the Gulf of Maine, Georges Bank, and Southern New England areas will likely reduce skate landings and discards from vessels fishing on a groundfish DAS. The proposed restrictions in the Gulf of Maine will benefit thorny and smooth skate populations, while restrictions on Georges Bank and in Southern New England will benefit winter, little, and barndoor skates. It is possible that with reduced opportunities to target skates on Category A DAS, vessel operators increase participations in skate exempted fisheries. Given the pending changes in the skate FMP, increased targeting of skates on Category B DAS unlikely because of the reduced trip limits.

The proposed changes to the Category B (regular) DAS program are unlikely to have noticeable impacts on the skate fishery and skates when compared to No Action. Amendment 3 to the Skate FMP, recently approved by the Council and pending review and approval by NMFS, will prohibit retention of skates while fishing on a Category B DAS regardless which options are adopted by this amendment. Amendment 3 will prevent the targeting of skates and skates in excess of the trip limits caught in this program will be discarded, but this will occur even if the changes proposed in this action are not adopted. While Option 2 allows the use of 6 inch mesh codends in trawl when fishing on GB in this program may result in the selection of smaller skates, there are no selectivity studies available to determine the extent of those impacts. In addition, the required gear, if fished correctly, will minimize skate catches.

Extending the Eastern U.S./Canada Haddock SAP and opening the CA II SAP in most years to target GB haddock may increase skate catches when compared to No Action. While the SAPs require the use of selective trawl gear, skates have been observed in tows using the haddock separator trawl. Since adoption of a landing limit, however, the ratio of skates to target species has decreased dramatically. Still, some skates will probably be caught in these SAPs that would not have been caught if the No Action alternative was selected.

Authorizing a pilot program to target GOM haddock using sink gillnets is not likely to have substantial impacts on skates. Vessels must use a Category A DAS, so this does not increase fishing effort, particularly when the impacts of the 50 percent DAS reduction and 24-hour clock are considered. It is possible that there may be minor differences in the sizes of skates caught since the pilot program does allow the use of 6-inch gillnets.

Elimination of the SNE Winter Flounder SAP would likely result in positive biological impacts to skate resources by reducing the potential for skate bycatch in these programs. These changes are likely minor given the small size of this program and the expectation that removing the program will only have slight impacts on fishing effort.

The formation of additional sectors may increase skate landings when compared to No Action. Since sector vessels will not be required to use groundfish DAS to target groundfish they may choose to use the DAS to increase the targeting of skates and/or monkfish. The performance of the permits in the Fixed Gear Sector in FY 2007 does not support this possibility, as their total skate landings remained nearly constant from FY 2006 to FY 2007. Mitigating these impacts, however, is the expectation that sector vessels will be more efficient and will need fewer trips and days fishing to harvest the available groundfish ACE. This should lead to reduced skate catches while on groundfish trips.

Proposed changes to AMs may also affect the skate fishery. For FY 2010 and FY 2011, the AM adjusts DAS counting in the year following a groundfish ACL overage. This would be expected to reduce skate catches from the groundfish fishery by reducing overall effort. Beginning in FY 2012 a hard TAC system is the AM. If the AM is triggered for a stock, then groundfish fishing with gear capable of catching the stock is generally prohibited in the stock area (with exceptions for certain species). This will reduce fishing effort and should reduce catches of skates while using a groundfish DAS. AMs for sectors would have similar effects. It could also push groundfish vessels into skate exempted fisheries, increasing effort on skates, but these opportunities are limited and not likely to outweigh the decline in effort.

7.7.8 Other Fisheries

Groundfish permit holders frequently hold permits in two open access fisheries (spiny dogfish and small mesh multispecies) and the limited access lobster fishery. The primary expected impacts of this action for all three fisheries are due to reduced groundfish fishing activity due to additional effort control restrictions or more efficient fishing within sectors.

7.7.8.1 Spiny Dogfish

The spiny dogfish fishery is jointly managed by the NEFMC and the MAFMC. Spiny dogfish are widely caught by all groundfish fishing gears and most removals are a combination of incidental catch and bycatch. Since dogfish gear is similar to groundfish gear fishing in the GOM/GB area is often under a groundfish DAS, within state waters, or in an exempted fishery. The fishery is managed with an annual quota and possession limits. When the quota is reached fishing for spiny dogfish is prohibited. Spiny dogfish was last assessed in 2006 (SAW 43); based on new status determination criteria that assessment determined the stock was not overfished and overfishing was not occurring. The stock is being assessed again in early 2010 through the TRAC.

Reductions in groundfish fishing effort would be expected to reduce discards of spiny dogfish by this fishery. Recent landing limits for this stock have been low and as a result this fishery does not provide much opportunity for vessels to supplement lost groundfish revenue with dogfish revenues. Even though this remains an open access fishery it is not likely that significant amounts of effort will shift into this fishery as a result of groundfish restrictions because of the low trip limits and the low landed value.

7.7.8.2 Small-mesh Multispecies

The small-mesh multispecies include silver hake (whiting), red hake, and offshore hake. They are managed by the NEFMC. Management measures include time and area restrictions, gear requirements, and possession limits. Sliver hake was last assessed in 2005 (SAW 42); both the northern and southern stocks were found not overfished and not subject to overfishing. Red hake and offshore hake have not been assessed in over ten years. While this remains an open access fishery, the limited market for whiting tends to inhibit new entrants into the fishery. Even though this remains an open access fishery it is not likely that significant amounts of effort will shift into this fishery as a result of groundfish restrictions.

In late summer 2009, the Council initiated work on an amendment to the management plan. The amendment will implement ACLs and AMs, and may consider adopting a limited-entry or other catch-share type system for the fishery. This amendment may be delayed until updated assessments are completed.

7.7.8.3 American Lobster

American lobster is managed by the ASMFC and NMFS under the provisions of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The management approach is complex and includes sub-areas with different trap limits and other regulations, as well as differing measures within state waters. The three stocks were last assessed in 2006 (ASMFC 2006). The assessment found that abundance of the GOM stock overall was relatively high compared to the 22-year time series and recent fishing mortality has been comparable to the past; the GB stock appeared to be stable with current abundance and fishing mortality are similar to their medians for the 22-year time series; and SNE stock abundance was relatively low compared to the 20-year time series and fishing mortality was relatively high.

Many groundfish fishing vessels possess a lobster non-trap license (American lobster category 1 or 2, see Table 298). Reduced groundfish fishing activity due to more restrictive effort controls or more efficient sector operations would be expected to reduce the number of trips landing lobsters in this permit category. Over 320 groundfish vessels possess trap permits, however, and reduced groundfish fishing activity could lead them to increase lobster fishing. This could add fishing pressure on these stocks, particularly in Area 1 (GOM) where most of the vessels are permitted.

The action adopts several changes to the DAS leasing and transfer programs (see section 4.2.6). The DAS transfer program conservation tax is permanently eliminated. The DAS transfer program essentially allows the permanent stacking of groundfish DAS from multiple permits onto one permit. The conservation tax reduces the number of DAS that can be transferred and is seen as inhibiting the transfer of multispecies permits. Removing the tax is expected to increase the number of permits that are combined into one groundfish permit. In the process of stacking groundfish DAS, duplicate permits are pared to one permit. There are 1,478 lobster permits held by vessels with limited access multispecies permits (some multispecies vessels may hold a lobster permit for more than one area). At least some of the transfers that take place are likely to be between two groundfish permits that hold a limited access lobster permit. In the process, one lobster limited access permit will be eliminated. As a result, it is likely that the total number of lobster permits will decline. It is difficult to predict the number of such exchanges or whether the remaining permits will be more active in the lobster fishery. Lobster fishing activity could increase several ways in spite of the reduced number of permits. If the eliminated permit did not use its lobster permit but the remaining permit does then lobster catches might increase. Since the groundfish vessel will have more DAS available it may retain more lobster while using those DAS than occurred when the permits were on different vessels.

During the comment period on the draft amendment, the proposed expansion of the sector program raised concerns that this could lead to an increase in fishing for lobsters by non-trap vessels. Since these vessels will not have to use DAS to target groundfish, the concern raised is that they will target lobsters while catching as little groundfish as possible, essentially using their groundfish ACE to increase their opportunities to fish for lobster. Restrictions for lobster catches by non-trap vessels were promulgated in 1999 (64 FR 68228) under the authority of ACFCMA. Vessels are limited to 100 lobsters per day up to a maximum of 500 lobsters per trip. It is noteworthy that these limits were established when there were over 160,000 DAS allocated to groundfish permit holders. DAS use peaked at over 65,000 DAS in FY 2001. The adopted restrictions were believed sufficient to control lobster catches by non-trap vessels in the face of this large potential effort. With DAS allocations resulting from this amendment expected to be on the order of 22,000 DAS, actual DAS use in recent years less than 35,000 DAS, and the expectation that sector vessels may fish fewer days because of more efficient operations, there would appear to be a large difference between the possible effort when the non-trap restrictions were adopted and the effort available to the fishery through sectors. Sector vessels would either have to increase recent fishing activity by a factor of almost five or substantially modify targeting behavior in order to have lobster catches that might exceed the conditions in place when the non-trap limits were adopted.

The possibility of a change in targeting behavior can be evaluated by considering the break-even analyses in section 7.5.1.3.1.2. Any change in targeting behavior to target lobsters while minimizing groundfish catches is only likely if vessel operators can expect such activity to be profitable. This would include covering not only variable trip costs but the fixed costs associated with operating a fishing business. Table 263 shows the average gross revenues per day for full-time groundfish fishing vessels of different sizes and using different gear, and shows the average contribution margin realized from those revenues. With a maximum daily limit of 100 lobsters, and assuming an average weight of three pounds per lobster, the daily catches of lobster would be 300 lbs. (Trawl landings averaged 337 lbs. per trip, for trips of any length, in 2008). In 2008, trawl vessels received on average $4 to $5 per pound for lobsters; maximum lobster revenues per day under these assumptions would be in the range of $1,200 to $1,500. This ranges from 22 percent to 53 percent of the average gross revenue per day for trawl vessels of different sizes, and between 49 percent and 76 percent of average gross revenues for gillnet vessels of different sizes. Clearly, for trawl vessels, targeting lobster will not, by itself, replace the average gross revenues of the recent past, and other species will not to be harvested on the same trips. Those other species are likely to be groundfish, reducing the possibility that sector vessels can leverage groundfish ACE to target lobsters. The situation is not as clear with respect to smaller gillnet vessels that could replace 76 percent of their average gross revenues if they maximize lobster catches on a daily basis. They would have to do so while minimizing catches of regulated groundfish in the same gear, since any catches of legal groundfish must be landed and a discard estimate is applied to kept catch. In 2008, sink gillnet vessels averaged 91 lbs. of lobster per trip of any length.

The combination of reduced effort expected under sector operations and non-trap lobster landing limits make it unlikely that the implementation of additional sectors will increase beyond the conditions in place when the non-trap limits were adopted. If fishing behavior by groundfish vessels changes dramatically to facilitate targeting lobsters, it is possible that some vessel/gear combinations (such as small gillnet vessels) might increase their lobster catches from current levels.

7.7.8.4 Atlantic Sea Scallops

The Atlantic Sea Scallop fishery is managed by the NEFMC. Management measures include restrictions on DAS, trip limits, and gear and crew requirements. A key feature of the FMP is a rotational management system that opens and closes areas to scallop fishing on a planned schedule to allow scallops to grow before harvesting and increase yield. This management program includes access to parts of the groundfish closed areas, including CAI and CAII.

This action proposes to allow a vessel to possess a limited access multispecies permit and a limited access scallop permit at the same time. At present this is only allowed for a small number of scallop dredge vessels that qualified for multispecies limited access combination permit. The impacts of this proposal on the scallop and multispecies fisheries are described in section 7.2.1.2.9and 7.5.1.2.9.

Two changes are proposed to SAPs which may also affect the scallop fishery. The area and season for the CAI Hook Gear Haddock SAP may be expanded by this action. The expanded area includes the scallop access area and the proposed season (May through January) coincides with scallop activity when the scallop fishery has access to the area (June 15 through February unless closed due to bycatch concerns). This creates a potential for gear conflicts between the mobile gear scallop dredge fishermen and fixed gear fishermen using longlines in those years when the scallop fleet has access to the area. A comparison of haddock catch per tow (weight) on the spring and fall trawl surveys and the summer dredge survey with the sea scallop catch per tow in the summer dredge fishery from 1996 through 2007 shows that there are some areas of overlap, particularly on the northeastern side of CAI (see Figure 157). The highest haddock distributions seem to be outside the scallop access area in depths of more than 50 fathoms, so there will be some ability for fishermen to avoid conflicts by fishing in different areas.

This action also modifies the CAII Yellowtail Flounder SAP so that GB haddock can be targeted within CAII even in years when the SAP is not open to allow the targeting of yellowtail flounder. Similar to the case with the CAI Haddock SAP, comparing survey distribution of haddock and sea scallops shows that there are areas of overlap within CAII (Figure 158). During periods when CAII is open to both sea scallop and groundfish fishermen there is a possibility of conflicts between user groups. These types of conflicts between mobile gear users tend to be less troublesome because the fishermen can readily cooperate on the fishing grounds to reduce interactions. The gear required when the SAP is only open for haddock fishing is not likely to catch scallops if fished correctly.

Figure 157 – Survey weight per tow of haddock and sea scallops in CAI, 1996 – 2007.

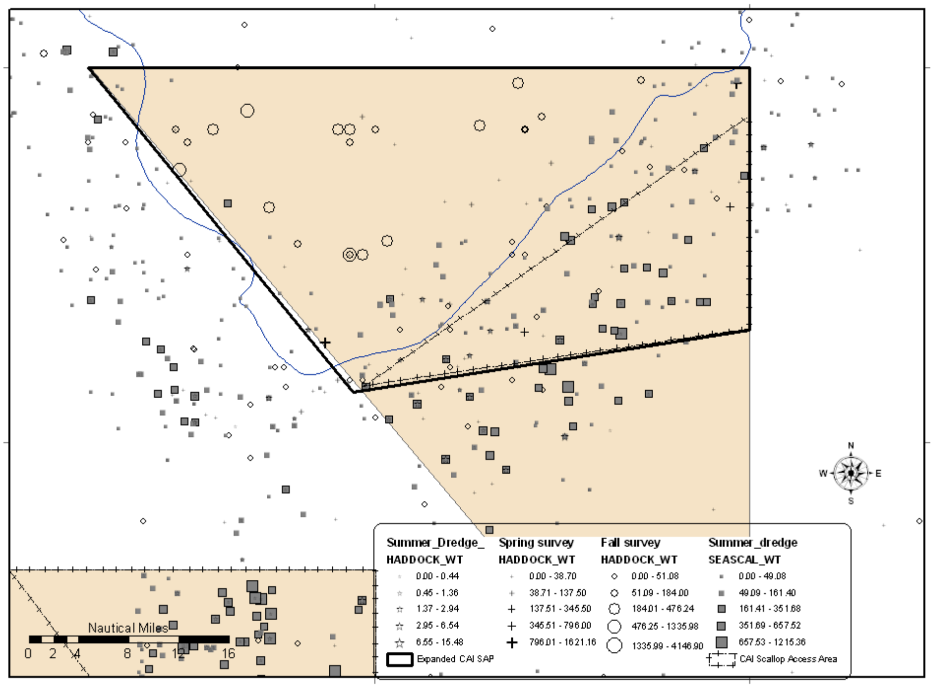
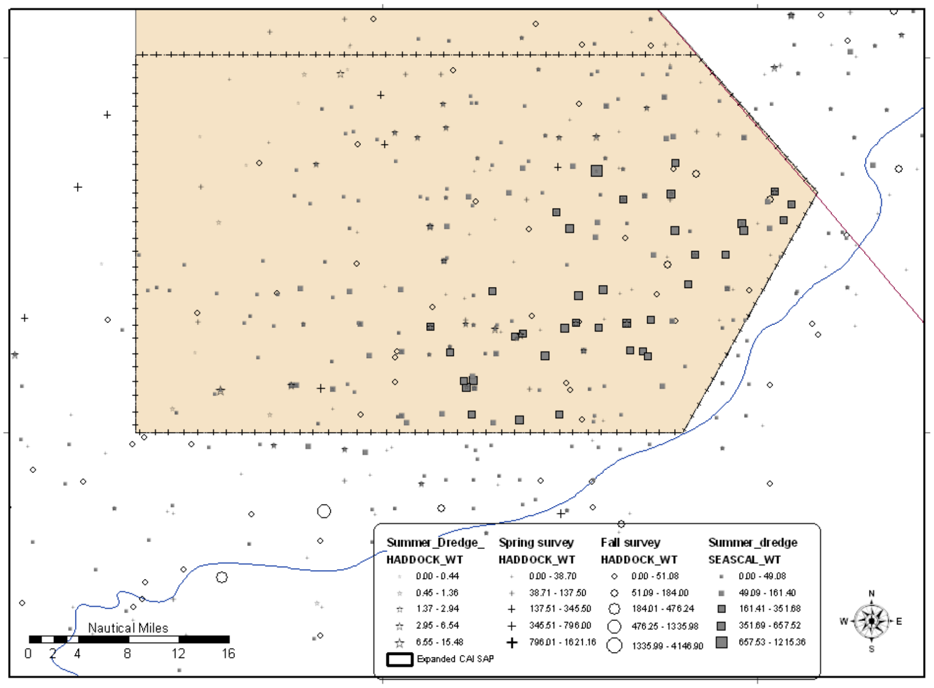


Figure 158 – Survey weight per tow of haddock and sea scallops in CAII, 1996 - 2007

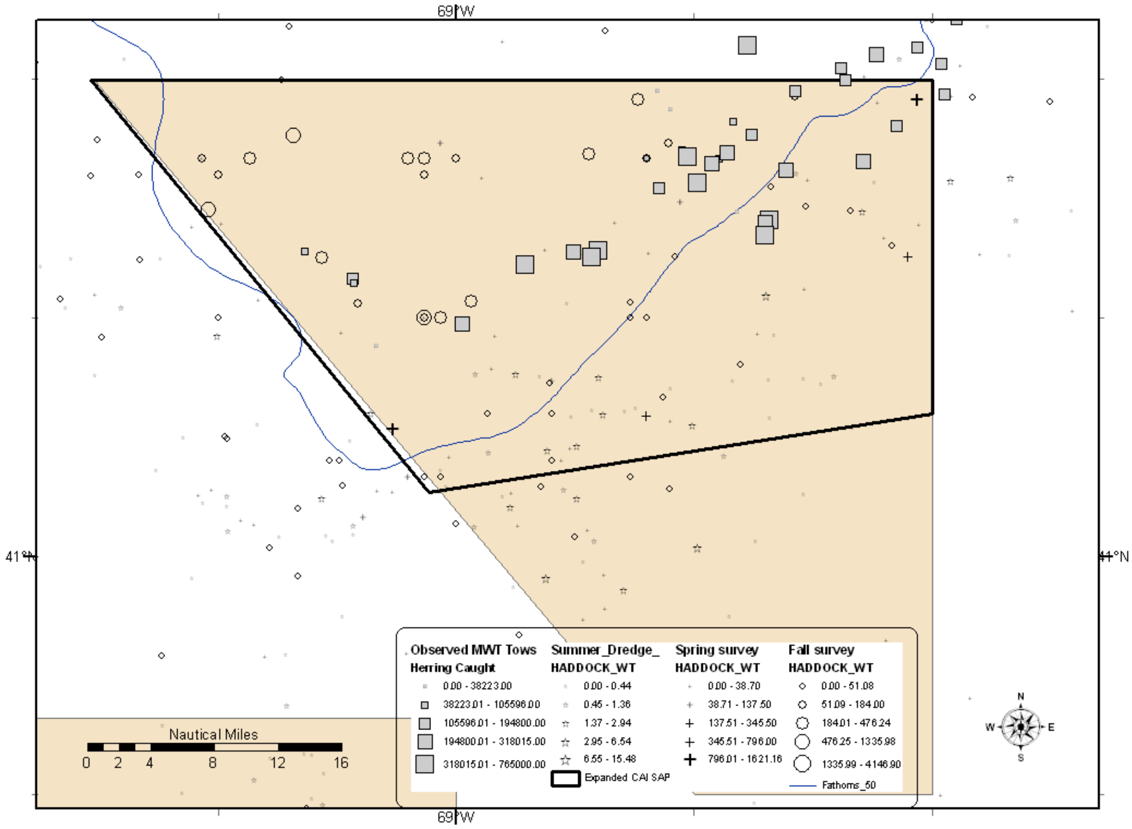


7.7.8.5 Atlantic Herring

The Atlantic Sea herring fishery is managed by the NEFMC. The fishery uses quotas by area and season. Prosecuted primarily by mid water trawls (single and paired) and purse seines, management measures include restrictions on the incidental catch of haddock and other regulated groundfish. Mid-water trawls are allowed access to the groundfish closed areas as an exempted fishery but their use of the areas is subject to numerous regulatory restrictions.

The proposed expansion of the CAI Hook Gear Haddock SAP in time and season may increase gear conflicts between mobile gear fishermen and fixed gear hook fishermen. Herring trawl vessels are known to fish in the north end of CAI. The location of observed mid-water trawl tows overlaps the distribution of haddock as noted in surveys (Figure 159). This suggests that the mid-water trawl vessels and longline vessels may attempt to fish in the same locations. There is considerable antipathy between the two user groups. Indeed, a primary hook gear user group – the Cape Cod Commercial Hook Fishermen's Association - is in the forefront of efforts to ban mid-water trawl access to the groundfish closed areas. With this history between the user groups any gear conflicts that result from expanding the CAI Hook Gear Haddock SAP may prove contentious and intractable.

Figure 159 – Comparison of observed mid-water trawl tows catching herring (all observed tows are from 2005-2008, August – October) and haddock survey distribution in CAI.



7.8 Cumulative Effects Analysis

7.8.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Amendment 16 together with past, present, and reasonably foreseeable future actions that affect the groundfish environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

Valued Ecosystem Components (VEC)
As noted in section 6.0 (Description of the Affected Environment), the VECs that exist within the groundfish fishery are identified and the basis for their selection is established. Those VECs were identified as follows:

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

Temporal Scope of the VECs
While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery, rather than foreign fleets. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, this analysis examines the period between implementation of this amendment (May 1, 2010) and the anticipated rebuilding of the fishery in 2014. 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 6.0). However, the analyses of impacts presented in this amendment focuses primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species (section 6.0).

Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (section 6.0) 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 301 and more thoroughly in Appendix I. The baseline conditions of the resources and human community are subsequently summarized although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this amendment is included. The culmination of all these factors is considered when making the cumulative effects assessment.

7.8.2 Past, Present and Reasonably Foreseeable Future Actions

Table 301 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 (a summary of the primary past, present and reasonably foreseeable future actions effecting this amendment can be found in Appendix I).

Note that most of the actions effecting this amendment and considered in Table 301 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straight-forward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management - the re-authorized 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 301 - Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Amendment 16 (based on actions listed in **Appendix I**).

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 and improved habitat protection 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 **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 thus limit 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 controls have curtailed fishing opportunities	**Mixed** Fishery resources continue to support communities but increasing effort 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 negative=actions that decrease revenue and well being of fishermen and/or associated businesses

7.8.3 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 302) summarizes the added effects of the condition of the VECs (i.e., status/trends from Section 5.0) and the sum effect of the past, present and reasonably foreseeable future actions (from Table 301 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straight-forward 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 5.1 and 5.2, respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions below in Table 302.

Impact Definitions for Table 302 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 302 - Cumulative effects assessment baseline conditions of the VECs

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 301)	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 but overfishing is 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 302 Continued

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 301)	Combined CEA Baseline Conditions
Non-groundfish Species (principle species listed in section 5.1.9)	**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 5.1.6); 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		
Human Communities		Complex and variable (see Section 5.2). Although there are exceptions, generally groundfish landings have decreased for most New England states since 2001. Declines in groundfish revenues since 2001 have also occurred in all states except CT.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities	**Negative –** short term lower revenues would continue until stocks are sustainable **Positive** – long term sustainable resources should support viable communities and economies

7.8.4 Summary Effects of Amendment 16 Actions

The focus of the alternatives contained in Amendment 16 can be divided into the following broad categories: (1) Updates to status determination criteria and formal rebuilding programs; (2) fishery program administration such as annual catch limits, adding Atlantic wolffish to the multispecies management unit, sector administration provisions, allocation of resources for sectors, sector monitoring and enforcement, transfer of ACE, sector participation in SAPs, the interaction of sectors with common pool vessels, movement between sectors, reporting requirements, commercial and recreational allocations, changes to the DAS leasing and transfer programs, SAPs, measures that can be periodically adjusted, and permitting changes for multispecies and scallop permit holders; and (3) measures to meet mortality objectives including effort control alternatives for commercial and recreational fisheries, Atlantic halibut minimum size, prohibition on the retention of Atlantic wolffish, implementation of additional sectors, and accountability measures.

Proposed actions taken under number one above would revise the status of groundfish stocks and modify rebuilding targets which in turn impact the alternatives in number three regarding the level of effort control measures needed to meet the mortality objectives of the FMP. Typically, effort control measures have the greatest overall impact on the fishery. Additional reductions would continue stocks on their rebuilding strategy and have a positive impact on biological resources (groundfish and non-groundfish stocks, protected species, and habitat). However, as with other past effort reductions, the human community would likely incur substantial short-term negative impacts as a result of lost fishing revenue. In the long-term, impacts on the directed fishery and human communities would likely be positive as stocks reach sustainable levels and effort controls are relaxed, while fewer controls may lead to an increased bycatch of non-groundfish species and possibly greater impacts to habitat and protected species.

Regarding impacts from the measures mentioned in number two, many of these alternatives focus on sector administration. Because under the proposed action sectors would be allocated a hard TAC for most regulated groundfish stocks, impacts on the directed fishery would be controlled. However, impacts to the other four VECs will vary based on which alternatives are selected. Depending on the sectors that are formed, the number of participants in each sector and the area where the sector is conducted, impacts could vary. For example, if sectors transfer their ACE, a trawl sector could transfer TAC to a gillnet sector. If the gillnet sector's effort then increases in an area where protected species are present, it could increase protected species interactions. Likewise the opposite could occur, thereby decreasing protected species interactions. Regarding impacts to human communities, the overall impact of sector management should be positive because sectors are created to provide maximum profits to their participants while also allowing members to have some control over their own management measures. However, based on sector administrative procedures (e.g., period of time chosen for landings history) there will likely be individuals that fair better than others. Overall, while it is difficult to predict the various outcomes that could occur under sector administration, it is important to note that individual sectors will be required to submit an annua1 operations plan that contains an environmental analysis of the direct, indirect, and cumulative impacts of that sector's operations.

Other measures mentioned under number two (permitting requirements, commercial and recreational allocations, reporting requirements, implementing ACLs and SAP modifications, etc.) would have impacts less substantial than effort reductions. Likewise, allocating shares of groundfish to the commercial and recreational fisheries would primarily be for the purpose of helping design better management measures to reduce effort on the party responsible should mortality targets be exceeded. Permitting requirements would entail allowing a vessel that possesses a multispecies limited access permit to also possess a limited access scallop permit and modifications to the conservation tax regulations for DAS leases and transfers. With the exception of one measure that would add a conservation tax for leased DAS, the remainder of these alternatives would provide increased flexibility to the industry and could encourage consolidation which decreases administrative burden for both NMFS and the industry. Finally, changes to the SAPs would provide greater opportunities to harvest healthy stocks while closing access to a depleted winter flounder stock. By potentially shifting effort away from stocks in need of greater protection, these changes could have a positive biological impact on groundfish species and human communities. Impacts to protected species, habitat, and non-groundfish species would likely be minor.

7.8.5 Cumulative Effects Summary

The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the SFA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.

Table 303 below is provided as a summary of likely cumulative effects found in the various groups of management alternatives contained in Amendment 16. Impacts are listed as no impact/neutral, positive, negative, or mixed. Impacts listed as no impact/neutral include those alternatives that have no impact or have a neutral impact (neither positive nor negative). Impacts listed as mixed contain both positive and negative impacts. The resultant cumulative effect is the CEA baseline exhibited in the first shaded column that, as described above in Table 302, represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the "other" actions. The resultant positive and negative cumulative effects are described below for each VEC and are exhibited in Table 302 in the shaded column.

Table 303 - Cumulative effects expected on the VECs.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
UPDATES TO STATUS DETERMINATION CRITERIA AND FORMAL REBUILDING PROGRAMS	REVISED STATUS DETERMINATION CRITERIA	Positive – revised criteria would guide management actions and rebuilding using the best available science. This, combined with past management efforts, should contribute with stock rebuilding and provide positive cumulative impacts	No Impact/Neutral – provided rebuilding continues, additional impacts to non-target species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to habitat are not anticipated	Positive – Overall revenues will increase as stocks rebuild however, revenues under the revised criteria would be less than no action once rebuilding is complete
	REVISED MORTALITY TARGETS FOR FORMAL REBUILDING PROGRAM	Positive – revised mortality targets would modify fishing mortality rates and adopt rebuilding programs for stocks recently declared overfished. This, combined with past management efforts, should contribute with stock rebuilding and provide positive cumulative impacts	No Impact/Neutral – provided rebuilding continues, additional impacts to non-target species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to habitat are not anticipated	Positive – over the long-term revised targets should lead to increased yields and thus greater profits

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
FISHERY PROGRAM ADMINISTRATION	ANNUAL CATCH LIMITS (ACL)	Positive – primarily administrative although if designed properly, in the long-term should reduce the risk of exceeding fishing mortality targets	No Impact/Neutral – provided rebuilding continues, additional impacts to non-target species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact/Neutral – provided rebuilding continues, additional impacts to habitat are not anticipated	Negative – past effort/revenue reductions would be in addition to yield that may be lost due to uncertainties in setting OFL, ABC and ACL. However, over time these uncertainties may be reduced
	ADDITION OF ATLANTIC WOLFFISH TO THE MANAGEMENT UNIT INCLUDING DESIGNATION OF EFH	Positive – past regulatory actions have reduced overall fishing effort (presumably on wolffish too) and although this alternative would be administrative, it would allow measures to be implemented that would protect this stock	No Impact – the addition to the management unit and potential EFH designation and regulation of wolffish would not likely impact non-groundfish stocks	Positive – if wolffish are listed as a protected species, it would provide an additional mechanism to protect the species	Positive – adding wolffish to the management unit is primarily administrative but would lead to the designation of wolffish EFH	No Impact – adding wolffish would not impact human communities but could lead to subsequent measures that reduce revenue

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
FISHERY PROGRAM ADMINISTRATION CONTINUED	SECTOR ADMINISTRATIVE PROVISIONS (DEFINITION/ FORMATION OF A SECTOR AND OPERATIONS PLAN)	No Impact – primarily administrative in nature designed to improve the effectiveness of sectors	No Impact – primarily administrative in nature designed to improve the effectiveness of sectors	No Impact – primarily administrative in nature designed to improve the effectiveness of sectors	No Impact – primarily administrative in nature designed to improve the effectiveness of sectors	Unknown/ Negative – operating costs for sectors are estimated to range between 60K-150K. It is difficult to estimate the costs associated with the proposed changes but the added cost would contribute to past revenue declines

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
FISHERY PROGRAM ADMINISTRATION CONTINUED	ALLOCATION OF RESOURCES [FOR SECTORS]	Positive – in combination with past and present regulations, would make it more likely that fishing mortality targets will not be exceeded in successive fishing years	No Impact – provided rebuilding continues, additional impacts to non-target species are not anticipated	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Low Negative – all methods to allocate resources have varying impacts on participants. Those that do not fair as well would likely have revenue losses.
	[SECTOR ALLOCATIONS IN THE] U.S./CANADA AREA	Low Positive – primarily administrative but may assist in controlling fishing mortality	Low Positive – if fishing mortality is controlled, it may reduce discards of non-target species	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Low Negative – all methods to allocate resources have varying impacts on participants. Those that do not fair as well would likely have revenue losses

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
FISHERY PROGRAM ADMINISTRATION CONTINUED	[SECTOR] MONITORING AND ENFORCEMENT	Positive – improved monitoring and enforcement may reduce discards of legal fish and confidence in landed amounts. This, combined with past effort reductions, may lead to better management in the future	No Impact – monitoring and enforcement measures are not expected to impact non-groundfish stocks and thus should have no cumulative effect	Low Positive – enhanced monitoring through observers could provide improved information regarding interactions between fisheries and protected species. This would have a positive cumulative impact	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Negative – participants would have increased monitoring and enforcement costs
	TRANSFER OF ANNUAL CATCH ENTITLEMENTS (ACE)	Negative – allowing the transfer of ACE should not increase fishing mortality however, if ACE is allowed to be carried into the next fishing year, it could increase the risk that overfishing will occur. Continued overfishing when combined with past failures to rebuild could prolong achieving sustainable stocks	No Impact – monitoring and enforcement measures are not expected to impact non-groundfish stocks and thus should have no cumulative effect	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Mixed – lack of ACE transfers would decrease flexibility/ revenues resulting in a negative cumulative impact whereas the transfer of ACE would provide positive cumulative impacts.

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
FISHERY PROGRAM ADMINISTRATION CONTINUED	SECTOR PARTICIPATION IN SPECIAL MANAGEMENT PROGRAMS	No Impact/Neutral – since the participation in SAPs would not provide sectors additional catch or effort, they are not expected to have any impact beyond what is already occurring.	No Impact – the participation in SAPs is not expected to result in a change in effort on non-groundfish species and thus no cumulative effect	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Positive – participation in SAPs provides access to year-round closures and the opportunity to increase revenues, resulting in positive cumulative impacts
	INTERACTION OF SECTOR WITH COMMON POOL VESSELS/UNIVERSAL EXEMPTIONS	Low Negative – these alternatives would provide sector's relief from certain effort control measures The elimination of certain requirements would not increase overall fishing effort but relief from the rolling closures could allow fishing in areas that disrupts spawning cod stocks	No Impact – the interaction of sectors with the common pool vessels is not expected to result in a change in effort on non-groundfish species and thus no cumulative effect	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	No Impact – provided rebuilding continues, additional impacts to habitat are not anticipated	Low Positive – these alternatives may result in a more reliable supply of fish to markets, and also facilitate more efficient sector operations
	MOVEMENT BETWEEN SECTORS	No Impact – administrative in nature	No Impact – administrative in nature	No Impact – administrative in nature	No Impact – administrative in nature	No Impact – administrative in nature

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
FISHERY PROGRAM ADMINISTRATION CONTINUED	REPORTING REQUIREMENTS	Low Positive – improved reporting requirements should improve data collection and lead to better management. This is particularly true if options 2 or 3 are chosen which would improve timeliness and accuracy of information for quota and ACL monitoring. Combined with past actions, this would have a positive impact on stock rebuilding	Low Positive – improved reporting requirements should improve data collection and lead to better management. Combined with past actions, this would have a positive impact on stock rebuilding	Low Positive – improved reporting requirements could enhance the understanding of fishery interactions with protected species	No Impact – administrative in nature	Mixed – vessels that declare into one area would not have to file a daily landing report but would lose flexibility to fish elsewhere. Vessels declaring more than one area would have the burden of daily reporting (negative).
	ALLOCATION OF GROUNDFISH TO THE COMMERCIAL AND RECREATIONAL GROUNDFISH FISHERIES	Positive – may provide more effective management of fishing mortality since both the commercial and recreational components are responsible for a specific amount of catch. Combined with past actions, this would have a positive impact on stock rebuilding	No Impact – allocation to the commercial and recreational fisheries is not expected to result in a change in effort on non-groundfish species and thus no cumulative effect	No Impact – provided rebuilding continues, additional impacts to protected species are not anticipated	Low Positive – may shift minor effort from commercial fisheries to recreational fisheries, which tend to have less of an impact on habitat. Overall would have a positive cumulative impact.	Mixed – may constrain fisheries depending upon the time periods chosen to determine the allocations. FY 1996-2006 would favor commercial, 2001-2006 favors recreational

~~Management Measure~~		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
FISHERY PROGRAM ADMINISTRATION CONTINUED	CHANGES TO THE DAS TRANSFER AND LEASING PROGRAMS	Mixed – options 2and 4 would either permanently or temporarily remove the transfer conservation tax. This would likely lead to greater effort and result in negative cumulative impacts. However, options 1 and 3 would continue conservation taxes, which would likely maintain or reduce effort, leading to positive cumulative impacts	Mixed – options 2 and 4 would potentially remove the tax, possibly leading to greater effort on groundfish and less effort on non-groundfish species. This would have positive cumulative impacts. Options 1 and 3 would continue conservations taxes, which would maintain or reduce effort groundfish and possible lead to increased fishing on non-target species	Unknown/ Mixed – options to modify DAS leasing and transfers are difficult to assess. Options 2 and 4 are unclear and depending how vessels react, could be positive or negative. Option 3 could be positive because it may reduce effort, however, this is difficult to predict. Therefore, it is not possible to assess the cumulative effects of these measures with any certainty.	Mixed – if a combination of measures was adopted such that the DAS transfer tax is decreased and the leasing tax is increased, total DAS allocations could be reduced enabling mortality targets to be achieved with less effort. This total effect is difficult to quantify but would have a low positive cumulative impact	Mixed/Unknown – changing or eliminating the DAS transfer tax would improve the financial gain to the owner involved in a transfer but may not be sufficient to offset the loss associated with having to give up permits. For this reason, the DAS leasing program may be more desirable. It is difficult to predict cumulative impacts for these measures.

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
FISHERY PROGRAM ADMINISTRATION CONTINUED	SPECIAL MANAGEMENT PROGRAMS (SAP)	Mixed – All but one of the SAPs (i.e., the SNE/MA Winter Flounder SAP) would increase effort, particularly on haddock, but also on GB cod and white hake. Individually these impacts may be minor but cumulatively the impact on cod and white hake could be negative. However, the cumulative impact on winter flounder would be positive (elimination of the SNE/MA Winter Flounder SAP) and likewise for pollock (B DAS Program option 2).	Mixed – many of the SAPs would have little or no impact on non-groundfish species however, the Closed Area I Hook Gear Haddock SAP may increase mortality on non-groundfish species, particularly skates, resulting in negative cumulative impacts.	Mixed – two of the SAPs (CA I Hook Gear and CA II YT Flounder) are expected to extend the season of the SAP and increase effort, respectively. No impact is expected from the Eastern US/CA SAP or the Cat B DAS revisions. Suspension of the SNE/MA Winter Flounder SAP would likely be positive. Overall this creates varying cumulative impacts on protected species	Mixed – changes to the CA I Hook Gear and Eastern US/CA SAP would result in neutral/ status quo impacts. The CA II YT Flounder SAP would likely be negative because some vessels would be using additional effort. Elimination of the SNE/MA Winter Flounder SAP would have a slight reduction in effort, thus a positive impact and impacts from changes to the Category B DAS program are unclear	Mixed – overall modifications to the SAPs (with the exception of the SNE/MA Winter Flounder SAP) would provide continued or improved access to programs. Economic gain would remain limited by TACs, but would still provide opportunities to gain revenue and have positive cumulative impacts. Elimination of the SNE/MA Winter Flounder SAP would result in a low loss in revenue (150K fleet-wide) but would contribute to negative cumulative effects.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
FISHERY PROGRAM ADMINISTRATION CONTINUED	PERIODIC ADJUSTMENT PROCESS	No Impact – primarily administrative in nature	No Impact – primarily administrative in nature	No Impact – primarily administrative in nature	No Impact – primarily administrative in nature	No Impact – primarily administrative in nature
	POSESSESSION OF A LIMITED ACCESS MULTISPECIES PERMIT AND A LIMITED ACCESS SCALLOP PERMIT BY THE SAME VESSEL	Mixed – Although this measure would not allocate more groundfish DAS, it could increase the use of latent effort or result in an effort shift from the New England states to the mid-Atlantic. This could lead to negative cumulative impacts. However, if this measure shifts effort away from groundfish and onto scallops, a resource that is in better condition, it could have positive cumulative impacts on the multispecies fishery.	Unknown – skates and monkfish are caught by both groundfish and scallop gear. Allowing a vessel to possess both permits could consolidate effort but it is unclear if that would also reduce catches of skates and monkfish	Unknown – there could be some impact on protected species but because it is unknown how many vessels would modify their permit, and where or what these vessels would be fishing for, the impacts cannot be determined.	No Impact – not likely to increase fishing effort but it could shift effort into other habitats designated as EFH. However, the shift is impossible to predict or assess.	Mixed – would provide greater flexibility/ revenue to scallop permit holders and reduce economic costs, resulting in positive cumulative impacts for some vessel owners. Groundfish permits and effort is predicted to shift from ME, NH, MA and RI to NY, CT and NJ. This could have negative cumulative impacts on the states losing permits and positive on those gaining.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
MEASURES TO MEET MORTALITY OBJECTIVES	COMMERCIAL FISHERY MEAUSRES	Positive – All four of the measures to reduce effort would have a positive impact, although options 3A and 4 appear to provide the greatest effort reductions, followed by option 2A and the no action alternative. Therefore, the greatest positive cumulative impacts would be realized from either 3A or 4, followed by 2A and no action. This set of alternatives also includes a measure expected to have positive cumulative effects by reducing mortality on SNE/MA winter and YT flounder and a pilot program that would likely increase mortality on GOM haddock`(but away from more depleted species) and reduce the haddock minimum size, allowing a greater portion of catch to be landed.	Positive – effort reductions on groundfish species would also be expected to reduce the catch of monkfish, skates and dogfish. This could be slightly offset if vessels attempt to redirect onto these species, but opportunities to redirect are limited	Positive – effort reductions in the groundfish fishery would likely reduce interactions with protected species and have an overall positive cumulative impact on protected species	Positive – effort reductions would have a positive cumulative effect on habitats designated as EFH. All four measures would reduce effort, but the greatest positive effect on EFH would be alternative 3A. Also, a measure reducing bottom time while targeting SNE/MA winter and YT flounder would have positive cumulative impacts and the Haddock Pilot Program would have no impact.	Negative – all four alternatives would substantially reduce revenues and result in negative, cumulative impacts. Option 4 would have the greatest negative cumulative impact, followed by options 2A, 3A and 1 (no action). Measures facilitating the target of haddock (Sink Gillnet Pilot Program) and Haddock Minimum Mesh Size) would only provide limited economic relief.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
MEASURES TO MEET MORTALITY OBJECTIVES CONTINUED	RECREATIONAL MANAGEMENT MEASURES	Mixed – provisions for landing fillets and the removal of hook limits may increase discards, thus having a low negative cumulative effect. All three measures to reduce mortality on GOM cod would be positive, though option three would provide the greatest benefit. Of the four measures to reduce mortality on GOM haddock option 1 appears to provide the greatest positive impact, while option four would not meet mortality targets. However, all of these measures would result in reduced mortality and positive cumulative impacts	No Impact – recreational measures are not expected to have an impact on non-groundfish species, thus no cumulative impact	No Impact – protected species are not known to interact with the recreational fishery, thus no cumulative impact	No Impact – the recreational fishery does not impact habitat, thus no cumulative impact	Mixed – impacts for landing fillets are highly variable depending on angler preference. Eliminating the two hook minimum would have positive economic and social impacts unless it drives catch up and results in exceeding ACLs. For GOM cod mortality reductions, option 3 has the greatest negative economic impacts followed by 1 and 2. For GOM haddock, option 3 has the greatest negative impact followed by 2 and 1.

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
MEASURES TO MEET MORTALITY OBJECTIVES CONTINUED	ATLANTIC HALIBUT MINIMUM SIZE	Low Positive – Increasing the minimum size limit may slightly reduce fishing mortality and increase the reproductive capability of this stock. This should result in positive cumulative impacts.	No Impact – a change in the halibut minimum size is not expected to have an impact on non-groundfish species, thus no cumulative impact	No Impact – this measure will not impact overall fishing effort or protected species, thus no cumulative impact	No Impact – this measure will not impact overall fishing effort or habitat, thus no cumulative impact	Low Negative – an increase in minimum fish size will likely result in a loss of commercial revenue and may effect the value of a recreational trip, resulting in negative cumulative impacts
	PROHIBITION ON RETENTION OF ATLANTIC WOLFFISH	Positive – prohibiting the retention of wolffish should result in a reduction in mortality on this likely overfished stock. This measure, when combined with past effort reductions, should have a positive cumulative impact.	No Impact – a prohibition on the retention of wolffish is not expected to have an impact on non-groundfish species, thus no cumulative impact	Mixed – should wolffish be listed, this measure would have positive cumulative impacts. If wolffish are not listed, then impacts would be neutral.	No Impact – because there is no directed fishery on wolffish, this measure is not expected to have any impact on habitats designated as EFH	Negative – commercial revenues would be reduced by 100K-150K, compounding the negative cumulative impacts from other past revenue reductions

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
MEASURES TO MEET MORTALITY OBJECTIVES CONTINUED	IMPLEMENTATION OF ADDITIONAL SECTORS/MODIFICATIONS TO EXISTING SECTORS	Positive – information suggests that ITQ systems (of which sectors are similar) increase the likelihood that a fishery will be sustainable. Regulatory discards are also expected to decline with sectors. Therefore, the creation of several additional sectors (for a total of 19 sectors) is expected to have positive cumulative impacts, when combined with past and future management actions.	Positive – the creation of sectors is expected to reduce all discards on all groundfish trips, including discards of monkfish, skates and dogfish. This, when combined with past and future actions to reduce efforts on these species, should result in positive cumulative impacts	Positive –if effort reductions result from the formation of additional sectors, it would reduce interactions with protected species because vessels would be fishing for less time. This would result in positive cumulative impacts.	No Impact – administrative in nature	Mixed – sectors should be able to operate in a more efficient manner which reduces trip costs and increases flexibility. This would result in positive cumulative impacts. However, increased reporting and monitoring costs could counter these positive impacts and create negative economic cumulative impacts

Management Measure		VECs				
		Managed Resources	Non-target Species	Protected Resources	Habitat Including EFH	Human Communities
MEASURES TO MEET MORTALITY OBJECTIVES CONTINUED	ACCOUNTABILITY MEASURES (AM)	Positive – for the commercial fishery there are two options for AMs, both of which are positive when compared to no action. However, option 1 does have the threat of a derby fishery and option 2 requires that several assumptions be made, some of which are difficult to validate. Regardless, either of these options when compared to having no AM in effect, would improve the ability to stay within fishing mortality targets and result in positive cumulative impacts. For the recreational fishery, there are three options that are all very similar and each would provide a positive cumulative impact over the no action.	No Impact – adopting AMs for the commercial and recreational fisheries is not expected to have an impact on non-groundfish species, thus no cumulative impact	Mixed/ Unknown – both options for the commercial fishery are difficult to predict because they will likely result in behavioral changes such as effort shifts and restricted areas and times. However, because the recreational fishery has no known impact with protected species, recreational AMs would have no impact.	Mixed/ Unknown – For commercial vessels; depends on specific implemen-tation No Impact – For recreational vessels; gear does not impact habitat	Positive – over the long-term, the implementation of effective AMs would be expected to contribute to the rebuilding of groundfish stocks, resulting in increased revenues for the commercial fishery and increased recreational harvest. This would result in positive cumulative impacts

Biological Cumulative Impacts

As noted, the long-term trend for cumulative impacts has been positive. Among the groups of measures considered in this action (updates to status determination criteria and formal rebuilding programs, fishery program administration, and measures to meet mortality objectives), very few of the alternatives would actually increase effort and among those that do, the increase is often on stocks such as haddock, that are not overfished nor have overfishing occurring.

Updates chosen by the Council as their proposed alternatives to the status determination criteria and rebuilding programs would have positive cumulative impacts on all species managed under the NE Multispecies FMP since these measures would bring management of the stocks in line with the most recent scientific advice from GARM III and help better achieve sustainable yield of the groundfish stocks. However, were the no action options for these alternatives chosen, the cumulative impact would likely remain positive, although to a lesser degree. This is because under the rebuilding schedule adopted through prior groundfish actions, effort would continue to be constrained, albeit without the adjustments needed to rebuild the stocks in a more timely fashion. Alternately, there would be no substantial cumulative impacts on non-groundfish species provided that groundfish stocks continue to be managed toward sustainable levels. This is because the primary non-groundfish species analyzed through this action are managed under other FMPs and their management programs account for some level of mortality via the multispecies fishery. Provided that the level of mortality is relatively stable, little direct or cumulative impacts are predicted for these non-groundfish species.

Several alternatives contained within the group of measures under fishery program administration would either have no or neutral impacts or be administrative in nature and result in no impact to either managed resources or non-groundfish species, thus resulting in no cumulative impact. Alternatives falling into this category include the definition and formation of a sector, preparation of a sector formation proposal and operations plan, sector annual reports, the periodic adjustment process, and movement between sectors. Another set of alternatives, allocation of resources or ACE, while not predicted to have biological impacts on directed groundfish species, could have indirect impacts on bycatch species that may result in greater effort. However, the additional level of effort is difficult to predict and unless it results in a substantial increase, is not expected to have a negative cumulative impact.

Measures regarding sector participation in special management programs and the interaction of sectors with common pool vessels/universal exemptions tend to have mixed impacts. The proposed action would allow sector vessels to participate in special management programs such as the various SAPs. Vessels participating in these programs would have their catch limited to the amount of allocated ACE, resulting in little or no impact compared to the no action alternative for directed multispecies. Therefore, no cumulative impacts would be expected. However, for non-groundfish stocks, it is possible that changes in fishing practices while participating in a SAP, such as increases in catch per unit effort on directed groundfish species, may increase the catch of non-groundfish species or mean that vessels obtain their ACE more quickly and shift effort onto non-groundfish stocks. Although difficult to predict with certainty, it is possible that these increases could be in excess of estimated effort, resulting in at least slightly negative cumulative impacts for non-groundfish species when considered with past overfishing practices.

Regarding the interaction of sectors with the proposed common pool vessels/universal exemptions, these measures clarify regulations that sectors cannot be exempt from (i.e., measures that apply to both sector and non-sector vessels) and measures that sectors will be exempt from such as trip limits, seasonal closed areas, six and a half inch mesh codend, and all the GOM rolling closure areas with the exception of several specific blocks. Compared to the no action alternative, there are several direct and indirect impacts to groundfish species that could contribute to cumulative impacts. While exemptions to DAS and seasonal closed areas would likely have little or no direct impact and thus cause no cumulative impacts, the use of a six-inch mesh codend and exemption from much the area covered by rolling closures would likely have some effect. In the case of the codend, the use of a smaller mesh size could equate to the catch of smaller haddock or a larger catch of haddock than allocated via sector ACE. If left unchecked for a lengthy period of time, this could ultimately have a negative impact on haddock stocks. However, given that the stock is neither overfished nor is overfishing occurring, it is difficult to predict whether such changes would lead to negative cumulative impacts on haddock. Regarding the preferred action to provide sector vessels exemptions from much of the rolling closures, to the extent that fishing occurs during periods when cod are aggregated, it may disrupt spawning or spawning habitat and when considered with past overfishing practices, could result in some level of negative cumulative impacts.

Two categories of alternatives – annual catch limits and the addition of Atlantic wolffish to the multispecies management unit/designation of EFH – are initially more administrative in nature but when combined with future actions, should yield positive cumulative impacts because adoption of these measures would lay the groundwork for better management in the future.

Other measures are predicted to have positive cumulative impacts, including the allocation of U.S./Canada shared stocks to sectors and sector monitoring and enforcement provisions. In the case of the U.S./Canada shared stock allocation, although no direct impacts to groundfish species are predicted, the preferred alternative would allocate cod and haddock on Eastern Georges Bank to sectors and may reduce the incentive for a derby fishery, thus reducing discards of non-target species. While precise impacts are difficult to predict, when considered with other past and present management actions intended to control the mortality of non-groundfish species, this measure is likely to have a slightly positive cumulative impact. The adoption of the preferred monitoring and enforcement provisions are designed to improve confidence that sector catches are accurate and reported correctly. When combined with past groundfish management actions, these measures should improve the likelihood of controlling fishing mortality, thus having an overall positive cumulative impact when taken into account with other ongoing past and present efforts to maintain sustainable groundfish stocks.

Alternatives with the greatest variability within the group of fishery program administration measures include measures proposed to allow the transfer of ACE, changes to the DAS leasing and transfer program, SAPs, and the possession of a limited access multispecies and scallop permit by the same vessel. The proposed measure to allow the transfer of ACE, when compared to the no action alternative, could increase the risk that overfishing would occur, leading to negative cumulative impacts on groundfish stocks. However, the no action alternative may also lead to negative cumulative impacts because without the ability to carryover unused ACE, vessels may fish right up to their quota, resulting in an overage or discarding. Within changes to the DAS leasing and transfer programs, the preferred alternative to permanently remove the transfer tax could increase effort on groundfish because it may increase the number of transfers and thus the number of DAS in use. A temporary suspension of the transfer tax would have similar results, but only for the short-term because it would be a temporary program. Under both these scenarios, cumulative impacts to non-groundfish species may be positive because it could result in the reduction of some permits in other limited access fisheries which in combination with current and past management practices would have a positive effect. Leaving the transfer tax in effect or adding a DAS leasing tax would be expected to result in status quo or a reduction in fishing effort, respectively, providing positive cumulative impacts. Another set of alternatives with mixed impacts would be those involving SAPs. All but one of the proposed changes to SAPs would increase or extend effort, particularly on haddock but also on cod and white hake. While the haddock resource is sustainable, the addition/extension of multiple programs targeting the species could have negative cumulative effects, particularly when combined with the proposed measure (see below) to reduce the minimum catch size for haddock. Also, impacts to cod and white hake, two depleted species, would provide additional negative cumulative impacts. The only positive effect from this suite of measures would be the elimination of the SNE/MA Winter Flounder SAP, which should help reduce effort on this overfished species. Finally, allowing for the possession of a limited access multispecies and scallop permit by the same vessel would not allocate more groundfish resources, but could increase the use of latent effort or shift effort away from states in New England to those in the mid-Atlantic. While this could have negative cumulative impacts, if effort were to shift off of groundfish and on to the scallop resource (which is in much better condition than many groundfish species) it could have positive cumulative impacts. Further; although non-groundfish species such as skates and monkfish are caught by groundfish and scallop gear, it is difficult to predict the impact this consolidated effort may have and thus to state whether there would be cumulative impacts.

The last group of alternatives, measures to meet mortality objectives would primarily provide positive cumulative impacts to managed groundfish species and would either have positive or no impact on non-groundfish species. As repeatedly stated, the nature of fisheries management is to manage toward sustainable stocks and mortality reductions are intended to do just that by furthering the rebuilding process. However, there are differences among some measures regarding their effectiveness and overall contribution to positive cumulative effects. For example, under the commercial fishery measures designed to maintain stock rebuilding, alternatives that would implement a 24-hour DAS clock (preferred alternative) and restricted gear areas or reduce DAS and add restricted gear areas would provide the greatest overall benefit and positive cumulative impact, followed by the use of differential DAS and trip limits or taking no action which would entail a reduction in DAS. Likewise, for recreational measures, provisions for landing filleted fish and the removal of hook limits could have a negative cumulative impact. However, this would hopefully be offset by additional measures to reduce mortality on GOM haddock and cod. Other proposed measures, such as changes to the Atlantic halibut minimum size, a prohibition on the retention of wolffish, and the implementation of AMs, would all contribute to sustainable groundfish stocks and thus be expected to have positive cumulative impacts with no impact on non-groundfish species.

<u>Protected Resource Cumulative Impacts</u>
As noted in the environmental consequences analysis for protected species, the primary impact of alternatives in this amendment on protected species is driven by the magnitude and breadth of changes in fishing effort that are required. This also is typically the case for the cumulative impacts to protected species and change in effort was the primary factor used in determining the cumulative impact of the measures.

Regarding the measures contained under updates to status determination criteria and formal rebuilding programs, no impact is expected provided groundfish stocks continue to rebuild. This is because these alternatives do not directly change fishing effort or behavior, but rather lay the groundwork to do so in the future.

Under fishery program administration, most measures are not anticipated to affect protected species because they would have only indirect impacts on fishing effort and would likely not substantially increase or decrease fishing gear interactions. Further, impacts from other measures, such as changes to the DAS transfer conservation tax, removal of the leasing cap/eligibility of CPH permits to lease DAS, and possession of a limited access multispecies and scallop permit by the same vessel are unknown or difficult to predict. For example, vessel reactions to the modifications in the transfer and leasing programs could result in greater or less effort and/or greater effort but less time on the water thus fewer opportunities for gear interactions. However, because much of the outcome depends upon how the industry reacts, it is not possible to provide a reliable assessment of the impacts from these measures. Likewise, it is difficult to predict how many vessels would take advantage of the opportunity to combine multispecies and scallop permits. If effort were to shift more toward scallop vessels, it could increase interactions with turtles. However, vessels that had primarily been scalloping could begin fishing more for groundfish, thus reducing opportunities for turtle interactions, but increasing gear interactions between small mammals and trawls. Therefore, there are multiple outcomes that could result in either positive or negative cumulative impacts from these measures; the extent of which is difficult to predict.

Positive cumulative impacts are also anticipated for several measures that fall under fishery program administration. For example, the preferred alternate to add wolffish to the multispecies management unit would be positive, particularly if this species is not listed as endangered, because it provides an additional mechanism for protection. Improved monitoring and enforcement in the sector program and better reporting requirements would also provide positive cumulative impacts to protected species if these measures afford improved information regarding interactions between fisheries and protected species. Finally, changes or the extension/elimination of SAPs could result in a combination of positive and negative cumulative impacts. For example, the preferred alternatives to expand the Hook Gear Haddock SAP and modifications to the CA II Yellowtail Flounder SAP could increase effort and thus gear interactions resulting in negative cumulative impacts. However, suspension of the SNE/MA Winter Flounder SAP would likely have slightly positive cumulative impacts as it would reduce gear interactions and no impacts are anticipated from changes to the Eastern .U.S./Canada SAP or the Category B DAS Program.

The third and final group of alternatives falls under measures to meet mortality objectives. Mostly positive cumulative impacts would be expected as a result of the measures to reduce commercial fishing effort. This is because all of these measures would involve substantial effort reductions which should reduce gear interactions, particularly when factored into past effort reductions and management actions taken through the ESA, MMPA and Magnuson-Stevens Act. Other measures with positive cumulative impacts include the preferred alternatives to implement several additional sectors and modify existing sectors, which should lead to more efficient fishing operations and ultimately fewer gear interactions with protected species. Unknown impacts are expected from the proposed implementation of AMs. This is because it is difficult to predict the behavioral changes such as effort shifts which may result from AMs. Finally, among this group of measures are two sets of alternatives that are predicted to have no impact on protected species, recreational measures and a proposed change to the Atlantic halibut minimum size. This is because, if implemented, these proposed changes would not impact gear interactions with protected species.

<u>Habitat Cumulative Impacts</u>

While the environmental impacts analysis of this document is focused on the direct and indirect impacts of this action on EFH, the cumulative effects assessment also considers non-fishing impacts such as those summarized in Appendix I and factored into the baseline and summarized in Table 302. Overall, the impact of non-fishing factors is difficult to measure.

Because many groundfish species move throughout the entire management area and spend a small or no portion of their life in the near-shore areas where non-fishing impacts are most acute, the effects are thought to be insignificant when viewed in the context of cumulative impacts. However, species with greater inshore habitat reliance are likely more negatively impacted. Another non-fishing factor that appears to have a negative impact on groundfish and other fisheries resources is climate change. Although it is not possible to factor in the exact role that climate change may be having on the groundfish fishery, when impacts such as increased acidification and rising water temperatures are factored into the unsustainable mortality that has occurred at times in the past, it is possible that the combined cumulative impacts have been negative.

For measures contained under updates to status determination criteria and formal rebuilding programs, no impact is expected provided groundfish stocks continue to rebuild. This is because these alternatives do not directly change fishing effort or behavior, but rather lay the groundwork for doing so in the future.

Regarding the group of measures that fall under fishing program administration, several would also have no cumulative impact on habitat such as establishing ACLs, addition of wolffish to the multispecies management unit, sector administrative provisions, allocation of resources and U.S./Canada TACs for sectors, sector monitoring and enforcement, the transfer of ACE, sector participation in SAPs, the interaction of sectors with common pool vessels/universal exemptions, movement between sectors, reporting requirements, periodic adjustment process, and the possession of a limited access multispecies and scallop permit by the same vessel. Several groups of alternatives would have positive or a combination of positive and negative cumulative impacts. This includes preferred measure allocating groundfish to commercial and recreational fisheries. Although difficult to predict, under this measure if effort were to shift from commercial to recreational fisheries, which tend to have fewer habitat interactions, then it could result in positive cumulative impacts compared to the no action alternative. Other alternatives with mixed impacts include changes to the DAS transfer and leasing program and SAPs. The Council's preferred alternatives to the transfer and leasing programs would eliminate the transfer tax and the DAS leasing cap, such that in theory vessels would be able to achieve mortality targets with less effort which would improve the quality of habitat and have positive cumulative impacts when taken into account with past actions. However, under the no action alternatives the opposite would occur and the cumulative impacts would be negative. Likewise, proposed changes to the SAPs involve a multitude of impacts. Preferred measures to modify the CA I Hook Gear Haddock SAP and Eastern U.S./Canada SAP would result in neutral cumulative impacts. Changes to the CA II Yellowtail Flounder SAP would likely be negative because some vessels would be using additional effort, thus increasing gear contact with the ocean floor. Finally, suspension of the SNE/Winter Flounder SAP would have a slight positive cumulative impact due to fewer gear interactions with the ocean floor and cumulative impacts from changes to the Category B DAS Program are difficult to predict.

The last category of alternatives, commercial fishery measures, would have no impact on habitat, except for measures to reduce effort, which when combined with the progress made through past actions and the positive impacts expected from the future implementation of the EFH Omnibus Amendment. This suite of alternatives would provide substantial effort reductions with the greatest positive cumulative impact on habitats designated as EFH resulting from option 3A (preferred alternative). While option 4 would also have positive cumulative impacts, it may lead to increased bottom contact time by mobile bottom tending gear. Likewise, options 2 and no action would also have positive cumulative impacts, but to a lesser degree than option 3A.

<u>Human Communities Cumulative Impacts</u>
Unlike other VECs, there are very few measures that do not impact human communities in some way. For measures found under updates to status determination criteria and formal rebuilding programs, revised criteria are thought to have a positive cumulative impact because when combined with past and current actions, overall revenues should increase when compared to the cumulative impacts from the corresponding no action alternatives.

Regarding measures found under the category of fishery program administration, the great majority of alternatives would result in a reduction in revenues and, when combined with past reductions, result in negative cumulative impacts. Negative measures include the implementation process for setting ACLs (preferred alternative), the addition of wolffish to the multispecies management unit (preferred alternative), various sector administrative provisions including preferred alternatives that modify how sectors are formed, and the content of their operations plan and annual reports, the allocation of resources, allocations in the U.S/Canada area, and sector monitoring and enforcement. Several other measures would have some combination of positive and negative cumulative impacts. For example, the preferred alternative to allow the transfer ACE would provide increased flexibility and revenues, resulting in positive cumulative impacts. The opposite would be true of the no action alternative. For reporting requirements, the cumulative outcome depends on whether a vessel is able to increase its flexibility (positive) versus taking on the increased burden of daily reporting (negative). With the allocation of groundfish to the commercial and recreational fisheries, the impact lies largely in which years are chosen to determine the time period used for determining allocations. For example, using the period of FY 1996 through 2006, the share for the commercial component is larger and would likely constrain the recreational fishery, resulting in negative cumulative impacts. However, for the period of FY 2001 through 2006 (preferred alternative), the opposite would be true and the commercial fishery would be constrained. Because past cumulative impacts have had a greater negative impact on the commercial fishery, further constraining the commercial fleet would likely have the greatest negative overall cumulative effect.

Additional mixed impacts result from measures to change the DAS transfer and leasing program, SAPs, and the possession of a limited access multispecies and scallop permit by the same vessel. In all of these alternatives, impacts hinge on tradeoffs. For the DAS transfer and leasing tax alternatives, the elimination of the tax is viewed as positive (preferred alternative), but it is unclear as to whether forfeiting non-groundfish permits as part of the sale would be worthwhile to the industry, particularly if the leasing program continues to be tax free. Continued access to the SAPs would provide economic gains and added flexibility but the loss of the SNE/MA Flounder SAP, though only responsible for a low level of revenue, would add to a growing number of other actions that produced negative cumulative impacts. Finally, the preferred measure allowing the possession of both scallop and multispecies permits would primarily have positive impacts because it could reduce operating costs. However, effort is predicted to shift from the northern to southern New England region which could have further negative cumulative impacts on the communities and ports in the Northeast.

The final group of alternatives, measures to meet mortality objectives, primarily results in negative impacts, at least in the short-term as stocks continue to rebuild and become sustainable. Measures to control commercial fishery effort would have the greatest negative cumulative impact, along with constrictions on recreational catches of GOM cod and haddock, an increase in the Atlantic halibut minimum size, and a prohibition on the retention of wolffish. However, the implementation of additional sectors, by providing improved efficiency and flexibility, along with the long-term impact that the implementation of AMs could have on rebuilding and maintaining sustainable stocks, would have positive cumulative impacts.

Total Cumulative Impacts of Amendment 16

When considering the long-term positive trends in rebuilding in combination with further effort control measures designed to maintain or achieve sustainable stocks, the cumulative impact of this action would be positive. While the short-term impacts, particularly to the human communities VEC, continue to be negative primarily due to economic losses, in the future as the status of the fishery improves and stocks recover, the industry and communities that rely on fisheries will incur positive impacts.

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8.0 Data and Research Needs

The M-S Act (section 303(a)) requires that FMPs identify data and research needs. The Council's Research Steering Committee reviews these needs on a periodic basis and updates them as needed. The most recent review occurred in November, 2008. The following needs related to the groundfish fishery were identified. This list may be revised or updated by the Council at any time. Only needs related to the multispecies fishery are shown here.

I. Fisheries

A. Stock Assessments

1. **Spatial-temporal distributions**
   Further investigations into stock definition, stock movements, mixing, and migration through tagging studies, DNA markers, morphological characteristics and other means for **groundfish**, **monkfish**, **skates**, **herring**, and **silver hake**.

2. **Biology**
   No needs specific to groundfish.

3. **Other**
   Investigate/determine the cause for retrospective patterns in New England **multispecies groundfish** assessments, and identify appropriate adjustments **(**e.g., data or model revisions) to resolve those patterns.

B. Surveys

Conduct intensive industry-based surveys of each of the five **sea scallop** access areas (Closed Area I, Closed Area II, Nantucket Lightship, Elephant Trunk and Delmarva areas) and beyond (Northern Gulf of Maine management area and Southern New England). Research new advanced scallop and multipurpose survey technologies (video, sonar, towed, AUV, etc.) and protocols that should be compatible with and complement the existing scallop resource surveys. Conduct peer-review and inter-survey calibrations of new and existing scallop surveys. Conduct deepwater (> 200 m) surveys and efficiency estimation of NMFS survey gear for **monkfish**. Surveys of spawning aggregations of **silver hake** on the southern flank of Georges Bank are also needed. Continue development of hydroacoustic surveys **of pelagic species** to provide an independent means of estimating stock sizes and/or defining localized depletion (long-term research).

C. Fishery Performance and Monitoring

1. Improve sampling of commercial catch at age data, such as through cooperative NMFS/industry programs to supplement port agent activities for **groundfish** and similarly for **Atlantic herring,** with an emphasis on bycatch.
2. Develop appropriate programs to collect information required for social and economic impact analyses for **groundfish**.
3. Conduct research on the extent and composition of discards and bycatch in the **monkfish**, **groundfish** (including small-mesh) and **skate** fisheries**.**

4. Investigate discard mortality rates by gear for **monkfish** and **groundfish**, and by gear type, area, season, depth and bottom type for **all seven skate species** with an emphasis on overfished species (thorny, winter and little skates).

D. Fisheries Management

Groundfish

1. Synthesize the available information/research results to improve utility to managers (in particular related to the following items):
   - Investigate relationships between stocks, including predator/prey relationships and evaluate whether stock status of some species is slowing the rebuilding of groundfish stocks.
   - Undertake comparative studies on the impacts (positive and negative) of gear on habitat, such as the different impacts between chain nets, roller gear and rockhopper gear, etc. Conduct studies on whether limiting roller or rockhopper gear, or specifying other aspects of trawl gear, results in areas of complex habitat that are not used by trawl fishermen.
   - Conduct research on the extent and composition of discards and bycatch in the groundfish fishery, including research to estimate discard mortality rates by gear for groundfish.
2. Develop a management strategy evaluation program (a specific approach to address scientific and management uncertainty).
3. Develop industry–based information collection systems to improve information used for groundfish management.
4. Quantify the impacts of closed areas, and evaluate the effectiveness of timing closures to coincide with spawning activity (e.g. Gulf of Maine rolling closures).
5. Investigate the effect of various management instruments (specifically user rights and ocean zoning) on management performance (biological, social and habitat) and enforcement.
6. Investigate the feasibility of public leasing of vessels to reduce fishing mortality for fisheries that have long-term potential to sustain the existing fleet.
7. Consider management options for minimizing impacts on vulnerable marine ecosystems.
8. Evaluate effects and effectiveness of permanent closed areas.

II. Fisheries Interactions

Bycatch

1. Research fishing practices or gear modifications that may change the ratio of component catch species or improve size and species selectivity of gear in **groundfish, scallop, monkfish, herring** and **skates**.
2. Synthesize predation information on **herring and other forage fishes** and conduct investigations to address information gaps; investigate the role of **herring and other forage fishes** in the Northwest Atlantic ecosystem and the importance of **herring**

and other species as a forage for other commercial fish stocks; assess the importance of herring as forage relative to other forage species in the region.

Expanded Ecosystem Studies

1. Explore ocean zoning and the use (siting) of marine resource services for long-term multi-jurisdictional planning.
2. Investigate relationships between stocks, including predator/prey relationships and evaluate whether stock status of some species is slowing the rebuilding of **groundfish** stocks.
3. Monitor trends in non-target, ecosystem components (e.g., **wolffish**).

Protected Species

1. Develop gear modifications or fishing techniques that may be used to reduce or eliminate the threat of sea turtle interactions without unacceptable reductions in target retention in **all fisheries**.

III. Habitat

1. Investigate growth rates for **deep sea coral species**.
2. Undertake detailed habitat mapping throughout the Council's area of operations, including along the continental slope for **red crab** and other deepwater species.
3. Further study the contribution of benthic habitat to prey survivability.
4. Quantify adverse impacts of fishing gears and gains to habitat possible through increases in catch per unit of fishing effort.
5. Conduct before-after control impact studies (BACI) in New England waters to test for fishing gear impacts in different substrates, depths and energy environments.
6. Link habitat types and their specific functions with fishery resource productivity.
7. (Evaluate/quantify the effects) of land-based activities on critical ocean habitats, including the potential for designating EFH using expanded metrics such as fish condition indices and habitat quality.

FMP-Specific Habitat Research

Groundfish

Undertake comparative studies on the impacts (positive and negative) of gear on habitat, such as the different impacts between chain nets, roller gear, and rockhopper gear, etc. Studies on whether limiting roller or rockhopper gear, or specifying other aspects of trawl gear, results in areas of complex habitat that are not used by trawl fishermen.

IV. Other Areas of Research

Groundfish

Develop appropriate programs to collect information required for social and economic impact analyses.

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9.0 Applicable Law

9.1 Magnuson-Stevens Fishery Conservation and Management Act

9.1.1 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. This section will be completed when the Proposed Action is submitted in the final amendment and EIS.

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.
The proposed management measures are designed to end overfishing on the groundfish stocks that are currently subject to excessive fishing pressure. In addition, the proposed action continues formal rebuilding programs that have already been designed for previously overfished stocks, and implements additional plans for stocks that are newly determined to be overfished. For overfished fisheries, the Magnuson-Stevens Act defines optimum yield as the amount of fish which provides for rebuilding to a level consistent with producing the maximum sustainable yield from the fishery. The measures are designed to achieve the fishing mortality rates, and yields, necessary to rebuild the overfished stocks as well as to keep fishing mortality below overfishing levels for stocks that are not in a rebuilding program. As described in section 7.2.1, this action is expected to end overfishing on groundfish stocks.

Because of the multispecies nature of this fishery, the measures necessary to rebuild overfished stocks also reduce fishing mortality on healthy stocks. This could prevent harvesting the optimum yield from those stocks while rebuilding programs are being followed for the overfished stocks. The proposed action includes measures that are designed to allow increased harvests of healthy stocks. These measures include the provisions for special access programs to target healthy stocks, as well as restricted gear areas to promote selective fishing practices. While many of the details of these programs have yet to be developed, the proposed action establishes the structure that can be used to access healthy stocks in order that optimum yield can be harvested from them during the period that other stocks are being rebuilt.

Conservation and management measures shall be based on the best scientific information available.
The proposed action is based on the most recent estimates of stock status available for each of twenty stocks included in the management unit. These estimates are in the form of information provided by the Northeast Fisheries Science Center in the GARM III proceedings. In the case of Atlantic wolffish, stock status was estimated by the NEFSC in the proceedings of the Data Poor Working Group (DPWG). For all stocks, stock size and fishing mortality in calendar year 2007 was estimated based on catch, trawl survey, observer, and other data through 2007. Management targets for this action are also based on the results of the GARM III and the DPWG, which contain a comprehensive review of fishing mortality thresholds and biomass targets for the groundfish complex.

With respect to bycatch information, the action uses bycatch information from the most recent assessments. Bycatch data from observer reports, vessel logbooks, or other sources must be rigorously reviewed before conclusions can be drawn on the extent and amount of bycatch. While additional observer data has been collected since the most recent assessments were completed, it has not been analyzed or reviewed through the stock assessment process and thus cannot be used.

The economic analyses in this document are based primarily on landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery.

To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The proposed action manages each individual groundfish stock as a unit throughout its range. In general, management measures specifically designed for one stock are applied to the entire range of the stock. There are minor exceptions, such as when a trip limit is applied to an area slightly different than the stock area to facilitate management and enforcement concerns. In addition, the groundfish complex as a whole is managed in close coordination. Many of the management measures are applied to all groundfish stocks. They are designed and evaluated for their impact on the fishery as a whole.

Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed management measures do not discriminate between residents of different states. They are applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. For example, the measures designed to rebuild GB cod have more impacts on fishermen who target that stock. Some of these impacts may be localized, as often communities near the stock may have developed small boat fisheries that target it. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.

The proposed action does include some measures designed to mitigate these distributive impacts. The sector allocation program and special management programs, including special access areas and the Category B DAS program, are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts.

The proposed action does allocate fishing privileges in several ways. First, for two stocks (GOM cod and GOM haddock), available groundfish catch is allocated to the commercial and recreational components of the fishery. This decision is based on catch history from 2001-2006 for the two components. Second, within the commercial fishery, permits eligible to join sectors are assigned a Potential Sector Contribution (PSC) that determines the pounds of fish that are allocated to the sector when the permit joins the sector. These PSCs are calculated under two different methods. For most stocks, the PSC is based on landings history from 1996-2006 for all permits. For GB cod, permits committed to one of the two existing sectors have their PSC determined using a different time period (1996-2001).

Using different periods for the various allocation decisions raised concerns that the allocation of fishing privileges was not fair and equitable. This complaint is clearly not valid for the commercial and recreational allocation decision: the same years are used for both components. Both components were subject to restrictive management measures during this period, though the impacts of those measures may not have been identical. The catch history is based on data peer reviewed through GARM III. The use of one set of years for allocating between these two groups does not mean the same set of years needs to be used to distribute this allocation within one of the groups – this is a separate decision that need not use the same period or method. For this reason, using a different set of years to calculate the PSC for commercial permits than the years used for the recreational/commercial allocation is not unfair or inequitable.

The use of two different time periods to determine the PSC for GB cod also raised concerns about fairness. The issue here is more complex. If sectors are to operate successfully, they need some certainty that their allocation is not likely to change based on future decisions to form sectors by other fishermen. The two existing sectors should not be forced to revisit their business plans as a result of other fishermen deciding to form sectors several years later, or due to a Council decision to revise sector policies. In essence the Council's decision in this case establishes a policy that sector allocation decisions, once made, will be adhered to. While this cannot be guaranteed because a future Council could make a different decision, the Council's decision on the GB cod PSC at least serves as a clear statement of intent. All of the PSCs calculated for permits not committed to one of the existing sectors are based on the same period.

The Council discussed whether to include provisions that limit the ACE that can be acquired by a sector. Amendment 13 adopted a 20 percent cap on the ACE that a sector can hold, while Amendment 16 removes that cap. Advice from the Groundfish PDT indicated it unlikely that any sector could acquire a sufficient share of a stock to exercise market power of the rest of the fishery. The Council ultimately decided that the flexibility and efficiency provided to sectors would be improved without a cap on ACE. Further, sectors do not technically "own" ACE, nor do individual permits. The ACE is based on the PSCs of member permits. For these reasons, this action does not include specific provisions to limit sector ACE.

Both the allocation between the commercial and recreational components and the PSC allocations can be expected to promote conservation. The commercial/recreational allocation will make it easier in the future to develop measures for the appropriate component in order to control fishing mortality. Without the allocation, measures have treated each component the same, leading to criticism that a component had to pay for excessive fishing pressure by the other component. The PSCs facilitate the application of quotas through sector management, which is expected to lead to a more precise control of harvests.

Additional allocation decisions may occur as a result of the implementation of ACLs. The ACL process requires the Council to allocate the available catch to various fisheries that catch groundfish. These decisions are effectively allocation decisions – they determine what can be caught before AMs are triggered. There is some guidance in this amendment that indicates recent catch history will be a key element in making these decisions, but until the actual ACLs are specified in a separate action it is not possible to evaluate whether the decisions are fair and equitable.

With respect to DAS allocations, this amendment reduces fishing privileges for all commercial limited access DAS permit holders by the same percentage The reduction was calculated (through the use of an analytic model) to be the amount necessary to achieve mortality targets and is thus expected to promote conservation.

Conservation and management measures shall, where practicable consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
The proposed management program relies on two systems to control fishing mortality in the commercial fishery: effort controls that rely primarily on restrictions in time fishing (days-at-sea, or DAS) and sector management. In the first, there are additional measures included that tend to reduce economic efficiency of vessels, but they are generally required for sound management reasons. For example, restrictions on minimum mesh size reduce catches, but benefit the resource by targeting larger fish that have had an opportunity to spawn. Closed areas also reduce efficiency by preventing fishermen from fishing in high catch areas, but provide benefits to both habitat protection and spawning aggregations of fish. In sector management, the sectors have been designed with the maximum allowable flexibility so that they may draft fishing plans that are as efficient and profitable as possible. Certain restrictions for sectors still exist that may slightly reduce efficiency, but all have critical conservation and management goals. These include rolling closures that were designed to protect spawning fish and increased administrative requirements.

Some of the measures in this amendment will improve economic efficiency, thus mitigating the effects of some of the measures necessary for conservation. Clearly, sectors are being implemented as an attempt to increase efficiency over DAS fishing. Some common pool management measures also mitigate economic effects of fishing restrictions in this action. For example, the decrease in the minimum size for haddock will allow more fish to be kept and sold, and the removal of the limit on hooks for the recreational fishery as well as increased trip limits for the handgear fleet will allow for more efficient fishing. Specific proposals that address economic concerns include the DAS leasing and DAS transfer provision of the amendment. These measures allow for fishermen to consolidate DAS on fewer vessels, making each active fishing vessel more economically viable.

Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
The measures allow for the use of different gear, vessel size, and fishing practices. While there are many restrictions included, especially for the common pool, with respect to minimum mesh size, quantity of gear, closed areas, and fishing time, there are no restrictions preventing the use of an authorized gear in an open area, and few restrictions on the deployment of that gear. The proposed action includes programs designed to encourage innovation in fishing practices in order to target healthy stocks. These programs include the sector provisions, special access programs, and the use of Category B DAS.

The sector program in particular takes into account variations in fishing practices. Sector vessels will be exempt from DAS limits, trip limits, some closed areas, and can request exemptions from other elements of the management program. This will increase the ability of fishermen to adjust fishing practices to take into account local conditions.

Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.
The Council considered the costs and benefits of a range of alternatives to achieve the goals and objectives of this FMP. It considered the costs to the industry of taking no action relative to adopting and maintaining existing rebuilding programs. The expected benefits are greater in the long-term if stocks are rebuilt, though it is clear there are significant short-term declines in revenue and possible increases in costs that can be expected. Sector administration provisions include increased reporting and monitoring requirements. These programs are expected to be costly. While the amendment expects sector participants to bear these costs, in FY 2010 many of the costs will be paid by taxpayers through NMFS. It is unclear how long such funding will remain available. In any event, these costs are believed essential to the effective transition fro the effort control system to the quota management system of sectors.

Some management alternatives were not selected in part because of concerns over the costs and burdens of administering the program. One hundred percent monitoring coverage are two examples of management measures whose costs were deemed to outweigh the benefits expected.

The management program does not duplicate other regulatory efforts. Management of multispecies in federal waters is not subject to coordinated regulation by any other management body. Absent Council action, a coordinated rebuilding effort to restore the health of the overfished stocks would not occur.

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse impacts on such communities.
Consistent with the requirements of the Magnuson-Stevens Act to prevent overfishing and rebuild overfished stocks, the proposed action will restrict fishing activity through the imposition of additional restrictions on fishing time, possession limits, allowable catches, and other measures. Analyses of the impacts of these measures show that landings and revenues are likely to decline for many participants in the upcoming years of the rebuilding program. In the short term, these declines will probably have negative impacts on fishing communities throughout the region, but particularly on those ports that rely heavily on groundfish. These declines are unavoidable given the m-S Act requirements to rebuild overfished stocks. The need to control fishing mortality means that catches cannot be as high as would likely occur with less stringent management measures.

There are measures are included that are designed to foster continued participation. As previously discussed, the sector allocation, special access program, and Category B DAS programs are designed to provide avenues for fishermen to continue to participate while stocks rebuild. Sector allocation programs are believed by many to provide an opportunity for local communities to maintain a presence on the fishery. Whether this will occur is subject to some debate, as there are some who believe that sectors will lead to fewer fishing vessels and as a result less vibrant fishing communities. What is clear, however, is that absent sectors, the ability of the industry to remain profitable under the needed DAS restrictions would be in question (see section 7.5.1.3.1) because the DAS allocations are so restrictive that many vessels would not remain in business.

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. Numerous elements of this action are designed to reduce bycatch. For common pool (non-sector) vessels, many trip limits have been increased (trip limits are a key reason for regulatory discards). Restricted gear areas, and the use of selective gears in special management programs, are adopted in order to reduce catches of stocks that continue to have low trip limits. The minimum size of haddock had been reduced to 18 inches, which should reduce discards of fish between that size and the 19 inch minimum size in place prior to this action. While discards may increase because landing windowpane flounder, ocean pout, Atlantic wolffish, and SNE/MA winter flounder is prohibited, these restrictions were adopted to discourage targeting and contribute to rebuilding objectives. Sector administration provisions could also reduce bycatch by eliminating trip limits for sector vessels. There is some evidence that this may have occurred with one of the existing sectors (see section 6.2.4.2.2).

Conservation and management measures shall, to the extent practicable, promote safety of human life at sea.

The primary controls on fishing mortality used in this plan are sector management and limitations on the number of DAS that vessels can fish. The design of sectors leaves it up to individual fishermen and sector managers to determine when and where they will fish throughout the year. There are limitless arrangements that could be devised through sectors in case a vessel or a certain segment of the fishery should become economically unviable. The flexibility in designing these arrangements should help mitigate any safety concerns associated with the relatively low TACs implemented in this action. Similarly, for vessels in the common pool, DAS can be used at any time, subject to limitations imposed by closed areas. Reductions in DAS could affect vessel safety if vessels are unable to remain economically viable. Comments received suggested that vessel maintenance and safety equipment are often two major costs that are trimmed when vessel revenues decline. Vessel revenues are expected to decline for many vessels under the proposed action. If operators are unable to afford maintenance or safety equipment, there could be an increased number of accidents. While reduced fishing time means that vessels are on the water for less time and subject to fewer hazards, it is not clear that this will compensate for the lack of spending on safety and maintenance equipment. Reduced time fishing could also lead to less experience for crew and vessel captains, which could adversely affect safety.

The proposed action, however, does include some measures that may help mitigate these problems. Both DAS leasing and the DAS transfer provision will help some vessels obtain more DAS so that they can remain profitable (and an analogous situation exists with the ACE transfer provision for sectors). While DAS are being reduced, for some areas the action includes some measures to make each DAS more profitable as discussed under National Standard 5 above.

9.1.2 Other M-SFCMA requirements

Section 303 (a) of FCMA contains required provisions for FMPs. This section will be completed when the Proposed Action is submitted in the final amendment and EIS.

(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 that specify and control allowable foreign catch. The measures in this management plan are designed to prevent overfishing and rebuild overfished stocks. There are no international agreements that are germane to multispecies management (the U.S./Canada resource Sharing Understanding, implemented through Amendment 13, is not considered an international agreement).

(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 13 (NEFMC 2003) included a thorough description of the multispecies fishery from 1994 through 2001, including the gears used, number of vessels, landings and revenues, and effort used in the fishery. Amendment 16 updates this information for the period 2001 through 2008. Information on the commercial harvesting sector can be found in section 6.2.3 Information on the recreational harvesting sector can be found in section 6.2.5. Short overviews of the gear used in the fishery, and the impacts of those gear on habitat, are in section 6.1.6.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

The present biological status of the fishery is described in section 6.1.8. Likely future conditions of the resource are described in section 7.2.1. The maximum sustainable yield and optimum yield for the fishery are described in section 4.1.1.

(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. 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. 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. This action modifies several reporting requirements (see sections 4.2.3.5.1 and 4.2.4).

(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;

The Proposed Action continues to allow the carry-over of a small number of DAS 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. This practice does not require consultation with the Coast Guard.

The Proposed Action also adopts a measure that will allow sectors 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. This practice does not require 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 in an earlier action. This action does not change those designations, except that it designates EFH for Atlantic wolffish which was previously not part of the management unit (see section 4.2.2.2).

(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 identified in section 8.0.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

Impacts of Amendment 16 on fishing communities directly affected by this action can be found in section 7.6. Possible impacts on fisheries conduced in adjacent areas are described in section 7.7.

(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 criteria for determining when the fishery is overfished, including an analysis of how the criteria were determined, can be found in Amendment 13 (NEFMC 2004), section 3.1.

(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 amendment. The proposed action includes a number of measures that are designed to minimize bycatch and associated mortality. These include increases in some trip limits that apply to common-pool vessels (section 4.3.2.1), requirements to use selective gears to reduce catches of stocks with low trip limits (sections 4.3.2.1, 4.2.7.3, 4.2.7.4, 4.2.7.6, 4.3.2.1), decreases in the haddock minimum size (section 4.3.2.3), and implementation of additional sectors and the exemption of those sectors from measures that tend to cause regulatory discards (sections 4.3.6 and 4.2.3.9).

(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 updated in this document, sections 6.2.3 and 6.2.5.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

Proposed management measures restrict harvest for all sectors of the fishery. The principal stock harvested by both the commercial and recreational sectors is GOM cod. This action establishes an allocation between these components and the mortality reductions targeted in this action are calculated after considering this distribution and recent catch composition (section 5.3.3.3). Recovery benefits have been allocated equitably, most notably for haddock: minimum size was reduced for both commercial and recreational catches, there remains no bag limit on recreational catch, and special access programs were enhanced for the commercial fleet.

(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.

Annual Catch Limits and Accountability Measures for both the commercial and recreational fisheries are adopted in this action. A detailed description of the ACL process can be found in section 4.2.1. AMs are described in section 4.3.7.

9.1.3 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.

9.1.3.1 Description of Action

The purpose of the Amendment 16 (Northeast Multispecies FMP) Proposed Action is to adopt management measures that are necessary to implement the most recent revisions to the MSFCMA including Annual Catch Limits and Accountability Measures, and to end overfishing on all Northeast groundfish stocks. This amendment also greatly expands and further defines the sector management program implemented in Amendment 13. Modifications are also proposed to many measures adopted by previous management actions so that the benefits to groundfish stocks are realized.

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 4.0. For a summary of the impacts of the Proposed Action on EFH, refer to Table 204 in the Habitat Impacts of the Proposed Action section 7.4.1.4. The Proposed Action includes the following general measures:

- Updates to status determination criteria
- Implementation of Annual Catch Limits and Accountability Measures for all stocks
- Addition of Atlantic wolffish to the management unit
- Fishery program administration changes, including expanded requirements for sectors
- Commercial fishing measures
- Recreational fishing measures
- Measures applicable to special management programs
- Establishment of 17 additional sectors in addition to reauthorization of the two existing sectors
- Measures to modify the DAS leasing and DAS transfer programs
- Requirements for vessel reporting systems
- Changes to the haddock trip limit

9.1.3.2 Potential Adverse Impacts of the Action on EFH

A list of specific measures and a summary of the habitat impacts of the proposed measures is found in section 7.4.1. The following proposed measures have the potential to affect EFH:

- Allocation of groundfish to the commercial and recreational fishing industries
- Removal of the DAS transfer tax
- Removal of cap on DAS leasing and allowing CPH permits to participate in the DAS transfer program
- CAII Yellowtail Flounder SAP modifications
- Simultaneous possession of a limited access multispecies and scallop permit
- Commercial fishery measures: 50% reduction in Category A DAS, 24 hour clock, use of specific trawls in restricted gear areas
- Implementation of additional sectors

Proposed management measures that are expected to have negative impacts are described in Table 304, and thosewiht expected positive impacts in Table 305. Most of these measures are difficult to assess on the basis of their impact on EFH, and therefore their impacts are speculative at best. It is not possible at this time to assess some of the proposed measures at all (such as implementation of additional sectors and the Category B DAS program. The only proposed measures that would, without doubt, have a significant habitat impact are the commercial fishery effort control measures. Implementation of a 24-hour clock, the area-specific use of bottom trawls designed to catch fewer groundfish species that are more closely associated with the bottom, and a 50% reduction in category A days-at-sea, will substantially reduce the amount of disturbance associated with bottom trawling throughout the range of the fishery. Given the overriding significance of these proposed measures, the overall impact of this action on EFH would be positive. Other proposed measures not mentioned above are not expected to affect EFH as they are either administrative in nature or are expected to have neutral or no habitat impacts (see section 7.4.1).

9.1.3.3 Proposed Measures to Avoid, Minimize, or Mitigate Adverse Impacts of This Action

None of the management measures proposed in this action would have any adverse habitat impacts that more than minimal and, overall, the net habitat effect of this action would be positive. Therefore, no mitigation measures are required. The adverse EFH impacts of the multispecies trawl fishery, as it existed in 2003, were evaluated in Amendment 13 to the FMP (NEFMC 2003) and minimized by the implementation of seven habitat closed areas on Georges Bank and in the Gulf of Maine. As a result of this action, the adverse habitat impacts of this fishery will continue to be minimized to the extent practicable, as required by the MSA and the EFH regulations [50 CFR Part 600.815(a)(2)(ii)].

9.1.3.4 Conclusions

Because there are no adverse impacts associated with this action, no EFH consultation is required.

Measures with Potential Negative Effects on EFH

Table 304 – Expected Negative Habitat Impacts of Proposed Action Relative to No Action Alternative

Removal of cap on DAS leasing and allowing CPH permits to participate in the DAS transfer program	0/-	Could lead to consolidation of groundfish permits onto fewer vessels. This is unlikely to reduce groundfish fishing effort, but may reduce effort in other fisheries. There may be some reduced fishing impacts in EFH as a result, but this is difficult to evaluate this with certainty.
CAII Yellowtail Flounder SAP modifications	0/-	Some vessels (i.e., non-sector vessels) may be using Category B DAS that they would otherwise not have used, resulting in some net increase in trawl fishing effort. The magnitude of the impact, however, cannot be determined because it is uncertain how many vessels would or could participate in this program.
Simultaneous possession of a limited access multispecies and scallop permit	0/-	If the former groundfish vessel participates in other fisheries after the multispecies permit is transferred, and this results in effort increases in other fisheries that use mobile bottom tending gears (e.g. summer flounder), then there may be a consequent negative effect on habitats designated EFH that overlap with those fisheries. The potential for, and likely magnitude of, this outcome is unknown at this time.

Measures with Potential Positive Effects on EFH

Table 305 – Expected Positive Habitat Impacts of Proposed Action Relative to No Action Alternative

Proposed Measure	Expected Relative Habitat Impacts	Rationale
Allocation of groundfish to the commercial and recreational fishing industries	0/+	May alter the distribution of fishing effort, potentially shifting effort from commercial fisheries that are more likely to have an adverse effect on habitats (e.g. commercial trawling) to recreational fisheries with less overall impact on habitats (e.g. recreational hook/line). Any such shift will likely be very small, as the proposed allocation estimates are based on historical averages.
Removal of the DAS transfer tax	+/0	Combined changes are expected to have minimal effect. Removing the DAS transfer tax could lead to consolidation of groundfish permits onto fewer vessels. This is unlikely to reduce groundfish fishing effort, but may reduce effort in other fisheries as duplicate permits are cancelled when a transfer takes place. It is difficult to evaluate this with certainty.
Commercial fishery effort control measures: 24 hour clock, restricted gear areas	+	Gears will likely have a reduced impact on the seabed since gears are required to minimize interactions with species that tend to remain close to the seabed floor. Additionally, the dramatic decrease in overall DAS allocations will translate to a reduction in fishing effort and will have benefits to habitats designated as EFH throughout the range of the fishery.
Implementation of additional sectors	+/0	Sector implementation is administrative. Operations plans must describe fishing practices and impacts on EFH. Addition of sectors could lead to reductions in effort as sectors fish more efficiently which would be expected to benefit EFH.

9.1.4 Skate Baseline Review

Federal regulations at 50 CFR 648.320(c) specify provisions for evaluating the impacts of FMPs on the skate fishery as a result of changes in several FMPs, including the Northeast Multispecies FMP. The regulatory requirement is that if an action is initiated that may make less restrictive one or more of the identified baseline measures such that the change will have an effect on the overall mortality for a species of skates subject to a formal rebuilding program, the skate PDT will evaluate the impacts of the proposed changes on rebuilding skate populations and develop management measures to mitigate the impacts if the changes to the baseline measures on rebuilding skates.

Amendment 3 to the Skate FMP was approved by the Council in April, 2009 and is undergoing review. That amendment adopts additional measures to rebuild overfished skate stocks and adopts ACLs and AMs for the skate fishery. It also removes the baseline review requirement. Since that action has not yet been approved by NMFS, the regulatory requirement to conduct a baseline review technically remains in effect. The following discussion draws from the fishery impacts discussion in section 7.7.7 in place of a review by the skate PDT.

With respect to the Northeast Multispecies FMP, there are three baseline measures that must be evaluated:

(i) NE Multispecies year-round closed areas;

(ii) NE Multispecies DAS restrictions;

(iii) Gillnet gear restrictions;

The Proposed Action does not modify the year-round closed areas, but does modify access to the CAII yellowtail flounder SAP and the CAI Hook Gear Haddock SAP. Both of these SAPs are expanded in time and/or area, increasing access to the closed areas. The changes to the CAII yellowtail flounder SAP allow the use of selective gear to target haddock during years the SAP is not open for targeting yellowtail flounder. These gears are designed to reduce catches of bottom-dwelling species such as skates, but in practice they have had mixed results. Since this program will open the area more frequently than before, there is likely to be some increases in skate catch from the area.

This action does not increase DAS allocations and does not remove requirements to use DAS when required by another management plan, so the baseline review is not triggered for this measure. For vessels that choose to join sectors, the action does remove the requirement that multispecies DAS be used to target groundfish, but it does not modify the requirement that the DAS be used if required to target other species. With respect to targeting groundfish, analyses in this document indicate that sectors are likely to lead to the use of fewer fishing DAS than prior than if the action is not adopted. Coupled with the overall reduction in DAS for vessels that do not choose to join sectors, overall groundfish fishing effort is expected to decline as a result of this action.

This action also proposes to adopt a pilot program to facilitate targeting GOM haddock with sink gillnets. This proposal does not allow the use of Category B DAS, so fishing effort will not increase, particularly in light of the overall DAS reductions and 24 –hour clock.

The changes expected to occur are unlikely to create a need for skate catch control measures in addition to those adopted by Amendment 3 to the Skate FMP.

9.2 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) and NOAA's agency policy and procedures for NEPA are found in NOAA Administrative Order 216-6.. All of those requirements are addressed in this document, as referenced below.

The required elements of an Environmental Impact Statement Assessment (EIS) are specified in 40 CFR 1508.9(b) and NAO 216-6 Section 5.04b.1. They are included in this document as follows:

- The need for this action is described in section 3.2;
- The alternatives that were considered are described in sections 4.0);
- The environmental impacts of the Proposed Action are described in section 7.0;
- The agencies and persons consulted on this action are listed in section 9.2.5.

This document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An Executive Summary can be found in section 1.0.
- A table of contents can be found in section 2.0.
- Background and purpose are described in section 3.0.
- A summary of the document can be found in section 1.0.
- A brief description of the affected environment is in section 6.0.
- Cumulative impacts of the alternatives are described in section 7.8.
- A list of preparers is in section 9.2.1.
- The index is in section 10.3.

9.2.1 Scoping Summary

The Council announced its intent to prepare Amendment 16 and an Environmental Impact Statement (SEIS) on November 6, 2006 (71 *Federal Register* 64941). The scoping period extended from that date until December 29, 2006. A summary of the scoping process, comments, and responses to those comments is provided in section 3.3 and is not repeated here.

9.2.2 Areas of Controversy

Amendment 16 was developed under close scrutiny, and there were mixed public reactions to the measures herein, especially on the topics of sector development, calculation of PSCs, and ACL implementation. Approximately 10,000 written comments were received during the comment period that offered various concerns with the amendment measures. Responses to those comments are in Appendix V. In addition to the public comments, one Council member submitted a minority report in response to the Council's decisions on PSC calculation and the commercial/recreational allocation. That report, along with the Executive Committee's response, is included in the amendment package.

The major areas of controversy are related to the expansion of the sector management program and the calculation of potential sector contributions. The expansion of sectors is viewed with trepidation by many industry participants as they fear it may lead to rapid consolidation of the fishery. Many other interests, however, were strong supporters of sectors as a desirable alternative to the effort control system. Fishermen also have divergent opinions on the proposed action for calculating PSCs for permits. While the majority of public comments supported the selected alternative it was not universally accepted, and the use of a separate allocation method for GB cod also is viewed as controversial as evidenced by the minority report submitted by a council member.

The required implementation of ACLs also drew considerable discussion. This tended to focus on the details of the proposed process since the legal requirement to implement ACLs is clearcut and as a result there was little disagreement over the concept of implementing the measure. But there was disagreement over the exact process used for implementing ACLs as proposed in this action.

9.2.3 Document Distribution

The draft document is available on the NEFMC web page, www.nefmc.org. Copies were provided to all Council members. Announcements of the documents availability will be made in the Federal Register and to the interested parties' mailing list. In addition, copies were distributed to the following:

US Environmental Protection Agency
EIS Filing Section
Office of Federal Activities
Ariel Rios Building (South Oval Lobby)
Mail Code 2252-A
1200 Pennsylvania Avenue N.W.
Washington, DC 20460

United States Environmental Protection Agency (USEPA), Region 1
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9.2.4 List of Preparers

The following personnel participated in the preparation of this EIS.

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Patrick Scida, National Marine Fisheries Service
Lori Steele, New England Fishery Management Council
Dr. David Stevenson, National Marine Fisheries Service
Dr. Eric Thunberg, National Marine Fisheries Service
John Walden, National Marine Fisheries Service
Thomas Warren, National Marine Fisheries Service

9.2.5 Agencies Consulted

The following agencies were consulted in the preparation of this document:

Mid-Atlantic Fishery Management Council
New England Fishery Management Council, which includes representatives from the following additional organizations:
- Connecticut Department of Environmental Protection
- Rhode Island Department of Environmental Management
- Massachusetts Division of Marine Fisheries
- New Hampshire Fish and Game
- Maine Department of Marine Resources

National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

9.2.6 Opportunity for Public Comment

The Proposed Action was developed during the period November 2006 through September 2009 and was discussed at the following meetings. Opportunities for public comment were provided at Advisory Panel, Committee, and Council meetings. There are limited opportunities to comment at PDT meetings and conference calls. In addition, a public comment period was held from April 24 through June 8, 2009. Comments were accepted via letter, facsimile, and email during that period (see Appendix VI).

Table 306 – List of public meetings

Date	Meeting Type	Location
2006		
9/26-9/28/2006	Council Meeting	Holiday Inn, Peabody, MA
11/6/2006	Oversight Committee	Holiday Inn, Peabody, MA
11/27/2006	Groundfish A16 Scoping Hearing	Holiday Inn, Ellsworth, ME
11/28/2006	Groundfish A16 Scoping Hearing	Eastland Park Hotel, Portland, ME
11/29/2006	Groundfish A16 Scoping Hearing	Urban Forestry Ctr., Portsmouth, NH
11/30/2006	Groundfish A16 Scoping Hearing	MA DMF, Gloucester, MA
12/5/2006	Groundfish A16 Scoping Hearing	Best Western East End, Riverhead, NY
12/7/2006	Groundfish A16 Scoping Hearing	Holiday Inn Express, Fairhaven, MA
12/12/2006	Groundfish A16 Scoping Hearing	Skyline Hotel, New York, NY
2007		
1/18/2007	Oversight Committee	Holiday Inn, Mansfield, Mansfield, MA
1/11/2004	PDT conference call	
2/6-2/8/07	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/7/2007	PDT Meeting	Falmouth Tech Park, Falmouth, MA
4/10-4/12/07	Council Meeting	Mystic Hilton, Mystic, CT
4/20/2007	Oversight Committee	Holiday Inn, Peabody, MA
5/29/2007	Advisory Panel	Holiday Inn, Mansfield, Mansfield, MA
5/31/2007	Oversight Committee (joint with Monkfish)	Providence Biltmore, Providence, RI
6/19-6/21/07	Council Meeting	Eastland Park Hotel, Portland, ME
6/26/2007	PDT conference call	
7/25/2007	PDT Meeting	Holiday Inn, Mansfield, Mansfield, MA
8/1/2007	Oversight Committee	Holiday Inn, Peabody, MA
8/21/2007	PDT conference call	
9/5/2007	Oversight Committee	Holiday Inn, Peabody, MA
9/18-9/19/07	Council	Radisson Hotel, Plymouth, MA
10/2/2007	PDT	MA Audubon, Newburyport, MA
10/16/2007	Oversight Committee	Holiday Inn, Peabody, MA
10/22/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA
11/6-11/7/07	Council Meeting	Hotel Viking, Newport, MA
12/6/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA

Date	Meeting Type	Location
12/12-12/13/07	Oversight Committee	Holiday Inn, Peabody, MA
2008		
1/9/2008	PDT	Starboard Galley, Newburyport, MA
1/17/07-8	Oversight Committee	Holiday Inn, Peabody, MA
1/24/2008	Council Meeting	Sheraton Ferncroft, Danvers, MA
1/22/2008	PDT conference call	
2/11/2008	Oversight Committee	Courtyard by Marriot, Portsmouth, NH
2/12/08-2/14/08	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/19/2008	PDT Meeting	Holiday Inn, Mansfield, MA
3/27/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
4/8/2008	PDT Meeting	Holiday Inn, Mansfield, MA
4/15-4/17/08	Council Meeting	Providence Biltmore, Providence, RI
5/13/2008	Oversight Committee	Holiday Inn, Peabody, MA
5/15/2008	PDT conference call	
5/16/2008	PDT conference call	
5/20/2008	Recreational Advisory Panel	Holiday Inn, Peabody, MA
5/27/2008	Advisory Panel	Holiday Inn, Peabody, MA
6/2/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
6/3-6/5/08	Council Meeting	Holiday Inn by the Bay, Portland, ME
7/1/2008	PDT conference call	
7/17/2008	Oversight Committee	Holiday Inn, Peabody, MA
8/13/2008	PDT Meeting	MA Audubon, Newburyport, MA
8/21/2008	PDT conference call	
8/26/2008	Oversight Committee	Holiday Inn, Peabody, MA
9/3-9/4/08	Council Meeting	Providence Biltmore, Providence, RI
9/11/2008	PDT conference call	
9/16/2008	Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/17/2008	Recreational Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/29/2008	Oversight Committee	Holiday Inn, Peabody, MA
10/15/2008	PDT conference call	
10/22/2008	PDT conference call	
10/30/2008	Oversight Committee	Sheraton Harborside, Portsmouth, NH
11/18-1/20/08	Council Meeting	Sheraton Ferncroft, Danvers, MA

Date	Meeting Type	Location
2009		
1/5/2009	PDT conference call	
1/29/2009	Oversight Committee	Holiday Inn, Mansfield, MA
2/9-2/11/09	Council Meeting	Sheraton Harborside, Portsmouth, NH
4/7-4/9/09	Council Meeting	Mystic Hilton, Mystic, CT
5/26/2009	Advisory Panel	Sheraton Colonial, Wakefield, MA
5/27/2009	Recreational Advisory Panel	Sheraton Colonial, Wakefield, MA
6/4/2009	PDT	Holiday Inn, Mansfield, MA
6/17/2009	Oversight Committee	Holiday Inn, Mansfield, MA
6/22-6/25/09	Council Meeting	Holiday Inn by the Bay, Portland, ME

9.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed action and the prosecution of the multispecies fishery are not likely to jeopardize any ESA-listed species or alter or modify any critical habitat. NMFS has already concurred on that action. The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when seen in light of the large reductions in fishing effort being implemented.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see section 7.2.2.2.3.4 of this document.

9.4 Marine Mammal Protection Act

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see section 7.2.2.2.3.4 of this document. The NEFMC has reviewed the impacts of Amendment 16 on marine mammal species and has concluded that the management actions contained in Amendment 16 are consistent with the provisions of the MMPA. The take of harbor porpoise under the existing FMP have been reduced to the point that would allow the stocks to achieve optimum levels. The level of take for the remaining odontocetes and seals that are affected by this fishery are low enough, in relation to the size of their populations, that it has been determined that the stocks would be allowed to achieve optimum levels. Therefore, since the mortality and serious injury that is likely to occur under the existing FMP has been assessed relative to the PBR allowed for each species under the MMPA and found to be below those levels, the NEFMC concludes that Amendment 16 will further reduce effort, providing additional protection to these species.

9.5 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 the CZMA regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in § 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity. The Council has determined that the proposed action is consistent with the CZM programs of the states and will send a notification of this determination, along with a copy of the amendment document, to the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina for their concurrence. Copies of the correspondence are on file at the Council office, and a list of the specific state contacts and a copy of the letters are available upon request.

9.6 Administrative Procedure Act

This action was developed in compliance with the requirements of the Administrative Procedures Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

9.7 Data Quality Act

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

9.7.1 Utility of Information Product

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the Proposed Action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the Proposed Action is included so that intended users may have a full understanding of the Proposed Action and its implications.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process. 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.

9.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA 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.

9.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the 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 Groundfish Assessment Review Meeting III (GARM III; NEFSC 2008) and 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 considered for this action were selected based upon the best scientific information available. The analyses conducted used information from the most recent complete calendar years, through 2007, and in some cases includes information that was collected during t calendar year 2008. Complete data were not available for calendar year 2008. 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 sections 4.0 of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in section 7.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service

Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

9.8 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 Amendment 16. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

9.9 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 document, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

9.10 Paperwork Reduction Act

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.

Amendment 16 may contain collection of information requirements subject to the PRA, including:

- Reporting requirements for SAPs and the Category B (regular) DAS Program

- Changes to possession limits, which will change the requirements to notify NMFS of plans to fish in certain areas
- Differential DAS counting areas, which will require advance notice to NMFS of areas that will be fished
- Sector monitoring provisions, and sector formation provisions
- Provisions for reporting area fished, in order to facilitate assignment of catch to stock areas

The PRA package prepared in support of this action and the information collection identified above, including the required forms and supporting statements, will be submitted when the Proposed Action is determined and the final amendment is submitted.

9.11 Regulatory Flexibility Act (RFA)

The purpose of the RFA is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the RFA requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains an IRFA, found below, which includes an assessment of the effects that the Proposed Action and other alternatives are expected to have on small entities.

9.11.1 Economic Impacts on Regulated Small Entities

The Proposed Action would affect regulated entities engaged in commercial fishing for groundfish and entities that provide recreational fishing services to anglers. These entities include any vessel that has been issued either an open access or a limited access Federal permit under the Northeast Multispecies Fishery Management Plan (FMP). The size standard for commercial fishing (NAICS code 114111) is $4 million in sales while the size standard for party/charter operators (part of NAICS code 487210) is $7 million. Available data indicate that based on 2005-2007 average conditions median gross sales by commercial fishing vessels were just over $200,000 and no single fishing entity earned more than $2 million. Note that available data are not adequate to identify affiliated vessels so each operating unit is considered a small entity for purposes of the RFA. For regulated party/charter operators the median value of gross receipts from passengers was just over $9,000 and did not exceed $500 thousand dollars in any year during 2001 to 2007. Therefore, all regulated commercial fishing and all regulated party/charter operators are determined to be small entities under the RFA. The remaining discussion describes the number of regulated entities, the number of participating regulated entities, and the potential economic impacts on participating regulated entities for party/charter operators and for commercial fishing vessels.

9.11.2 Commercial Fishing Vessels

The Proposed Action would substantially change the provisions developed under Amendment 13 affecting sector formation and would substantially change effort controls for commercial fishing vessel owners that do not choose to join a sector. Among vessel owners that possess a permit to land groundfish, only limited access permit holders would be eligible to join a sector. Vessel owners that possess only an open access permit would continue to be regulated with effort controls. Since the economic impacts on small fishing businesses depend on the type of permit(s) held economic impacts for each permit type is discussion below.

9.11.2.1 Open Access Permits (HB, I, J, K)

Of the available open access permits that may be held by vessel owners the Proposed Action would not make any changes to regulations affecting permit categories J or K. Permit category I is a recreational party/charter permit. The potential impacts of the Proposed Action changes to regulations affecting party/charter operators are discussed later. Permit category HB is an open access permit requiring the use of rod and reel hand gear and allows the vessel owner to retain up to a specified possession limit for groundfish with special provisions for cod; the primary target species for these vessels. Provisions for the cod possession limit tie the possession limit for HB permits to the daily GOM cod possession limit for limited access permits, such that, the HB possession limit would be proportionally adjusted to the change in the limited access permit possession limit. Currently any vessel with an HB permit is limited to a cod possession limit of 75 pounds. Since the limited access possession limit would be increased from 800 to 2,000 pounds per day the HB permit possession limit would be increased from 75 to 200 pounds. Thus the Proposed Action would provide increased economic opportunities for vessel owners that now hold HB permits and may provide an incentive for new entrants.

During FY 2007 a total of 1,292 category HB permits were issued. Approximately half of these permits reported any fishing activity on a VTR during FY 2007. Of these active vessels only 75 reported landing cod. Among those vessels landing cod a total of 342 reported trips were taken on which 302 trips landed less than 75 pounds. Thus, based on recent activity reports the change in the cod trip limit may have a modest positive impact on current participating small fishing entities. Given the substantial increase in the cod trip limit under the Proposed Action past activity may not be a reliable predictor of future activity. Nevertheless, the raised possession limit for cod may be expected to offer improved economic opportunities to both current participants in the fishery as well as being an attractive alternative for fishing businesses that may participate in the future.

9.11.2.2 Limited Access Permits (HA, A, C, D, E, F)

The Proposed Action would limit eligibility to join a sector to vessel owners that hold a limited access permit. This means that limited access permit holders may elect to join a sector or opt to remain under an effort control program, thereby, offering vessel owners greater flexibility in making business decisions. However, this flexibility may be illusory in some instances. Since sectors are self-selecting some vessel owners may not be accepted into the sector of their choice or any sector at all. Vessel owners with little or no PSC to contribute to a sector's overall ACE may find it difficult to find a sector that will accept them. Since each sector member is required to sign a joint and severable contract, some vessel owners may not be accepted for past behaviors that may be deemed unacceptable to the sector membership. As of September 1, 2009 a total of 723 of 1,480 eligible permits elected to join a sector. The extent to which any of the circumstances that may have hindered individual flexibility previously described had an impact on any of the 757 permits that did not join a sector is unknown.

Joining a sector is voluntary. This means that the decision whether or not to join a sector may be expected to be based on whichever (i.e. joining a sector or opting for the effort control program) offers the greater economic advantage. Since sectors will be granted a set of universal exemptions and may request additional exemptions from regulatory measures that will apply to vessels that opt for the so-called "common pool" sector vessels will be afforded greater flexibility than otherwise. However, sectors will have to bear the administrative costs associated with preparing an environmental assessment as well as the monitoring costs associated with a sector manager, dockside monitoring, and at-sea monitoring. The magnitude of the administrative costs for sector formation and operation was estimated to range from $60,000 to $150,000 per sector and the cost potential cost for dockside and at-sea monitoring ranged from $13,500 to $17,800 per vessel. Although these estimates are uncertain they serve to illustrate the fact that the potential administrative costs associated with joining a sector may be expected to influence a vessel owner's decision. At least for FY 2010 the majority of these administrative costs will be subsidized by the NMFS. Whether these subsidies- which include providing financial support for preparation of sector EAs, dockside monitoring, and at-sea monitoring - will continue beyond FY 2010 is not known. Nevertheless, these subsidies may make joining a sector a more attractive economic alternative during FY 2010 than otherwise.

The economic impacts of the Proposed Action on vessel owners that choose to join a sector cannot be reliably quantified since any given sector may be expected to operate in a different manner. A quantitative estimate of the economic impact of the Proposed Action effort control measures on fishing businesses were reported in Section 7.5.1.3.1.1. Since joining a sector is voluntary the economic impact on small fishing businesses that choose to join a sector may be expected to be less than that estimated for the common pool.

Since the number of vessels that would join a sector was not known, the economic impacts of the Proposed Action effort control measures reported in Section 7.5.1.3.1.1 were based on the assumption that no new sectors form. Under this assumption vessels operating under remain in the common pool may be expected to experience gross revenue losses of 9.8% relative to a 2005-2007 baseline. Note that this impact is only slightly larger than the estimated reduction in revenue associated with the interim action measures (9.5%) using the same 2005-2007 baseline. This means that the aggregate impact of the Proposed Action may have no additional economic burden beyond that already incurred through interim action. However, since there are substantial differences between the interim and the Proposed Action measures, the impacts may be expected to differ among participating vessels even though the aggregate estimated impacts were similar.

Estimated impacts for the Proposed Action suggest that the impact on fishing revenue may be expected to be larger on smaller vessels in terms of physical size compared to larger vessels. Similarly, impacts on gillnet vessels tended to be higher than impacts on trawl vessels. These tendencies may be a reflection of the differential impacts associated with trip or day boat status. That is, both trip and day boats are affected by the same DAS reduction. However, the 24-hour clock is likely to have a larger impact on day boats since most trips are less than 24-hours in duration. In some respects the 24-hour clock has economic effects that are similar to differential DAS counting since the number of trips that may be taken given the same allocation of DAS is reduced. The extent to which the increased trip limit for GOM cod mitigates this effect on day boats is uncertain.

The Proposed Action would implement a suite of gear restricted areas that would limit the use of fishing gear to gear that meet specified performance characteristics that reduce bycatch of flatfish; winter flounder and yellowtail flounder in particular. The designated restricted gear areas correspond to the SNE/MA stock areas for these two species. Vessels that opt for the common pool would be required to adopt specialized gear at an estimated cost of $13,000 for a complete setup or about $750 to modify existing gear whereas sector vessels would not be subject to the restricted gear regulations.

The Proposed Action effort control measures would apply to limited access vessels that are managed by DAS. This includes anyone with a limited access permit categories A, D, E and F. Neither permit category C (small vessel exemption) nor category HA (hand gear) vessels are regulated by DAS. These vessels would be unaffected by the principal effort controls under Proposed Action and would benefit from the change in trip limits for GOM cod. The GOM cod possession limit would be increased from 200 lbs to 750 pounds while category C permit holders would be subject to the same trips limits as that of DAS vessels. Additionally, since vessels with these permits are not regulated by DAS they would not be subject to the proposed commercial common pool accountability measures.

Given the economic considerations presented by the effort control measures vessels with limited access category C or HA permits may be expected to have comparatively little PSC to bring to a sector and may be expected to have substantially improved economic opportunities under the common pool measures compared to the interim action. In fact, none of the limited access category C permit holders had elected to join a sector as of September 1, 2009 and only 6 of the 130 category HA permit holders had elected to join a sector. Of the remaining vessels that had not elected to join a sector 337 DAS permit holders had no Category A DAS of which 164 had not qualified for a PSC for any stock. These vessels may still be able to participate in the groundfish fishery but would only be able to do so through the DAS leasing program. Among the vessels that did not join a sector and either had some PSC and/or had nonzero Category A DAS the reasons for electing to remain in the common pool are uncertain. Many of these vessels may have had low PSCs, may have not been accepted by any sector, considered the cost of joining a sector to be too high, or made a business decision in which the economic opportunities of fishing under effort controls to be superior to joining a sector.

The flexibility afforded sectors includes exemptions from certain specified regulations as well as the ability to request additional exemptions. Sector members would no longer be limited by DAS allocations and would instead be limited by their available ACE. In this manner the economic incentive changes from maximizing the value of throughput of all species on a DAS to maximizing the value of the ACE. This change places a premium on timing of landings to market conditions as well as changes in the selectivity and composition of species landed on fishing trips.

The substantial changes affecting vessels that choose to join a sector make it difficult to assess the economic impact on these fishing businesses. The only sector that has been operating since sector allocation was first authorized in 2004 is the Georges Bank Cod Hook Sector. The average revenue per sector member during fishing years 2004 to 2008 increased from $61 thousand in 2004 to $112 thousand in 2008. Comparative analysis of vessels using similar gear that did not join sectors suggests that vessels that joined the sector were more technically efficient. Whether this difference in efficiency was because of the flexibility associated with regulatory exemptions or a self-selection effect is not known. Nevertheless, available information is suggestive that economic performance among sector vessels may be expected to improve relative to continuing to remain under effort controls.

Table 307 - Summary of GB Cod Hook Sector Performance

Fishing Year	Revenue per Vessel	Total Revenue	Members
2004	$61	$3,529	58
2005	$86	$4,217	49
2006	$78	$2,882	37
2007	$102	$2,545	25
2008	$112	$2,130	19

The Proposed Action would allow the trading of stock-specific ACE between sectors that would provide additional flexibility to participating vessels in the event that 1) the initial portfolio of

ACE by stock does not match the desired portfolio, or 2) a sector exceeds its ACE and needs additional quota to cover the overage to be able to continue fishing. The qualification criterion used to compute the PSC for each stock means that allocations of ACE may or may not be consistent with contemporary fishing patterns. The portfolio of stock-specific PSC based on the qualifying years from 1996-2006 that sectors will end up with may not quite match up with current activity or fishing opportunities. While inter-sector trading of ACE will allow sectors to balance initial and desired quota allocations this is not likely to be a costless transaction. The potential shortfalls or surplus in PSC for any given sector was evaluated for each sector by subtracting the average shares by stock for fishing years 2005-2007 from the sector PSC (Table 2). In this manner a positive value is indicative of a PSC that exceeds recent activity. In this case ACE for this specifies may represent a surplus that could be traded to another sector. By contrast, a negative value means that the PSC is less than recent activity and the sector may be expected to want to acquire additional ACE. Note that even sectors with a comparatively large negative value for GB haddock may not need addition GB haddock ACE since the proposed ACL exceeds recent landings by a substantial amount.

For several sectors (Port Clyde Community Groundfish and the Northeast Coastal Community are some examples) there was reasonable correspondence between recent activity shares and the sectors' PSCs as the difference between the two did not exceed ±2%. In other cases, sectors either have substantial potential surplus or deficits depending on stock. For example, recent GOM cod landings exceed the NSC 3 PSC by 10.3%. On the other hand, recent GOM cod landings by vessels that have enlisted in the Sustainable Fisheries Sector were 6.7% below their sector's PSC. Whether the Sustainable Fisheries Sector may choose to increase targeting of GOM cod or may be trading partners with NSC 3 is not known.

Although the common pool is not formally considered a sector, its PSC would be the basis for assigning an ACL to the common pool. Note that the difference between the common pool recent activity share and the PSC is positive for all stocks except for GOM haddock. This means that the ability for sector vessels to trade ACE amongst themselves to match 2005-2007 activity shares will not be possible since the aggregate "ACE" assigned to the common pool will be larger than its recent history and cannot be traded. For the majority of stocks this difference is small (less than ±2% but for SNE/MA yellowtail flounder this difference is 15.3%. Thus sectors may find it difficult to obtain sufficient SNE/MA yellowtail ACE to be able to take full advantage of all available fishing opportunities within this stock area.

Table 308 - Summary of Sector PSC minus 2005-2007 Average Share by Sector

Sector Name	Number of Permits	GOM Cod	GB Cod	GOM Haddock	GB Haddock	CCGOM Yellowtail	GB Yellowtail	SNEMA Yellowtail	Pollock	Redfish	White Hake	Plaice	GOM Winter	GB Winter	Witch
Common	757	2.4%	2.3%	-0.7%	1.1%	4.1%	0.8%	15.3%	1.8%	1.7%	2.7%	4.1%	7.4%	1.1%	1.2%
NSC2	75	-1.8%	-1.7%	-10.2%	1.3%	-8.1%	0.4%	1.6%	-5.3%	-6.7%	1.4%	0.5%	-3.4%	-0.9%	-1.4%
NSC3	74	-10.3%	0.9%	-3.5%	0.0%	-0.1%	0.0%	0.4%	-1.7%	0.9%	1.8%	3.6%	1.3%	0.0%	1.9%
NSC4	47	0.7%	1.9%	-0.5%	2.2%	0.0%	1.2%	2.0%	0.7%	2.8%	2.9%	3.3%	0.4%	-0.4%	2.0%
NSC5	39	0.3%	-0.9%	0.7%	1.3%	1.3%	0.7%	-9.3%	0.4%	0.5%	0.2%	-0.7%	0.7%	-0.6%	0.1%
NSC6	21	0.5%	-1.1%	-0.9%	0.1%	-1.0%	0.4%	3.5%	-0.3%	-2.4%	-0.9%	-3.3%	1.0%	1.5%	-2.5%
NSC7	25	0.4%	-2.1%	0.5%	1.0%	3.3%	0.5%	-3.1%	0.1%	0.3%	-0.1%	0.3%	2.9%	-5.0%	0.3%
NSC8	22	0.3%	-3.2%	0.0%	-0.1%	3.2%	0.6%	-6.2%	-0.1%	-0.1%	-0.1%	-0.6%	1.1%	2.3%	-0.8%
NSC9	44	1.3%	-5.3%	2.1%	0.4%	2.1%	-0.6%	-1.3%	1.8%	3.7%	1.5%	1.3%	1.4%	4.2%	1.0%
NSC10	33	-2.1%	-0.1%	-2.2%	0.4%	-9.2%	1.0%	0.4%	0.9%	0.3%	0.4%	0.6%	-13.1%	0.5%	0.4%
NSC11	47	0.1%	0.2%	-0.3%	0.0%	-0.3%	0.0%	0.0%	-5.5%	-0.2%	0.7%	1.2%	0.2%	0.0%	0.4%
NSC12	10	0.5%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.2%	-0.1%	0.0%	0.1%
NSC13	31	0.7%	-4.5%	0.4%	1.1%	0.5%	-2.0%	-4.9%	0.7%	1.8%	0.5%	0.1%	0.5%	-2.1%	-0.6%
GB Cod Fixed Gear	88	1.2%	15.3%	-0.5%	-4.3%	0.8%	0.0%	0.1%	5.1%	-0.7%	0.7%	0.4%	0.3%	0.0%	0.5%
Tri-State	16	0.6%	-0.4%	2.6%	0.7%	0.1%	-4.5%	-2.2%	-0.6%	-0.3%	-1.5%	-3.2%	-2.8%	-0.4%	-0.5%
Sustainable Harvest	93	6.7%	-1.6%	13.3%	-5.2%	3.6%	1.5%	5.0%	1.8%	-1.9%	-8.6%	-9.8%	2.2%	-0.1%	-2.2%
NE Coast Community	19	0.3%	0.1%	0.2%	0.0%	0.0%	0.0%	-2.0%	0.3%	0.2%	0.3%	0.2%	0.0%	-0.2%	0.1%
Port Clyde	39	-1.7%	0.2%	-0.9%	0.0%	-0.1%	0.0%	0.7%	-0.3%	0.0%	-1.9%	1.7%	0.0%	0.0%	-0.1%

9.11.2.3 Commercial Fishing Impacts of Non-Selected Effort Control Alternatives

In addition to the Proposed Action two other effort control programs were considered. These alternatives included one that relied on increased use of differential DAS (Alternative 2a) and another (Alternative 4) that would have implemented a 40% reduction in DAS over FW42 levels as well as gear restricted areas. A detailed comparison of estimated economic impacts between the Proposed Action and the non-selected alternatives may be found in Section 7.5.1.3.1.3. The findings are summarized herein.

The aggregate impact of the Proposed Action was lower (a 9.8% reduction in total fishing revenue) as compared to Alternative 2A (14.7% reduction) and Alternative 4 (18.5% reduction). Among the considered alternatives Alternative 4 tended to have larger adverse impacts on fishing businesses across home port states and dependence on groundfish for total fishing income. Alternative 2A tended to have larger adverse impacts on vessels from Maine, and Massachusetts while the Proposed Action impacts were larger for vessels from New Hampshire as well as from Southern New England and Mid-Atlantic states. However, due to differences in fishing strategies at the individual business level one alternative may provide regulatory relief for some vessels but may prove more burdensome for others. There was no one alternative that would have provided regulatory relief for all fishing businesses.

9.11.3 Party/Charter Impacts

The Proposed Action continues most management measures implemented under the Interim Action. For this reason, the Proposed Action would not have substantial economic impacts over and above what had previously analyzed. Nevertheless the expected economic impacts on small entities engaged in party/charter businesses are discussed below. The manner in which the realized economic impacts during FY 2009 and continuing into FY 2010 and beyond may differ from that discussed below cannot be assessed at this time because the FY 2009 fishing year will not end until April, 2010.

Party/charter permits are issued as an open access category I permit under the Northeast Multispecies FMP. During Fishing Year 2007 (FY 2007) 762 party/charter permits were issued. Additionally, limited access permit holders (1,525 during FY 2007) may take passengers for hire, but do not possess a party/charter permit since the Multispecies FMP prohibits issuing both an open access and a limited access permit to the same vessel. During FY 2007 there were 128 of the 762 open access party/charter permit holders that reported taking at least one for-hire trip, of which, 74 reported keeping groundfish on one or more trips. An additional 29 limit access permit holders reported taking passengers for hire, of which, 18 reported keeping groundfish on one or more for-hire trips. Thus a total of 92 party charter operators participated in the party/charter recreational groundfish fishery during FY 2007.

Available data indicate that about two-thirds of participating party/charter operators would not be adversely affected by the Proposed Action. These vessels either did not take any trips in the Gulf of Maine during April 1 to April 15 that retained cod, did not report keeping any winter flounder in the SNE/MA stock area, or did not retain more than 10 Georges Bank cod on any for-hire trip. The remaining 29 participating vessels were estimated to lose an average of $10,393 in sales due to potential lost passengers. All but four of these affected vessels were adversely affected by only one of the Proposed Action recreational measures.

The realized impact on party/charter vessels is uncertain since impacts depend on angler response to any one of the proposed measures. These responses may be expected to have different impacts depending on where party/charter operators are located. The majority of party/charter operators from Maine, New Hampshire, and Massachusetts take trips exclusively in the Gulf of Maine. Passenger demand in these three states would only be adversely affected by the two-week extension of the closed season on Gulf of Maine cod. While party/charter operators may be expected to try to shift trips that would otherwise have taken place during early April to later in the month or into May the ability to do so may be limited. At least some of the impacts of the extended closure may be offset by the reduction in the haddock size limit as this action would increase the number of opportunities for party/charter passengers to keep more haddock. Since the majority of occasions where haddock were kept occurred in the Gulf of Maine, to the extent that party/charter demand is influenced by the chance to keep more fish, passenger demand may be expected to increase for Gulf of Maine party/charter operators.

Unlike the party/charter passengers in the Gulf of Maine, anglers taking party/charter trips may be affected by the removal of the bag limit on Georges Bank cod and/or the prohibition on keeping winter flounder. Compared to angler response to the Gulf of Maine cod closure, angler response to these measures may be larger because they would affect all trips not just trips during a particular season. The prohibition on retaining winter flounder may be particularly sensitive since the winter flounder season is short and occurs during early spring when the availability of substitute species is limited. Angler response to removing the bag limit on Georges Bank cod is uncertain. Realized trips indicate that the majority of angler trips harvest fewer than 10 cod per angler. However, angler trip demand is believed to be driven by expectations and the extent to which those expectations may be constrained by regulation may be anticipated to influence demand. Note that these two measures (prohibition on SNE/MA winter flounder and removing the GB cod bag limit) are likely to have a larger impact on party/charter operators from Rhode Island to New Jersey. Since the number of trips that also landed haddock is likely to be comparatively small, reduced passenger demand for trips in the SNE/MA area as a result of the prohibition on landings SNE/MA winter flounder may not be expected to be offset by the reduction in the haddock size limit. It is more likely that removing the GB cod bag limit will have more of an influence and would be expected to increase passenger demand for trips. When compared to the No Action alternative, however, this is not a change in management measures.

In additional to the measures described above that were implemented on May 1, 2009 the Proposed Action would remove the limit on the number of hooks and would remove the prohibition on filleting fish at sea. These two measures would provide some economic relief to party/charter operators although the relative magnitude of this relief is uncertain. Removal of the limit on hooks would improve the likelihood that a recreationally caught fish would be able to be retained. At least part of the underlying motivation fishing is to keep fish particularly in so-called meat fisheries removal of the hook limit would enhance the value of a recreational fishing trip even if the number of fishing trips does not change. At-sea filleting of fish may be expected to increase the quality of services that party/charter operators may offer to their customer base. Whether this service increases the demand for party/charter trips is uncertain, but would increase the overall value of the recreational fishing experience.

9.12 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." 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, of the principles set forth in the Executive Order.

The Northeast groundfish fishery has been regulated by days at sea (DAS) since 1994. Since then the fishery has been regulated through a series of DAS reductions in concert with numerous other measures including year-round and seasonal area closures, gear restrictions, and trip limits. In the absence of output controls these measures were unable to prevent persistent overfishing from occurring, in part, because DAS controls lack a direct link between the individual benefits received from fishing and the external costs of overfishing. The Proposed Action would bring the Northeast Multispecies FMP into compliance with the 2006 MSA reauthorization that required setting of ABCs, ACLs and AMs. The Proposed Action would expand the use of sector allocation originally established in 2004. Expansion of sector allocation will also key the transition from effort controls to output controls where sector allocation is one means of allocating available ACL to groups of affiliated vessel owners. These allocations to sectors will more effectively link actions with the costs and benefits of those actions limiting the external diseconomies to individual sector members. That is, actions by one sector will not impose external diseconomies on other sectors, but within-sector external diseconomies may remain.

The economic impacts of the Proposed Action are uncertain. Analysis of the impacts of the effort control measures (Section 7.5.1.3.1) indicate that fishing revenue could decline by a little less than 10%. During fishing year 2007 just over 600 vessels reported groundfish revenues. The total value of all species reported by these 600 vessels was $193.3 million in constant 1999 dollars. Applying the 10% reduction in revenue to FY 2007 totals landed by the 600 groundfish vessels, results in an estimated reduction of $19.3 million measured in constant 1999 dollars. Note, however, that the estimated reduction in fishing revenue was based on an assumption that no new sectors would form, and that the estimated impact on fishing revenue was based on the same baseline (fishing revenue during 2005-2007) as that of the Interim Action. The former was necessary because many of the provisions for joining a sector including qualification criteria for PSC were not known at the time the analysis had to be completed, while the latter means that the economic impacts of the Proposed Action effort control measures may result in comparatively little added economic burden during 2010 beyond what has already occurred as a result of taking action during 2009. That is, the estimated reduction in fishing revenue for 2009 was 9.5% while the estimated reduction under the Proposed Action was 9.8%. At this time the realized impact of taking Interim Action is not known since the 2009 fishing year began in May, 2009.

Joining a sector is voluntary. This means that the decision whether or not to join a sector may be expected to be based on whichever (i.e. joining a sector or opting for the effort control program) offers the greater economic advantage. Since sectors will be granted a set of universal exemptions and may request additional exemptions from regulatory measures that will apply to vessels that opt for the so-called "common pool" sector vessels will be afforded greater flexibility than otherwise. Sector members would no longer be limited by DAS allocations and would instead be limited by their available ACE. In this manner the economic incentive changes from maximizing the value of throughput of all species on a DAS to maximizing the value of the ACE. This change places a premium on timing of landings to market conditions as well as changes in the selectivity and composition of species landed on fishing trips. The manner in which this may be accomplished will depend on the operational rules established by each sector and the relative skill with which sector members are able to manage a portfolio with different levels of quota available for different stocks. The only sector that has been operating since sector allocation was first authorized in 2004 is the Georges Bank Cod Hook Sector. The average revenue per sector member during fishing years 2004 to 2008 increased from $61 thousand in 2004 to $112 thousand in 2008. Comparative analysis of vessels using similar gear that did not join sectors suggests that vessels that joined the sector were more technically efficient. Whether this difference in efficiency was because of the flexibility associated with regulatory exemptions or a self-selection effect is not known. Nevertheless, available information is suggestive that economic performance among sector vessels may be expected to improve relative to continuing to remain under effort controls.

Table 309 - Summary of GB Cod Hook Sector Performance

Fishing Year	Revenue per Vessel ($1,000)	Total Revenue ($1,000)	Members
2004	$61	$3,529	58
2005	$86	$4,217	49
2006	$78	$2,882	37
2007	$102	$2,545	25
2008	$112	$2,130	19

Summary

The Proposed Action would not be significant for purposes of E.O. 12866. Quantified impacts would be approximately $19 million, but may not differ substantially from that estimated for the Interim Action. Available data suggest that vessels that join sectors will be more efficient than they would otherwise be if they were unable to join a sector.

9.13 E.O. 12898 - Environmental Justice

Executive Order (E.O.) 12898 requires that, "to the greatest extent practicable and permitted by law… each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions…" Due to data constraints and other concerns, the means for conducting this analysis in detail are not yet available at this time. Nonetheless, many of the participants in the groundfish industry may come from lower income and/or ethnic minority populations. These populations may be more vulnerable to more restrictive management measures. For example, in many ports crew may be comprised of ethnic minorities, and many regions in which fishing is an important livelihood can also be economically impoverished. Although some economic impacts are likely to occur, it is not expected nor can it be shown at this time that there would be a disproportionately high and adverse effect on the health or environment of minority and low-income populations.

10.0 References

10.1 Literature Cited

Abernathy, A., ed. 1989. Description of the Mid-Atlantic environment. U.S. Dep. Interior, Minerals Manage. Ser., Herndon, VA. 167 p. + appendices.

Aguilar, A. 2002. Fin whale Balaenoptera physalus. In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. pp. 435–438.

Albikovskaya, L. K. 1982. Distribution and abundance of Atlantic wolffish, spotted wolffish and northern wolffish in the Newfoundland area. Northw. Atl. Fish. Org. Sci. Coun. Stud. No.3:29-32.

Albikovskaya, L. K. 1983. Feeding characteristics of wolffishes in the Labrador-Newfoundland region. Northw. Atl. Fish. Org. Sci. Coun. Stud. No.6:35-38.

Almeida, F., L. Arlen, P. Auster, J. Cross, J. Lindholm, J. Link, D. Packer, A, Paulson, R. Reid, and P. Valentine. 2000. The effects of marine protected areas on fish and benthic fauna: the Georges Bank closed area II example. Poster presented at Am. Fish. Soc. 130th Ann. Meet. St. Louis, MO, August 20-24, 2000.

Backus, R.H. 1987. Georges Bank. Massachusetts Inst. Tech. Press, Cambridge, MA. 593 p.

Beardsley, R.C., B. Butman, W.R. Geyer, and P. Smith. 1996. Physical oceanography of the Gulf of Maine: an update. *In* G.T Wallace and E.F. Braasch, eds. Proceedings of the Gulf of Maine ecosystem dynamics scientific symposium and workshop. p. 39-52. Reg. Assn. for Res. on the Gulf of Maine (RARGOM), Rep. 97-1.

Best, P.B., J. L. Bannister, R.L. Brownell, Jr., and G.P. Donovan (eds.). 2001. Right whales: worldwide status. J. Cetacean Res. Manage. (Special Issue) 2. 309pp.

Bigelow, H. B. and W.C. Schroeder. 1953. Fishes of the Gulf of Maine. Fish Bull., U.S. 53:1-577.

Boesch, D.F. 1979. Benthic ecological studies: macrobenthos. Chapter 6 in Middle Atlantic outer continental shelf environmental studies. Conducted by Virginia Inst. Mar. Stud. under contract AA550-CT6062 with U.S. Dep. Interior, Bur. Land Manage. 301 p.

Bowman R. E., C. E. Stillwell, W. L. Michaels, and M. D. Grosslein. 2000. Food of Northwest Atlantic fishes and two common species of squid. NOAA Tech. Memo. NMFS-F/NE-155, 138pp.

Braun-McNeill, J., and S.P. Epperly. 2004. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). Mar. Fish. Rev. 64(4):50-56.

Brodziak, Jon K. T. 2005. Haddock, *Melanogrammus aeglefinus*, life history and habitat characteristics. NOAA Tech. Mem. NMFS-NE-196.

Brooks, D.A. 1996. Physical oceanography of the shelf and slope seas from Cape Hatteras to Georges Bank: A brief overview. *In* K. Sherman, N.A. Jaworski, and T.J. Smayda, eds. The northeast shelf ecosystem – assessment, sustainability, and management. p. 47-75. Blackwell Science, Cambridge, MA. 564 p.

Brown, M.W., O.C. Nichols, M.K. Marx, and J.N. Ciano. 2002. Surveillance of North Atlantic right whales in Cape Cod Bay and adjacent waters—2002. Final Report to the Division of Marine Fisheries, Commonwealth of Massachusetts. 29pp.

Burdge, Rabel J. 1998. A Conceptual Approach to Social Impact Assessment (revised edition).

Social ecology Press, Middleton, WI.

Burnett, J., L. O'Brien, R.K. Mayo, J. Darde, and M Bohan. 1989. Finfish maturity sampling and classification schemes used during Northeast Fisheries Science Center bottom trawl surveys, 1963-1989. NOAA Tech Mem. NMFS-F/NEC-76, iii + 14 p.

Butman, V., M. Noble and J. Moody. 1982. Observations of near-bottom currents at the shelf break near Wilmington Canyon in the Mid-Atlantic outer continental shelf area: results of 1978-1979 field seasons. U.S. Geol. Surv. Final Rep. to U.S. Dep. Interior, Bur. Land Manage: 3-1-3-58.

Clapham, P.J. 2002. Humpback whale, Megaptera novaeangliae. In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp 589-591.

Clapham, P.J., S.B. Young, and R.L. Brownell. 1999. Baleen whales: Conservation issues and the status of the most endangered populations. Mammal Rev. 29(1):35-60

Collette, B. B. and G. Klein-MacPhee. 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. 3rd Edition. Smithsonian Institution Press, Washington, DC.

Colvocoresses, J.A. and J.A. Musick. 1984. Species associations and community composition of Middle Atlantic Bight continental shelf demersal fishes. Fish. Bull. (U.S.) 82: 295-313.

Cook, S.K. 1988. Physical oceanography of the Middle Atlantic Bight. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 1-50. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Cooper, R.A., P.C. Valentine, J.R. Uzmann, and R.A. Slater. 1987. Submarine canyons. *In* R.H. Backus and D.W. Bourne, eds. Georges Bank. p. 52-63. MIT Press, Cambridge, MA.

Correia, Steve, Robert Glenn, Penny Howell, Larry Jacobson, and Carl Wilson. 2006. American lobster stock assessment for peer review. Stock Assessment Report No. 06-03. Atlantic States Marine Fisheries Commission (ASMFC). 352 p.

Costello, Christopher, Steven D. Gaines, John Lynham. 2008. Can Catch Shares Prevent Fisheries Collapse? *Science* 19 September 2008: Vol. 321. no. 5896, pp. 1678 – 1681.

Di Jin and Thunberg, Eric. 2005. An analysis of fishing vessel accidents in fishing area off the northeastern United States. Safety Science. 43:523-540.

Dirlam, J. and D. Georgianna. 1994. "Recent adjustment in New England Fresh Fish Processing." Marine Resource Economics. 9:375-384.

Dorsey, E.M. 1998. Geological overview of the sea floor of New England. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 8-14. MIT Sea Grant Pub. 98-4.

Falk-Petersen, I. R., and T. K. Hansen. 1991. Reproductive biology of wolffish *Anarhincas lupus* from north-Norwegian waters. Int. Coun. Explor. Mer, Demersal Fish. Comm. ICES CM 1991/G:14:17.

Farrington, Marriane. Selectivity and Survival of Atlantic Cod and Haddock in the Northwest Atlantic Longline Fishery. NOAA Project 95-NER-141. July 31, 1998.

Gabriel, W. 1992. Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, northwest Atlantic. J. Northwest Atl. Fish. Sci. 14: 29-46.

Georges Bank Cod Fixed Gear Sector. 2007. Georges Bank Cod Fixed Gear Sector Annual Report. June 28, 2007.

Georges Bank Hook Sector. 2004. Georges Bank Hook Sector Annual Report.

Georges Bank Hook Sector. 2005. Georges Bank Hook Sector Annual Report.

Georges Bank Hook Sector. 2006. Georges Bank Hook Sector Annual Report. June 29, 2006.

Georges Bank Hook Sector. 2006. Georges Bank Hook Sector Annual Report. June 28, 2007.

Goode, G. B. 1884. The food fishes of the United States. In: *The Fisheries and Fishery Industries of the United States*. U.S. Comm. Fish Fish. Rept., Sect. 1, Part. 3, pp. 163-682.

Grant, S.M., W. Hiscock, and P. Brett. 2005. Mitigation of capture and survival of wolffish captured incidentally in the Grand Bank yellowtail flounder otter trawl fishery. Centre for Sustainable Aquatic Resources, Marine Institute of Memorial University of Newfoundland, Canada. P-136, xii + 68 p.

Gunnarsson, A., E. Hjorleifsson, K. Thorarinsson and G. Marteinsdottir. 2006. Growth, maturity and fecundity of wolffish *Anarhichas lupus* L. in Icelandic waters. J. Fish Biol. 68:1158-1176.

Hagen, N. T. and K. H. Mann. 1992. Functional response of the predators American lobster *Homarus americanus* and Atlantic wolffish *Anarhichas lupus* to increasing numbers of the green urchin *Stronglycoentrotus droebachiensis*. J. Exp. Mar. Biol. Ecol. 159:89-112.

Hall-Arber, Madeleine, Christopher Dyer, John Poggie, James McNally and Renee Gagne. 2001. Fishing Communities and Fishing Dependency in the Northeast Region of the United States. MARFIN Project Final Report to National Marine Fisheries Service.

Harrington, J.M., Myers, R.A. and Rosenberg, A.A. 2005. Wasted Resources: Bycatch and discards in US Fisheries. Oceana, Washington, DC, 282 pp.

He, Pingguo, Hamilton, Rachel, and Smith, Tracey. 2005. The effect of mesh size and shape on codend selectivity in the Gulf of Maine multispecies trawl fisheries. NOAA Fisheries Cooperative Research Partners Program, EA 133F-02-CN-0040. Published as: He, Pingguo. 2007. Selectivity of large-mesh trawl cod-ends in the Gulf of Maine; I. Comparison of square and diamond mesh. Fisheries Research 83:44:59.

Hecker, B. 1990. Variation in megafaunal assemblages on the continental margin south of New England. Deep-Sea Res. 37: 37-57.

Hecker, B. 2001. Polygons BH1–4 (Veatch, Hydrographer, Oceanographer and Lydonia Canyons). *In* S. Azimi, ed. Priority ocean areas for protection in the Mid-Atlantic. p. 32-36. Natural Resources Defense Council, Washington, DC. 59 p.

Hecker, B. and G. Blechschmidt. 1979. Epifauna of the northeastern U.S. continental margin. *In* B. Hecker, G. Blechschmidt, and P. Gibson, eds. Epifaunal zonation and community structure in three mid- and North Atlantic canyons. Appendix A. Final Rep. Canyon Assess. Stud. in the Mid- and North Atlantic Areas of the U.S. Outer Continental Shelf. U.S. Dep. Interior, Bur. Land Manage., Washington, DC, January 11, 1980.

Hecker, B., D.T. Logan, F.E. Gandarillas, and P.R. Gibson. 1983. Megafaunal assemblages in canyon and slope habitats. Vol. III: Chapter I. Canyon and slope processes study. Final Rep. prepared for U.S. Dep. Interior, Minerals Manage. Ser., Washington, D.C.

Hirth, H.F. 1997. Synopsis of the biological data of the green turtle, *Chelonia mydas* (Linnaeus 1758). USFWS Biological Report 97(1). 120pp.

Horwood, J. 2002. Sei whale, Balaenoptera borealis. In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 1069-1071.

Howell P., Howe A., Gibson M., Ayvasian S. 1992. Fishery management plan for inshore stocks of winter flounder. Atlantic States Marine Fisheries Commission. Fish Mgmt. Rep 21. May 1992.

Howell, W. Hunting, Morin, Michael, Rennels, Nathan, and Goethel, David. 2008. Residency of adult Atlantic cod (*Gadus morhua*) in the Western Gulf of Maine. Fisheries Research, 91: 123-132.

Idoine, J.S. 1998. Atlantic wolffish. In: S. H. Clark, ed. *Status of Fishery Resources off the*

Northeastern United States for 1998. NOAA Tech. Memo. NMFS-NE-115:100-101.

International Council for the Exploration of the Sea [ICES]. 2000. Report of the ICES Advisory Committee on the Marine Environment (ACME) 2000. Cooperative Research Report No. 241, 27 pp.

James, M.C., R.A. Myers, and C.A. Ottenmeyer. 2005a. Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. Proc. R. Soc. B, 272: 1547-1555.

Jin, Di, P. Hoagland, and E. Thunberg, 2005, "An analysis of the relationship between fish harvesting and processing sectors in New England." Marine Resource Economics. 21:47-62.

Johannessen, T., J. Gjosaeter and E. Moksness. 1993. Reproduction, spawning behaviour and captive breeding of the common wolffish, *Anarhincas lupus* L. Aquaculture 115:41-51.

Johnson, Donna L. 2004. American plaice, *Hippoglossoides platessoides*, life history and habitat characteristics. NOAA Tech. Mem. NMFS-NE-187.

Johnson, A., G. Salvador, J. Kenney, J. Robbins, S. Kraus, S. Landry, and P. Clapham. 2005. Fishing gear involved in entanglements of right and humpback whales. Mar. Mamm. Sci. 21(4): 635-645.

Jonsson, G. 1982. Contribution to the biology of catfish (*Anarhichas lupus*) at Iceland. Rit Fiskideild 6:3-26.

Katona, S.K., V. Rough, and D.T. Richardson. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution Press, Washington, D.C. 316pp.

Keats, D. W., G. R. South, and D. H. Steele. 1985. Reproduction and egg guarding of Atlantic wolffish (*Anarhichas lupus*: Anarhichidae) and ocean pout (*Macrozoarces americanus:* Zoarcidae) in Newfoundland waters. Can. J. Zool. 63:2565-2568.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginia's sea turtles: 1979-1986. Virginia J. Sci. 38(4): 329-336.

Keith, Charles. 2006. Status of Fishery Resources off the Northeastern US, Atlantic wolffish (Anarhichas lupus). NEFSC Resource Evaluation and Assessment Division. http://www.nefsc.noaa.gov/sos/spsyn/og/wolf/

Kelley, J.T. 1998. Mapping the surficial geology of the western Gulf of Maine. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 15-19. MIT Sea Grant Pub. 98-4.

Kenney, R.D. 2002. North Atlantic, North Pacific, and Southern hemisphere right whales. *In*: W.F.Perrin, B. Wursig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 806-813.

King M.J, M. H. Kao, J. A. Brown, and G. L. Fletcher. 1989. Lethal freezing temperatures of fish: limitations to seapen culture in Atlantic Canada. Proc. Ann. Aquacult. Assoc. Can. 89-3:47-49.

Leatherback Turtle Expert Working Group (TEWG). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555. 116 pp.

Liao, Y.-Y., and M. C. Lucas. 2000. Growth diet and metabolism of common wolffish in the North Sea, a fast growing population. J. Fish Biol. 56:810-825.

Lindeboom, H.J., and S.J. de Groot. 1998. Impact II. The effects of different types of fisheries on the North Sea and Irish Sea benthic ecosystems. NIOZ Rapport 1998-1. 404 p.

Mahon, R., S.K. Brown, K.C.T. Zwanenburg, D.B. Atkinson, K.R. Buja, L. Claflin, G.D. Howell, M.E. Monaco, R.N. O'Boyle, and M. Sinclair. 1998. Assemblages and biogeography of demersal fishes of the east coast of North America. Can. J. Fish. Aquat. Sci. 55: 1704-

1738.

Marciano, David, Rosen, Shale, Pol, Michael, and Szymanski, Mark. 2005. Testing the selectivity of gillnets to target haddock in the Gulf of Maine. NOAA Fisheries Cooperative Research Partners Program, contract EA 133F-04-SE-0821.

McCay, Bonnie and Marie Cieri. 2000. Fishing Ports of the Mid-Atlantic. Report to the Mid-Atlantic Fishery Management Council. Dover, Delaware.

McElderry, Howard and Bruce Turris. 2008. Evaluation of Monitoring and Reporting Needs for Groundfish Sectors in New England: Phase II Report. Archipelago Marine Research Ltd. and Pacific Fisheries Management Incorporated. Prepared for the Gulf of Maine Research Institute, Portland, ME.

Mid-Atlantic Fishery Management Council [MAFMC] and New England Fishery Management Council [NEFMC]. 2007. Northeast Region Standardized Bycatch Reporting Methodology: An Omnibus Amendment to the Fishery Management Plans of the New England and Mid-Atlantic Fishery Management Councils. June 2007. SBRM 2007.

Morgan, G.R. 1997. Individual quota management in fisheries: methodologies for determining catch quotas and initial quota allocation. *FAO Fisheries Technical Paper.* No. 371. Rome, FAO. 41p.

Morgan, L.E. and R. Chuenpagdee. 2003. Shifting gears: assessing the collateral impacts of fishing methods in U.S. waters. Pew Science Series on Conservation and the Environment, 42 p.

Morreale, S.J. and E.A. Standora. 1998. Early life stage ecology of sea turtles in northeastern U.S. waters. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-413, 49 pp.

Morreale, S.J. and E.A. Standora. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. Chel. Conserv. Biol. 4(4):872-882.

Mountain, D.G., R.W. Langton, and L. Watling. 1994. Oceanic processes and benthic substrates: influences on demersal fish habitats and benthic communities. *In* R.W. Langton, J.B. Pearce, and J.A. Gibson, eds. Selected living resources, habitat conditions, and human perturbations of the Gulf of Maine: environmental and ecological considerations for fishery management. p. 20-25. NOAA Tech. Mem. NMFS-NE-106. 70 p.

Murray, K.T. 2006. Estimated average annual by-catch of Loggerhead Sea Turtles (Caretta caretta) in U.S. Mid-Atlantic bottom otter trawl gear, 1996-2004. U.S. Dep. Commer., Northeast Fish. Sci. Cent. Ref. Doc. 06-19; 26 p.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pp. 137-164 In: Lutz, P.L., and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

National Research Council (NRC). 1990. Decline of the Sea Turtles: Causes and Prevention. Committee on Sea Turtle Conservation. Natl. Academy Press, Washington, D.C. 259 pp.

National Research Council [NRC]. 2002. Effects of trawling and dredging on seafloor habitat. Ocean Studies Board, Division on Earth and Life Studies, National Research Council. National Academy Press, Washington, D.C. 126 p.

Nelson, G. A., and M. R. Ross. 1992. Distribution, growth and food habits of the Atlantic wolffish *Anarhichas lupus*) from the Gulf of Maine-Georges Bank region. J. Northw. Atl. Fish. Sci. 13:53-61.

New England Fishery Management Council [NEFMC]. 1998. Final Amendment #11 to the Northeast Multispecies Fishery Management Plan, #9 to the Atlantic Sea Scallop Fishery Management Plan, Amendment #1 to the Monkfish Fishery Management Plan, Amendment #1 to the Atlantic Salmon Fishery Management Plan, and components of the proposed Atlantic Herring Fishery Management Plan for Essential Fish Habitat, incorporating the environmental assessment. October 7, 1998.

New England Fishery Management Council [NEFMC]. 2003. Amendment 13 to the Northeast Multispecies Fishery Management Plan, including a Final Supplemental Environmental Impact Statement and an Initial Regulatory Flexibility Analysis. Vols I and II, submitted Dec 1 2003.

New England Fishery Management Council [NEFMC]. 2004a. Framework Adjustment 40A (FW 40A) to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council [NEFMC]. 2004b. Framework Adjustment 40B (FW 40B) to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council [NEFMC]. 2005. Framework Adjustment 41 (FW 41) to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council [NEFMC]. 2006. Framework Adjustment 42 (FW 42) to the Northeast Multispecies Fishery Management Plan.

Nies, T. A. and A. J. Applegate IV. 2007. Accuracy of Self-Reported Fishing Locations in the New England Multispecies Trawl Fishery. New England Fishery Management Council; unpublished manuscript.

National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC). 2001. Stock assessments of loggerheads and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S.

NMFS and U.S. Fish and Wildlife Service (USFWS). 1991a. Recovery plan for U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.

NMFS and USFWS. 1991b. Recovery plan for U.S. population of Atlantic green turtle. National Marine Fisheries Service, Washington, D.C. 58 pp.

NMFS and USFWS. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, MD. 139 pp.

NMFS and USFWS. 2007. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, MD. Available at: http://www.fws.gov/northflorida/SeaTurtles/2007-Reviews/2007-sea-turtle-ESA-reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007a. Loggerhead sea turtle (/Caretta caretta/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 65 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007b. Leatherback sea turtle (/Dermochelys coriacea/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 79 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007c. Kemp's ridley sea turtle/ (Lepidochelys/ /kempii/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 50 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007d. Green sea turtle (/Chelonia mydas/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 102 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

NMFS. 1998. Recovery Plan for the blue whale (*Balaenoptera musculus*). Prepared by R.R.

Reeves, P.J. Clapham, R.L. Brownell, Jr., and G.K. Silber for the National Marine Fisheries Service, Silver Spring, MD. 42pp.

NMFS. 2005. Recovery Plan for the North Atlantic right whale (*Eubalaena glacialis*). National Marine Fisheries Service, Silver Spring, MD. 137pp.

NMFS. 1991. Final recovery plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

National Marine Fisheries Service (NMFS). 2009c. Correspondence between ENTRIX, Inc and the Northeast Fisheries Science Center regarding impacts to sea turtles from fishing gear.

Northeast Data Poor Stocks Working Group. 2009. The Northeast Data Poor Stocks Working Group Report, December 8-12, 2008 Meeting. Part A. Skate species complex, Deep sea red crab, Atlantic wolfish, Scup, and Black sea bass. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-02; 496 p.

Northeast Fisheries Science Center [NEFSC]. 2002a. Final Report of the Working Group on Re-Evaluation of Biological Reference Points for New England Groundfish. National Marine Fisheries Service, Northeast Fisheries Science Center. 232 p.

Northeast Fisheries Science Center [NEFSC]. 2002b. Workshop on the effects of fishing gear on marine habitats off the northeastern United States, October 23-25, 2001, Boston, Massachusetts. U.S. Natl. Mar. Fish. Serv. Northeast Fish. Cent. Woods Hole Lab. Ref. Doc. 02-01. 86 p.

Northeast Fisheries Science Center (NEFSC). 2002c. 34th Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 02-07.

Northeast Fisheries Science Center (NEFSC). 2004. 38th Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 04-03.

Northeast Fisheries Science Center [NEFSC]. 2005. Assessment of 19 Northeast Groundfish Stocks through 2004. 2005 Groundfish Assessment Review Meeting (GARM II). Northeast Fish. Cent. Woods Hole Lab. Ref. Doc. 06-13. 508 p.

Northeast Fisheries Science Center (NEFSC). 2006a. 42nd Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 06-01.

Northeast Fisheries Science Center (NEFSC). 2006b. 43rd Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 06-25.

Northeast Fisheries Science Center [NEFSC]. 2007a. Report of the Review Panel for the Northeast Data Poor Stocks Working Group (DPWG): Monkfish. August 14, 2007. 9 p.

Northeast Fisheries Science Center (NEFSC). 2007b. 44th Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 07-10.

Northeast Fisheries Science Center (NEFSC). 2008a. 47th Northeast Regional Stock Assessment Workshop (40th SAW) Assessment Report. NEFSC Reference Document 08-11.

Northeast Fisheries Science Center [NEFSC]. 2008b. Assessment of 19 Northeast Groundfish Stocks Through 2007: Report of the 3rd Groundfish Assessment Review Meeting (GARM III), Northeast Fisheries Science Center, Woods Hole, Massachusetts, August 4 – 8, 2008. Northeast Fish. Cent. Woods Hole Lab. Ref. Doc. 08-15. 867 p.

Northeast Fisheries Science Center [NEFSC]. 2009. Report by the Peer Review Panel for the Northeast Data Poor Stocks Working Group (DPWG). 20 January 2009. 34 p.

Overholtz, W.J. and A.V. Tyler. 1985. Long-term responses of the demersal fish assemblages of Georges Bank. Fish. Bull. (U.S.) 83: 507-520.

Palka, D., M. Rossman, A. VanAtten, and C. Orphanides. 2008a. Effect of Pingers on Harbor Porpoise and Seal Bycatch in the US Northeast Gillnet Fishery. Paper SC/60/SM2 presented to the Scientific Committee, June 2008 (unpublished); 27 pp. Paper available from IWC Secretariat: secretariat@iwcoffice.org.

Palka, D.L. and C. D. Orphanides. 2008b. Harbor porpoise bycatch rates that indicate compliance with pinger regulations for the Northeast gillnet fishery. U.S. Department of Commerce, Northeast Fisheries Science Center Ref. Doc. 08-10; 13 pp.

Palmer, M. C. and S. E. Wigley. 2007. Validating the Stock Apportionment of Commercial Fisheries Landings Using Positional Data from Vessel Monitoring Systems (VMS). Northeast Fisheries Science Center Reference Document CDR 07-22.

Pavlov, D. A., and E. Moksness. 1994. Production and quality of eggs obtained from wolffish (*Anarhincas lupus* L.) reared in captivity. Aquaculture. 122:295-312.

Pavlov, D. A., and G. G. Novikov. 1993. Life history peculiarities of common wolffish (*Anarhincas lupus*) in the White Sea. ICES J. Mar. Sci. 50:271-277.

Payne, A. I., R. Cook, E. Bell, R. K. Mohn, and M. McAllister. February 3 - 8, 2003. Report on the Groundfish Science Peer Review Meeting. Center for Independent Experts. Available at: http://www.nefsc.noaa.gov/groundfish/Payne.pdf.

Perrin, W.F., B. Wursig, and J.G.M. Thewissen (eds.). 2002. Encyclopedia of Marine Mammals. Academic Press, CA.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.

Pol, Michael. 2001. Effects of Trawl Net Modifications During the 2000 Nantucket Sound Squid Fishery. Conservation Engineering Project Report, Conservation Engineering Program, Massachusetts Division of Marine Fisheries. Unpublished manuscript. 21 pp.

Poppe, L.J., J.S. Schlee, B. Butman, and C.M. Lane. 1989a. Map showing distribution of surficial sediment, Gulf of Maine and Georges Bank. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-1986-A, scale 1:1,000,000.

Poppe, L.J., J.S. Schlee, Knebel H.J. 1989b. Map showing distribution of surficial sediment on the mid-Atlantic continental margin, Cape Cod to Albemarle sound. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-1987-D, scale 1:1,000,000.

Pratt, S. 1973. Benthic fauna. *In* Coastal and offshore environmental inventory, Cape Hatteras to Nantucket Shoals. p. 5-1 to 5-70. Univ. Rhode Island, Mar. Pub. Ser. No. 2. Kingston, RI.

Reid, R.N. and F.W. Steimle, Jr. 1988. Benthic macrofauna of the middle Atlantic continental shelf. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 125-160. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Riget, F. and J. Messtorff. 1988. Distribution, abundance and migration of Atlantic wolffish (*Anarhichas lupus*) and spotted wolffish (*Anarhichas minor*) in west Greenland waters. NAFO-SCI. Counc. Stud. No. 12:13-20.

Rountree, R.A. 2002. Wolffishes. Family Anarhichadidae. Pages 485-496. In: Collette, B.B., and G. Klein-MacPhee. (eds.). Bigelow and Schroeder's Fishes of the Gulf of Maine. 3rd Edition. Smithsonian Institution Press, Washington, D.C. 748 p.

Rudolph, T. J. Pappalardo, M. Sanderson, H. Milliken, and M. Farrington. 2006. Survival of sub-legal Atlantic cod in the Northwest Atlantic longline fishery. NEC Grant 04-827. 30 pp.

Sanchirico, James N., Daniel Holland, Kathryn Quigley, and Mark Fina. 2006. Catch-quota balancing in multispecies individual fishing quotas. Marine Policy 30: 767-785.

Schmitz, W.J., W.R. Wright, and N.G. Hogg. 1987. Physical oceanography. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 27-56. Jones and Bartlett Publishers Inc., Boston, MA.

Sears, R. 2002. Blue Whale, Balaenoptera musculus. - In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp.112-116.

Shepard, F.P., N.F. Marshall, P.A. McLonghlin, and F.G. Sullivan. 1979. Currents in submarine canyons and other sea valleys. Am. Assn. Petrol. Geol., Studies in Geol. No. 8.

Sherman, K., N.A. Jaworski, T.J. Smayda, eds. 1996. The northeast shelf ecosystem – assessment, sustainability, and management. Blackwell Science, Cambridge, MA. 564 p.

Shoop, C.R. and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6: 43-67.

Sigourney, D. B., M. R. Ross, J. Brodziak, and J. Burnett. 2006. Length at age, sexual maturity and distribution of Atlantic halibut, *Hippoglossus hippoglossus* L., off the Northeast USA. *J. Northw. Atl. Fish. Sci*., **36**: 81–90.

Stefansson, Gunnar and Andrew A. Rosenberg. 2005. Combining control measures for more effective management of fisheries under uncertainty: quotas, effort limitation and protected areas. Philosophical Transactions of the Royal Society – B. 360: 133–146.

Steimle, F.W. and C. Zetlin. 2000. Reef habitats in the middle Atlantic bight: abundance, distribution, associated biological communities, and fishery resource use. Mar. Fish. Rev. 62: 24-42.

Steimle, F.W., C.A. Zetlin, P.L. Berrien, D.L. Johnson and S. Chang. 1999. Essential fish habitat source document: tilefish, *Lopholatilus chamaeleonticeps*, life history and habitat characteristics. NOAA Tech. Mem. NMFS-NE-152. 30 p.

Stevenson, D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, and M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. NOAA Tech. Memo. NMFS-NE-181. 179 p.

Stumpf, R.P. and R.B. Biggs. 1988. Surficial morphology and sediments of the continental shelf of the middle Atlantic bight. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 51-72. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mamm. Sci. 9: 309-315.

Templeman, W. 1984. Migrations of Wolffishes, *Anarhichas sp*., from tagging in the Newfoundland area. J. Northw. Atl. Fish. Sci. 5:93-97.

Templemann, W. 1986. Some biological aspects of Atlantic wolffish (*Anarhincas lupus*) in the Northwest Atlantic. J. Northw. Atl. Fish. Sci. 7:57-65.

Theroux, R.B. and M.D. Grosslein. 1987. Benthic fauna. *In* R.H. Backus and D.W. Bourne, eds. Georges Bank. p. 283-295. MIT Press, Cambridge, MA.

Theroux, R.B. and R.L. Wigley. 1998. Quantitative composition and distribution of the macrobenthic invertebrate fauna of the continental shelf ecosystems of the northeastern United States. NOAA Tech. Rep. NMFS 140. 240 p.

Townsend, D.W. 1992. An overview of the oceanography and biological productivity of the Gulf of Maine. *In* D.W. Townsend and P.F. Larsen, eds. The Gulf of Maine. p. 5-26. NOAA Coast. Ocean Prog. Reg. Synthesis Ser. No. 1. Silver Spring, MD. 135 p.

Tucholke, B.E. 1987. Submarine geology. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 56-113. Jones and Bartlett Publishers Inc., Boston, MA.

Turris, Bruce and Howard McElderry. 2008. Evaluation of Monitoring and Reporting Needs for Groundfish Sectors in New England: Phase I Report. Prepared for the Gulf of Maine Research Institute. April 2008.

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

Turtle Expert Working Group (TEWG). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-444, 115 pp.

USFWS and NMFS. 1992. Recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). NMFS, St. Petersburg, Florida.

USFWS. 1997. Synopsis of the biological data on the green turtle, *Chelonia mydas* (Linnaeus 1758). Biological Report 97(1). U.S. Fish and Wildlife Service, Washington, D.C. 120 pp.

Valentine, P.C. and R.G. Lough. 1991. The sea floor environment and the fishery of eastern Georges bank. U.S. Dep. Interior, U.S. Geol. Sur. Open File Rep. 91-439. 25 p.

Valentine, P.C., E.W. Strom, R.G. Lough, and C.L. Brown. 1993. Maps showing the sedimentary environment of eastern Georges bank. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-2279-B, scale 1:250,000.

Waring, G.T., D.L. Palka, P.J. Clapham, S. Swartz, M. Rossman, T. Cole, L.J. Hansen, K.D. Bisack, K. Mullin, R.S. Wells, D.K. Odell, and N.B. Barros. 1999. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 1999. NOAA Technical Memorandum NMFS-NE-153.

Waring, G.T., J.M. Quintal, S.L. Swartz, eds. 2002. Draft U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2001. NOAA Technical Memorandum NMFS-NE-169.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley, Editors. 2006. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2005. NOAA Tech. Memo. NMFS-NE-194, 352pp.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley, Editors. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2006. NOAA Tech. Memo. NMFS-NE-201, 378 pp.

Waring, G.T., R.M. Pace, J.M. Quintal, C. P. Fairfield, K. Maze-Foley (eds). 2003. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2003 . NOAA Technical Memorandum NMFS-NE-182. 287 p.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley, eds. 2009. Draft U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2009. Available at: http://www.nmfs.noaa.gov/pr/sars/draft.htm.

Watling, L. 1998. Benthic fauna of soft substrates in the Gulf of Maine. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 20-29. MIT Sea Grant Pub. 98-4.

Whitehead, H. 2002. "Sperm whale Physeter macrocephalus". In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 1165-1172.

Wiebe, P.H., E.H. Backus, R.H. Backus, D.A. Caron, P.M. Glibert, J.F. Grassle, K. Powers, and J.B. Waterbury. 1987. Biological oceanography. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 140-201. Jones and Bartlett Publishers Inc., Boston, MA.

Wigley, R.L. and R.B. Theroux. 1981. Atlantic continental shelf and slope of the United States –

macrobenthic invertebrate fauna of the middle Atlantic bight region – faunal composition and quantitative distribution. Geol. Surv. Prof. Pap. 529-N. 198 p.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, *Megaptera novaengliae*, in the mid-Atlantic and southeast United States, 1985-1992. Fish. Bull., U.S. 93:196-205.

Worthington, L.V. 1976. On the North Atlantic circulation. Johns Hopkins Ocean. Stud. No. 6. Johns Hopkins Univ. Press, Baltimore, MD. 110 p.

Wright, W.R. and L.V. Worthington. 1970. The water masses of the North Atlantic Ocean: a volumetric census of temperature and salinity. Ser. Atlas Mar. Environ., Am. Geol. Soc. Folio No. 19.

Wynne, K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant, Narragansett. 115pp.

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10.2 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 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 (CAM): 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.

Data Poor Working Group (DPWG): A standing assessment panel assembled to address stocks with limited or poor data. Two reports have been prepared as of the submission of this document.

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.

GARM: The monstrous hound Garm guards the entrance to Helheim, the Norse realm of the dead. It has four eyes and a chest drenched with blood. Also: **Groundfish Assessment Review Meeting**; peer reviewed assessment of groundfish stock managed by the Northeast Multispecies Fishery Management Plan. There have been three GARM cycles. GARM III was a series of four peer reviewed meetings held in 2007 and 2008. The final meeting evaluated stock status and provides the scientific basis for this management action.

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").

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.

Valued Ecosystem Component: A resource or environmental feature that is important (not only economically) to a local human population, or has a national or international profile, or if altered from its existing status, will be important for the evaluation of environmental impacts of industrial developments, and the focusing of administrative efforts.

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.

10.3 List of Public Meetings

Date	Meeting Type	Location
2006		
9/26-9/28/2006	Council Meeting	Holiday Inn, Peabody, MA
11/6/2006	Oversight Committee	Holiday Inn, Peabody, MA
11/27/2006	Groundfish A16 Scoping Hearing	Holiday Inn, Ellsworth, ME
11/28/2006	Groundfish A16 Scoping Hearing	Eastland Park Hotel, Portland, ME
11/29/2006	Groundfish A16 Scoping Hearing	Urban Forestry Ctr., Portsmouth, NH
11/30/2006	Groundfish A16 Scoping Hearing	MA DMF, Gloucester, MA
12/5/2006	Groundfish A16 Scoping Hearing	Best Western East End, Riverhead, NY
12/7/2006	Groundfish A16 Scoping Hearing	Holiday Inn Express, Fairhaven, MA
12/12/2006	Groundfish A16 Scoping Hearing	Skyline Hotel, New York, NY
2007		
1/18/2007	Oversight Committee	Holiday Inn, Mansfield, Mansfield, MA
1/11/2004	PDT conference call	
2/6-2/8/07	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/7/2007	PDT Meeting	Falmouth Tech Park, Falmouth, MA
4/10-4/12/07	Council Meeting	Mystic Hilton, Mystic, CT
4/20/2007	Oversight Committee	Holiday Inn, Peabody, MA
5/29/2007	Advisory Panel	Holiday Inn, Mansfield, Mansfield, MA
5/31/2007	Oversight Committee (joint with Monkfish)	Providence Biltmore, Providence, RI
6/19-6/21/07	Council Meeting	Eastland Park Hotel, Portland, ME
6/26/2007	PDT conference call	
7/25/2007	PDT Meeting	Holiday Inn, Mansfield, Mansfield, MA
8/1/2007	Oversight Committee	Holiday Inn, Peabody, MA
8/21/2007	PDT conference call	
9/5/2007	Oversight Committee	Holiday Inn, Peabody, MA
9/18-9/19/07	Council	Radisson Hotel, Plymouth, MA
10/2/2007	PDT	MA Audubon, Newburyport, MA
10/16/2007	Oversight Committee	Holiday Inn, Peabody, MA
10/22/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA
11/6-11/7/07	Council Meeting	Hotel Viking, Newport, MA
12/6/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA

Date	Meeting Type	Location
12/12-12/13/07	Oversight Committee	Holiday Inn, Peabody, MA
2008		
1/9/2008	PDT	Starboard Galley, Newburyport, MA
1/17/07-8	Oversight Committee	Holiday Inn, Peabody, MA
1/24/2008	Council Meeting	Sheraton Ferncroft, Danvers, MA
1/22/2008	PDT conference call	
2/11/2008	Oversight Committee	Courtyard by Marriot, Portsmouth, NH
2/12/08-2/14/08	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/19/2008	PDT Meeting	Holiday Inn, Mansfield, MA
3/27/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
4/8/2008	PDT Meeting	Holiday Inn, Mansfield, MA
4/15-4/17/08	Council Meeting	Providence Biltmore, Providence, RI
5/13/2008	Oversight Committee	Holiday Inn, Peabody, MA
5/15/2008	PDT conference call	
5/16/2008	PDT conference call	
5/20/2008	Recreational Advisory Panel	Holiday Inn, Peabody, MA
5/27/2008	Advisory Panel	Holiday Inn, Peabody, MA
6/2/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
6/3-6/5/08	Council Meeting	Holiday Inn by the Bay, Portland, ME
7/1/2008	PDT conference call	
7/17/2008	Oversight Committee	Holiday Inn, Peabody, MA
8/13/2008	PDT Meeting	MA Audubon, Newburyport, MA
8/21/2008	PDT conference call	
8/26/2008	Oversight Committee	Holiday Inn, Peabody, MA
9/3-9/4/08	Council Meeting	Providence Biltmore, Providence, RI
9/11/2008	PDT conference call	
9/16/2008	Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/17/2008	Recreational Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/29/2008	Oversight Committee	Holiday Inn, Peabody, MA
10/15/2008	PDT conference call	
10/22/2008	PDT conference call	
10/30/2008	Oversight Committee	Sheraton Harborside, Portsmouth, NH
11/18-1/20/08	Council Meeting	Sheraton Ferncroft, Danvers, MA

Date	Meeting Type	Location
2009		
1/5/2009	PDT conference call	
1/29/2009	Oversight Committee	Holiday Inn, Mansfield, MA
2/9-2/11/09	Council Meeting	Sheraton Harborside, Portsmouth, NH
4/7-4/9/09	Council Meeting	Mystic Hilton, Mystic, CT
5/26/2009	Advisory Panel	Sheraton Colonial, Wakefield, MA
5/27/2009	Recreational Advisory Panel	Sheraton Colonial, Wakefield, MA
6/4/2009	PDT	Holiday Inn, Mansfield, MA
6/17/2009	Oversight Committee	Holiday Inn, Mansfield, MA
6/22-6/25/09	Council Meeting	Holiday Inn by the Bay, Portland, ME

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Appendix I

Summary of Past, Present, or Reasonably Foreseeable Future Actions

APPENDIX I

The actions summarized in the table below are presented in chronological order, and codes indicate whether an action relates to the past (P), present (Pr), or reasonably foreseeable future (RFF). When any of these abbreviations occur together, it indicates that some past actions are still relevant to the present and/or future. A brief explanation of the rationale for concluding what effect each action has (or will have) had on each of the VECs is provided in the table and is not repeated here.

Table I-1. Impacts of Past, Present and Reasonably Foreseeable Future Actions on the five VECs. These actions do not include those which were considered to have little impact on the fishery or actions under consideration in this Amendment.

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS						
[P] Prosecution of the groundfish fisheries by foreign fleets in the area that would become the U.S. EEZ (prior to implementation of the MSA)	Foreign fishing pressure peaked in the 1960s and slowly declined until passage of the MSA in 1974 and implementation of the Multispecies FMP	**Direct High Negative** Foreign fishing depleted many groundfish stocks	**Potentially Direct High Negative** Limited information on discarding, but fishing effort was very high and there were no gear requirements to reduce bycatch	**Potentially Direct High Negative** Limited information on protected resources encounters, but fishing effort was very high	**Potentially Direct High Negative** Limited information on habitat, but fishing effort was very high	**Potentially Indirect Negative** Revenue from fishing was split between foreign and domestic communities, rather than just domestic communities
[P] Original FMP implemented in 1977	Established management of cod, haddock and yellowtail via catch quotas, quota allocations by vessel class and catch limits	**Direct Positive** Provided slight effort reductions and regulatory tools available to rebuild and manage stocks	**Indirect Positive** Reduced directed fishing effort on cod, haddock and yellowtail which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P Interim Plan (1982)	Implemented GB seasonal closed areas, minimum fish size requirements in GB and GOM and permit requirements	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability
P Multispecies Plan (1986)	Revised FMP to include pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder and white hake. Allowed additional minimum fish size restrictions, extended GB spawning area closures and a SNE closure to protect yellowtail flounder	**Direct Positive** Reduced directed fishing effort and provided the opportunity to manage additional groundfish species	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P Amendments 1-4 to the Multispecies FMP (1987-1991)	Implemented closure in SNE/MA to protect yellowtail, extended GB RMA, added minimum mesh size requirements to SNE, excluded scallop dredge vessels from SNE closure, incorporated silver hake, red hake and ocean pout into the FMP	**Direct Positive** Reduced directed fishing effort and provided the opportunity to manage additional groundfish species	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability
P Multispecies Emergency Action (1994)	Implemented 500-lb haddock trip limit, expanded CA II closure time and area, prohibited scallop dredge vessels from possessing haddock from Jan-Jun and prohibited pair-trawling for multispecies	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Amendment 5 to the FMP (1994)	Made the above Emergency Action measures permanent, enacted a moratorium on new participants in the fishery, reduced DAS for most vessels by 50% over a 5-7 year period, implemented mandatory reporting and observer requirements, etc.	**Direct High Positive** Reduced directed fishing effort and capped the number of participants allowed to direct on the fishery	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability by limiting the number of participants in the directed fishery. However, there was a negative impact for fishermen and communities where participation was reduced
, Pr Emergency Action (1994)	Implemented additional closed areas, prohibited scallop vessels from fishing in the closed areas, disallowed any fishery using mesh smaller than minimum mesh requirements, prohibited retaining regulated species with small mesh, etc.	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 9 (1985)	Made the above Emergency Action measures permanent	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities
P, Pr Amendment 7 to the Multispecies FMP (1996)	Accelerated Amendment 5 DAS reduction schedule, implemented seasonal GOM closures, implemented 1,000 lb haddock trip limit, expanded the 5% bycatch rule, etc.	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 20 (1997)	Implemented GOM cod daily trip limit of 1,000 lb, increased the haddock daily trip limit to 1,000 lb and added gillnet effort-reduction measures such as net limits	**Mixed** Reduced directed fishing effort but allowed for an increase in haddock landings	**Mixed** Gillnet restrictions and reduced effort on cod helped reduce discards/bycatch but this may have been offset by increased effort on haddock	**Indirect Positive** Although the haddock daily trip limit increased, gillnet restrictions provide an overall positive impact	**Mixed** Reduced cod daily trip limit would be offset by increase haddock daily landing limit	**Mixed** Reduced revenues from a smaller cod daily trip limit could be offset by the increased haddock daily landing limit but gillnet effort reductions also have negative eco/soc impacts
P, Pr Framework 24 (1998)	Implemented an adjustment to GOM cod daily trip limit by requiring vessels to remain in port and run their DAS clock for a cod overage and implemented the DAS carryover provisions	**Direct Low Positive** Implemented minor effort reductions	**Indirect Low Positive** Implemented minor effort reductions which resulted in minor discard/bycatch reductions	**Indirect Low Positive** Slightly reduced fishing effort, thus reduced interactions with protected species	**Indirect Low Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Vessels must remain in port with their clock running for a cod overage which has a negative impact but vessels may carryover DAS from one fishing year into the next.
P, Pr Framework 25 (1998)	Implemented GOM inshore closure areas, the year-round WGOM closure, the CLCA and reduced the GOM cod daily trip limit to 700 lb	**Direct Low Positive** Implemented effort reductions via reduced cod trip limit and closure areas	**Indirect Low Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Closure areas and effort controls reduce gear interactions with habitat	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 26 (1999)	Expansion of April GOM inshore closure area and, additional seasonal inshore GOM and GB area closures	**Direct Low Positive** Implemented effort reductions via closure areas	**Indirect Low Positive** Reduced directed fishing effort which resulted in discard bycatch reductions	**Indirect Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Closure areas and effort controls reduce gear interactions with habitat	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts
P, Pr, RFF Amendment 11 (1998)	Designated EFH for all species in the multispecies FMP and required Federal agencies to consult with NMFS on actions that may adversely effect EFH	**Indirect Low Positive** A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to multispecies stocks	**Indirect Low Positive** A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to other stocks that share the same EFH as multispecies stocks	**Indirect Low Positive** Consultation with NFMS that leads to the protection of multispecies EFH is beneficial to protected resources that share a need for the same habitat that multispecies stocks require	**Direct High Positive** Consultation with NMFS on activities that may adversely effect habitat provides NMFS the opportunity to mitigate or even prevent EFH impacts	**Indirect Low Positive** For instances where NMFS consults on projects impacting multispecies EFH, the overall health of the stocks should improve which would lead to long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 27 (1999)	Established large GOM rolling closures, modified CLCA, decreased GOM daily trip limit to 200 lb with subsequent reduction to 30 lb, increased haddock trip limit to 2,000 lb and increased minimum mesh size	**Mixed** Reduced directed fishing effort while also allowing the haddock trip limit to increase	**Mixed** A reduction in directed effort helped minimize bycatch and discards but increased haddock trip limit was somewhat offsetting	**Mixed** Reduced directed effort helps minimize protected species encounters but this was somewhat offset by the increased haddock trip limit	**Indirect Positive** Reduced directed effort and closed areas help improve habitat, this may be slightly offset by the increased haddock trip limit	**Mixed** Short term negative from closed areas and the reduced cod trip limit which were not offset by the increased haddock trip limit. Long term positive because of increased probability of sustainable stocks
P Interim Rule (1999)	Revised GOM cod trip limit to 100 lb/day up to 500 lb max and revised the DAS running clock to allow a 1-day overage only	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Low Positive** Effort controls result in reduced interactions with protected species	**Indirect Low Positive** Effort controls result in reduced habitat interactions	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts
P, Pr, RFF Amendment 9 (1999)	Prohibited used of brush sweep trawl gear, added halibut to the FMP with a 1-fish per trip possession limit	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Low Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Effort controls result in reduced habitat interactions	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[P, Pr] Framework 31 (2000)	Increased GOM Daily limit to 400 lb/day up to 4,000/lb per trip, added Feb GOM inshore closure and extended 1999 Interim Rule running clock measure	**Mixed** Increased cod directed fishing effort while also reducing effort via closure area and cod running clock measure	**Mixed** Increased effort on cod could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure area and cod running clock measure	**Mixed** Increased cod effort could increase interactions but somewhat offset by effort reductions via closure area and cod running clock measure	**Indirect Low Positive** Minor positive impacts from inshore closure area	**Mixed** Short term positive from increased cod trip limit but long-term sustainability of the cod resource was effected
[P, Pr] Framework 33 (2000)	Added GB seasonal closure area, added conditional GOM closure areas and increase haddock trip limit to 3,000 lb	**Mixed** Increased haddock directed fishing effort while also reducing effort via closure areas	**Mixed** Increased effort on haddock could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure areas	**Mixed** Increased haddock effort could increase interactions but somewhat offset by effort reductions via closure areas	**Indirect Low Positive** Minor positive impacts from closure areas	**Mixed** Short term positive from increased haddock trip limit but negative impacts resulting from closure areas

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Interim Action (Settlement Agreement; 2002)	Restricted DAS use, modified DAS clock for trip vessels, added year-round closure of CLCA, expanded rolling closures, prohibited front-loading DAS clock, increased GOM trawl and gillnet mesh size, added new limitations on Day gillnets and further restricted charter/party vessels	**Direct High Positive** Implemented substantial directed fishing reductions	**Indirect High Positive** Implemented substantial directed fishing reductions which also reduced discards/bycatch	**Indirect Positive** Fishing reductions and expanded closure areas reduce protected species interactions	**Indirect High Positive** Fishing reductions and expanded closure areas reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but positive regarding the long term sustainability of the fishery

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Interim Action (Settlement Agreement Continued; 2002)	Continued above interim measures, further reduced DAS allocations, prohibited issuance of additional handgear permits, eliminated GOM Jan and Feb closures, increased SNE trawl and GB/SNE gillnet mesh sizes, further limited day and trip gillnets, added longline gear restrictions, added possession limit and restrictions on yellowtail catch and increased GOM cod daily trip limit to 500/4,000 lb max	**Direct High Positive** Implemented substantial directed fishing reductions	**Indirect High Positive** Implemented substantial directed fishing reductions which also reduced discards/bycatch	**Indirect Positive** Fishing reductions reduce protected species interactions	**Indirect Positive** Fishing reductions reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Amendment 13 (2004)	Adopted new rebuilding periods and a new rebuilding program that included periodic adjustments and default DAS reductions to reduce effort over time, allowed DAS to be leased or transferred, created sector allocation and special access programs to allow access to stocks that can support an increase in catch	**Direct High Positive** Implemented substantial directed fishing reductions	**Mixed** Implemented substantial directed fishing reductions which also reduced discards/bycatch. However, the mores stringent restrictions created pressure to direct on other stocks (e.g., monkfish)	**Indirect Positive** Fishing reductions reduce protected species interactions	**Indirect Positive** Fishing reductions reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive
P, Pr, RFF Framework 40A (2004)	Created additional SAPs to target healthy stocks	**Direct Positive** Directing effort toward healthy stocks relieved pressure on stocks of concern	**Indirect Negative** Increased bycatch of monkfish and skates	**Negligible** Although effort increased slightly, no effort shifts impacting protected species are known to have occurred	**Negligible** Although effort increased slightly, no effort shifts impacting habitat are known to have occurred	**Indirect Positive** Provided vessels the opportunity for greater revenue while relieving pressure on stocks of concern

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Framework 40B (2005)	Relaxed DAS leasing and transfer requirements, created new yellowtail flounder SAP, provided greater opportunity for vessels to participate in the GB Cod Hook Sector, removed the net trip limit for gillnets, etc.	**Negligible** Mix of alternatives, some of which slightly increased effort and others that slightly decreased effort. Overall, changes did not threaten rebuilding targets established by Amendment 13	**Indirect Low Negative** Mix of alternatives that primarily had little impact on discards/bycatch with the exception of removing the net trip limit for gillnets which increased monkfish effort	**Negligible** Slight effort changes did not have measurable impacts to protected species	**Negligible** Slight effort changes did not have measurable impacts to habitat	**Indirect Low Positive** Slight changes to the leasing and transfer programs along with greater opportunities to participate in SAPs provides an opportunity for greater revenue
P, Pr, RFF Framework 41 (2005)	Allowed for participation in the Hook Gear Haddock SAP by non-Sector vessels	**Direct Low Positive** Encouraged effort on haddock, a healthy stock, and thus away from other stocks of concern	**Indirect Low Negative** Although directed effort shifted to a healthier stock, there was an overall effort increase resulting in a greater opportunity for bycatch/discards	**Negligible** Slight effort changes did not have measurable impacts to protected species	**Negligible** Slight effort changes did not have measurable impacts to habitat	**Indirect Low Positive** Greater opportunity to fish for a healthy stock provides increased revenue

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
[P] Emergency Action (2006)	Implemented differential A DAS of 1.4:1, restricted the B Regular DAS program and US/CA Haddock SAP and reduced trip limits on cod, yellowtail, etc.	**Direct High Positive** Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	**Mixed** Effort reductions lead to reduced discards/bycatch but the B Regular DAS program increased monkfish and skate bycatch	**Negligible** Effort changes did not have measurable impacts to protected species	**Negligible** Effort changes did not have more than minimal impacts to habitat	**Mix** Short term effort reductions have a negative impact on revenues but increase long term sustainability of stocks
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[P, Pr, RFF] Framework 42 (2006)	Reduced the number of A DAS available, modified differential DAS counting to 2:1 in the GOM and SNE, reduced trip limits for several stocks, increased recreations minimum fish sizes, required use of VMS by all vessels, modified the SAPs, limited the bycatch of monkfish and skates for vessels using a haddock separator trawl, etc.	**Direct High Positive** Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	**Indirect Positive** Effort reductions lead to reduced discards/bycatch and measures were implemented to control monkfish and skate bycatch	**Indirect Low Positive** Overall effort reductions have a positive impact, particularly to protected species in high use areas such as the GOM and SNE where strict differential counting rules are in effect	**Indirect Low Positive** Overall effort reductions have a positive impact	**Mixed** Effort reductions have a significant negative impact to vessel owners and communities, primarily due to loss of revenues. Over the long term however, stocks should remain sustainable

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Framework 43 (2006)	Established a haddock incidental bycatch limit in the herring fishery on GB	**Mixed** While the incidental haddock allowance allows some legal catch of haddock which has a negative impact, the area is closed after the bycatch cap is reached which prohibits further harvest (positive impact)	**Negligible** The herring fishery is fairly clean and the increased haddock bycatch problem arose from strong 2003 and 2004 year classes. Allowing legal retention of haddock bycatch should not alter fishing practices in a manner that would impact species taken as bycatch	**Negligible** Although attaining the bycatch cap could reduce effort on GB, the extent of this reduction was not expected to have an overall impact on protected species	**Negligible** Gear used to target herring have been found not to have an impact on habitat	**Mixed** Allowing herring vessels to continue fishing practices on GB has a positive impact on those vessels and communities. However, the loss of the potential haddock catch has a negative impact on fishermen targeting groundfish
RFF Framework 44 (2010)	Would set ACLs, establish TACs for transboundary U.S./CA stocks, and possibly make adjustments to trip limits/DAS measures	**Unknown** Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability	**Unknown** Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability	**Unknown** Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability thus potentially reducing opportunities for interactions with protected species	**Unknown** Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability thus potentially reducing effort and gear impacts	**Negative** Analysis is not complete however, negative short-term impacts are likely as any further effort reductions would further reduce revenues

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
RFF Sector EAs (2010)	Sector EAs would be prepared for each sector approved under this Amendment. These documents would assess impacts from exemptions granted to individual sectors that go beyond the universal exemptions	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Low Positive** Because one of the intents of sectors is to provide participants greater freedom to maximize their operations, revenues would be expected to be slightly higher
OTHER FISHERY-RELATED ACTIONS						
P, Pr, RFF Atlantic Sea Scallop FMP – a series of amendment and framework actions from the mid-1990s through the present	Implementation of the Atlantic Sea Scallop FMP and continued management of the fishery, primarily through effort controls	**Direct Positive** Effort reductions taken over time have resulted in a sustainable scallop fishery	**Indirect Positive** Effort reductions taken over time also reduced bycatch, including gear modifications that improved bycatch escapement	**Mixed** Effort reductions taken over time reduced interactions with protected species however, turtle interactions remain problematic	**Indirect Positive** Effort reductions reduced gear contact with habitat and the current rotational access program focuses fishing effort on sandy substrates which are less susceptible to habitat impacts	**Indirect Positive** Initial negative impacts due to effort reductions have been supplanted by a sustainable, profitable fishery

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
OTHER FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Monkfish FMP – a series of amendment and framework actions from implementation of the FMP in 1999 through the present	Implementation of the monkfish FMP and continued management of the fishery, primarily through effort controls	**Direct Positive** Effort reductions have resulted in a fishery that is no longer overfished, nor is overfishing occurring	**Indirect Positive** Effort reductions taken over time also reduced bycatch	**Indirect Positive** Reducing effort reduced opportunities for interactions with protected species	**Indirect Positive** Reducing effort reduced opportunities for habitat interactions	**Indirect Positive** Reducing effort has created a sustainable fishery
Pr, RFF Large Whale Take Reduction Plan Amendment (2008)	Removed the DAM program, will implement sinking ground lines for lobster gear, includes more trap/pot and gillnet fisheries under the protection plan and requires additional markings on gear to improve information regarding where and how entanglements occur	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on groundfish	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on non-groundfish species	**Direct Positive** New regulations implemented to protect large whales are expected to have a positive impact on large whales by reducing incidental takes	**Negligible** Changes implemented through the amendment are not expected to have substantial changes to habitat	**Indirect Negative** Changes implemented through the amendment require some gear changes for gillnet fisheries which have minor negative economic impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
OTHER FISHERY-RELATED ACTIONS CONTINUED						
RFF Harbor Porpoise Take Reduction Plan Amendment (~2010)	Options are currently under development to reduce takes of harbor porpoise toward the long-term zero mortality rate goal	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact groundfish	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact non-groundfish species	**Direct Positive** Changes to protect harbor porpoise have a positive impact on protected species	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact habitat	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact human communities
RFF Essential Fish Habitat Omnibus Amendment (~2010/2011)	This amendment would revised EFH designations for all New England fisheries, possibly establish new HAPCs and consider measures to further protect critical habitat	**Unknown** If new measures are implemented to protect habitat, they would likely have a positive impact on groundfish	**Unknown** If new measures are implemented to protect habitat, they could have a positive impact non-groundfish species	**Unknown** If new measures are implemented to protect habitat, they could potentially impact protected species	**Direct Positive** New measures implemented to protect habitat would have a positive impact on habitat	**Unknown** If new measures are implemented to protect habitat, they would likely impact human communities
RFF Amendment 3 to the Skate FMP (2010)	This amendment would address rebuilding of winter and thorny skates and reduce mortality on little and smooth skates	**Unknown** If actions are taken to reduce skate mortality, they could impact groundfish	**Unknown** If actions are taken to reduce skate mortality, they could impact non-groundfish species	**Unknown** If actions are taken to reduce skate mortality, they could impact protected species	**Unknown** If actions are taken to reduce skate mortality, they could impact habitat	**Unknown** If actions are taken to reduce skate mortality, they could impact human communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
NON FISHERY-RELATED ACTIONS						
P, Pr, RFFA Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability and can lead to reduced income from fishery resources
P, Pr, RFFA Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
NON FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFFA Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Positive** Improves beaches and can help protect homes along the shore line
P, Pr, RFFA Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFFA Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Initially reduced habitat quality in the immediate project area	**Mixed** End users benefit from improved pipelines, cables, etc., but reduced habitat quality may impact fisheries and revenues

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
NON FISHERY-RELATED ACTIONS CONTINUED						
Pr, RFFA Liquefied Natural Gas (LNG) terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several LNG terminals are proposed, including ME, MA, NY, NJ and MD)	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Mixed** End users benefit from a steady supply of natural gas but reduced habitat quality may impact fisheries and revenues
RFFA Offshore Wind Energy Facilities (w/in 5 years)	Construction of wind turbines to harness electrical power (Several facilities proposed from ME through NC, including off the coast of MA)	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Mixed** End users benefit from a clean energy production but reduced habitat quality may impact fisheries and revenues

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

October 16, 2009

Ms. Pat Kurkul
Northeast Regional Administrator
NMFS/NOAA
55 Great Republic Drive
Gloucester, MA 01930

RE: Final Amendment 16 to the Northeast Multispecies Fishery Management Plan including an Environmental Impact Statement

Dear Pat:

On June, 2009, the Council approved Amendment 16 to the Northeast Multispecies Fishery Management Plan. Pleas accept submission of this amendment. Enclosed you will find six bound copies, one color master and twenty CDs of Final Amendment 16 to the Northeast Multispecies Fishery.

Council member David Goethel submitted a minority report on Amendment 16 pursuant to section 302(e) (4). That letter is attached as part of the submission package. I have also attached the Council Chair's reply to this letter. Please consider both letters as you review this amendment.

We appreciate the assistance the Regional Office and the Northeast Fishery Science Center staff provided for this Amendment. We look forward to working with them in the future.

Please call me if you have any questions.

Sincerely,

Paul J. Howard
Executive Director

enclosures

David T. Goethel
23 Ridgeview Terrace
Hampton, NH 03842

June 27, 2009

Honorable Gary Locke,
Secretary
Department of Commerce
Washington, DC

Dear Mr. Secretary,

Pursuant to section 302(e)(4), I am submitting a minority report requesting that you remand sections 4.3.3.3.4 (Sector Baseline Calculations) and 4.3.5 (Allocation to commercial/ and recreational fisheries) of Amendment 16 to the Northeast Multispecies Plan, back to the New England Fisheries Management Council (NEFMC) for reconsideration.

Congress has clearly and repeatedly established that making fair and equitable allocations among various user groups is a fundamental priority of US fishery management policy. It is also clear they anticipated that different sectors of the fishery might try to use the Council political process to secure unfair allocations that could be highly disruptive to the affected fisheries and fishing communities. Consequently, Congress has placed an extraordinary level of emphasis on ensuring such fairness and equity is achieved in the following provisions:

Section 301(a)(4) also known as National Standard 4:

"(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."

Section 303(a)(14), Required Provisions:

"Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, shall--

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably

among the commercial, recreational, and charter fishing sectors in the fishery and"

Section 304(e)(4), Rebuilding Overfished Fisheries:
"(4) For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations prepared pursuant to paragraph (3) or paragraph (5) for such fishery shall—

(B) allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery; and"

Adding to Congressional emphasis on this policy, there are numerous additional references to the need to achieve fairness and equity throughout the Magnuson-Stevens Fishery Conservation and Management Act.

Recent votes of the NEFMC, in my opinion, violated these specific provisions and fundamental statutory policy by allocating to the two existing commercial fishery sectors their best 5 year period of Georges Bank cod and to the recreational fishery it's historic 5 year high allocation of Gulf of Maine cod and haddock. The remainder of the commercial fishery was allocated the period of 1996-2006 based on catch history. Since two user groups received their historic high allocation of the most important New England groundfish species then, effectively, all other fishermen received less. Such allocations are neither fair nor equitable. They will provide an excessive share of the fishing privileges to a select few fishermen. They will be highly disruptive to the affected fisheries and fishing communities.

This problem could have been easily remedied by establishing a common, fair and equitable baseline of 1996-2006 for all user groups. Although this point was made repeatedly by Council members at the recent Council meeting, the message was lost in the din of special interest groups clamoring for more than their fair share of the allocation. The result was a particularly large reduction in Gulf of Maine cod for the vast majority of commercial fishermen.

Left in its present form I believe this allocation scheme will almost certainly result in a lawsuit that could hold up implementation of Amendment 16. To paraphrase one fisherman who is part owner of three headboats, one six passenger charter boat, and a commercial boat; "Even though our business won big time, what was the Council thinking?....anyone with half a brain would see this is unfair...." Disenfranchised commercial fishermen are using a three word sentence, not fit for inclusion in a public document, to describe their unfair treatment by these allocation measures. Council member David Goethel voted against submission of Amendment 16 package because I believe the allocation decision is a fatal flaw in an otherwise well developed amendment that is full of painful and very difficult decisions.

Because Amendment 16 is vital to ongoing efforts to rebuild New England's groundfish stocks I urge the Secretary to remand the above referenced sections back to the New England Fisheries Management Council with clear instructions to put all user groups on a level playing field and comply with Congressional policy so clearly stated in the statute. I urge this action be taken prior to publication of Amendment 16 as a proposed final rule. While this may delay the implementation date by several months, this would be preferable to potentially having the Amendment held hostage for months in Federal court.

I do not undertake submitting this report lightly but feel that the Council process must remain transparent, fair and equitable to all user groups. The truth is that disenfranchised fishermen have less interest in rebuilding fish stocks and consequently make management more challenging.

Sincerely,

David T. Goethel

David T. Goethel
Member
New England Fishery Management Council

New England Fishery Management Council
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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

August 12, 2009

Honorable Gary Locke
Secretary Department of Commerce
1401 Constitution Ave., NW
Washington, DC 20230

Dear Mr. Secretary,

In accordance with the New England Fishery Management Council's policy on minority reports, the Council's Executive Committee has provided the following comments on the enclosed minority report submitted by member David Goethel.

Mr. Goethel addressed two issues in his minority report. The first issue concerns the vote on the sector baseline issue. The vote on this issue was 12 in favor, 4 opposed (including Mr. Goethel) and one abstention.

The 1996-2006 baseline for new sector members was chosen as the best method for ensuring a fair and equitable allocation using as much sound data as possible. In addition to seeking a fair method of allocation, the Council also has a stated interest in promoting stability in the fishery and fostering an environment where sectors can create efficient and effective business plans. Amendment 13 gave the existing sectors an allocation of Georges Bank (GB) cod (using years 1996-2001) that was the basis of their operations and planning, and that amendment contemplated freezing baselines once an allocation was created. The Council reiterated its commitment to promoting stability through frozen baselines by motion at its June 2009 meeting. Thus, the decision to maintain the existing allocation of GB cod to existing sectors was not arbitrary, but rather was an iteration of an important Council objective. It should also be noted that the use of this allocation period over the longer one resulted in only a small quantitative difference with regards to the amount of GB cod that was actually allocated to the existing sectors.

The second issue addressed by Mr. Goethel concerns the allocation between recreational and commercial fishermen. The vote on this issue was 11 in favor, 5 opposed (including Mr. Goethel) and one abstention.

First and foremost, this allocation is entirely separate from and unrelated to the baseline calculation for Potential Sector Contributions. The Council's decision to use the more recent time period reflected considerations of potential inaccuracy in recreational catch data in earlier years. Futhermore, history from the more recent time period is more consistent with current conditions in the fishery. It is more representative of where the fishery is at present, and where it is likely to be going in terms of the proportions caught by the two components of the fishery. Differential management actions that affected the two components in years prior to the chosen allocation period created uneven conditions that are not reflective of the current state of the fishery. As noted by the Groundfish PDT in its July 14, 2008 report to the Oversight Committee, "It is difficult to compare the impacts of different sets of regulations between components of the fishery." The recent years were therefore chosen as the most reliable indicator of future fishing practices.

Sincerely,

John Pappalardo
Chairman

enclosure

Appendix II

Closed Area Model

Description and Performance

The Closed Area Model

Management measures considered under this action include trip limits, differential days-at-sea counting, seasonal area closures and an overall days-at-sea reduction through changing the A/B day split. As with Amendment 13, and Framework 42, one of the primary analytic tools used to analyze both the biological and economic impacts of the proposed alternatives to achieve mortality objectives is the closed area model (CAM). The CAM projects changes in mortality brought about by area closures, revised trip limits and changes in days-at-sea through a non-linear programming model using the General Algebraic Modeling System (GAMS). The CAM was designed so that the impact of all three types of management measures can be analyzed ***simultaneously***. There are no other models currently available which can analyze the combined impact of reductions in days-at-sea, closed areas and trip limits simultaneously. Management measures, such as mesh size changes, special access programs, or the use of "B" days-at-sea cannot be analyzed within the CAM. However, they can be analyzed outside the CAM, and the results incorporated in the analysis. Additionally, the CAM is a **one-year** model, meaning that it only estimates changes for a one-year period. The main utility in using the CAM is to evaluate management alternatives when mortality needs to be reduced to meet rebuilding targets.

The CAM allocates effort to specific block, month combinations for each vessel holding a valid year 2007 multispecies permit, and landing groundfish in 2007. The model maximizes profit for each vessel by allocating their effort to the highest profit blocks. Because the revenue functions embedded in the model are downward sloping, effort stops flowing to a block when marginal profit hits zero. The model can incorporate changes in allowable days at sea, trip limits, and differential days at sea and changes in CPUE by species and stock area.

In order to assess the impact of the proposed suite of management measures, an initial model run is made to calibrate model parameters to approximate the distribution of effort based on observed effort levels. Once this process is complete, another model run is made with the management measures from the status quo management regime included as constraints. Subsequent runs are then made for each proposed alternative, where an alternative is a complete set of management measures. The estimated catch from each option is compared to the status quo catch, and the percentage change in landings is calculated. These numbers are be interpreted as the percent change in exploitation brought about by the proposed management action. The percent change in exploitation is then converted to a percent change in F, and that number is compared to the needed change in F based on the stock status. For example, if the stock assessment concluded that stock x needed a 50% reduction in F, and the closed area model results indicated that the management measures would yield a 51% reduction, then that particular option would be considered adequate to meet the mortality reductions.

Changes in the Closed Area Model

The closed area model has been modified, based on external peer reviews, and comments received as part of the PDT deliberations from the original model used in Amendment 13. The first set of changes took place prior to use of the model for Framework 42, and was based on the advice of the external reviewers during the economic and social science peer review in January, 2004 (http://www.nefsc.noaa.gov/groundfish). The first change was to incorporate costs in the model so each vessel would maximize profit, as opposed to revenue. The second change concerned choice of fishing location. Previously, vessels were restricted to fishing in block-month combinations where records showed they fished. Now, vessels are allowed to shift their effort to blocks where they hadn't fished previously based on the fishing locations of similarly configured vessels from their fishing ports. Thirdly, the total amount of effort available to a fishing vessel is now based on their fishing year allocation. This differs from previous versions where vessels were allocated their average days-at-sea used over a four year period. By allowing vessels to fish up to their allocated effort, the possibility latent effort could be activated is now incorporated in the model. Finally, the model was run 250 times for each option incorporating a stochastic CPUE for each species-block-month-gear combination. Thus, the median (50th percentile) outcome could be reported rather than relying on a single point-estimate. This was consistent with the percentiles that are reported for the rebuilding trajectories, and with the target that is used for reducing fishing mortality.

Subsequent to Framework 42, several additional improvements were made based on deliberations made by the Plan Development Tam (PDT), and also the availability of better spatial data. The first change was to use 2007 VMS data to construct effort locations, resulting in greater spatial coverage for each vessel. This allowed use of a single year of data rather than a range of years. Secondly, lease information was explicitly considered for each vessel based on past leasing behavior. Vessels were given an increase in their days-at-sea allocation if they leased days from other vessels during 2007, and had days subtracted if they leased days to other vessels. Thirdly, cost and discard data from vessels fishing in 2007 were used in the model. Fourthly, the opportunity cost of labor was included in the model as part of the cost function. An hourly rate was converted into a daily rate based on a manufacturing wage rate of $20 per hour. This is because crew needs to earn income in order for them to fish. Fifthly, only one iteration using a mean CPUE was conducted for each management option. This was because the stochastic version of the model used in Framework 42 resulted in very narrow confidence intervals on the catch distribution. Thus, additional information was not being gained by using the stochastic version of the CAM. Finally, and perhaps most importantly, profit per block was estimated based on all species caught by a gear type, and not just groundfish species. This resulted in higher revenues per block and month than if just groundfish species were included. This change also assured that species like monkfish and skates that require use of a groundfish DAS were included.

Closed Area Model Performance

An earlier version of the CAM was used to evaluate the biological and economic impacts of the management measures proposed in Amendment 13. The estimates published in

Amendment 13 were compared to realized estimates of fishing mortality. The results shown below are based on the analysis done for Amendment 13.

Biological Impacts

One of the inputs for the CAM used to analyze measures for Amendment 13 was the number of DAS used. Since more DAS are allocated to vessels than are used, and since other measures (DAS leasing, the DAS transfer program) made it uncertain how many DAS would be used, the CAM was run with three different scenarios on DAS use. The conclusion was that fishing mortality targets would be met under all three assumptions, though at the higher level of DAS use there was more uncertainty in the results, particularly for two stocks: GOM cod and witch flounder. The results of the CAM reflect a change in exploitation, which is converted into a change in fishing mortality while taking into account other management measures - such as changes in mesh size –that cannot be incorporated into the model. Amendment 13 also cautioned that the model results should not be considered as point estimates, but reflected the likelihood of achieving management targets..

Evaluating the performance of the model with respect to fishing mortality is complicated for several reasons. First, fishing mortality is based on the calendar year, while management measures are designed for a fishing year. Since Amendment 13 was implemented on May 1, 2004, the mortality estimates determined by GARM II for calendar year 2004 do not reflect a full year under Amendment 13 regulations. Second, as described in GARM II, the assessments of several groundfish stocks exhibit retrospective patterns; that is, the fishing mortality estimated in the terminal year of the assessment is typically revised in later assessments when additional years of data are added to the assessment. In most cases, the original terminal year estimate of mortality is under-estimated compared to subsequent estimates of fishing mortality for the same year. These retrospective patterns, however, are not always consistent in magnitude or direction between assessments. The CAM predicts changes in exploitation/fishing mortality. The determination whether those changes are large enough to meet mortality targets relies on measuring those changes from the most recent estimate of mortality. If that estimate of mortality is in error or is later revised, the model may correctly predict the magnitude of a change but mortality targets may still be exceeded. Finally, the model is used to assess how three distinct management measures -- days at sea changes, trip limits and area closures, interact to change fishing exploitation rates, which are then converted into changes in fishing mortality (F). Management measures which are imposed in addition to the three main measures, such as mesh size changes, need to have their potential impact on F estimated outside the model, and then incorporated into the CAM results. Measures such as the eastern Georges Bank resource sharing agreement with Canada also have the potential to influence the realized versus the predicted outcome from the CAM. For example, closing the eastern portion of Georges Bank when a TAC is met can force vessels to shift their effort to inshore locations. Because TAC management is not an option in the CAM, the shift in effort would not be predicted by the CAM, and therefore the realized changes in F may be different than what was predicted.

The model results are reported below (Table 1). Amendment 13 predictions of changes in fishing mortality that assumed a 39% and a 50% reduction in used DAS are compared to the GARM II estimates of CY 2004 fishing mortality. Actual DAS use in FY 2004 approached a 50 percent reduction in used DAS. For major stocks with age-based assessments, the predictions are also compared to Groundfish PDT estimates of CY 2004 mortality based on preliminary landings information (see the biological impacts discussion in FW 42 for details). Two comparisons are made for GB yellowtail flounder since two assessments were accepted by GARM II.

When compared to the change in mortality between CY 2001 and CY 2004 mortality (which reflects only eight months under Amendment 13 management measures), the CAM model accurately predicted the change in mortality (direction and relative magnitude) that would result from Amendment 13 for six stocks: GB cod, witch flounder, plaice, GOM winter flounder, SNE/MA winter flounder, and GOM/GB windowpane flounder. The model correctly predicted the direction of change, but not the relative magnitude, for three additional stocks: CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and white hake. The model did not accurately predict the direction of change for eight stocks: GB haddock, GOM haddock, GOM cod, GB yellowtail flounder, GB winter flounder, pollock, SNE/MA windowpane flounder, and halibut. Mortality for redfish is too low to draw meaningful conclusions on model performance.

The first full calendar year under Amendment 13 management measures was 2005. The Groundfish PDT used six months of preliminary landing statistics to estimate the likely fishing mortality for CY 2005 for nine stocks that have age-based assessments and associated projections. The uncertainty associated with these estimates is described in FW 42. Based on these estimates, the CAM appears to have underestimated the reduction in mortality for four stocks: GB cod, GB yellowtail flounder, witch flounder, and SNE/MA winter flounder. Model results appear accurate for three stocks: CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, and plaice, while the model over-estimated the mortality reduction for GB haddock and GOM cod.

Over-estimates of the mortality reduction for GB haddock (CY 2004 and CY 2005), GB winter flounder (CY 2004), and GB yellowtail flounder (CY 2004) may be explained by the CAII yellowtail flounder SAP and the Category B (regular) DAS program. These programs were not modeled by the CAM, and these three stocks were targeted in all three programs. At the time of development of Amendment 13, fishing mortality for GB yellowtail flounder was believed to be less than half of F_{MSY}; recent GARM II estimates indicate that fishing mortality in 2001 was threefold higher than F_{MSY}. Measures in Amendment 13 were based on the GARM I estimate and the CAII SAP was created to allow fishing mortality on this stock to increase. Amendment 13 analysis cautioned that the catch of GB winter flounder would also likely increase as a result of these programs.

The CAM results for GOM cod cannot be readily explained. GARM II noted that the fishery in CY 2004 was targeting weak year classes, but it is not certain if this entirely explains the difference between the model results and mortality changes. The DAS leasing program also contributed to increased GOM cod catches, but analysis suggests these increases were relatively minor. Additionally, the US-Canada resource sharing agreement, and subsequent management of some stocks with hard TACs may have caused a shift of effort to inshore waters. This may also explain the underestimate of the mortality reduction for GB cod and yellowtail flounder, since vessels were prohibited from the eastern part of Georges bank once the yellowtail flounder TAC was met.

From the standpoint of biological objectives, the CAM used for Amendment 13 appears to have adequately determined the changes in mortality that would result for most stocks, the exception being GOM cod. While the model appears to have correctly characterized the changes for CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, SNE/MA winter flounder, and white hake, GARM II revised the estimate of 2001 mortality for those stocks and as a result the mortality targets were not met in 2004 and will probably not be met in 2005.

Table 1 – Comparison of changes in fishing mortality to Amendment 13 estimates

	GARM II		PDT Estimate	Fishing Mortality, Percent Change from 2001 to:		A13 Estimated Mortality Reduction	
Stock	**2001**	**2004**	**2005**	**2004**	**2005**	**50% DAS**	**35% DAS**
GB Cod	0.58	0.24	0.16	-59%	-72%	-49%	-42%
GB Haddock	0.18	0.24	0.18	33%	0%	-41%	-30%
GB Yellowtail(1)	0.91	1.19	0.2	31%	-78%	-36%	-28%
GB Yellowtail(2)	0.8	1.75	0.4	119%	-50%	-36%	-28%
SNE/MA Yellowtail	1.83	0.99	0.58	-46%	-68%	-65%	-56%
CC/GOM Yellowtail	1	0.75	0.48	-25%	-52%	-69%	-63%
GOM Cod	0.36	0.58	0.34	61%	-6%	-47%	-38%
Witch Flounder	0.631	0.199	0.13	-68%	-79%	-53%	-42%
Plaice	0.33	0.15	0.14	-55%	-58%	-51%	-42%
GOM Winter Flounder	0.58	0.13		-78%		-50%	-34%
SNE/MA Winter Flounder	0.85	0.38	0.27	-55%	-68%	-49%	-37%
GB Winter Flounder*	1.25	1.86		49%		-38%	-28%
White Hake	1.36	1.18		-13%		-42%	-32%
Pollock	3.53	3.51		-1%		-40%	-31%
Redfish							
Ocean Pout	0.007	0.003		-57%			
GOM/GB Windowpane	0.05	0.04		-20%		-30%	-23%
SNE/MAB Windowpane	0.38	0.44		16%			
GOM Haddock	0.12	0.18		50%		-43%	-33%
Halibut	0.06	0.09		50%			

CAM Performance for Framework Adjustment 42

As noted, the CAM was also used to design management measures for FW 42 so the expected impacts of those measures on fishing mortality as estimated by the CAM were compared to realized changes in fishing mortality. When FW 42 was developed, the most recent assessment estimated fishing mortality for 2004. An estimate of 2005 catches was used to estimate fishing mortality for each stock. Based on these estimates of fishing mortality and the differences between those values and the rebuilding targets, FW 42 measures were designed to achieve changes in fishing mortality for seven stocks. These targeted chances were compared to the changes in mortality documented by the GARM III results. Since FW 42 was not implemented until late in 2006 and it is unrealistic to expect the measures would have achieved the targeted reductions for the entire year, the comparisons are made between 2005 and 2007(Table 2). The PDT cautions that the terminal year estimates of mortality – in this case, for 2007 – may be in error even though adjusted for retrospective patterns by GARM III. These comparisons show that the realized reductions in mortality were similar to the targeted reductions for five of the stocks, but exceeded the targeted reductions for GB cod and white hake.

FW 42 also estimated changes in mortality expected to result from the FW 42 measures for a larger group of stocks (essentially all stocks included in the closed area model used to design effort control measures). These were compared to the changes that actually occurred (based on GARM III results). In general, FW 42 under-estimated the mortality reductions for GB cod, haddock, winter flounder, and yellowtail flounder but did reasonably well for estimating reductions for other stocks. Two exceptions are GOM haddock and pollock, where the framework predicted a reduction but mortality increased from 2005 to 2007. A partial explanation for the under-estimate of the impacts of the measures on the four GB stocks may be that the FW 42 analyses (the closed area model) cannot model the in –season regulation adjustments for the US/CA area. Another may be changes in operating costs that occurred over time that might have moved effort onto inshore stocks. The difference in pollock may be partly due to increased targeting of pollock in the Category B (regular) DAS program which is not included in the model.

Table 2 – Comparison of mortality reduction targeted in FW 42 and actual reduction as determined by GARM III. FW 42 targeted reductions from Table 45, FW 42.

Stock	FW 42 Targeted Reduction from 2005	Realized Reduction, 2005-2007
GB Cod	0%	-58%
SNE/MA Yellowtail	-55%	-51%
CC/GOM Yellowtail	-46%	-46%
GOM Cod	-32%	-28%
SNE/MA Winter Flounder	-9%	-11%
GB Winter Flounder	-46%	-60%
White Hake	-13%	-45%

Table 3 – Comparison of mortality change from 2005 to 2007 predicted by FW 42 and as measured by GARM III.

	FW 42 Predicted Mortality Change	Realized Mortality Change, 05-07
GB Cod	-9%	-58%
GB Haddock	1%	-26%
GB Yellowtail	-40%	-75%
SNE/MA Yellowtail	-63%	-51%
CC/GOM Yellowtail	-49%	-46%
GOM Cod	-44%	-28%
Witch Flounder	-25%	-53%
Plaice	-11%	-63%
GOM Winter Flounder	-52%	NA
SNE/MA Winter Flounder	-19%	-11%
GB Winter Flounder	-41%	-60%
White Hake	-18%	-45%
Pollock	-17%	228%
Redfish	-5%	
GOM Haddock	-22%	35%

Appendix III

An analysis of catch rates of groundfish species from a bait selectivity experiment in Closed Area I

Steven J. Correia[1]
Massachusetts Division of Marine Fisheries
June 10, 2008

This paper was produced at the request of the Cape Cod Commercial Hook Fishermen's Association by the Massachusetts Division of Marine Fisheries. Although the author is a member of the Multi-species Plan Development Team (PDT), the opinions and conclusions of this paper are independent of the PDT.

Introduction

The Cape Cod Commercial Hook Fishermen's Association has requested that the Closed Area I Hook Gear Haddock Special Access Program (SAP) area be expanded and the SAP open from May 1 to January 31. Data from a bait selectivity study (Leach and Golhor, 2005) can be used to compare expected hook fishery catch rates of groundfish in the proposed expansion with the current SAP.

However, this study was not designed to address impacts of expanding the Closed Area SAP and as such, are limiting with respect to comparing catch rates in the two areas. For example, the distribution of sets within the proposed area was based on fishermen's knowledge of sites with commercially viable catch rates of groundfish and selection did not involve random component. However, the area selected does not cover the entire proposed area (Figure 1). Similarly, the distribution of hauls by month within the proposed area is inconsistent: no data exist for January, one sample for August, and very low number of samples in May (5) and July (6) in the proposed area. Data were not collected in the proposed area in 2003, but 176 hauls were collected in the current SAP area in 2003. Bait type by area is heterogeneous especially with respect to squid (109 in current area, 2 hauls in proposed area). Finally, the data are given at the haul level rather than the trip level. I ignored the cluster sampling design of the original study and conducted the analysis at haul level. This will result in underestimating the variance, but should have no impact on the mean.

Methods

Datasets were provided by the Cape Cod Commercial Hook Association and represents data taken by trained, independent data collectors[1] during the experiment. The dataset consists of catches of species by weight and categorized as kept or discarded, as well as location of haul and number of hooks per haul. I trimmed the datasets so that characteristics (Year, Month, bait type) for both the current SAP area (Inside) and the proposed SAP area (Proposed) were similar. I selected 2004 and 2005 for years, clams, fish with binders/ casings and herring for bait, and May, June, July, August, September, November, and December for months. The trimmed dataset consists of 193 hauls within the current SAP (Inside) and 106 hauls in the proposed area. Catch weight in each haul was standardized to lb per 1000 hooks. Comparisons of the number of hauls by categories in the full dataset and trimmed dataset are shown in Tables 1-3.

I calculated 5 order statistics (minimum, 1st quartile, median, 3rd quartile, maximum) and the mean for the distribution of catch weight in a haul for each species by area. These provide useful summaries for comparing the central location and shape of the catch rate distribution among groundfish species in the current and proposed area.

I used a randomization test (1,000 replications) using t-statistic with pooled standard error to test for equality of means for catch in weight of total cod and total white hake in the proposed and inside areas.

[1] Most observers were independent contractors that were former observers in the Alaskan fisheries. A few trips were observed by NEFSC at sea observer program.

I calculated the ratio estimator statistics for each area using catch weight in pounds on each haul:

$$R_{\text{species A}} = \sum \text{lb. species A} / \sum \text{lb. haddock kept}$$

I calculated ratio estimators for total cod: haddock-kept and total white hake: haddock-kept for both the Inside and Proposed area (all months and baits aggregated). I estimated approximate 95% confidence limits using the percentile method with nonparametric bootstrap (1000 replications) and the Efron's bias corrected and accelerated method (BC_a) using 25,000 replications (Efron, 1987).

Table 1. Distribution of the number of hauls conducted in the Closed Area 1 SAP (Inside) and the proposed expanded SAP area (Proposed) by year for the full and trimmed dataset.

	Full dataset		Trimmed dataset	
Year	**Inside**	**Proposed**	**Inside**	**Proposed**
2003	176	0	0	0
2004	295	118	186	95
2005	17	11	7	11
Total	488	129	193	106

Table 2. Distribution of the number of hauls conducted in the Closed Area 1 SAP (Inside) and the proposed expanded SAP area (Proposed) by month for the full dataset and trimmed dataset.

	Full dataset		Trimmed dataset	
Month	**Inside**	**Proposed**	**Inside**	**Proposed**
Jan	10	0	0	0
Feb	71	5	0	0
May	6	5	6	4
June	7	11	7	11
July	80	6	44	5
Aug	67	1	66	1
Sept	57	33	56	32
Oct	82	15	0	0
Nov	71	23	8	23
Dec	37	30	6	30
Total	488	129	193	106

Table 3. Distribution of the number of hauls conducted in the Closed Area 1 SAP (Inside) and the proposed expanded SAP (Proposed) by bait.

	Full dataset		Trimmed dataset	
Bait	**Inside**	**Proposed**	**Inside**	**Proposed**
Clams	4	8	4	8
Fish with binders/casings	113	55	113	45
Herring	249	63	76	53
Mackerel	4	0	0	0
Other	6	0	0	0
Squid	109	2	0	0
Unknown	3	1	0	0

Results

Summary statistics for catch per haul by species and area are given in Table 4. Haddock, cod and white hake are listed by kept, discarded and total. All other species are listed as total. Species are listed if they had a positive observation in the full dataset. Catch in weight was dominated by haddock kept (mean catch rate of 875.1 lb. in the inside area and 858 lb. in the proposed area). Catch rates for other species were nearly an order of magnitude lower (mean catch rate for total cod was 18.6 lb in the inside area and 9.8 lb in the proposed area, mean catch rate for total white hake was 11.3 lb in the inside area and 9.9 lb in the proposed area. I focused on comparing haddock, cod and white hake as catches of other species were negligible (as they were in the full dataset).

Summaries of the catch distribution by haul for kept haddock, total cod and total white hake by area for all months and bait combined are shown in Figure 2. Both the linear scale and arithmetic scale are provided to help facilitate seeing the shape of the distributions. Figure 2 suggests little difference in either central location or in distribution of catch rates between the two areas for these three species. Similarly, catch distributions by haul for haddock, total cod and total white hake by months and area and bait combined are shown in Figures 3, 4 and 5. The distributions of catches for haddock between areas appear similar for each month with the exception of May and June, where catch rates may be higher in the proposed area (Figure 3). The distribution of catch rates for total cod and white hake also appear to be similar across area for each month (Figures 4, 5). This analysis indicates that catch rates for cod and white hake are not higher in the proposed area than the current SAP (inside area).

The randomization tests indicates that total cod catch per 1000 hooks in the proposed area (10.2 lbs per 1000 hooks) are not significantly greater than in catch rates in the current SAP (18.6 lb per 1000 hooks). The observed t-statistic (-2.78) had an achieved significance level = 0.99 indicating that the total cod catch is significantly less in the proposed area than in the current SAP. The bootstrap distribution of the t-statistic along with observed t-statistic is shown in Figure 6.

Total white hake catch per 1000 hooks in the proposed area (9.9 lbs per 1000 hooks) are not significantly greater than in catch rates in the current SAP (11.3 lb per 1000 hooks). The observed t-statistic (-.60) had an achieved significance level = 0.69. The bootstrap distribution of the t-statistic along with observed t-statistic is shown in Figure 6.

Ratio estimator

Bootstrap results are summarized in (Table 6). Ratio estimators were moderately well estimated with CV ranging from 12% to 18% and with negligible bias (< 0.016 SE units or 0.6%). The distribution of bootstrap replications of the ratio estimator for total cod: haddock kept and total white hake: haddock kept are shown in Figure 7.

The ratio estimator for total cod: haddock kept inside the current SAP was 0.021 with approximate 95% BC_a confidence limits of 0.016-0.027 compared with 0.014 (0.009-0.019). The ratio estimator is well below 5% and the cod: haddock ratio estimator is not statistically higher in the proposed area than in the current SAP area.

The ratio estimator for total white hake: haddock kept inside the current SAP was 0.013 with approximate 95% BC_a confidence limits of 0.01-0.016 compared with 0.013 (0.010-0.019). The ratio estimator is well below 5% and the white hake: haddock ratio in the proposed area is not statistically higher than in the current SAP area.

Conclusions

These analyses are on a trimmed dataset from a bait selectivity study. Data limitations include incomplete spatial coverage of the proposed area, imbalance in number of hauls within months between the current SAP and proposed area, and low or no sampling in some of the months proposed for the expanded SAP. In addition, most samples are from 2004. With these caveats in mind, these analyses indicate catch rates of species in the proposed area are not higher than in the current SAP. Similarly, the ratio estimators for total cod: haddock kept and total white hake to haddock kept are below 5% and do not appear to be higher in the proposed area than in the current SAP for either cod or white hake.

Literature Cited

Efron, B. 1987. Better Bootstrap Confidence Intervals. Journal of the American Statistical Association. 82 (397) pp 171-185.

Leach, M and S. Golhor (2005) Production and Testing of an Alternative Bait Selecting for Haddock, Final Report to NEC- award #P4UZE113.

Table 4. Summary order statistics and mean for catch in weight (lb per 1000 hooks) for various species in the trimmed dataset.

Species	area	Mean	Min.	1st Quartile	Median	3rd Quartile	Max.
Haddock kept (dressed)	Inside current SAP	875.1	0.0	535.4	834.2	1179.0	2199.0
	Proposed area	858.3	9.3	360.6	721.8	1335.0	2551.0
haddock discard	Inside current SAP	4.7	0.0	0.0	2.2	6.4	70.1
	Proposed area	4.8	0.0	1.0	3.3	7.9	34.2
cod kept	Inside current SAP	18.2	0.0	0.0	0.0	23.8	198.8
	Proposed area	9.8	0.0	0.0	0.0	10.7	95.2
cod discard	Inside current SAP	0.4	0.0	0.0	0.0	0.0	23.1
	Proposed area	0.4	0.0	0.0	0.0	0.0	5.8
cod total	Inside current SAP	18.6	0.0	0.0	0.0	24.0	198.8
	Proposed area	10.2	0.0	0.0	0.0	13.1	97.8
white hake kept	Inside current SAP	11.1	0.0	0.0	0.0	15.6	135.0
	Proposed area	6.5	0.0	0.0	0.0	4.2	76.8
white hake discards	Inside current SAP	0.2	0.0	0.0	0.0	0.0	5.3
	Proposed area	3.4	0.0	0.0	0.0	2.9	106.7
white hake total	Inside current SAP	11.3	0.0	0.0	0.0	17.0	135.0
	Proposed area	9.9	0.0	0.0	0.0	11.8	106.7
yellowtail flounder total	Inside current SAP	0.0	0.0	0.0	0.0	0.0	0.0
	Proposed area	0.0	0.0	0.0	0.0	0.0	2.2
winter flounder total	Inside current SAP	0.0	0.0	0.0	0.0	0.0	0.0
	Proposed area	0.0	0.0	0.0	0.0	0.0	0.0
witch flounder total	Inside current SAP	0.0	0.0	0.0	0.0	0.0	0.0
	Proposed area	0.0	0.0	0.0	0.0	0.0	0.0
American plaice total	Inside current SAP	0.0	0.0	0.0	0.0	0.0	1.5
	Proposed area	0.6	0.0	0.0	0.0	0.0	21.1
halibut total	Inside current SAP	0.1	0.0	0.0	0.0	0.0	13.3
	Proposed area	0.0	0.0	0.0	0.0	0.0	0.0
barndoor skate total	Inside current SAP	0.7	0.0	0.0	0.0	0.0	44.4
	Proposed area	0.9	0.0	0.0	0.0	0.0	72.2
pollock total	Inside current SAP	0.2	0.0	0.0	0.0	0.0	15.7
	Proposed area	0.0	0.0	0.0	0.0	0.0	0.0
dogfish total	Inside current SAP	2.8	0.0	0.0	0.0	0.0	514.3
	Proposed area	6.5	0.0	0.0	0.0	0.0	608.8

Table 6. Ratio estimators of total white hake: haddock kept and total cod: haddock kept., Jackknife standard error (SE) and bias (in standard error units), and 95% confidence limits using the Percentile method (1000 bootstrap replications) and the Bias Corrected and Accelerated method (BCa) using 10,000 replications.

species	Area	Ratio estimator (CV)	Jackknife SE	Jackknife bias (SE units)	95% CL percentile method		95% CL BCa method	
Total white hake	Inside	0.013 (12.3%)	0.0016	0.013	0.010	0.016	0.010	0.016
	Proposed	0.013 (18.2%)	0.0024	0.004	0.009	0.018	0.009	0.019
Total cod	Inside	0.021 (13.2%)	0.0027	0.012	0.016	0.026	0.016	0.027
	Proposed	0.014 (18.7%)	0.0026	0.016	0.009	0.019	0.010	0.020

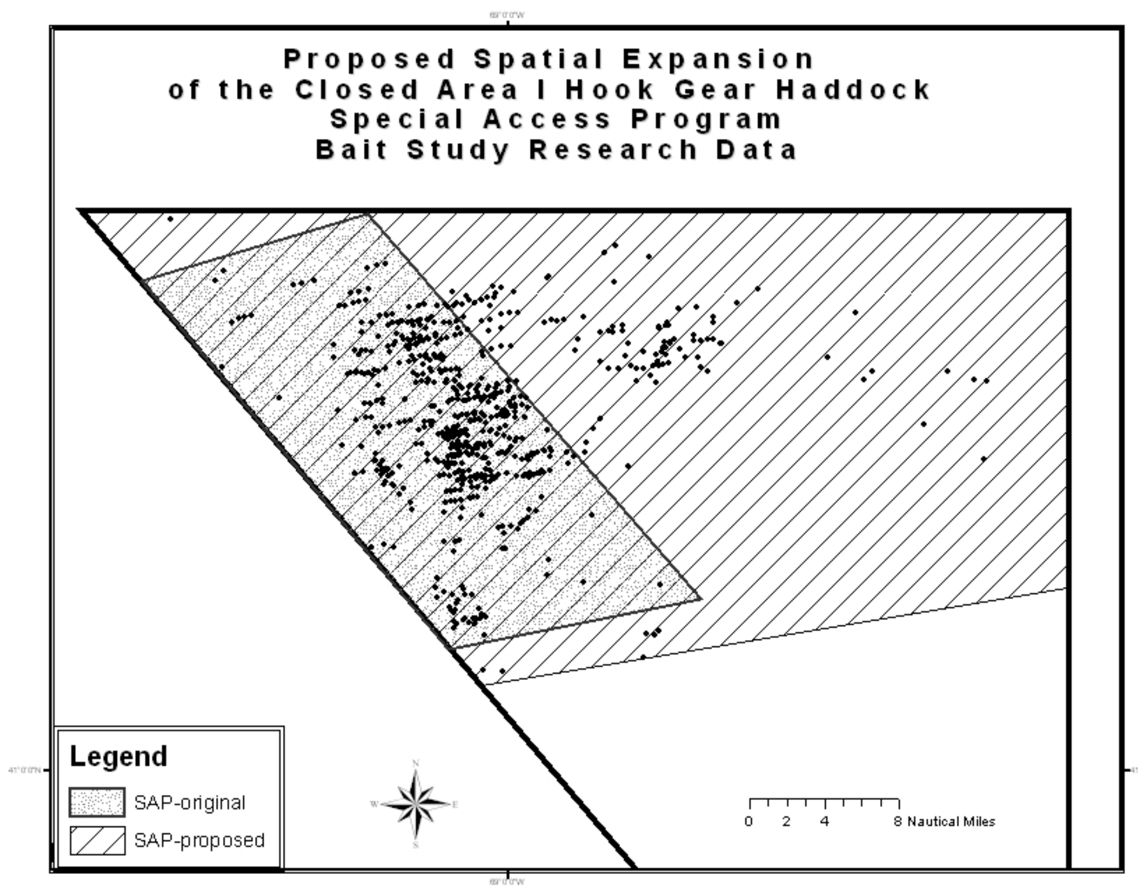


Figure 1. Location of hauls used in the bait selectivity study (Figure provided by Cape Cod Commercial Hook Fisherman's Association). This represents haul locations in the full dataset.

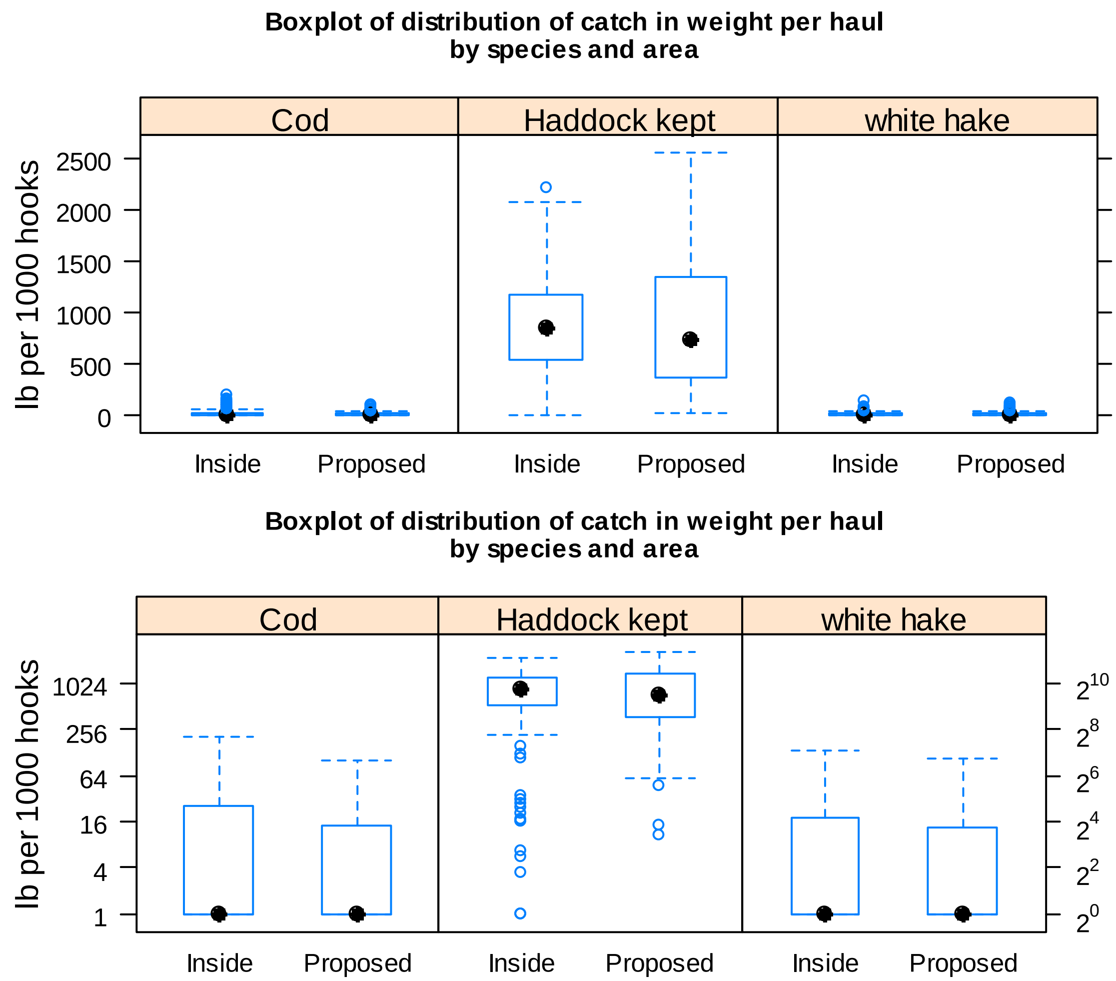


Figure 2. Boxplot of the distribution of catch in weight per haul by species and area.
Top panel: linear scale. Bottom Panel: semi-log scale. Black dot is the median, box is the interquartile range.

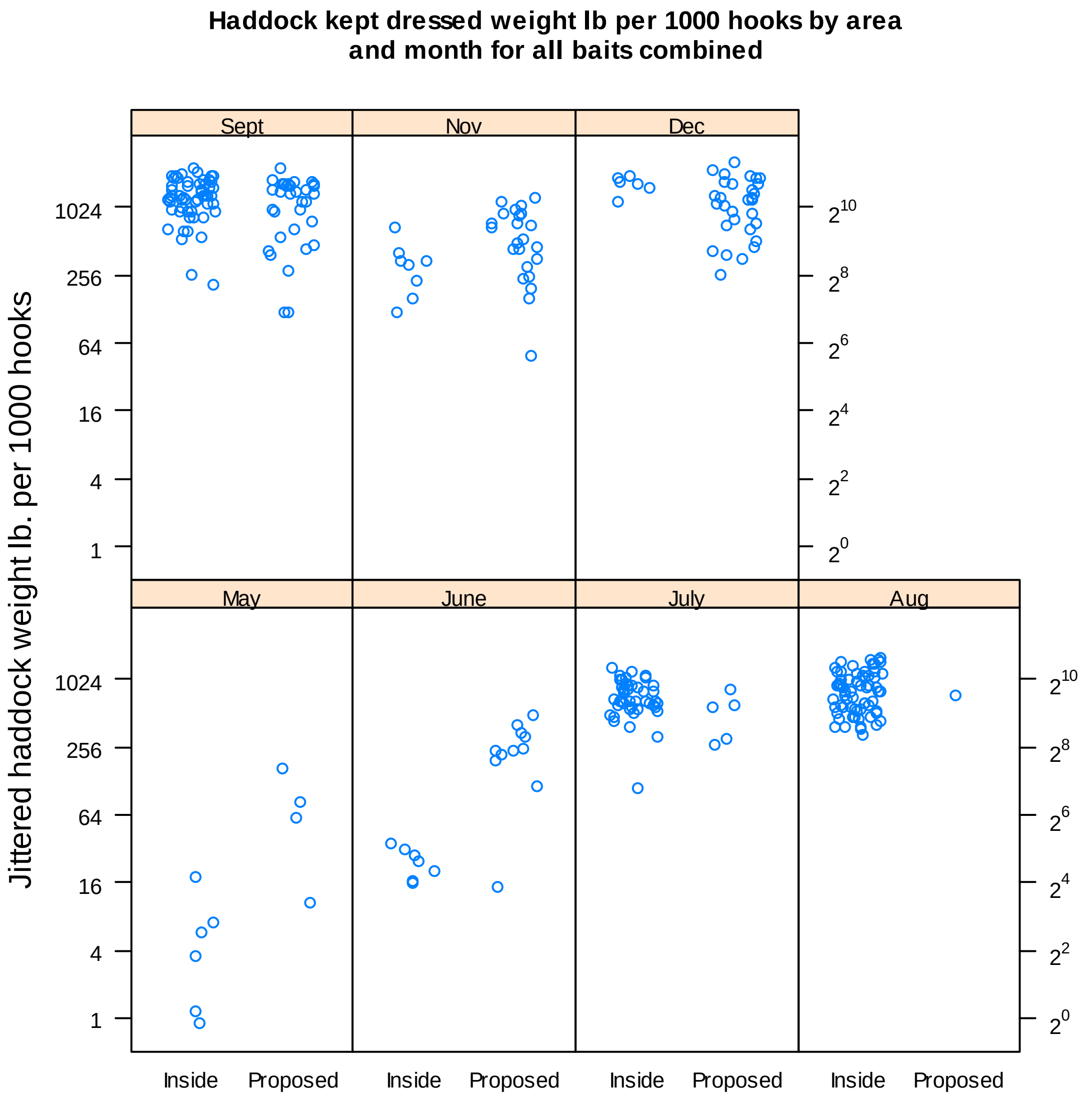


Figure 3. Distribution of catch in weight per 1000 hooks by haul for kept haddock. Note semi-log scale.

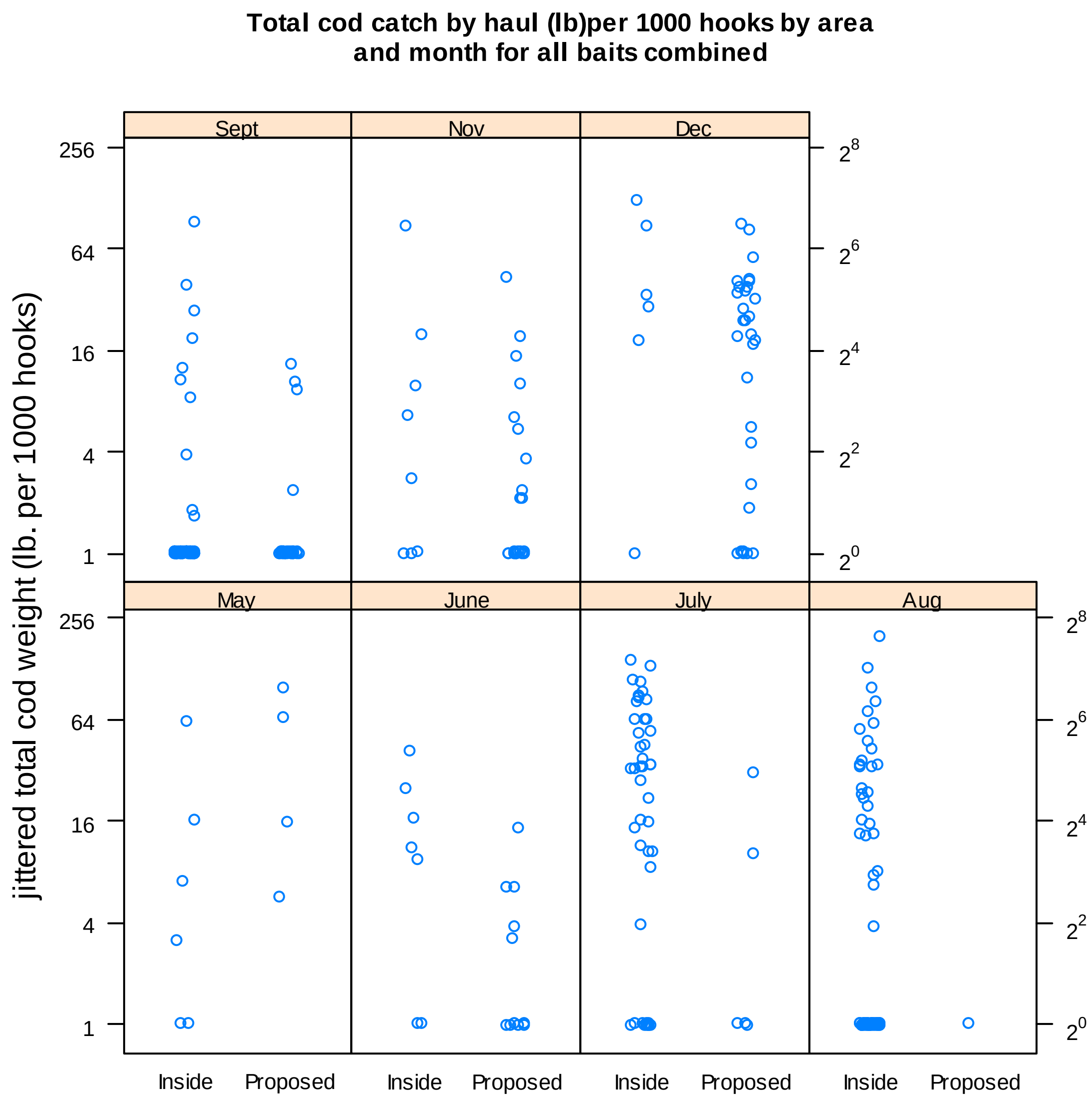


Figure 4. Jittered catch rate of total cod (weight per 1000 hooks) by month. Note semi-logarithmic scale on Y axis.

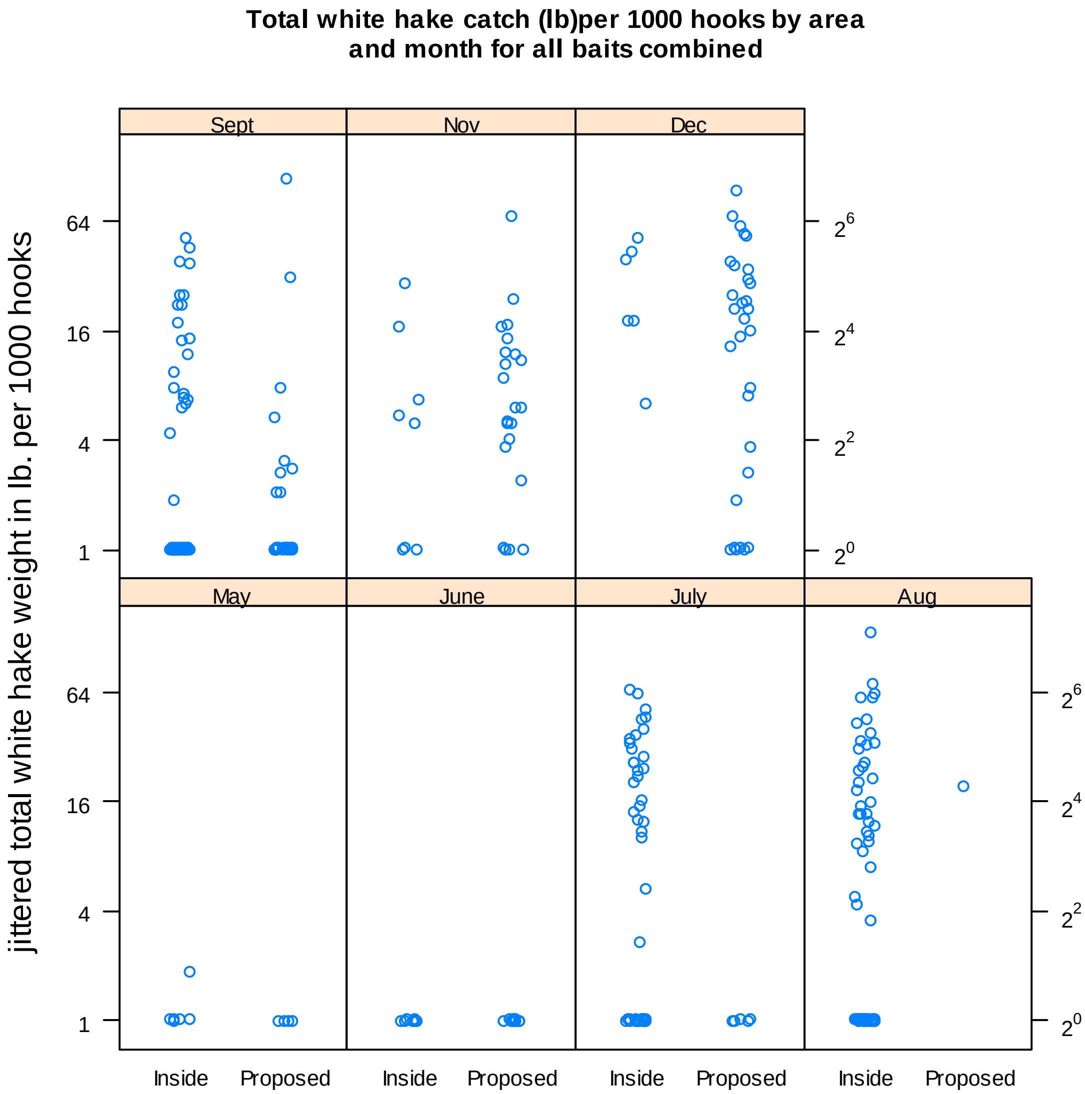


Figure 5. Catch rate of total white hake (weight per 1000 hooks) in an haul by month. Note semi-logarithmic scale on Y axis.

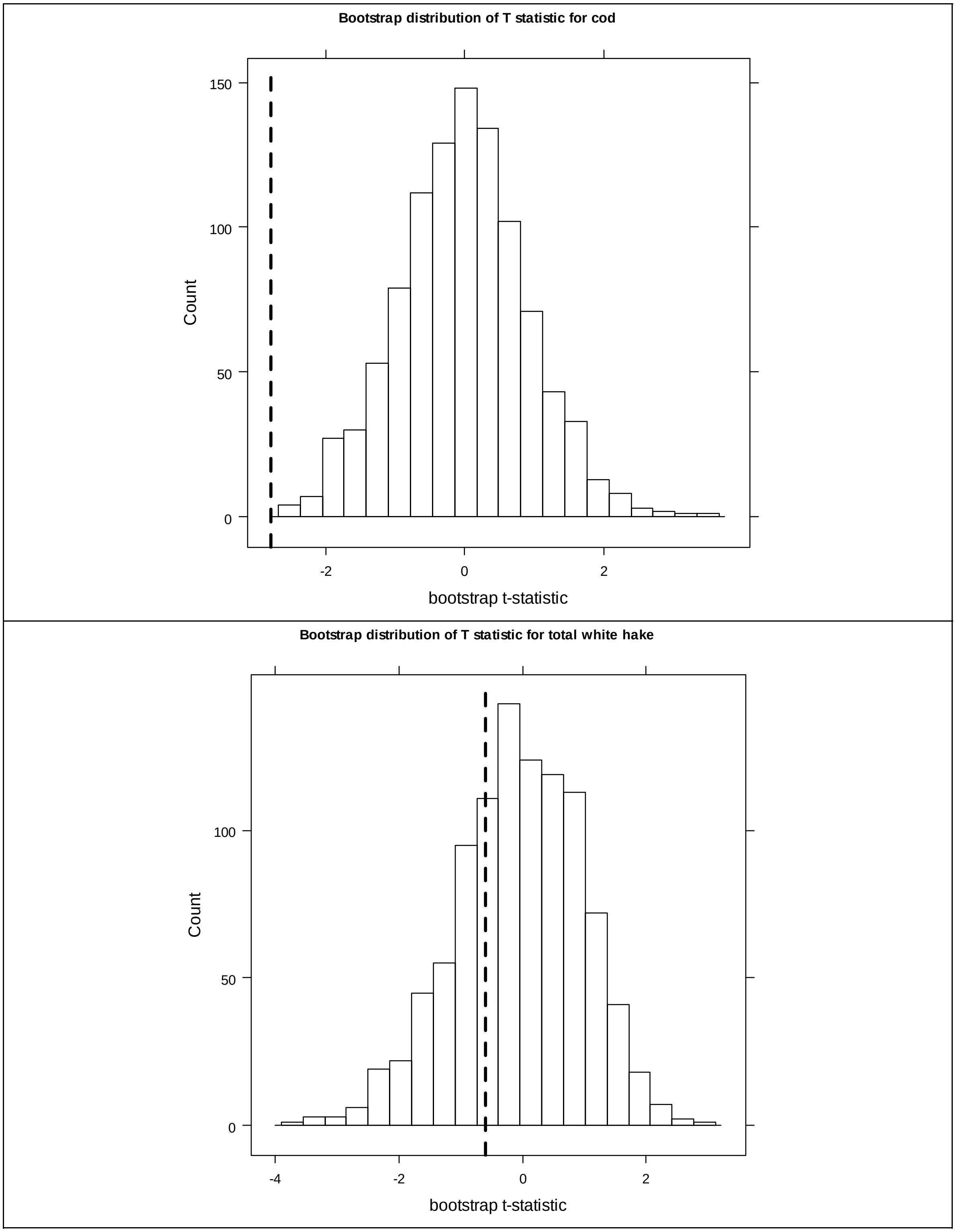
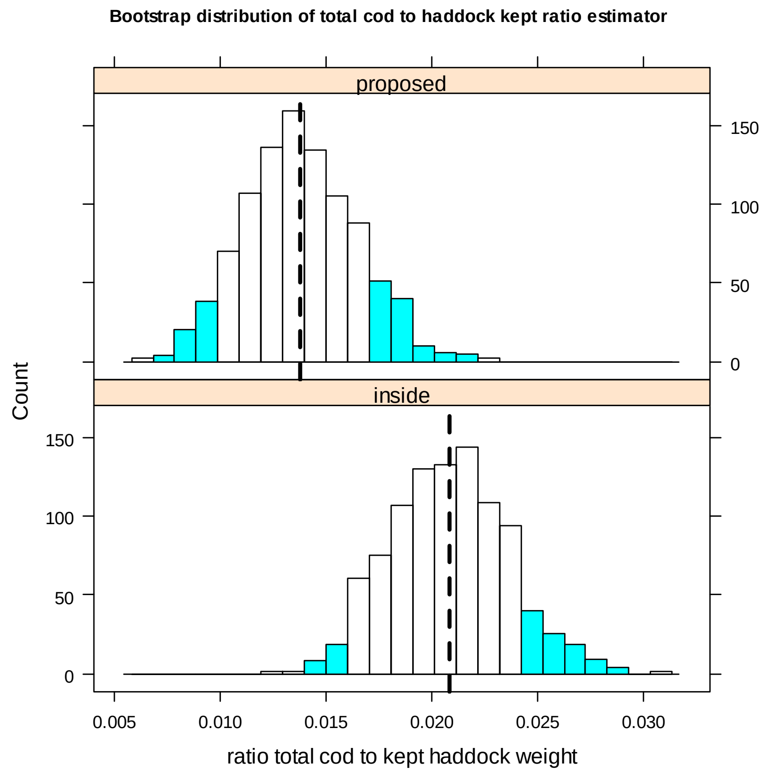


Figure 6. Distribution of bootstrapped t-statistic (1,000 replications). Top panel: Bootstrap distribution of T-statistic for mean cod catch proposed-mean cod catch inside area. Dashed line is the observed T.statistic -2.78. Bottom panel : Bootstrap distribution of T-statistic for mean white hake catch proposed-mean white hake catch inside area. Dashed line is the observed T.statistic -0.60.



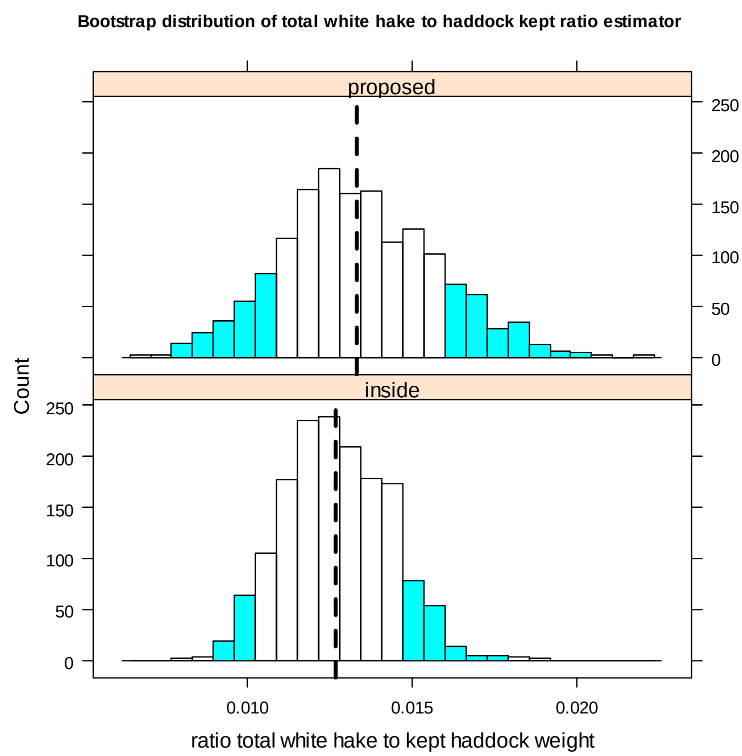


Figure 6. Distribution of bootstrapped ratio estimators (1,000 replications). Top two panels: Total cod to kept haddock in current SAP (inside) and proposed area. Bottom two panels: total white hake to kept haddock. Dashed black lines are the observed ratio estimator.

Literature cited

Appendix IV

Status of the ESA-listed Species

likely to be Affected

by the

Multispecies FMP Fisheries

Status of Large Whales

All of the cetacean species that are likely to be affected by the multispecies FMP were once the subject of commercial whaling which likely caused their initial decline. Commercial whaling for right whales along the U.S. Atlantic coast peaked in the 18th century, but right whales continued to be taken opportunistically along the coast and in other areas of the North Atlantic into the early 20th century (Kenney 2002). World-wide, humpback whales were often the first species to be taken and frequently hunted to commercial extinction (Clapham *et al.* 1999), meaning that their numbers had been reduced so low by commercial exploitation that it was no longer profitable to target the species. Wide-scale exploitation of the more offshore fin whale occurred later with the introduction of steam-powered vessels and harpoon gun technology (Perry *et al.* 1999). Sei whales became the target of modern commercial whalers primarily in the late 19th and early 20th century after populations of other whales, including right, humpback, fin and blues, had already been depleted. The species continued to be exploited in Iceland until 1986 even though measures to stop whaling of sei whales in other places had been put into place in the 1970's (Perry *et al*. 1999). Today, the greatest known threats to cetaceans are ship strikes and gear interactions although the number of each species affected by these activities does vary.

Information on the range-wide status of each species as it is listed under the ESA is included here to provide the reader with information on the status of each species, overall. Additional background information on the range-wide status of these species can be found in a number of published documents, including recovery plans (e.g. NMFS 1991a), the Marine Mammal Stock Assessment Reports (SAR) (e.g., Waring *et al.* 2007), status reviews (NMFS and USFWS 1995), and other publications (***e.g.***, Clapham *et al.* 1999; Perry *et al.* 1999; Best *et al.* 2001).

North Atlantic right whales

The North Atlantic right whale (*Eubalaena glacialis*) has been listed as endangered under the Endangered Species Act (ESA) since 1973. It was originally listed as the "northern right whale" as endangered under the Endangered Species Conservation Act, the precursor to the ESA in June 1970. The species is also designated as depleted under the Marine Mammal Protection Act (MMPA).

In December 2006, NMFS completed a comprehensive review of the status of right whales in the North Atlantic and North Pacific Oceans. Based on the findings from the status review, NMFS concluded that right whales in the northern hemisphere exist as two species: North Atlantic right whale (*Eubalaena glacialis*) and the North Pacific right whale (*Eubalaena japonica*). NMFS determined that each of the species is in danger of extinction throughout its range. In 2008, based on the status review, NMFS listed the endangered northern right whale (*Eubalaena spp.*) as two separate endangered species: the North Atlantic right whale (*E. glacialis*) and North Pacific right whale (*E. japonica*) (73 FR 12024).

The International Whaling Commission (IWC) recognizes two right whale populations in the North Atlantic: a western and eastern population (IWC 1986). It is thought that the eastern population migrated along the coast from northern Europe to northwest Africa. However, sighting surveys from the eastern Atlantic Ocean suggest that right whales present in this region are rare (Best *et al.* 2001) and it is unclear whether a viable population in the eastern North Atlantic still exists (Brown 1986; NMFS 1991). Photo-identification work has shown that some of the whales observed in the eastern Atlantic were previously identified as western Atlantic right whales (Kenney 2002). The remainder of this section focuses on the findings of studies conducted, primarily, in the western north Atlantic since this is the information that is currently available to describe the status of North Atlantic right whales.

North Atlantic right whales generally occur from the southeast U.S. (waters off of Georgia, Florida) to Canada (*e.g.*, Bay of Fundy and Scotian Shelf) (Kenney 2002; Waring *et al.* 2007). Like other right whales, they follow an annual pattern of migration between low latitude winter calving grounds and high latitude summer foraging grounds (Perry *et al.* 1999; Kenney 2002). The concept of right whales occurring predominantly in more nearshore continental shelf waters has been challenged by telemetry data that has shown lengthy and somewhat distant excursions into deep water off of the continental shelf (Mate *et al.* 1997). Knowlton *et al.* (1992) reported several long-distance movements as far north as Newfoundland, the Labrador Basin, and southeast of Greenland; in addition, resightings of photographically identified individuals have been made off Iceland, arctic Norway, and in the old Cape Farewell whaling ground east of Greenland. Right whales have also been observed in the Gulf of Mexico (Moore and Clark, 1963; Schmidly *et al.*, 1972). It is unclear whether these long range excursions represent an extended range for some individuals, are geographic anomalies or indicate the existence of important habitat areas not presently well described.

Research results suggest the existence of six major habitats or congregation areas for western North Atlantic right whales: the coastal waters of the southeastern United States; the Great South Channel; Georges Bank/Gulf of Maine; Cape Cod and Massachusetts Bays; the Bay of Fundy; and the Scotian Shelf (Waring et al. 2008). Right whales are most abundant in Cape Cod Bay between February and April (Watkins and Schevill 1982; Schevill *et al.* 1986; Hamilton and Mayo 1990) and in the Great South Channel in May and June (Kenney *et al.* 1986; Payne *et al.* 1990; Kenney *et al.* 1995; Kenney 2001) where they have been observed feeding predominantly on copepods of the genera *Calanus* and *Pseudocalanus* (Baumgartner and Mate 2005; Waring *et al.* 2007). Right whales also frequent Stellwagen Bank and Jeffrey's Ledge, as well as Canadian waters including the Bay of Fundy and Browns and Baccaro Banks in the summer through fall (Mitchell *et al.* 1986; Winn *et al*. 1986; Stone *et al.* 1990). However, right whales are not necessarily stationary in any feeding area. Telemetry studies have shown extensive right whale movements over the continental shelf during the summer foraging period (Mate et al. 1992; Mate *et al.* 1997; Baumgartner and Mate 2005), likewise, sightings separated by perhaps two weeks should not necessarily be assumed to indicate a stationary or resident animal (Waring *et al*. 2008).

In the winter, only a portion of the known right whale population is seen on the calving grounds. The winter distribution of the remaining right whales remains uncertain (NMFS 2005; Waring *et al.* 2007). Results from winter surveys and passive acoustic studies suggest that animals may be dispersed in several areas including Cape Cod Bay (Brown *et al.* 2002) and offshore waters of the southeastern U.S. (Waring *et al.* 2007). As has been observed for right whales during the summer foraging period, right whales can also make extensive excursions during the winter months. In 2000, for example, one photo-identified right whale made the round-trip from Cape Cod Bay to the southeast at least twice between January and March (Brown and Marx 2000; Waring et al. 2008).

Right whale calving occurs in the winter months in coastal waters off of Georgia and Florida (Kraus *et al.* 1988). Like other cetacean species, sexually mature right whale females give birth to a single calf following a 1 year gestation period (Kenney 2002). Weaning of the calf occurs after about 1 year (Kenney 2002). As of 2005, 92 reproductively-active North Atlantic right whale females had been identified (Kraus *et al.* 2007). From 1983-2005, the number of new mothers recruited to the population (with an estimated age of 10 for the age of first calving), varied from 0-11 each year with no significant increase or decline over the period (Kraus *et al.* 2007). By 2005, 16 right whales had produced at least 6 calves each, and 4 cows had at least seven calves. Two of these cows were at an age which indicated a reproductive life span of at least 31 years (Kraus *et al.* 2007).

A total of 156 right whale calves have been born during the 2000/2001-2006/2007 calving seasons (Waring *et al*. 2007; 2008, DRAFT). The mean calf production for the fifteen year period from 1993-2007 was 15.6 (13.7-17.1; 95% C.I) (Waring et al. 2008). However, calving numbers have been sporadic, with large differences among years. The three calving years (97/98; 98/99; 99/00) provided low recruitment levels with only 10 calves born for the entire period (Waring *et al*. 2007). The following six calving seasons (2000-2007) were remarkably better with 31, 21, 19, 16, 28, 19 and 22 births, respectively (Waring et al. 2008). Calf counts for the 2007/2008 and 2008/2009 calving seasons are still preliminary.

As of August 1, 2008, there were 368 individually identified right whales in the photo-identification catalog that were presumed to be alive (Hamilton *et al*. 2008). An additional 25 were known to be dead, and 135 were presumed to be dead as they had not been sighted in the past six years (Hamilton *et al.* 2008). Waring *et al.* (2007) reported a slightly skewed sex ratio for the photo-identified and catalogued population of 196M:187F. Therefore, the number of photo-identified and catalogued female North Atlantic right whales is less than 200 whales.

Examination of the minimum number of right whales alive as calculated from the sightings database indicate a slight increase in the number of catalogued whales (Waring *et al*. 2007). Based on counts of animals alive from the sightings database as of 30 May 2007, for the years 1990-2003, the mean growth rate for the period was 1.8% (Waring et al. 2008). However, there was significant variation in the annual growth rate due to apparent losses exceeding gains during 1998-1999 (Waring *et al*. 2007; 2008, DRAFT). The level of growth is significantly lower than healthy populations of large whales (Pace *et al.* 2008).

There is general agreement that right whale recovery is negatively affected by anthropogenic mortality. From 2002-2006, right whales had the highest proportion of entanglement and ship strike events relative to the number of reports for a species (Glass *et al.* 2008). Given the small population size and low annual reproductive rate of right whales, human sources of mortality may have a greater effect to relative population growth rate than for other large whale species (Waring *et al.* 2007). For the period 2002-2006, the annual mortality and serious injury rate for the North Atlantic right whale averaged to be 3.8 per year (2.4 in U.S. waters; 1.4 in Canadian waters) (Glass *et al*. 2008, Waring *et. al.* 2008 DRAFT). Twenty-one confirmed right whale mortalities were reported along the U.S. east coast and adjacent Canadian Maritimes from 2002-2006 (Glass *et al*. 2008). These numbers represent the minimum values for human-caused mortality for this period. Given the range and distribution of right whales in the North Atlantic, and the fact that positively buoyant species like right whales may become negatively buoyant if injury prohibits effective feeding for prolonged periods, it is highly unlikely that all carcasses will be observed (Moore *et. al.* 2004, Glass *et al.* 2008)). Moreover, carcasses floating at sea often cannot be examined sufficiently and may generate false negatives if they are not towed to shore for further necropsy (Glass *et al*. 2008). Decomposed and/or unexamined animals represent lost data, some of which may relate to human impacts (Waring *et al.* 2007).

It should also be noted that mortality and serious injury event judgments are based upon the best available data and additional information may result in revisions (Cole *et al.* 2005). Of the 21 total, confirmed right whale mortalities (2002-2006) described in Glass *et al.* (2008), 3 were confirmed to be entanglement mortalities (1 yearling female, 1 adult female, 1 calf (sex not listed)) and 10 were confirmed to be ship strike mortalities (1 yearling female, 1 yearling male, 6 adult females, 1 male calf, and 1 female of unknown age). Serious injury involving right whales was documented for 4 entanglement events: 1 calf (sex not indicated), 2 adult females, and 1 individual of unknown sex and age. A serious injury determination was also made for each of 2 right whale ship strike events: 1 individual of unknown sex and age, and 1 yearling male.

Entanglement or vessel collisions may not cause direct mortalities, but may weaken or otherwise affect individuals so that further injury or death is likely (Waring *et. al* 2007). Some right whales that have been entangled were subsequently involved in ship strikes (Hamilton *et al*. 1998) suggesting that the animal may have become debilitated by the entanglement to such an extent that it was less able to avoid a ship. In the same, skeletal fractures and/or broken jaws sustained during a vessel collision may heal, but then compromise a whale's ability to efficiently filter feed (Moore *et al.* 2007). A necropsy of right whale #2143 ("Lucky") found dead in January 2005 suggested the animal (and her near-term fetus) died after healed propeller wounds from a previous ship strike re-opened and became infected as a result of pregnancy (Moore *et al.* 2007, Glass *et al.* 2008).

Sometimes, even with a successful disentanglement, an animal may die of injuries sustained by fishing gear (*e.g.* right whale #3107) (Waring et al. 2008).

Entanglement records from 1990-2006 maintained by NMFS include 45 confirmed right whale entanglement events (Waring et al. 2008). Because whales often free themselves of gear following an entanglement event, scarification analysis of living animals may provide better indications of fisheries interactions rather than entanglement records (Waring *et al.* 2008 DRAFT). Data presented in Knowlton *et al.* 2008 indicate the annual rate of entanglement interaction remains at high levels. Four hundred and ninety-three individual, catalogued right whales were reviewed and 625 separate entanglement interactions were documented between 1980 and 2004. Approximately 358 out of 493 animals (72.6% of the population) were entangled at least once; 185 animals bore scars from a single entanglement, however one animal showed scars from 6 different entanglement events. The number of male and female right whales bearing entanglement scars was nearly equivalent (142/202 females, 71.8%; 182/224 males, 81.3%), indicating that right whales of both sexes are equally vulnerable to entanglement. However, juveniles appear to become entangled at a higher rate than expected if all age groups were equally vulnerable. For all years but one (1998), the proportion of juvenile, entangled right whales exceeded their proportion within the population.

Other factors that have been suggested as affecting the right whales are reduced genetic diversity (and/or inbreeding), contaminants, biotoxins, disease, nutritional stress, and loss of critical habitat. However, there is currently no evidence available to determine their potential effect, if any. It has been hypothesized that the low level of genetic variability in this species produces a high rate of mate incompatibility and unsuccessful pregnancies (Frasier *et al.* 2007). Analyses are currently under way to assess this relationship further as well as the influence of genetic characteristics on the potential for species recovery (Frasier *et al.* 2007). Contaminant studies have confirmed that right whales are exposed to and accumulate contaminants. Antifouling agents and flame retardants that have been proven to disrupt reproductive patterns and have been found in other marine animals, have raised new concerns for their effects on right whales (Kraus *et al.* 2007). Recent data also support a hypothesis that chromium, an industrial pollutant, may be a concern for the health of the North Atlantic right whales and that inhalation may be an important exposure route (Wise *et al.* 2008). The impacts of biotoxins on marine mammals are also poorly understood, yet data is showing that marine algal toxins may play significant roles in mass mortalities of these animals (Rolland *et al.* 2007). Although there are no published data concerning the effects of biotoxins on right whales, researchers are now certain that right whales are being exposed to measurable quantities of paralytic shellfish poisoning (PSP) toxins and domoic acid via trophic transfer through the copepods upon which they feed (Durbin *et al.* 2002, Rolland *et al.* 2007).

It has also been suggested that North Atlantic right whales are food limited. Although North Atlantic right whales seem to have thinner blubber than right whales from the South Atlantic (Kenney 2000), there is no evidence at present to demonstrate that the decline in birth rate and increase in calving interval is related to a food shortage. Nevertheless, a connection among right whale reproduction and environmental factors may yet be found. Modeling work by Caswell *et al.* (1999) and Fujiwara and Caswell (2001) suggests that the North Atlantic Oscillation (NAO), a naturally occurring climactic event, does affect the survival of mothers and the reproductive rate of mature females, and it also seems to affect calf survival (Clapham *et al.* 2002). Greene *et al.* (2003) described the potential oceanographic processes linking climate variability to the reproduction of North Atlantic right whales. Climate-driven changes in ocean circulation have had a significant impact on the plankton ecology of the Gulf of Maine, including effects on *Calanus finmarchicus*, a primary prey resource for right whales. Researchers found that during the 1980's, when the NAO index was predominately positive, *C. finmarchicus* abundance was also high; when a record drop occurred in the NAO index in 1996, *C. finamarchicus* abundance levels also decreased significantly. Right whale calving rates since the early 1980's seem to follow a similar pattern, where stable calving rates were noted from 1982-1992, but then two major, multi-year declines occurred from 1993-2001, consistent with the drops in copepod abundance. It has been hypothesized that right whale calving rates are thus a function of food availability as well as the number of females available to reproduce (Greene et al 2003, Greene and Pershing 2004). Such findings suggest that future climate change may emerge as a significant factor influencing the recovery of right whales. Some believe the effects of increased climate variability on right whale calving rates should be incorporated into future modeling studies so that it may be possible to determine how sensitive right whale population numbers are to variable climate forcing (Greene and Pershing 2004).

Humpback whales

Humpback whales inhabit all major ocean basins from the equator to subpolar latitudes. They generally follow a predictable migratory pattern in both hemispheres, feeding during the summer in the higher near-polar latitudes and migrating to lower latitudes in the winter where calving and breeding takes place (Perry *et al.* 1999). Humpbacks are listed under the ESA at the species level. Therefore, information is presented below regarding the status of humpback whales throughout their range.

North Pacific, Northern Indian Ocean and Southern Hemisphere. Humpback whales range widely across the North Pacific during the summer months; from Port Conception, CA, to the Bering Sea (Johnson and Wolman 1984, Perry *et al.* 1999). Although the IWC only considered one stock (Donovan 1991) there is evidence to indicate multiple populations migrating between their respective summer/fall feeding areas to winter/spring calving and mating areas within the North Pacific Basin (Anglis and Outlaw 2007, Carretta *et al.* 2007). NMFS recognizes three management units within the U.S. EEZ for the purposes of managing this species under the MMPA. These are: the eastern North Pacific stock, the central North Pacific stock and the western North Pacific stock (Anglis and Outlaw 2007, Carretta *et al.* 2007). Winter/spring populations of humpback whales also occur in Mexico's offshore islands, however the migratory destinations of these whales is currently not well known (Anglis and Outlaw 2007, Carretta *et al.* 2007). Recent research efforts via the Structure of Populations, Levels of Abundance, and Status of Humpback Whales (SPLASH) Project estimate the abundance of humpback whales to be just under 20,000 whales for the entire North Pacific, a number which doubles previous population predictions (Calambokidis *et al.* 2008). There are indications that the eastern North Pacific stock was growing in the 1980's and early 1990's with a best estimate of 6-8% growth per year (Carretta *et al.* 2007). The central North Pacific stock appears to also have increased in abundance between the 1980's -1990's (Anglis and Outlaw 2007). Although, there is no reliable population trend data for the western North Pacific stock, as surveys of the known feeding areas are incomplete and many feeding areas remain unknown, minimum population size is currently estimated at 367 whales (Anglis and Outlaw 2007).

Little or no research has been conducted on humpbacks in the Northern Indian Ocean so information on their current abundance does not exist (Perry *et al.* 1999). Since these humpback whales do not occur in U.S. waters, there is no recovery plan or stock assessment report for the northern Indian Ocean humpback whales. Likewise, there is no recovery plan or stock assessment report for southern hemisphere humpback whales, and there is also no current estimate of abundance for humpback whales in the southern hemisphere although there are estimates for some of the six southern hemisphere humpback whale stocks recognized by the IWC (Perry *et al.* 1999). Like other whales, southern hemisphere humpback whales were heavily exploited for commercial whaling. Although they were given protection by the IWC in 1963, Soviet whaling data made available in the 1990's revealed that 48,477 southern hemisphere humpback whales were taken from 1947-1980, contrary to the original reports to the IWC which accounted for the take of only 2,710 humpbacks (Zemsky *et al.* 1995, IWC 1995, Perry *et al.* 1999).

Atlantic. Humpback whales from most Atlantic feeding areas calve and mate in the West Indies and migrate to feeding areas in the northwestern Atlantic during the summer months. Most of the humpbacks that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod Bays. Previously, the North Atlantic humpback whale population was treated as a single stock for management purposes, however due to the strong fidelity to the region displayed by many whales, the Gulf of Maine stock was reclassified as a separate feeding stock (Waring *et al.* 2007). Sightings are most frequent from mid-March through November between 41° N and 43° N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffrey's Ledge (CeTAP 1982) and peak in May and August. Small numbers of individuals may be present in this area year-round, including the waters of Stellwagen Bank. They feed on a number of species of small schooling fishes, particularly sand lance and Atlantic herring, targeting fish schools and filtering large amounts of water for their associated prey. It is hypothesized humpback whales may also feed on euphausiids (krill) as well as capelin (Waring *et al*. 2007; Stevick *et al.* 206).

In winter, whales from waters off New England, Canada, Greenland, Iceland, and Norway, migrate to mate and calve primarily in the West Indies where spatial and genetic mixing among these groups does occur (Waring *et al.* 2007). Various papers (Clapham and Mayo 1990; Clapham 1992; Barlow and Clapham 1997; Clapham *et al.* 1999) summarize information gathered from a catalogue of photographs of 643 individuals from the western North Atlantic population of humpback whales. These photographs identified reproductively mature western North Atlantic humpbacks wintering in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks, north of the Dominican Republic. The primary winter range also includes the Virgin Islands and Puerto Rico (NMFS 1991b).

Humpback whales travel through Mid-Atlantic waters to and from the calving/mating grounds, but it may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the Mid-Atlantic have been increasing during the winter months, peaking January through March (Swingle *et al.* 1993). Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the Mid-Atlantic since they are not participating in reproductive behavior in the Caribbean. Swingle *et al.* (1993) identified a shift in distribution of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter months. Identified whales using the Mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding populations in the Mid-Atlantic region. Strandings of humpback whales have increased between New Jersey and Florida since 1985 consistent with the increase in Mid-Atlantic whale sightings. Strandings were most frequent during September through April in North Carolina and Virginia waters, and were composed primarily of juvenile humpback whales of no more than 11 meters in length (Wiley *et al.* 1995).

Photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project gave an ocean-basin-wide estimate of 11,570 animals during 1992/1993 and an additional genotype-based analysis yielded a similar by less precise estimate of 10,400 whales (95% c.i. = 8,000 - 13,600) (Waring *et al.* 2007). For management purposes under the MMPA, the estimate of 11,500 individuals is regarded as the best available estimate for the North Atlantic population (Waring *et al.* 2007). Assessing abundance for the Gulf of Maine stock of humpback whales has proved problematic, however, the best, recent estimate for the Gulf of Maine stock is 847 whales, derived from the 2006 aerial survey (Waring *et al.* 2007).

As is the case with other large whales, the major known sources of anthropogenic mortality and injury of humpback whales occur from fishing gear entanglements and ship strikes. For the period 2002 through 2006, the minimum annual rate of human-caused mortality and serious injury to the Gulf of Maine humpback whale stock averaged 4.4 animals per year (U.S. waters, 4.0; Canadian waters, 0.4) (Glass *et al.* 2008; Waring *et al.* 2008 DRAFT). Between 2002 and 2006 humpback whales were involved in 77 confirmed entanglement events and 9 confirmed ship strike events (Glass *et al.* 2008). Over the five-year period, humpback whales were the most commonly observed entangled whale species; entanglements accounted for 6 mortalities and nine serious injuries (Glass *et al.* 2008). Although ship strikes were relatively uncommon, 7 of the 9 confirmed events were fatal (Glass *et al*. 2008). It was assumed that all of these events involved members of the Gulf of Maine stock of humpback whales unless a whale was confirmed to be from another stock; in reports prior to 2007, only events involving whales confirmed to be members of the Gulf of Maine stock were included. As of February 2008, there was no available information to indicate that the events described here do *not* include a Gulf of Maine animal. There were also many carcasses that washed ashore or were spotted floating at sea for which the cause of death could not be determined (Glass *et al.* 2008; Waring *et al.* 2008 DRAFT).

Based on photographs taken between 2000-2002 of the caudal peduncle and fluke of humpback whales, Robbins and Mattila (2004) estimated that at least half (48-57%) of the sample (187 individuals) was coded as having a high likelihood of prior entanglement. Evidence suggests that entanglements have occurred at minimum rate of 8-10% per year. Scars acquired by Gulf of Maine stock humpback whales between 2000 and 2002 suggest a minimum of 49 interactions with gear took place. Based on composite scar patterns, it was believed that male humpback whales were more vulnerable to entanglement than females. Males may be subject to other sources of injury that could affect scar pattern interpretation. Images were obtained from a humpback whale breeding ground; 24% exhibited raw injuries, presumable a result from agonistic interactions. However, current evidence suggests that breeding ground interactions alone cannot explain the higher frequency of healed scar patterns among Gulf of Maine stock male humpback whales (Robbins and Matilla 2004).

Humpback whales, like other baleen whales, may also be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including fisheries operations, vessel traffic, and coastal development. Currently, there is no evidence that these types of activities are affecting humback whales. In October 2006, NMFS declared an unusual mortality event (UME) for humpback whales in the Northeast United States. At least 17 dead humpback whales have been discovered since March 2006. There has also been a documented bloom of *Alexandrium* sp., a toxic dinoflagellate that causes red tide from Maine to Massachusetts. Prior to the most recent UME, there had been only three other known cases of a mass mortality involving large whale species along the east coast: 1987–1988, 2003, and 2005. Geraci *et al.* (1989) provide strong evidence that, in the former case, these deaths of humpback whales resulted from the consumption of mackerel whose livers contained high levels of saxitoxin, a naturally occurring red tide toxin; the origin of which remains unknown. It has been suggested that the occurrence of a red tide event is related to an increase in freshwater runoff from coastal development, leading some observers to suggest that such events may become more common among marine mammals as coastal development continues (Clapham *et al.* 1999).

Changes in humpback distribution in the Gulf of Maine have been found to be associated with changes in herring, mackerel, and sand lance abundance associated with local fishing pressures (Stevick *et al.* 2006; Waring *et al.* 2007). Shifts in relative finfish species abundance correspond to changes in observed humpback whale movements (Stevick *et al.* 2006).

Fin Whales

Fin whales inhabit a wide range of latitudes between 20-75° N and 20-75° S (Perry *et al.* 1999). Fin whales spend the summer feeding in the relatively high latitudes of both hemispheres, particularly along the cold eastern boundary currents in the North Atlantic and North Pacific Oceans and in Antarctic waters (IWC 1992).

North Pacific and Southern Hemisphere. Within the U.S. waters in the Pacific, fin whales are found seasonally off of the coast of North America and Hawaii, and in the Bering Sea during the summer (Angliss *et al.* 2001). NMFS recognizes three fin whale stocks in the Pacific for the purposes of managing this species under the MMPA. These are: Alaska (Northeast Pacific), California/Washington/Oregon, and Hawaii (Angliss *et al.* 2001). Reliable estimates of current abundance for the entire Northeast Pacific fin whale stock are not available (Angliss *et al.* 2001). Stock structure for fin whales in the southern hemisphere is unknown and there are no current estimates of abundance for southern hemisphere fin whales. Prior to commercial exploitation, the abundance of southern hemisphere fin whales is estimated to have been at 400,000 (IWC 1979; Perry *et al.* 1999).

North Atlantic. Like right and humpback whales, fin whales are believed to use North Atlantic waters primarily for feeding, and more southern waters for calving. However, evidence regarding where the majority of fin whales winter, calve, and mate is still scarce. Clark (1995) reported a general pattern of fin whale movements in the fall from the Labrador/Newfoundland region, south past Bermuda and into the West Indies, but neonate strandings along the U.S. Mid-Atlantic coast from October through January suggest the possibility of an offshore calving area (Hain *et al.* 1992).

During 1978-1982 aerial surveys, fin whales accounted for 24% of all cetaceans and 46% of all large cetaceans sighted over the continental shelf between Cape Hatteras and Nova Scotia (Waring *et al.*1998). Underwater listening systems have also demonstrated that the fin whale is the most acoustically common whale species heard in the North Atlantic (Clark 1995). The single most important area for this species appeared to be from the Great South Channel, along the 50m isobath past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffrey's Ledge (Hain *et al.*1992).

NMFS has designated one population of fin whale for U.S. waters of the North Atlantic (Waring *et al.* 1998) where the species is commonly found from Cape Hatteras northward although there is information to suggest some degree of separation. A number of researchers have suggested the existence of fin whale subpopulations in the North Atlantic based on local depletions resulting from commercial overharvesting (Mizroch and York 1984) or genetics data (Bérubé *et al.* 1998). Photoidentification studies in western North Atlantic feeding areas, particularly in Massachusetts Bay, have shown a high rate of annual return by fin whales, both within years and between years (Seipt *et al.* 1990) suggesting some level of site fidelity. In 1976, the IWC's Scientific Committee proposed seven stocks (or populations) for North Atlantic fin whales. These are: (1) North Norway, (2) West Norway-Faroe Islands, (3) British Isles-Spain and Portugal, (4) East Greenland-Iceland, (5) West Greenland, (6) Newfoundland-Labrador, and (7) Nova Scotia (Perry *et al.* 1999). However, it is uncertain whether these boundaries define biologically isolated units (Waring *et al.* 1999).

Various estimates have been provided to describe the current status of fin whales in western North Atlantic waters. One method used the catch history and trends in Catch Per Unit Effort to obtain an estimate of 3,590 to 6,300 fin whales for the entire western North Atlantic (Perry *et al.* 1999). Hain *et al.* (1992) estimated that about 5,000 fin whales inhabit the Northeastern United States continental shelf waters. The 2007 Stock Assessment Report (SAR) gives a best estimate of abundance for the western North Atlantic stock of fin whales as 2,269 (C.V. = 0.37) (Waring *et al*. 2007). This estimate is considered extremely conservative in view of the incomplete coverage of the known habitat of the stock and the uncertainties regarding population structure and whale movements between surveyed and unsurveyed areas (Waring *et al.* 2007). Current and maximum net productivity rates are unknown for this stock (Waring *et al*. 2007).

Like right whales and humpback whales, anthropogenic mortality and injury of fin whales include entanglement in commercial fishing gear and ship strikes. Of 18 fin whale mortality records collected between 1991 and 1995, four were associated with vessel interactions, although the proximal cause of mortality was not known. From 2001-2005, there were 8 confirmed fin whale deaths resulting from vessel strikes (Waring et al. 2007). These records constitute an annual rate of serious injury or mortality of 1.6 fin whales from vessel collisions (Waring *et al*. 2007). NMFS data include six additional records of fin whale collisions with vessels, but the available supporting documentation is insufficient to determine if the whales sustained mortal injuries from the encounters (Waring *et al*. 2007). During the same time period, there were also 3 mortalities and 1 serious injury where entanglement was confirmed to be the cause (Waring *et al*. 2007).

Sei Whales

Sei whales are a widespread species in the world's temperate, subpolar, subtropical, and even tropical marine waters. Sei whales reach sexual maturity at 5-15 years of age. The calving interval is believed to be 2-3 years (Perry *et al.* 1999).

North Pacific and Southern Hemisphere. The IWC only considers one stock of sei whales in the North Pacific (Donovan 1991), but for NMFS management purpose under the MMPA, sei whales in the eastern North Pacific are considered a separate stock (Carretta *et al.* 2001). There are no abundance estimates for sei whales along the U.S. west coast or in the eastern North Pacific (Carretta *et al.* 2001).

The stock structure of sei whales in the southern hemisphere is unknown. Like other whale species, sei whales in the southern hemisphere were heavily impacted by commercial whaling, particularly in the mid-20th century as humpback, fin and blue whales became scarce. Sei whales were protected by the IWC in 1977 after their numbers had substantially decreased and they also became more difficult to find (Perry *et al.* 1999).

North Atlantic. Sei whales occur in deep water throughout their range, typically over the continental slope or in basins situated between banks (NMFS 1998b). In the northwest Atlantic, the whales travel along the eastern Canadian coast in June, July, and autumn on their way to and from the Gulf of Maine and Georges Bank where they occur in winter and spring. Within the action area, the sei whale is most common on Georges Bank and into the Gulf of Maine/Bay of Fundy region during spring and summer, primarily in deeper waters. In years of reduced predation on copepods by other predators, and thus greater abundance of this prey source, sei whales are reported in more inshore locations (Waring *et al*. 2007).

Although sei whales may prey upon small schooling fish and squid in the action area, available information suggests that calanoid copepods and euphausiids are the primary prey of this species. Sei whales are occasionally seen feeding in association with right whales in the southern Gulf of Maine and in the Bay of Fundy. However, there is no evidence to demonstrate interspecific competition between these species for food resources.

There is limited information on the stock identity of sei whales in the North Atlantic (Waring *et al*. 2007). For purposes of the Marine Mammal Stock Assessment Reports, and based on a proposed IWC stock definition, NMFS recognizes the sei whales occurring from the U.S. east coast to Cape Breton, Nova Scotia, and east to 42° W longitude as the "Nova Scotia stock" of sei whales (Waring *et al*. 2007).

The abundance estimate of 207sei whales (CV=0.62), obtained from an aerial survey conducted in August 2006 covering 10,676 km of trackline in the region from the 2000 m depth contour on the southern edge of Georges Bank to the upper Bay of Fundy and to the entrance of the Gulf of St. Lawrence, is considered the best available for the Nova Scotia stock of sei whales because it is the most recent (Waring *et al*. 2007). This estimate is considered extremely conservative in view of the known range of the sei whale in the entire western North Atlantic, and the uncertainties regarding population structure and whale movements between surveyed and unsurveyed areas Waring *et al*. 2007). Current and maximum net productivity rates are unknown for this stock. There are insufficient data to determine trends of the sei whale population (Waring *et al.* 2007).

Few instances of injury or mortality of sei whales due to entanglement or vessel strikes have been recorded in U.S. waters. Entanglement is not known to impact this species in the U.S. Atlantic (Waring *et al*. 2007), possibly because sei whales typically inhabit waters further offshore than most commercial fishing operations, or perhaps entanglements do occur but are less likely to be observed. A small number of ship strikes of this species have been recorded. One incident occurred in 1994 when a carcass was brought in on the bow of a container ship in Charlestown, Massachusetts. Two other mortalities as a result of vessel strikes, one each in 2001 and 2003, have been confirmed (Waring *et al*. 2007). Other impacts noted above for other baleen whales may also occur.

Status of Sea Turtles

Sea turtles continue to be affected by many factors occurring on the nesting beaches and in the water. Poaching, habitat loss, and nesting predation by introduced species affect hatchlings and nesting females while on land. Fishery interactions, vessel interactions, and (non-fishery) dredging operations, for example, affect sea turtles in the neritic zone (defined as the marine environment extending from mean low water down to 200m (660 foot) depths, generally corresponding to the continental shelf (Lalli and Parsons 1997). Fishery interactions also affect sea turtles when these species and the fisheries co-occur in the oceanic zone (defined as the open ocean environment where bottom depths are greater than 200m (Lalli and Parsons 1997)[1]. As a result, sea turtles still face many of the original threats that were the cause of their listing under the ESA.

Sea turtles are listed under the ESA at the species level rather than as subspecies or distinct population segments (DPS). Therefore, information on the range-wide status of each species is included to provide the reader with information on the status of each species, overall. Additional background information on the range-wide status of these species can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; USFWS 1997; Marine Turtle Expert Working Group (TEWG) 1998; TEWG 2000; NMFS and USFWS 2007a; 2007b; 2007c; 2007d; TEWG 2007), and recovery plans for the loggerhead sea turtle (NMFS and USFWS 1991a, 2008), leatherback sea turtle (NMFS and USFWS 1992; NMFS and USFWS 1998a;), Kemp's ridley sea turtle (USFWS and NMFS 1992), and green sea turtle (NMFS and USFWS 1991b; NMFS and USFWS 1998b).

Loggerhead sea turtle

Loggerhead sea turtles are a cosmopolitan species. They are found in temperate and subtropical waters and occupy a range of habitats including offshore waters, continental shelves, bays, estuaries, and lagoons. The loggerhead is the most abundant species of sea turtle in U.S. waters. Genetic differences exist between loggerhead sea turtles that nest and forage in the different ocean basins (Bowen 2003; Bowen and Karl 2007). Differences in the maternally inherited mitochondrial DNA also exist between loggerhead nesting groups that occur within the same ocean basin (TEWG 2000; Pearce 2001; Bowen 2003; Bowen *et al*. 2005; Shamblin 2007). Site fidelity of females to one or more nesting beaches in an area is believed to account for these genetic differences (TEWG 2000; Bowen 2003). However, loggerhead sea turtles are currently listed under the ESA at the species level rather than as subspecies or distinct population segments (DPS). Therefore, information on the range-wide status of the species is included below.

Pacific Ocean. In the Pacific Ocean, major loggerhead nesting grounds are generally located in temperate and subtropical regions with scattered nesting in the tropics. The abundance of loggerhead sea turtles at nesting colonies throughout the Pacific basin has declined dramatically over the past ten to twenty years. Loggerhead sea turtles in the

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[1] As described in Bolten (2003), oceanographic terms have frequently been used incorrectly to describe sea turtle life stages. The terms "benthic" and "pelagic" are sometimes used incorrectly to refer to the neritic and oceanic zones, respectively. The term benthic refers to occurring on the bottom of a body of water, whereas the term pelagic refers to in the water column. Turtles can be "benthic" or pelagic" in either the neritic or oceanic zones.

Pacific Ocean are represented by a northwestern Pacific nesting group (located in Japan) and a smaller southwestern Pacific nesting group that occurs in Australia (Great Barrier Reef and Queensland), New Caledonia, New Zealand, Indonesia, and Papua New Guinea. Data from 1995 estimated the Japanese nesting group at 1,000 adult females (Bolten *et al*. 1996). More recent information suggests that nest numbers have increased somewhat over the period of 1998-2004 (NMFS and USFWS 2007a). However, this time period is too short to make a determination of the overall trend in nesting (NMFS and USFWS 2007a). Genetic analyses of loggerhead females nesting in Japan indicate the presence of genetically distinct nesting colonies (Hatase *et al*. 2002).

In Australia, long-term census data have been collected at some rookeries since the late 1960s and early 1970s, and nearly all the data show marked declines in nesting since the mid-1980s. The nesting group in Queensland, Australia was as low as 300 adult females in 1997 (Limpus and Limpus 2003).

Pacific loggerhead sea turtles are captured, injured, or killed in numerous Pacific fisheries including gillnet, longline, and trawl fisheries in the western and/or eastern Pacific Ocean (NMFS and USFWS 2007a). In Australia, where sea turtles are taken in bottom trawl and longline fisheries, efforts have been made to reduce fishery bycatch (NMFS and USFWS 2007a).

Indian Ocean. Loggerhead sea turtles are distributed throughout the Indian Ocean, along most mainland coasts and island groups (Baldwin *et al*. 2003). Throughout the Indian Ocean, loggerhead sea turtles face many of the same threats as in other parts of the world including loss of nesting beach habitat, fishery interactions, and turtle meat and/or egg harvesting.

In the southwestern Indian Ocean, loggerhead nesting has shown signs of recovery in South Africa where protection measures have been in place for decades. However, in other southwestern areas (*e.g.*, Madagascar and Mozambique) loggerhead nesting groups are still affected by subsistence hunting of adults and eggs (Baldwin *et al*. 2003). The largest known nesting group of loggerheads in the world occurs in Oman in the northern Indian Ocean. An estimated 20,000 to 40,000 females nest at Masirah, the largest nesting site within Oman, each year (Baldwin *et al*. 2003). In the eastern Indian Ocean, all known nesting sites are found in Western Australia (Dodd 1988). As has been found in other areas, nesting numbers are disproportionate within the area with the majority of nesting occurring at a single location. This may, however, be the result of fox predation on eggs at other Western Australia nesting sites (Baldwin *et al*. 2003).

Mediterranean Sea. Nesting in the Mediterranean Sea is confined almost exclusively to the eastern basin (Margaritoulis *et al*. 2003). The greatest numbers of nests in the Mediterranean are found in Greece with an average of 3,050 nests per year (Margaritoulis *et al*. 2003; NMFS and USFWS 2007a). Turkey has the second largest number of nests with 2,000 nests per year (NMFS and USFWS 2007a). There is a long history of exploitation of loggerheads in the Mediterranean (Margaritoulis *et al*. 2003). Although much of this is now prohibited, some directed captures still occur (Margaritoulis *et al*.

2003). Loggerheads in the Mediterranean also face the threat of habitat degradation, incidental fishery interactions, vessel strikes, and marine pollution (Margaritoulis *et al*. 2003). Longline fisheries, in particular, are believed to catch thousands of juvenile loggerheads each year (NMFS and USFWS 2007a), although genetic analyses indicate that only a portion of the loggerheads captured originate from loggerhead nesting groups in the Mediterranean (Laurent *et al*. 1998).

Atlantic Ocean. Ehrhart *et al*. (2003) provided a summary of the literature identifying known nesting habitats and foraging areas for loggerheads within the Atlantic Ocean. Detailed information is also provided in the 5-year status review for loggerheads (NMFS and USFWS 2007a) and the final revised recovery plan for loggerheads in the Northwest Atlantic Ocean (NMFS and USFWS 2008), which was recently published by NMFS and FWS in December 2008 and is a second revision to the original recovery plan that was approved in 1984 (NMFS 1984) and most recently revised in 1991 (NMFS and USFWS 1991a).

Briefly, nesting occurs on island and mainland beaches on both sides of the Atlantic and both north and south of the Equator (Ehrhart *et al*. 2003). By far, the majority of Atlantic nesting occurs on beaches of the southeastern U.S. (NMFS and USFWS 2007a). Annual nest counts for loggerhead sea turtles on beaches from other countries are in the hundreds with the exception of Brazil, where a total of 4,837 nests were reported for the 2003-2004 nesting season (Marcovaldi and Chaloupka 2007; NMFS and USFWS 2007a), and Mexico, where several thousand nests are estimated to be laid each year and the Yucatán nesting population had a range of 903-2,331 nests per year from 1987-2001 (Zurita *et al*. 2003; NMFS and USFWS 2008). In both the eastern and western Atlantic, waters as far north as 41°N to 42°N latitude are used for foraging by juveniles as well as adults (Shoop 1987; Shoop and Kenney 1992; Ehrhart *et al*. 2003; Mitchell *et al*. 2003). Of all loggerhead populations in the Atlantic Ocean, those comprising individuals that nest and/or forage in U.S. waters of the Northwest Atlantic have been most extensively studied.

In U.S. Atlantic waters, loggerheads commonly occur throughout the inner continental shelf from Florida to Cape Cod, Massachusetts and in the Gulf of Mexico from Florida to Texas, although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al*. 1995a, 1995b; Braun and Epperly 1996; Mitchell *et al*. 2003). Loggerheads have been observed in waters with surface temperatures of 7E to 30EC, but water temperatures ≥11EC are most favorable (Shoop and Kenney 1992; Epperly *et al*. 1995b). The presence of loggerhead sea turtles in U.S. Atlantic waters is also influenced by depth. Aerial surveys of continental shelf waters north of Cape Hatteras, North Carolina indicate that loggerhead sea turtles are most commonly sighted in waters with bottom depths ranging from 22 to 49 m deep (Shoop and Kenney 1992). However, survey and satellite tracking data support that they occur in waters from the beach to beyond the continental shelf (Mitchell *et al*. 2003; Braun-McNeill and Epperly 2004; Blumenthal *et al*. 2006; Hawkes *et al*. 2006; McClellan and Read 2007).

Loggerhead sea turtles occur year round in ocean waters off North Carolina, South Carolina, Georgia, and Florida. In these areas of the South Atlantic Bight, water temperature is influenced by the proximity of the Gulf Stream. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast U.S. (*e.g.*, Pamlico and Core Sounds) and also move up the U.S. Atlantic coast (Epperly *et al*. 1995a, 1995b, 1995c; Braun-McNeill and Epperly 2004), occurring in Virginia foraging areas as early as April and on the most northern foraging grounds in the Gulf of Maine in June (Shoop and Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by mid-September but some may remain in Mid-Atlantic and Northeast areas until late fall. By December, loggerheads have migrated from inshore and more northern coastal waters to waters offshore of North Carolina, particularly off of Cape Hatteras, and waters further south where the influence of the Gulf Stream provides temperatures favorable to sea turtles (Shoop and Kenney 1992; Epperly *et al*. 1995b; Epperly and Braun-McNeill 2002).

Loggerheads mate from late March to early June, and eggs are laid throughout the summer, with a mean clutch size of 100-126 eggs in the southeastern U.S. Individual females nest multiple times during a nesting season, with a mean of 4.1 nests per individual (Murphy and Hopkins 1984). Nesting migrations for an individual female loggerhead are usually on an interval of 2 to 3 years, but can vary from 1 to 7 years (Dodd 1988).

For the past decade or so, the scientific literature has recognized five distinct nesting groups, or subpopulations, of loggerhead sea turtles in the Northwest Atlantic, divided geographically as follows: (1) a northern group of nesting females that nest from North Carolina to northeast Florida at about 29EN latitude; (2) a south Florida group of nesting females that nest from 29EN latitude on the east coast to Sarasota on the west coast; (3) a Florida Panhandle group of nesting females that nest around Eglin Air Force Base and the beaches near Panama City, Florida; (4) a Yucatán group of nesting females that nest on beaches of the eastern Yucatán Peninsula, Mexico (Márquez 1990; TEWG 2000); and (5) a Dry Tortugas group that nests on beaches of the islands of the Dry Tortugas, near Key West, Florida (NMFS SEFSC 2001). Genetic analyses of mitochondrial DNA, which a sea turtle inherits from its mother, indicate that there are genetic differences between loggerheads that nest at and originate from the beaches used by each of the five identified nesting groups of females (TEWG 2000). However, analyses of microsatellite loci from nuclear DNA, which represents the genetic contribution from both parents, indicates little to no genetic differences between loggerheads originating from nesting beaches of the five Northwest Atlantic nesting groups (Pearce and Bowen 2001; Bowen 2003; Bowen *et al*. 2005; Shamblin 2007). These results suggest that female loggerheads have site fidelity to nesting beaches within a particular area, while males provide an avenue of gene flow between nesting groups by mating with females that originate from different nesting groups (Bowen 2003; Bowen *et al*. 2005). The extent of such gene flow, however, is unclear (Shamblin 2007).

The lack of genetic structure makes it difficult to designate specific boundaries for the nesting subpopulations based on genetic differences alone. Therefore, the 2008 Recovery

Plan recently used a combination of geographic distribution of nesting densities, geographic separation, and geopolitical boundaries, in addition to genetic differences, to reassess the designation of these subpopulations to identify recovery units.

The 2008 Recovery Plan designates five recovery units for the Northwest Atlantic population of loggerhead sea turtles based on the aforementioned nesting groups and inclusive of a few other nesting areas not mentioned above. The first four of these recovery units represent nesting assemblages located in the southeast U.S. The fifth recovery unit is composed of all other nesting assemblages of loggerheads within the Greater Caribbean, outside the U.S., but which occur within U.S. waters during some portion of their lives. The five recovery units representing nesting assemblages are: (1) the Northern Recovery Unit (NRU: Florida/Georgia border through southern Virginia), (2) the Peninsular Florida Recovery Unit (PFRU: Florida/Georgia border through Pinellas County, Florida), (3) the Dry Tortugas Recovery Unit (DTRU: islands located west of Key West, Florida), (4) the Northern Gulf of Mexico Recovery Unit (NGMRU: Franklin County, Florida through Texas), and (5) the Greater Caribbean Recovery Unit (GCRU: Mexico through French Guiana, The Bahamas, Lesser Antilles, and Greater Antilles). The Recovery Team evaluated the status and trends of the Northwest Atlantic loggerhead population for each of the five recovery units, using nesting data available as of October 2008 (NMFS and USFWS 2008).

From the beginning of standardized surveys in 1989 until 1998, the PFRU, the largest nesting assemblage in the Northwest Atlantic by an order of magnitude, had a significant increase in the number of nests. However, from 1998 through 2007, Witherington *et al.* (2009) reported a decrease of 39.9% in annual nest counts. In 2008, a slight increase in nest counts was reported, but this did not alter the declining trend. The Loggerhead Recovery Team acknowledged that this dramatic change in status for the PFRU is a serious concern and requires immediate attention to determine the cause(s) of this change and the actions needed to reverse it. The NRU, the second largest nesting assemblage of loggerheads in the U.S., has been declining at a rate of 1.3% annually since standardized surveys were implemented in 1983. Overall, there is strong statistical data to suggest the NRU has experienced a long-term decline. The NGMRU has shown a significant declining trend of 6.8% annually since index nesting beach surveys were initiated in 1997. However, evaluation of long-term nesting trends for the NGMRU is difficult because of changed and expanded beach coverage. No statistical trends in nesting abundance can be determined for the DTRU because of the lack of long-term data. Similarly, statistically valid analyses of long-term nesting trends for the entire GCRU are not available because there are few long-term standardized nesting surveys representative of the region. Additionally, changing survey effort at monitored beaches and scattered and low-level nesting by loggerheads at many locations currently precludes comprehensive analyses (NMFS and USFWS 2008).

Sea turtle nesting surveys are important in that they provide information on the relative abundance of nesting each year, and the contribution of each nesting group to total nesting of the species. Nest counts can also be used to estimate the number of reproductively mature females nesting annually. The final revised recovery plan compiled the most recent information on mean number of loggerhead nests and the approximated counts of nesting females per year for four of the five identified recovery units (i.e., nesting groups). They are: (1) for the NRU, a mean of 5,215 loggerhead nests per year with approximately 1,272 females nesting per year; (2) for the PFRU, a mean of 64,513 nests per year with approximately 15,735 females nesting per year; (3) for the DTRU, a mean of 246 nests per year with approximately 60 females nesting per year; and (4) for the NGMRU, a mean of 906 nests per year with approximately 221 females nesting per year. For the GCRU, the only estimate available for the number of loggerhead nests per year is from Quintana Roo, Yucatán, Mexico, where a range of 903-2,331 nests per year was estimated from 1987-2001 (NMFS and USFWS 2007a). There are no annual nest estimates available for the Yucatán since 2001 or for any other regions in the GCRU, nor are there any estimates of the number of nesting females per year for any nesting assemblage in this recovery unit.

Unlike nesting surveys, in-water studies of sea turtles typically sample both sexes and multiple age classes. In-water studies have been conducted in some areas of the Northwest Atlantic and provide data by which to assess the relative abundance of loggerhead sea turtles and changes in abundance over time (Maier *et al*. 2004; Morreale *et al*. 2004; Mansfield 2006; Ehrhart *et al*. 2007; Epperly *et al*. 2002). Maier *et al*. (2004) used fishery-independent trawl data to establish a regional index of loggerhead abundance for the southeast coast of the U.S. (Winyah Bay, South Carolina to St. Augustine, Florida) during the period 2000-2003. A comparison of loggerhead catch data from this study with historical values suggested that in-water populations of loggerhead sea turtles along the southeast U.S. coast appear to be larger, possibly an order of magnitude higher than they were 25 years ago (Maier *et al*. 2004). A comparison of catch rates for sea turtles in pound net gear fished in the Pamlico-Albemarle Estuarine Complex of North Carolina between the years 1995-1997 and 2001-2003 similarly found a significant increase in catch rates for loggerhead sea turtles for the latter period (Epperly *et al*. 2007). A long-term, on-going study of loggerhead abundance in the Indian River Lagoon System of Florida found a significant increase in the relative abundance of loggerheads over the last 4 years of the study (Ehrhart *et al*. 2007). However, there was no discernible trend in loggerhead abundance during the 24-year time period of the study (1982-2006) (Ehrhart *et al*. 2007).

In contrast to these studies, Morreale *et al*. (2004) observed a decline in the incidental catch of loggerhead sea turtles in pound net gear fished around Long Island, New York, during the period 2002-2004 in comparison to the period 1987-1992, with only two loggerheads observed captured in pound net gear during the period 2002-2004. No additional loggerheads were reported captured in pound net gear through 2007, although 2 were found cold-stunned on Long Island beaches in the fall of 2007 (NMFS 2008). Using aerial surveys, Mansfield (2006) also found a decline in the densities of loggerhead sea turtles in Chesapeake Bay over the period 2001-2004 compared to aerial survey data collected in the 1980s. Significantly fewer loggerheads (p<0.05) were observed in both the spring (May-June) and the summer (July-August) of 2001-2004 compared to those observed during aerial surveys in the 1980s (Mansfield 2006). A comparison of median densities from the 1980s to the 2000s suggested that there had been a 63.2% reduction in densities during the spring residency period and a 74.9% reduction in densities during the summer residency period (Mansfield 2006).

The diversity of a sea turtle's life history leaves them susceptible to many natural and human impacts, including impacts while they are on land, in the neritic environment, and in the oceanic environment. Recent studies have established that the loggerhead's life history is more complex than previously believed. Rather than making discrete developmental shifts from oceanic to neritic environments, research is showing that both adults and (presumed) neritic stage juveniles continue to use the oceanic environment and will move back and forth between the two habitats (Witzell 2002; Blumenthal *et al*. 2006; Hawkes *et al*. 2006; McClellan and Read 2007). One of the studies tracked the movements of adult post-nesting females and found that differences in habitat use were related to body size with larger turtles staying in coastal waters and smaller turtles traveling to oceanic waters (Hawkes *et al*. 2006). A tracking study of large juveniles found that the habitat preferences of this life stage were also diverse with some remaining in neritic waters and others moving off into oceanic waters (McClellan and Read 2007). However, unlike the Hawkes *et al*. (2006) study, there was no significant difference in the body size of turtles that remained in neritic waters versus oceanic waters (McClellan and Read 2007). In either case, the research not only supports the need to revise the life history model for loggerheads but also demonstrates that threats to loggerheads in both the neritic and oceanic environments are likely impacting multiple life stages of this species.

The 5-year status review and 2008 Recovery Plan provide a summary of natural as well as anthropogenic threats to loggerhead sea turtles (NMFS and USFWS 2007a, 2008). Amongst those of natural origin, hurricanes are known to be destructive to sea turtle nests. Sand accretion, rainfall, and wave action that result from these storms can appreciably reduce hatchling success. Other sources of natural mortality include cold stunning and biotoxin exposure.

Anthropogenic factors that impact hatchlings and adult females on land, or the success of nesting and hatching include: beach erosion, beach armoring, and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, feral hogs, dogs, and an increased presence of native species (*e.g.*, raccoons, armadillos, and opossums) which raid nests and feed on turtle eggs (NMFS and USFWS 2007a, 2008). Although sea turtle nesting beaches are protected along large expanses of the Northwest Atlantic coast (in areas like Merritt Island, Archie Carr, and Hobe Sound National Wildlife Refuges), other areas along these coasts have limited or no protection. Sea turtle nesting and hatching success on unprotected high density east Florida nesting beaches from Indian River to Broward County are affected by all of the above threats.

Loggerheads are affected by a completely different set of anthropogenic threats in the marine environment. These include oil and gas exploration, coastal development, and transportation; marine pollution; underwater explosions; hopper dredging; offshore artificial lighting; power plant entrainment and/or impingement; entanglement in debris; ingestion of marine debris; marina and dock construction and operation; boat collisions; poaching; and fishery interactions.

A 1990 National Research Council (NRC) report concluded that for juveniles, subadults, and breeders in coastal waters, the most important source of human caused mortality in U.S. Atlantic waters was fishery interactions. Of these, the U.S. south Atlantic and Gulf of Mexico shrimp fisheries were considered to pose the greatest cause of mortality to neritic juvenile and adult age classes of loggerheads, accounting for an estimated 5,000 to 50,000 loggerhead deaths each year (NRC 1990). Significant changes to the south Atlantic and Gulf of Mexico shrimp fisheries have occurred since 1990, and the effects of these shrimp fisheries on ESA-listed species, including loggerhead sea turtles, have been assessed several times through Section 7 consultation under the ESA. There is also a lengthy regulatory history with regard to the use of Turtle Excluder Devices (TEDs) in the U.S. south Atlantic and Gulf of Mexico shrimp fisheries (Epperly and Teas 2002; NMFS 2002b; Lewison *et al*. 2003). Section 7 consultation was reinitiated in 2002 to, in part, consider the effect of a new rulemaking that would require increasing the size of TED escape openings to allow larger loggerheads (and green sea turtles) to escape from shrimp trawl gear. The resulting Opinion was completed in December 2002 and concluded that, as a result of the new rule, annual loggerhead mortality from capture in shrimp trawls would decline from an estimated 62,294 to 3,947 turtles assuming that all TEDs were installed properly and that compliance was 100% (Epperly *et al*. 2002; NMFS 2002b). The total level of take for loggerhead sea turtles (individuals caught in the gear regardless of whether they subsequently escaped through the TED opening) as a result of the U.S. south Atlantic and Gulf of Mexico shrimp fisheries was estimated to be 163,160 loggerheads per year (NMFS 2002b). On February 21, 2003, NMFS issued the final rule in the *Federal Register* to require the use of the larger opening TEDs (68 FR 8456). The rule also provided the measures to disallow several previously approved TED designs that did not function properly under normal fishing conditions, and to require modifications to the trynet and bait shrimp exemptions to the TED requirements to decrease mortality of sea turtles.

The NRC (1990) report also stated that other U.S. Atlantic fisheries collectively accounted for 500 to 5,000 loggerhead deaths each year, but recognized that there was considerable uncertainty in the estimate. Subsequent studies suggest that these numbers were underestimated. For example, the first estimate of loggerhead sea turtle bycatch in U.S. Mid-Atlantic bottom otter trawl gear was completed in September 2006 (Murray 2006, 2008). Observers reported 66 loggerhead sea turtle interactions with bottom otter trawl gear during the period of which 38 were reported as alive and uninjured and 28 were reported as dead, injured, resuscitated, or of unknown condition (Murray 2006, 2008). Seventy-seven percent of observed sea turtle interactions occurred on vessels fishing for summer flounder (50%) and croaker (27%). The remaining 23% of observed interactions occurred on vessels targeting weakfish (11%), long-finned squid (8%), groundfish (3%), and short-finned squid (1%). Based on observed interactions and fishing effort as reported on VTRs, the average annual loggerhead bycatch in these bottom otter trawl fisheries combined was estimated to be 616 sea turtles per year for the period 1996-2004 (Murray 2006, 2008). The Atlantic sea scallop fishery is estimated to take several hundred loggerhead sea turtles annually in its dredge and trawl fisheries (NMFS 2008). Other U.S. Atlantic coastal fisheries, such as those using gillnets, also take loggerheads, although estimates of takes in other fisheries have not been completed.

The U.S. tuna and swordfish longline fisheries that are managed under the Highly Migratory Species (HMS) FMP were estimated to capture 1,905 loggerheads (no more than 339 mortalities) for each 3-year period (NMFS 2004a). NMFS has mandated gear changes for the HMS fishery to reduce sea turtle bycatch and the likelihood of death from those takes that would still occur (Fairfield-Walsh and Garrison 2007). In 2006, there were 46 observed interactions between loggerhead sea turtles and longline gear used in the HMS fishery. Nearly all of the loggerheads (42 of 46) were released alive but with injuries (Fairfield-Walsh and Garrison 2007). The majority of the injured sea turtles had been hooked internally (Fairfield-Walsh and Garrison 2007). Based on the observed take, an estimated 561 (range = 318-981) loggerhead sea turtles are estimated to have been taken in the longline fisheries managed under the HMS FMP in 2006 (Fairfield-Walsh and Garrison 2007). This number is an increase from 2005 when 274 loggerheads were estimated to have been taken in the fisheries, but is still lower than some previous years in the period of 1992-2006 (Fairfield-Walsh and Garrison 2007). This fishery represents just one of several longline fisheries operating in the Atlantic Ocean. Lewison *et al*. (2004) estimated that 150,000-200,000 loggerheads were taken in the Atlantic longline fisheries in 2000 (includes the U.S. Atlantic tuna and swordfish longline fisheries as well as others).

Leatherback sea turtle

Leatherback sea turtles are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic and Pacific Oceans, the Caribbean Sea, and the Gulf of Mexico (Ernst and Barbour 1972). Leatherback sea turtles are the largest living turtles and range farther than any other sea turtles species; their large size and tolerance of relatively low temperatures allows them to occur in northern waters such as off Labrador and in the Barents Sea (NMFS and USFWS 1995).

In 1980, the leatherback population was estimated at approximately 115,000 adult females globally (Pritchard 1982). By 1995, this global population of adult females was estimated to have declined to 34,500 (Spotila *et al.* 1996). However, the most recent population size estimate for the North Atlantic alone is a range of 34,000-94,000 adult leatherbacks (TEWG 2007). Thus, there is uncertainty with respect to global population estimates of leatherback sea turtles.

Pacific Ocean. Leatherback nesting has been declining at all major Pacific basin nesting beaches for the last two decades (Spotila *et al*. 1996; NMFS and USFWS 1998a; Sarti *et al*. 2000; Spotila *et al*. 2000). Leatherback turtles disappeared from India before 1930, have been virtually extinct in Sri Lanka since 1994, and appear to be approaching extinction in Malaysia (Spotila *et al*. 2000). For example, the nesting group on

Terengganu (Malaysia) - which was one of the most significant nesting sites in the western Pacific Ocean - has declined severely from an estimated 3,103 females in 1968 to 2 nesting females in 1994 (Chan and Liew 1996). Nesting groups of leatherback turtles along the coasts of the Solomon Islands, which historically supported important nesting groups, are also reported to be declining (D. Broderick, pers. comm., *in* Dutton *et al*. 1999). In Fiji, Thailand, Australia, and Papua-New Guinea (East Papua), leatherback turtles have only been known to nest in low densities and scattered colonies.

Only an Indonesian nesting group has remained relatively abundant in the Pacific basin. The largest, extant leatherback nesting group in the Indo-Pacific lies on the north Vogelkop coast of Irian Jaya (West Papua), Indonesia, with over 1,000 nesting females during the 1996 season (Suarez *et al*. 2000). During the early-to-mid 1980s, the number of female leatherback turtles nesting on the two primary beaches of Irian Jaya appeared to be stable. However, in 1999, for example, local Indonesian villagers started reporting dramatic declines in sea turtles near their villages (Suarez 1999). Declines in nesting groups have been reported throughout the western Pacific region where observers report that nesting groups are well below abundance levels that were observed several decades ago (*e.g.*, Suarez 1999).

In the western Pacific Ocean and South China Seas, leatherback turtles are captured, injured, or killed in numerous fisheries including Japanese longline fisheries. Leatherback turtles in the western Pacific are also threatened by poaching of eggs, killing of nesting females, human encroachment on nesting beaches, incidental capture in fishing gear, beach erosion, and egg predation by animals.

In the eastern Pacific Ocean, leatherback nesting is declining along the Pacific coast of Mexico and Costa Rica. According to reports from the late 1970s and early 1980s, three beaches located on the Pacific coast of Mexico support as many as half of all leatherback turtle nests. Since the early 1980s, the eastern Pacific Mexican population of adult female leatherback turtles has declined to slightly more than 200 during 1998-99 and 1999-2000 (Sarti *et al*. 2000). Spotila *et al*. (2000) reported the decline of the leatherback nesting at Playa Grande, Costa Rica, which had been the fourth largest nesting group in the world. Between 1988 and 1999, the nesting group declined from 1,367 to 117 female leatherback turtles. Based on their models, Spotila *et al*. (2000) estimated that the group could fall to less than 50 females by 2003-2004. An analysis of the Costa Rican nesting beaches indicates a decline in nesting during the past 15 years of monitoring (1989-2004) with approximately 1,504 females nesting in 1988-89 to an average of 188 females nesting in 2000-2001 and 2003-2004 (NMFS and USFWS 2007b). A similar dramatic decline has been seen on nesting beaches in Pacific Mexico, where tens of thousands of leatherback nests were laid on the beaches in the 1980s but where a total of only 120 nests on the four primary index beaches (combined) were counted in the 2003-2004 season.

Commercial and artisanal swordfish fisheries off Chile, Columbia, Ecuador, and Peru, purse seine fisheries for tuna in the eastern tropical Pacific Ocean, and California/Oregon drift gillnet fisheries are known to capture, injure or kill leatherback turtles in the eastern

Pacific Ocean. Given the declines in leatherback nesting in the Pacific, some researchers have concluded that the leatherback is on the verge of extinction in the Pacific Ocean (*e.g.,* Spotila *et al*. 1996; Spotila *et al*. 2000).

Indian Ocean. Leatherbacks nest in several areas around the Indian Ocean. These sites include Tongaland, South Africa (Pritchard 2002), and the Andaman and Nicobar Islands (Andrews *et al*. 2002). Intensive survey and tagging work in 2001 provided new information on the level of nesting in the Andaman and Nicobar Islands (Andrews *et al*. 2002). Based on the survey and tagging work, it was estimated that 400-500 female leatherbacks nest annually on Great Nicobar Island (Andrews *et al*. 2002). The number of nesting females using the Andaman and Nicobar Islands combined was estimated around 1000 (Andrews and Shanker 2002). Some nesting also occurs along the coast of Sri Lanka although in much smaller numbers than in the past (Pritchard 2002).

Atlantic Ocean. Evidence from tag returns and strandings in the western Atlantic suggests that adult leatherback sea turtles engage in routine migrations between boreal, temperate and tropical waters (NMFS and USFWS 1992). Leatherbacks are frequently thought of as a pelagic species that feed on jellyfish (*i.e.*, *Stomolophus, Chryaora*, and *Aurelia* (Rebel 1974)), and tunicates (salps, pyrosomas) in oceanic habitat. However, leatherbacks are also known to use coastal waters of the U.S. continental shelf (James *et al*. 2005b; Eckert *et al*. 2006; Murphy *et al*. 2006) as well as the European continental shelf on a seasonal basis (Witt *et al*. 2007).

A 1979 aerial survey of the outer Continental Shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia showed leatherbacks to be present throughout the area with the most numerous sightings made from the Gulf of Maine south to Long Island. Leatherbacks were sighted in water depths ranging from 1-4151m but 84.4% of sightings were in waters less than 180 m (Shoop and Kenney 1992). Leatherbacks were sighted in waters within a sea surface temperature range similar to that observed for loggerheads; from 7-27.2°C (Shoop and Kenney 1992). However, leatherbacks appear to have a greater tolerance for colder waters in comparison to loggerhead sea turtles since more leatherbacks were found at the lower temperatures as compared to loggerheads (Shoop and Kenney 1992). This aerial survey estimated the leatherback population for the northeastern U.S. at approximately 300-600 animals (from near Nova Scotia, Canada to Cape Hatteras, North Carolina). However, the estimate was based on turtles visible at the surface and does not include those that were below the surface out of view. Therefore, it likely underestimates the leatherback population for the northeastern U.S. Estimates of leatherback abundance of 1,052 turtles (C.V.= 0.38) and 1,174 turtles (C.V.= 0.52) were obtained from surveys conducted from Virginia to the Gulf of St. Lawrence in 1995 and 1998, respectively (Palka 2000). However, since these estimates were also based on sightings of leatherbacks at the surface, the author considered the estimates to be negatively biased and the true abundance of leatherbacks may be 4.27 times the estimates (Palka 2000). Studies of satellite tagged leatherbacks suggest that they spend a 10% - 41% of their time at the surface, depending on the phase of their migratory cycle (James *et al*. 2005a). The greatest amount of surface time (up to 41%) was recorded when leatherbacks occurred in continental shelf and slope waters north of 38° N (James *et al*. 2005a).

Leatherbacks are a long lived species (> 30 years). They mature at a younger age than loggerhead turtles, with an estimated age at sexual maturity of about 13-14 years for females with 9 years reported as a likely minimum (Zug and Parham 1996) and 19 years as a likely maximum (NMFS SEFSC 2001). In the U.S. and Caribbean, female leatherbacks nest from March through July. They nest frequently (up to 7 nests per year) during a nesting season and nest about every 2-3 years. During each nesting, they produce 100 eggs or more in each clutch and can produce 700 eggs or more per nesting season (Schultz 1975). However, a significant portion (up to approximately 30%) of the eggs can be infertile. Therefore, the actual proportion of eggs that can result in hatchlings is less than this seasonal estimate. As is the case with other sea turtle species, leatherback hatchlings enter the water soon after hatching. Based on a review of all sightings of leatherback sea turtles of <145 cm (56.55 in) curved carapace length (CCL), Eckert (1999) found that leatherback juveniles remain in waters warmer than 26° C until they exceed 100 cm (39 in) CCL.

Sea turtle nesting survey data is important in that it provides information on the relative abundance of nesting, and the contribution of each population/subpopulation to total nesting of the species. Nest counts can also be used to estimate the number of reproductively mature females nesting annually, and as an indicator of the trend in the number of nesting females in the nesting group. The 5-year review for leatherback sea turtles (NMFS and USFWS 2007b) compiled the most recent information on mean number of leatherback nests per year for each of the seven leatherback populations or groups of populations that were identified by the Leatherback TEWG as occurring within the Atlantic. These are: Florida, North Caribbean, Western Caribbean, Southern Caribbean, West Africa, South Africa, and Brazil. In the U.S., the Florida Statewide Nesting Beach Survey program has documented an increase in leatherback nesting numbers from 98 nests in 1988 to between 800 and 900 nests in the early 2000s (NMFS and USFWS 2007b). An analysis of Florida's Index Nesting Beach Survey sites from 1989-2006 shows a substantial increase in leatherback nesting in Florida during this time, with an annual growth rate of approximately 1.17 (Leatherback TEWG 2007). The TEWG reports an increasing or stable trend for all of the seven populations or groups of populations with the exception of the Western Caribbean and West Africa. However, caution is also warranted even for those that were identified as stable or increasing. In St. Croix, for example, researchers have noted a declining presence of neophytes (first-time nesters) since 2002 (Garner *et al*. 2007). In addition, the leatherback rookery along the northern coast of South America in French Guiana and Suriname supports the majority of leatherback nesting in the western Atlantic (Leatherback TEWG 2007), and represents more than half of total nesting by leatherback sea turtles world-wide (Hilterman and Goverse 2004). Nest numbers in Suriname have shown an increase and the long-term trend for the Suriname and French Guiana nesting group seems to show an increase (Hilterman and Goverse 2004). In 2001, the number of nests for Suriname and French Guiana combined was 60,000, one of the highest numbers observed for this region in 35 years (Hilterman and Goverse 2004). The most recent Leatherback TEWG report (2007) indicates that using nest numbers from 1967-2005, a positive population growth rate was found over the 39-year period for French Guinea and Suriname, with a 95% probability that the population was growing. Nevertheless, given the magnitude of leatherback nesting in this area compared to other nest sites, impacts to this area that negatively impact leatherback sea turtles could have profound impacts on the species, overall.

Tag return data demonstrate that leatherbacks that nest in South America also use U.S. waters. A nesting female tagged May 29, 1990, in French Guiana was later recovered and released alive from the York River, VA. Another nester tagged in French Guiana was later found dead in Palm Beach, Florida (STSSN database). Many other examples also exist. For example, leatherbacks tagged at nesting beaches in Costa Rica have been found in Texas, Florida, South Carolina, Delaware, and New York (STSSN database). Leatherback turtles tagged in Puerto Rico, Trinidad, and the Virgin Islands have also been subsequently found on U.S. beaches of southern, Mid-Atlantic and northern states (STSSN database).

Of the Atlantic turtle species, leatherbacks seem to be the most vulnerable to entanglement in fishing gear. This susceptibility may be the result of their body type (large size, long pectoral flippers, and lack of a hard shell), and their attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface, and perhaps to the lightsticks used to attract target species in longline fisheries. They are also susceptible to entanglement in gillnets (used in various fisheries) and capture in trawl gear (*e.g.*, shrimp trawls, bottom otter trawls). Sea turtles entangled in fishing gear generally have a reduced ability to feed, dive, surface to breathe or perform any other behavior essential to survival (Balazs 1985). In addition to drowning from forced submergence, they may be more susceptible to boat strikes if forced to remain at the surface, and entangling lines can constrict blood flow resulting in tissue necrosis.

Leatherbacks are exposed to pelagic longline fisheries in many areas of their range. According to observer records, an estimated 6,363 leatherback sea turtles were caught by the U.S. Atlantic tuna and swordfish longline fisheries between 1992-1999, of which 88 were released dead (NMFS SEFSC 2001). Since the U.S. fleet accounts for only 5-8% of the hooks fished in the Atlantic Ocean, adding up the under-represented observed takes of the other 23 countries actively fishing in the area would likely result in annual take estimates of thousands of leatherbacks over different life stages (NMFS SEFSC 2001).

Leatherbacks are susceptible to entanglement in the lines associated with trap/pot gear used in several fisheries. From 1990-2000, 92 entangled leatherbacks were reported from New York through Maine (Dwyer *et al.* 2002). Additional leatherbacks stranded wrapped in line of unknown origin or with evidence of a past entanglement (Dwyer *et al.* 2002). A review of leatherback mortality documented by the STSSN in Massachusetts suggests that vessel strikes and entanglement in fixed gear (primarily lobster pots and whelk pots) are the principal sources of this mortality (Dwyer *et al.* 2002). Fixed gear fisheries in the Mid-Atlantic have also contributed to leatherback entanglements. For example, in North Carolina, two leatherback sea turtles were reported entangled in a crab pot buoy inside Hatteras Inlet (NMFS SEFSC 2001). A third leatherback was reported entangled in a crab pot buoy in Pamlico Sound off of Ocracoke. This turtle was disentangled and released alive; however, lacerations on the front flippers from the lines were evident (NMFS SEFSC 2001). In the Southeast, leatherbacks are vulnerable to entanglement in Florida's lobster pot and stone crab fisheries as documented on stranding forms. In the U.S. Virgin Islands, where one of five leatherback strandings from 1982 to 1997 were due to entanglement (Boulon 2000), leatherbacks have been observed with their flippers wrapped in the line of West Indian fish traps (R. Boulon, pers. comm. to Joanne Braun-McNeill, NMFS SEFSC 2001).

Leatherback interactions with the U.S. south Atlantic and Gulf of Mexico shrimp fisheries, are also known to occur (NMFS 2002). Leatherbacks are likely to encounter shrimp trawls working in the coastal waters off the Atlantic coast (from Cape Canaveral, Florida through North Carolina) as they make their annual spring migration north. For many years, TEDs that were required for use in the U.S. south Atlantic and Gulf of Mexico shrimp fisheries were less effective for leatherbacks as compared to the smaller, hard-shelled turtle species, because the TED openings were too small to allow leatherbacks to escape. To address this problem, on February 21, 2003, NMFS issued a final rule to amend the TED regulations. Modifications to the design of TEDs are now required in order to exclude leatherbacks as well as large benthic immature and sexually mature loggerhead and green turtles.

Other trawl fisheries are also known to interact with leatherback sea turtles although on a much smaller scale. In October 2001, for example, a fisheries observer documented the take of a leatherback in a bottom otter trawl fishing for *Loligo* squid off of Delaware. TEDs are not required in this fishery. In November 2007, fisheries observers reported the capture of a leatherback sea turtle in bottom otter trawl gear fishing for summer flounder.

Gillnet fisheries operating in the nearshore waters of the Mid-Atlantic states are also known to capture, injure and/or kill leatherbacks when these fisheries and leatherbacks co-occur. Data collected by the NEFSC Fisheries Observer Program from 1994 through 1998 (excluding 1997) indicate that a total of 37 leatherbacks were incidentally captured (16 lethally) in drift gillnets set in offshore waters from Maine to Florida during this period. Observer coverage for this period ranged from 54% to 92%. In North Carolina, a leatherback was reported captured in a gillnet set in Pamlico Sound in the spring of 1990 (D. Fletcher, pers.comm. to Sheryan Epperly, NMFS SEFSC 2001). Five other leatherbacks were released alive from nets set in North Carolina during the spring months: one was from a net (unknown gear) set in the nearshore waters near the North Carolina/Virginia border (1985); two others had been caught in gillnets set off of Beaufort Inlet (1990); a fourth was caught in a gillnet set off of Hatteras Island (1993), and a fifth was caught in a sink net set in New River Inlet (1993). In addition to these, in September 1995, two dead leatherbacks were removed from a 11-inch (28.2 cm) monofilament shark gillnet set in the nearshore waters off of Cape Hatteras, North Carolina (STSSN unpublished data reported in NMFS SEFSC 2001).

Fishing gear interactions and poaching are problems for leatherbacks throughout their range. Entanglements are common in Canadian waters where Goff and Lien (1988) reported that 14 of 20 leatherbacks encountered off the coast of Newfoundland/Labrador were entangled in fishing gear including salmon net, herring net, gillnet, trawl line and crab pot line. Leatherbacks are known to drown in fish nets set in coastal waters of Sao Tome, West Africa (Castroviejo *et al.* 1994; Graff 1995). Gillnets are one of the suspected causes for the decline in the leatherback sea turtle population in French Guiana (Chevalier *et al.* 1999), and gillnets targeting green and hawksbill turtles in the waters of coastal Nicaragua also incidentally catch leatherback turtles (Lagueux *et al.* 1998). Observers on shrimp trawlers operating in the northeastern region of Venezuela documented the capture of six leatherbacks from 13,600 trawls (Marcano and Alio 2000). An estimated 1,000 mature female leatherback sea turtles are caught annually in fishing nets off of Trinidad and Tobago with mortality estimated to be between 50-95% (Eckert and Lien 1999). However, many of the turtles do not die as a result of drowning, but rather because the fishermen butcher them in order to get them out of their nets (NMFS SEFSC 2001).

Leatherback sea turtles may be more susceptible to marine debris ingestion than other species due to the tendency of floating debris to concentrate in convergence zones that adults and juveniles use for feeding areas (Shoop and Kenney 1992; Lutcavage *et al.* 1997). Investigations of the stomach contents of leatherback sea turtles revealed that a substantial percentage (44% of the 16 cases examined) contained plastic (Mrosovsky 1981). Along the coast of Peru, intestinal contents of 19 of 140 (13%) leatherback carcasses were found to contain plastic bags and film (Fritts 1982). The presence of plastic debris in the digestive tract suggests that leatherbacks might not be able to distinguish between prey items and plastic debris (Mrosovsky 1981). Balazs (1985) speculated that the object may resemble a food item by its shape, color, size or even movement as it drifts about, and induce a feeding response in leatherbacks.

Kemp's ridley sea turtle

The Kemp's ridley is one of the least abundant of the world's sea turtle species. In contrast to loggerhead, leatherback and green sea turtles which are found in multiple oceans of the world, Kemp's ridleys typically occur only in the Gulf of Mexico and the northern half of the Atlantic Ocean (USFWS and NMFS 1992).

The majority of Kemp's ridleys nest along a single stretch of beach near Rancho Nuevo, Tamaulipas, Mexico (Carr 1963; USFWS and NMFS 1992; NMFS and USFWS 2007c). There is a limited amount of scattered nesting to the north and south of the primary nesting beach (NMFS and USFWS 2007c). The number of nesting adult females reached an estimated low of 300 in 1985 (USFWS and NMFS 1992; TEWG 2000; NMFS and USFWS 2007c). Conservation efforts by Mexican and U.S. agencies have aided this species by eliminating egg harvest, protecting eggs and hatchlings, and reducing at-sea mortality through fishing regulations (TEWG 2000). From 1985 to 1999, the number of nests observed at Rancho Nuevo, and nearby beaches increased at a mean rate of 11.3% (95% C.I. slope = 0.096-0.130) per year (TEWG 2000). An estimated 5,500 females nested in Tamaulipas over a 3-day period in May 2007 (NMFS and USFWS 2007c).

Kemp's ridleys mature at 10-17 years (Caillouet *et al*. 1995; Schmid and Witzell 1997; Snover *et al*. 2007; NMFS and USFWS 2007c). Nesting occurs from April through July each year with hatchlings emerging after 45-58 days (USFWS and NMFS 1992). Once they leave the beach, neonates presumably enter the Gulf of Mexico where they feed on available sargassum and associated infauna or other epipelagic species (USFWS and NMFS 1992). The presence of juvenile turtles along both the Atlantic and Gulf of Mexico coasts of the U.S., where they are recruited to the coastal benthic environment, indicates that post-hatchlings are distributed in both the Gulf of Mexico and Atlantic Ocean (TEWG 2000).

The location and size classes of dead turtles recovered by the STSSN suggests that benthic immature developmental areas occur in many areas along the U.S. coast and that these areas may change given resource quality and quantity (TEWG 2000). Foraging areas documented along the Atlantic coast include Pamlico Sound (NC), Chesapeake Bay, Long Island Sound, Charleston Harbor (SC) and Delaware Bay. Developmental habitats are defined by several characteristics, including coastal areas sheltered from high winds and waves such as embayments and estuaries, and nearshore temperate waters shallower than 50m (NMFS and USFWS 2007c). The suitability of these habitats depends on resource availability, with optimal environments providing rich sources of crabs and other invertebrates. A wide variety of substrates have been documented to provide good foraging habitats, including seagrass beds, oyster reefs, sandy and mud bottoms and rock outcroppings (NMFS and USFWS 2007c). Adults are primarily found in near-shore waters of 37m or less that are rich in crabs and have a sandy or muddy bottom (NMFS and USFWS 2007c).

Next to loggerheads, Kemp's ridleys are the second most abundant sea turtle in Virginia and Maryland state waters, arriving in these areas during May and June (Keinath *et al.* 1987; Musick and Limpus 1997). In the Chesapeake Bay, where the seasonal juvenile population of Kemp's ridley sea turtles is estimated to be 211 to 1,083 turtles (Musick and Limpus 1997), ridleys frequently forage in submerged aquatic grass beds for crabs (Musick and Limpus 1997). Kemp's ridleys consume a variety of crab species, including *Callinectes* sp., *Ovalipes* sp., *Libinia* sp., and *Cancer* sp. Mollusks, shrimp, and fish are consumed less frequently (Bjorndal 1997). Upon leaving Chesapeake Bay in autumn, juvenile ridleys migrate down the coast, passing Cape Hatteras in December and January (Musick and Limpus 1997). These larger juveniles are joined there by juveniles of the same size from North Carolina sounds and smaller juveniles from New York and New England to form one of the densest concentrations of Kemp's ridleys outside of the Gulf of Mexico (Epperly *et al.* 1995a; Epperly *et al.* 1995b; Musick and Limpus 1997).

Kemp's ridleys face many of the same natural threats as loggerheads, including destruction of nesting habitat from storm events, natural predators at sea, and oceanic events such as cold-stunning. Although cold-stunning can occur throughout the range of the species, it may be a greater risk for sea turtles that utilize the more northern habitats of Cape Cod Bay and Long Island Sound. For example, as reported in the national STSSN database, in the winter of 1999/2000, there was a major cold-stunning event where 218 Kemp's ridleys, 54 loggerheads, and 5 green turtles were found on Cape Cod beaches. Annual cold stun events do not always occur at this magnitude; the extent of episodic major cold stun events may be associated with numbers of turtles utilizing Northeast waters in a given year, oceanographic conditions and the occurrence of storm events in the late fall. Although many cold-stun turtles can survive if found early enough, cold-stunning events can represent a significant cause of natural mortality.

Like other turtle species, the severe decline in the Kemp's ridley population appears to have been heavily influenced by a combination of exploitation of eggs and impacts from fishery interactions. From the 1940s through the early 1960s, nests from Ranch Nuevo were heavily exploited (USFWS and NMFS 1992), but beach protection in 1966 helped to curtail this activity (USFWS and NMFS 1992). Following World War II, there was a substantial increase in the number of trawl vessels, particularly shrimp trawlers, in the Gulf of Mexico where the adult Kemp's ridley turtles occur. Information from fishers helped to demonstrate the high number of turtles taken in these shrimp trawls (USFWS and NMFS 1992). Subsequently, NMFS has worked with the industry to reduce turtle takes in shrimp trawls and other trawl fisheries, including the development and use of TEDs. As described above, there is lengthy regulatory history with regard to the use of TEDs in the U.S. south Atlantic and Gulf of Mexico shrimp fisheries (Epperly and Teas 2002; NMFS 2002; Lewison *et al*. 2003). The Biological Opinion completed in 2002 concluded that 155,503 Kemp's ridley sea turtles would be taken annually in the shrimp fishery with 4,208 of the takes resulting in mortality (NMFS 2002).

Although changes in the use of shrimp trawls and other trawl gear has helped to reduce mortality of Kemp's ridleys, this species is also affected by other sources of anthropogenic impacts similar to those discussed above. For example, in the spring of 2000, a total of five Kemp's ridley carcasses were recovered from the same North Carolina beaches where 275 loggerhead carcasses were found. Cause of death for most of the turtles recovered was unknown, but the mass mortality event was suspected to have been from a large-mesh gillnet fishery operating offshore in the preceding weeks. The five ridley carcasses that were found are likely to have been only a minimum count of the number of Kemp's ridleys that were killed or seriously injured as a result of the fishery interaction since it is unlikely that all of the carcasses washed ashore.

Green sea turtle

Green turtles are distributed circumglobally, and can be found in the Pacific, Indian and Atlantic Oceans as well as the Mediterranean Sea (NMFS and USFWS 1991b; Seminoff 2004; NMFS and USFWS 2007d). In 1978, the Atlantic population of the green sea turtle was listed as threatened under the ESA, except for the breeding populations in Florida and on the Pacific coast of Mexico, which were listed as endangered. As it is difficult to differentiate between breeding populations away from the nesting beaches, in water all green sea turtles are considered endangered.

Pacific Ocean. Green turtles occur in the eastern, central, and western Pacific. Foraging areas are also found throughout the Pacific and along the southwestern U.S. coast (NMFS and USFWS 1998b). Nesting is known to occur in the Hawaiian archipelago, American

Samoa, Guam, and various other sites in the Pacific but none of these are considered large breeding sites (with 2,000 or more nesting females per year)(NMFS and USFWS 1998b). The main nesting sites for the green sea turtle in the eastern Pacific are located in Michoacan, Mexico, and in the Galapagos Islands, Ecuador (NMFS and USFWS 2007d). The number of nesting females per year exceed 1,000 females at each site (NMFS and USFWS 2007d). However, historically, greater than 20,000 females per year are believed to have nested in Michoacan, alone (Cliffton *et al*. 1982; NMFS and USFWS 2007d). Thus the current number of nesting females is still far below what has historically occurred.

Historically, green turtles were used in many areas of the Pacific for food. They were also commercially exploited and this, coupled with habitat degradation led to their decline in the Pacific (NMFS and USFWS 1998b). Green turtles in the Pacific continue to be affected by poaching, habitat loss or degradation, fishing gear interactions, and fibropappiloma (NMFS and USFWS 1998b; NMFS 2004d).

Indian Ocean. There are numerous nesting sites for green sea turtles in the Indian Ocean. One of the largest nesting sites for green sea turtles worldwide occurs on the beaches of Oman where an estimated 20,000 green sea turtles nest annually (Hirth 1997; Ferreira *et al*. 2003). Based on a review of the 32 Index Sites used to monitor green sea turtle nesting worldwide, Seminoff (2004) concluded that declines in green turtle nesting were evident for many of the Indian Ocean Index Sites. While several of these had not demonstrated further declines in the more recent past, only the Comoros Island Index Site in the Western Indian Ocean showed evidence of increased nesting (Seminoff 2004).

Atlantic Ocean. As has occurred in other oceans of its range, green turtles were once the target of directed fisheries in the United States and throughout the Caribbean. In 1890, over one million pounds of green turtles were taken in the Gulf of Mexico green sea turtle fishery (Doughty 1984). However, declines in the turtle fishery throughout the Gulf of Mexico were evident by 1902 (Doughty 1984).

In the western Atlantic, green sea turtles range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean (Wynne and Schwartz 1999). Green turtles occur seasonally in Mid-Atlantic and Northeast waters such as Long Island Sound (Musick and Limpus 1997; Morreale and Standora 1998; Morreale *et al*. 2004), presumably for foraging.

Some of the principal feeding pastures in the western Atlantic Ocean include the upper west coast of Florida and the northwestern coast of the Yucatan Peninsula. Additional important foraging areas in the western Atlantic include the Mosquito and Indian River Lagoon systems and nearshore wormrock reefs between Sebastian and Ft. Pierce Inlets in Florida, Florida Bay, the Culebra archipelago and other Puerto Rico coastal waters, the south coast of Cuba, the Mosquito Coast of Nicaragua, the Caribbean Coast of Panama, and scattered areas along Colombia and Brazil (Hirth 1971).

Age at maturity for green sea turtles is estimated to be 20-50 years (Balazs 1982, Frazer and Ehrhart 1985; Seminoff 2004). As is the case with the other turtle species described above, adult females may nest multiple times in a season and typically do not nest in successive years (NMFS and USFWS 1991b; Hirth 1997).

As is also the case for the other sea turtle species described above, nest count information for green sea turtles provides information on the relative abundance of nesting, and the contribution of each nesting group to total nesting of the species. Nest counts can also be used to estimate the number of reproductively mature females nesting annually. The 5-year status review for the species identified eight geographic areas considered to be primary sites for green sea turtle nesting in the Atlantic/Caribbean, and reviewed the trend in nest count data for each (NMFS and USFWS 2007d). These include: (1)Yucatán Peninsula, Mexico, (2) Tortuguero, Costa Rica, (3) Aves Island, Venezuela, (4) Galibi Reserve, Suriname, (5) Isla Trindade, Brazil, (6) Ascension Island, United Kingdom, (7) Bioko Island, Equatorial Guinea, and (8) Bijagos Achipelago (Guinea-Bissau) (NMFS and USFWS 2007d). Nesting at all of these sites was considered to be stable or increasing with the exception of Bioko Island and the Bijagos Archipelago where the lack of sufficient data precluded a meaningful trend assessment for either site (NMFS and USFWS 2007d). Seminoff (2004) likewise reviewed green sea turtle nesting data for eight sites in the western, eastern, and central Atlantic, including all of the above with the exception that nesting in Florida was reviewed in place of Isla Trindade, Brazil. Seminoff (2004) concluded that all sites in the central and western Atlantic showed increased nesting with the exception of nesting at Aves Island, Venezuela, while both sites in the eastern Atlantic demonstrated decreased nesting. These sites are not inclusive of all green sea turtle nesting in the Atlantic. However, other sites are not believed to support nesting levels high enough that would change the overall status of the species in the Atlantic (NMFS and USFWS 2007d).

By far, the most important nesting concentration for green turtles in the western Atlantic is in Tortuguero, Costa Rica (NMFS and USFWS 2007d). Nesting in the area has increased considerably since the 1970's and nest count data from 1999-2003 suggest nesting by 17,402-37,290 females per year (NMFS and USFWS 2007d). The number of females nesting per year on beaches in the Yucatán , at Aves Island, Galibi Reserve, and Isla Trindade number in the hundreds to low thousands, depending on the site (NMFS and USFWS 2007d). In the U.S., certain Florida nesting beaches have been designated index beaches. Index beaches were established to standardize data collection methods and effort on key nesting beaches. The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring since establishment of the index beaches in 1989, perhaps due to increased protective legislation throughout the Caribbean (Meylan *et al.* 1995).
An average of 5,039 green turtle nests were laid annually in Florida between 2001 and 2006 with a low of 581 in 2001 and a high of 9,644 in 2005 (NMFS and USFWS 2007d). Occasional nesting has been documented along the Gulf coast of Florida, at southwest Florida beaches, as well as the beaches on the Florida Panhandle (Meylan *et al.* 1995). More recently, green turtle nesting occurred on Bald Head Island, North Carolina just east of the mouth of the Cape Fear River, on Onslow Island, and on Cape Hatteras

National Seashore. Increased nesting has also been observed along the Atlantic Coast of Florida, on beaches where only loggerhead nesting was observed in the past (Pritchard 1997).

Green turtles face many of the same natural threats as loggerhead and Kemp's ridley sea turtles. In addition, green turtles appear to be susceptible to fibropapillomatosis, an epizootic disease producing lobe-shaped tumors on the soft portion of a turtle's body. Juveniles are most commonly affected. The occurrence of fibropapilloma tumors may result in impaired foraging, breathing, or swimming ability, leading potentially to death.

As with the other sea turtle species, incidental fishery mortality accounts for a large proportion of annual human-caused mortality outside the nesting beaches, while other activities like dredging, pollution, and habitat destruction account for an unknown level of other mortality. Stranding reports indicate that between 200-400 green turtles strand annually along the Eastern U.S. coast from a variety of causes most of which are unknown (STSSN database). Sea sampling coverage in the pelagic driftnet, pelagic longline, southeast shrimp trawl, and summer flounder bottom trawl fisheries has recorded takes of green turtles.

Literature Cited

Andrews, H.V., and K. Shanker. 2002. A significant population of leatherback turtles in the Indian Ocean. Kachhapa. 6:19.

Andrews, H.V., S. Krishnan, and P. Biswas. 2002. Leatherback nesting in the Andaman and Nicobar Islands. Kachhapa. 6:15-18.

Angliss, R.P. and R.B. Outlaw. 2007. Alaska Marine Mammal Stock Assessments, 2006. NOAA
Technical Memorandum NOAA-TM-AFSC-168. 244p.

Balazs, G.H. 1982. Growth rates of immature green turtles in the Hawaiian Archipelago, p. 117-125. *In* K.A. Bjorndal (ed.), Biology and conservation of sea turtles. Smithsonian Institution Press, Washington D.C.

Balazs, G.H. 1985. Impact of ocean debris on marine turtles: entanglement and ingestion. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-54:387-429.

Baldwin, R., G.R. Hughes, and R.T. Prince. 2003. Loggerhead turtles in the Indian Ocean. Pages 218-232. *In*: A.B. Bolten and B.E. Witherington (eds.) Loggerhead Sea Turtles. Smithsonian Books, Washington, D.C. 319 pp.

Barlow, J., and P. J. Clapham. 1997. A new birth-interval approach to estimating demographic parameters of humpback whales. Ecology, 78: 535-546.

Baumgartner, M.F. and B.R. Mate. 2005. Summer and fall habitat of North Atlantic right whales (*Eubalaena glacialis*) inferred from satellite telemetry. Canadian Journal of Fisheries and Aquatic Sciences 62: 527-543.

Berube, M., A. Aguilar, D. Dendanto, F. Larsen, G. Notarbatolo di Sciara, R. Sears, J. Sigurjonsson, J. Urban-R, and P. Palsboll. 1998. Population genetic structure of North Atlantic, Mediterranean Sea and Sea of Cortez fin whales: analysis of mitochondrial and nuclear loci. Molecular ecology 7: 585-599

Best, P.B., J. L. Bannister, R.L. Brownell, Jr., and G.P. Donovan (eds.). 2001. Right whales: worldwide status. *J. Cetacean Res. Manage.* (Special Issue). 2. 309pp.

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. Pages 199-233 In: Lutz, P.L. and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Blumenthal, J.M., J.L. Solomon, C.D. Bell, T.J. Austin, G. Ebanks-Petrie, M.S. Coyne, A.C. Broderick, and B.J. Godley. 2006. Satellite tracking highlights the need for international cooperation in marine turtle management. Endang. Spec. Res. 2: 51-61.

Bolten, A.B., J.A. Wetherall, G.H. Balazs, and S.G. Pooley (compilers). 1996. Status of marine turtles in the Pacific Ocean relevant to incidental take in the Hawaii-based pelagic longline fishery. U.S. Dept. of Commerce, NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-230.

Boulon, R., Jr., 2000. Trends in sea turtle strandings, U.S. Virgin Islands: 1982 to 1997. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SEFSC-436:261-263.

Bowen, B.W. 2003. What is a loggerhead turtle? The genetic perspective. pp. 7-27. *In*: Loggerhead Sea Turtles. A.B. Bolten and B.E. Witherington (eds.), Smithsonian Press, Washington D.C.

Bowen, B.W., A.L. Bass, L. Soares, and R.J. Toonen. 2005. Conservation implications of complex population structure: lessons from the loggerhead turtle (*Caretta caretta*). Molecular Ecology 14: 2389-2402.

Bowen, B.W., and S.A. Karl. 2007. Population genetics and phylogeography of sea turtles. Molecular Ecology 16: 4886-4907.

Bowen, B.W., A.L. Bass, S. Chow, M. Bostrom, K.A. Bjorndal, A.B. Bolten, T. Okuyama, B.M. Bolker, S. Epperly, E. LaCasella, D. Shaver, M. Dodd, S.R. Hopkins-Murphy, J.A. Musick, M. Swingle, K. Rankin-Baransky, W. Teas, W.N. Witzell, and P.H. Dutton. 2003. Natal homing in juvenile loggerhead sea turtles (*Caretta caretta*). Molec. Ecol. 13: 3797-3808.

Braun, J., and S.P. Epperly. 1996. Aerial surveys for sea turtles in southern Georgia waters, June 1991. Gulf of Mexico Science. 1996(1): 39-44.

Braun-McNeill, J., and S.P. Epperly. 2004. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). Mar. Fish. Rev. 64(4):50-56.

Brown, M.W., O.C. Nichols, M.K. Marx, and J.N. Ciano. 2002. Surveillance, Monitoring and Management of North Atlantic Right Whales in Cape Cod Bay and Adjacent Waters -2002 Final Report. Center for Coastal Studies, Provincetown, MA. and the New England Aquarium, Boston, MA.

Brown, M.W. and M.K. Marx. 1998. Surveillance, Monitoring and Management of North Atlantic Right Whales, *Eubalaena glacialis,* in Cape Cod Bay, Massachusetts: January to Mid-May, 1998 Final Report. Center for Coastal Studies, Provincetown, MA. and the New England Aquarium, Boston, MA.

Brown, S.G. 1986. Twentieth-century records of right whales (*Eubalaena glacialis*) in the northeast Atlantic Ocean. *In*: R.L. Brownell Jr., P.B. Best, and J.H. Prescott (eds.) Right whales: Past and Present Status. IWC Special Issue No. 10. p. 121-128.

Caillouet, C., C.T. Fontaine, S.A. Manzella-Tirpak, and T.D. Williams. 1995. Growth of head-started Kemp's ridley sea turtles (*Lepidochelys kempi*) following release. Chel. Cons. Biol. 1:231-234.

Calambokidis, J., E. A. Falcone, T.J. Quinn., A.M. Burdin, P.J. Clapham, J.K.B. Ford, C.M. Cabriele, R. LeDuc, D. Matilla, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urban, D. Weller, B.H. Witteveen, M.Yamaguchi, A. Bendlin, D. Camacho, K. Flynn, A. Havron, J. Huggins, and N. Maloney. 2008. SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific. Final Report for
Contract AB133F-03-RP-00078; 57pp.

Carretta, J.V., K.A. Forney, M.M. Muto, J. Barlow, J. Baker, B. Hanson and M. Lowry. 2007. U.S. Pacific Marine Mammal Stock Assessments: 2006. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC. 316 p.

Carr, A.R. 1963. Pan specific reproductive convergence in Lepidochelys kempi. Ergebn. Biol. 26: 298-303.

Castroviejo, J., J.B. Juste, J.P. Del Val, R. Castelo, and R. Gil. 1994. Diversity and status of sea turtle species in the Gulf of Guinea islands. Biodiversity and Conservation 3:828-836.

Caswell, H., M. Fujiwara, and S. Brault. 1999. Declining survival probability threatens the North Atlantic right whale. Proc. Nat. Acad. Sci. 96: 3308-3313.

Cetacean and Turtle Assessment Program (CeTAP). 1982. Final report or the cetacean and turtle assessment program, University of Rhode Island, to Bureau of Land Management, U.S. Department of the Interior. Ref. No. AA551-CT8-48. 568 pp.

Chan, E.H., and H.C. Liew. 1996. Decline of the leatherback population in Terengganu, Malaysia, 1956-1995. Chelonian Conservation and Biology 2(2):192-203.

Chevalier, J., X. Desbois, and M. Girondot. 1999. The reason for the decline of leatherback turtles *(Dermochelys coriace*a) in French Guiana: a hypothesis p.79-88. In Miaud, C. and R. Guyétant (eds.), Current Studies in Herpetology, Proceedings of the ninth ordinary general meeting of the Societas Europea Herpetologica, 25-29 August 1998 Le Bourget du Lac, France.

Clapham, P.J. 1992. Age at attainment of sexual maturity in humpback whales, *Megaptera novaengliae*. Can. J. Zool. 70:1470-1472.

Clapham, P.J. and C.A. Mayo. 1990. Reproduction of humpback whales (*Megaptera novaengliae*) observed in the Gulf of Maine. Rep. Int. Whal. Commn. Special Issue 12: 171-175.

Clapham, P.J., S.B. Young, R.L. Brownell, Jr. 1999. Baleen whales: conservation issues and the status of the most endangered populations. Mammal Review 29(1): 35-60.

Clapham, P., S. Brault, H. Caswell, M. Fujiwara, S. Kraus, R. Pace and P. Wade. 2002. Report of the Working Group on Survival Estimation for North Atlantic Right Whales.

Clark, C.W. 1995. Application of U.S. Navy underwater hydrophone arrays for scientific research on whales. Reports of the International Whaling Commission 45: 210-212.

Cliffton, K., D.O. Cornejo, and R.S. Felger. 1982. Sea turtles of the Pacific coast of mexico. Pages 199-209. In: Bjorndal, K.A. (ed.), Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washingotn, D.C.

Cole, T.V.N, D.L. Hartley and R.L. Merrick. 2005. Mortality and Serious Injury Determinations for Large Whale Stocks along the Eastern Seaboard of the United States, 1999-2003. Northeast Fisheries Science Center Reference Document. 05-08; 18 pp.

Dodd, C.K. 1988. Synopsis of the biological data on the loggerhead sea turtles Caretta caretta (Linnaeus 1758). U.S. Fish and Wildlife Service, Biological Report 88 (14).

Donovan, G.P. 1991. A review of IWC stock boundaries. Rep. Int. Whal. Comm., Spec. Iss. 13:39-63.

Doughty, R.W. 1984. Sea turtles in Texas: A forgotten commerce. Southwestern Historical Quarterly. pp. 43-70.

Durbin, E, G. Teegarden, R. Campbell, A. Cembella, M.F. Baumgartner, B.R. Mate. 2002. North Atlantic right whales, *Eubalaena glacialis*, exposed to Paralytic Shellfish Poisoning (PSP) toxins via a zooplankton vector, *Calanus finmarchicus*. *Harmful Algae*. 1: 243-251.

Dutton, P.H., B.W. Bowen, D.W. Owens, A. Barragan, and S.K. Davis. 1999. Global phylogeography of the leatherback turtle (*Dermochelys coriacea*). Journal of Zoology 248:397-409.

Dwyer, K.L., C.E. Ryder, and R. Prescott. 2002. Anthropogenic mortality of leatherback sea turtles in Massachusetts waters. Poster presentation for the 2002 Northeast Stranding Network Symposium.

Eckert, S.A. 1999. Global distribution of juvenile leatherback turtles. Hubbs Sea World Research Institute Technical Report 99-294.

Eckert, S.A. and J. Lien. 1999. Recommendations for eliminating incidental capture and mortality of leatherback sea turtles, *Dermochelys coriacea*, by commercial fisheries in Trinidad and Tobago. A report to the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). Hubbs-Sea World Research Institute Technical Report No. 2000-310, 7 pp.

Eckert, S.A., D. Bagley, S. Kubis, L. Ehrhart, C. Johnson, K. Stewart, and D. DeFreese. 2006. Internesting and postnesting movements of foraging habitats of leatherback sea turtles (*Dermochelys coriacea*) nesting in Florida. Chel. Cons. Biol. 5(2): 239-248.

Epperly, S.P. and W.G. Teas. 2002. Turtle Excluder Devices - Are the escape openings large enough? Fish. Bull. 100:466-474.

Epperly, S.P., J. Braun, and A.J. Chester. 1995a. Aerial surveys for sea turtles in North Carolina inshore waters. Fishery Bulletin 93:254-261.

Epperly, S.P., J. Braun, A.J. Chester, F.A. Cross, J.V. Merriner and P.A. Tester. 1995b. Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. Bull. of Marine Sci. 56(2):547-568.

Epperly, S.P., J. Braun, and A. Veishlow. 1995c. Sea turtles in North Carolina waters. Cons. Biol. 9(2): 384-394.

Epperly, S., L. Avens, L. Garrison, T. Henwood, W. Hoggard, J. Mitchell, J. Nance, J. Poffenberger, C. Sasso, E. Scott-Denton, and C. Yeung. 2002. Analysis of sea turtle bycatch in the commercial shrimp fisheries if southeast U.S. waters and the Gulf of Mexico. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-SEFSC-490, 88pp.

Ehrhart, L.M., D.A. Bagley, and W.E. Redfoot. 2003. Loggerhead turtles in the Atlantic Ocean: geographic distribution, abundance, and population status. Pp. 157-174 In: Bolten, A.B. and B.E. Witherington (eds.). Loggerhead Sea Turtles. Smithsonian Institution Press, Washington D.C.

Ehrhart. L.M., W.E. Redfoot, and D.A. Bagley. 2007. Marine turtles of the central region of the Indian River Lagoon System, Florida. Florida Scient. 70(4): 415-434.

Ernst, C.H. and R.W. Barbour. 1972. Turtles of the United States. Univ. Press of Kentucky, Lexington. 347 pp.

Fairfield-Walsh, C. and L.P. Garrison. Estimated bycatch of marine mammals and turtles in the U.S. Atlantic pelagic longline fleet during 2006. NOAA Technical Memorandum NOAA NMFS-SEFSC-560. 54pp.

Frasier, T.R., B.A. McLeod, R.M. Gillett, M.W. Brown and B.N. White. 2007. Right Whales Past and Present as Revealed by Their Genes. Pp 200-231. *In*: S.D. Kraus and R.M. Rolland (eds) *The Urban Whale*. Harvard University Press, Cambridge, Massachusetts, London, England. vii-xv + 543pp.

Frazer, N.B. and L.M. Ehrhart. 1985. Preliminary growth models for green, *Chelonia mydas*, and loggerhead, *Caretta caretta*, turtles in the wild. Copeia. 1985-73-79.

Garner, J.A., S.A. Garner, and W. C. Coles. 2006. Tagging and nesting research on leatherback sea turtles (*Dermochelys coriacea*) on Sandy Point, St. Croix, U.S. Virgin Islands, 2006. Annual Report of the Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife. 52pp.

Geraci, Joseph R., Daniel M. Anderson, R.J. Timperi, David J. St. Aubin, Gregory A. Early, John H.Prescott, and Charles A. Mayo. 1989. Humpback Whales (Megaptera novaeangliae) Fatally Poisoned by Dinoflagellate Toxin. Can. J. Fish. and Aquat. Sci. 46(11): 1895-1898.

Glass, A. H., T. V. N. Cole, M. Garron, R. L. Merrick, and R. M. Pace III. 2008. Mortality and Serious Injury Determinations for Baleen Whale Stocks Along the United States Eastern Seaboard and Adjacent Canadian Maritimes, 2002-2006. Northeast Fisheries Science Center Document 08-04; 18 pp.

Goff, G.P. and J.Lien. 1988. Atlantic leatherback turtle, *Dermochelys coriacea*, in cold water off Newfoundland and Labrador. Can. Field Nat.102(1):1-5.

Graff, D. 1995. Nesting and hunting survey of the turtles of the island of Svo Tomé. Progress Report July 1995, ECOFAC Componente de Svo Tomé e Príncipe, 33 pp.

Greene, C.H., A.J. Pershing, R.D. Kenney, and J.W. Jossi. 2003. Impact of climate variability on the recover of endangered North Atlantic right whales. Oceanography. 16: 96-101.

Greene, C.H and A.J. Pershing. 2004. Climate and the conservation biology of North Atlantic right whales: the right whale at the wrong time? Frontiers in Ecology and the Environment. 2(1): 29-34.

Hain, J.H.W., M.J. Ratnaswamy, R.D. Kenney, and H.E. Winn. 1992. The fin whale, *Balaenoptera physalus*, in waters of the northeastern United States continental shelf. Reports of the International Whaling Commission 42: 653-669.

Hamilton, P.K., and C.A. Mayo. 1990. Population characteristics of right whales (*Eubalaena glacialis*) observed in Cape Cod and Massachusetts Bays, 1978-1986. Reports of the International Whaling Commission, Special Issue No. 12: 203-208.

Hatase, H., M. Kinoshita, T. Bando, N. Kamezaki, K. Sato, Y. Matsuzawa, K. Goto, K. Omuta, Y. Nakashima, H. Takeshita, and W. Sakamoto. 2002. Population structure of loggerhead turtles, *Caretta caretta*, nesting in Japan: Bottlenecks on the Pacific population. Marine Biology 141:299-305.

Hawkes, L.A., A.C. Broderick, M.H. Godfrey, and B,J, Godley. 2005. Status of nesting loggerhead turtles *Caretta caretta* at Bald head Island (North Carolina, USA) after 24 years of intensive monitoring and conservation. Oryx: 39(1): 65-72.

Hilterman, M.L. and E. Goverse. 2004. Annual report of the 2003 leatherback turtle research and monitoring project in Suriname. World Wildlife Fund - Guianas Forests and Environmental Conservation Project (WWF-GFECP) Technical Report of the Netherlands Committee for IUCN (NC-IUCN), Amsterdam, the Netherlands, 21p.

Hirth, H.F. 1971. Synopsis of biological data on the green sea turtle, Chelonia mydas. FAO Fisheries Synopsis No. 85: 1-77.

Hirth, H.F. 1997. Synopsis of the biological data of the green turtle, *Chelonia mydas* (Linnaeus 1758). USFWS Biological Report 97(1). 120pp.

International Whaling Commission (IWC). 1986. Right whales: past and present status. Reports of the International Whaling Commission, Special Issue No. 10; Cambridge, England.

International Whaling Commission (IWC). 1992. Report of the comprehensive assessment special meeting on North Atlantic fin whales. Reports of the International Whaling Commission 42:595-644.

International Whaling Commission (IWC). 1995. Report of the Scientific Committee, Annex E. Rep. Int. Whal. Comm. 45:121-138.

James, M.C., R.A. Myers, and C.A. Ottenmeyer. 2005a. Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. Proc. R. Soc. B, 272: 1547-1555.

James, M.C., C.A. Ottensmeyer, and R.A. Myers. 2005b. Identification of high-use habitat and threats to leatherback sea turtles in northern waters: new directions for conservation. Ecol. Lett. 8:195-201.

Johnson, J.H.and A.A. Wolman. 1984. The humpback whale,*Megaptera novaengliae*. Mar. Fish. Rev. 46(4): 30-37.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginias sea turtles: 1979-1986. Virginia J. Sci. 38(4): 329-336.

Kenney, R.D. 2001. Anomalous 1992 spring and summer right whale (*Eubalaena glacialis*) distribution in the Gulf of Maine. Journal of Cetacean Research and Management (special Issue) 2: 209-23.

Kenney, R.D. 2002. North Atlantic, North Pacific and Southern Right Whales. pp. 806-813, *In*: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.). Encyclopedia of Marine Mammals. Academic Press, San Diego, CA.

Kenney, R.D., H.E. Winn, and M.C. Macaulay. 1995. Cetaceans in the Great South Channel, 1979-1989: right whale (*Eubalaena glacialis*). Cont. Shelf. Res. 15: 385-414.

Kenney, R.D., M.A.M. Hyman, R.E. Owen, G.P. Scott, and H.E. Winn. 1986. Estimation of prey densities required by Western North Atlantic right whales. Mar. Mamm. Sci. 2(1): 1-13.

Knowlton, A. R., J. Sigurjonsson, J.N. Ciano, and S.D. Kraus. 1992. Long-distance movements of North Atlantic right whales (*Eubalaena glacialis*). Mar. Mamm. Sci. 8(4): 397-405.

Knowlton, A.R., L. A. Cooper, P. K. Hamilton, M. K. Marx, H. M. Pettis, and S. D. Kraus. 2008. Analysis of scarring on North Atlantic right whales *(Eubalaena glacialis)*: Monitoring rate of entanglement interaction- 1980 – 2004. Final report to the Northeast Fisheries Science Center, NMFS, Contract No. EA133F-03-SE-0323. New England Aquarium: 25pp.

Kraus, S.D., M.J. Crone, and A.R. Knowlton. 1988. The North Atlantic right whale. Pages 684-98 *in* W.J. Chandler, ed. Audbon wildlife report 1988/1989. Academic Press, San Diego, CA.

Lageux, C.J., C. Campbell, L.H. Herbst, A.R. Knowlton and B. Weigle. 1998. Demography of marine turtles harvested by Miskitu Indians of Atlantic Nicaragua. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SEFSC-412:90.

Lalli, C.M. and T.R. Parsons. 1997. Biological oceanography: An introduction – 2nd Edition. Pages 1-13. Butterworth-Heinemann Publications. 335 pp.

Laurent, L., P. Casale, M.N. Bradai, B.J. Godley, G. Gerosa, A.C. Broderick, W. Schroth, B. Schierwater, A.M. Levy, D. Freggi, E.M. Abd El-Mawla, D.A. Hadoud, H.E. Gomati, M. Domingo, M. Hadjichristophorou, L. Kornaraki, F. Demirayak, and C. Gautier. 1998. Molecular resolution of the marine turtle stock composition in fishery bycatch: A case study in the Mediterranean. Molecular Ecology 7:1529-1542.

Lewison, R.L., L.B. Crowder, and D.J. Shaver. 2003. The impact of turtle excluder devices and fisheries closures on loggerhead and Kemp's ridley strandings in the western Gulf of Mexico. Cons. Biol. 17(4): 1089-1097.

Lewison, R.L., S.A. Freeman, and L.B. Crowder. 2004. Quantifying the effects of fisheries on threatened species: the impact of pelagic longlines on loggerhead and leatherback sea turtles. Ecology Letters. 7: 221-231.

Limpus, C.J. and D.J. Limpus. 2003. Loggerhead turtles in the equatorial Pacific and southern Pacific Ocean: A species in decline. *In*: Bolten, A.B., and B.E. Witherington (eds.), Loggerhead Sea Turtles. Smithsonian Institution.

Lutcavage, M.E. and P. Plotkin, B. Witherington, and P.L. Lutz. 1997. Human impacts on sea turtle survival, p.387-409. In P.L. Lutz and J.A. Musick, (eds.), The Biology of Sea Turtles, CRC Press, Boca Raton, Florida. 432pp.

Maier, P. P., A. L. Segars, M. D. Arendt, J. D. Whitaker, B. W. Stender, L. Parker, R. Vendetti, D. W. Owens, J. Quattro, and S. R. Murphy. 2004. Development of an index of sea turtle abundance based on in-water sampling with trawl gear. Final report to the National Marine Fisheries Service. 86 pp.

Mansfield, K. L. 2006. Sources of mortality, movements, and behavior of sea turtles in Virginia. Chapter 5. Sea turtle population estimates in Virginia. pp.193-240. Ph.D. dissertation. School of Marine Science, College of William and Mary.

Marcano, L.A. and J.J. Alio-M. 2000. Incidental capture of sea turtles by the industrial shrimping fleet off northwestern Venezuela. U.S. department of Commerce, NOAA Technical Memorandum NMFS-SEFSC-436:107.

Marcovaldi, M.A. and M. Chaloupka. 2007. Conservation status of the loggerhead sea turtle in Brazil: an encouraging outlook. Endangered Species research 3:133-143.

Margaritoulis, D., R. Argano, I. Baran, F. Bentivegna, M.N. Bradai, J.A. Camiñas, P. Casale, G. De Metrio, A. Demetropoulos, G. Gerosa, B.J. Godley, D.A. Haddoud, J. Houghton, L. Laurent, and B. Lazar. 2003. Loggerhead turtles in the Mediterranean Sea: Present knowledge and conservation perspectives. Pages 175-198. *In*: A.B. Bolten and B.E. Witherington (eds.) Loggerhead Sea Turtles. Smithsonian Books, Washington, D.C. 319 pp.

Márquez, R. 1990. FAO Species Catalogue, Vol. 11. Sea turtles of the world, an annotated and illustrated catalogue of sea turtle species known to date. FAO Fisheries Synopsis, 125. 81pp.

Mate, B.M., S.L. Nieukirk, R. Mescar, and T. Martin. 1992. Application of remote sensing methods for tracking large cetaceans: North Atlantic right whales (*Eubalaena glacialis*). Final Report to the Minerals Management Service, Contract No. 14-12-0001-30411, 167 pp.

Mate, B.M., S.L. Nieukirk, and S.D. Kraus. 1997. Satellite monitored movements of the North Atlantic right whale. J. Wildl. Manage. 61:1393-1405.

McClellan, C.M. and A.J. Read. 2007. Complexity and variation in loggerhead sea turtle life history. Biol. Lett. 3pp.

Meylan, A., B. Schroeder, and A. Mosier. 1995. Sea turtle nesting activity in the state of Florida. Fla. Mar. Res. Publ. 52:1-51.

Mitchell, E., V.M. Kozicki, and R.R. Reeves. 1986. Sightings of right whales, *Eubalaena glacialis*, on the Scotian Shelf, 1966-1972. Reports of the International Whaling Commission (Special issue). 10: 83-107.

Mizroch, S.A. and A.E. York. 1984. Have pregnancy rates of Southern Hemisphere fin whales, *Balaenoptera physalus*, increased? Reports of the International Whaling Commission, Special Issue No. 6:401-410.

Moore, JC and E. Clark. 1963. Discovery of Right Whales in the Gulf of Mexico. Science 141: 269.

Morreale, S.J. and E.A. Standora. 1993. Occurrence, movement, and behavior of the Kemp's ridley and other sea turtles in New York waters. Final Report April 1988-March 1993. 70pp.

Morreale, S.J. and E.A. Standora. 1998. Early life stage ecology of sea turtles in northeastern U.S. waters. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-413, 49 pp.

Morreale, S. J., C.F. Smith, K. Durham, R. DiGiovanni Jr., A.A. Aguirre. 2004. Assessing health, status and trends in northeastern sea turtle populations. Year-end report Sept, 2002-Nov. 2004 to the Protected Resources Division, NMFS, Gloucester MA.

Morreale, S.J. and E.A. Standora. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. Chel. Conserv. Biol. 4(4):872-882.

Murphy, T.M. and S.R. Hopkins. 1984. Aerial and ground surveys of marine turtle nesting beaches in the southeast region. United States Final Report to NMFS-SEFSC. 73pp.

Murray, K.T. 2006. Estimated average annual bycatch of loggerhead sea turtles (*Caretta caretta*) in U.S. Mid-Atlantic bottom otter trawl gear, 1996-2004. U.S. Dep. Commer., Northeast Fish. Sci. Cent. Ref. Doc. 06-19, 26pp.

Murray, K.T. 2008. Estimated average annual bycatch of loggerhead sea turtles (*Caretta caretta*) in U.S. Mid-Atlantic bottom otter trawl gear, 1996-2004 (Second Edition). U.S. Dep. Commer., Northeast Fish. Sci. Cent. Ref. Doc. 06-19, 26pp.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pp. 137-164 In: Lutz, P.L., and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Mrosovsky, N. 1981. Plastic jellyfish. Marine Turtle Newsletter 17:5-6.

National Research Council. 1990. Decline of the Sea Turtles: Causes and Prevention. Committee on Sea Turtle Conservation. Natl. Academy Press, Washington, D.C. 259 pp.

NMFS (National Marine Fisheries Service). 1984. Recovery plan for marine turtles. St. Petersburg, Florida: National Marine Fisheries Service.

NMFS. 1991a. Final recovery plan for the North Atlantic right whale (Eubalaena glacialis). Prepared by the Right Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 86 p.

NMFS. 1991b. Final recovery plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the national Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

NMFS 1994. State and federal fishery interactions with sea turtles in the Mid-Atlantic area. NOAA/NMFS, Silver Spring, MD, 13pp.

NMFS. 1998a. Final recovery plan for the shortnose sturgeon (*Acipenser brevirostrum*). Prepared by the Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. October 1998.

NMFS. 1998b. Unpublished. Draft recovery plans for the fin whale (*Balaenoptera physalus*) and sei whale (*Balaenoptera borealis*). Prepared by R.R. Reeves, G.K. Silber, and P.M. Payne for the National Marine Fisheries Service, Silver Spring, Maryland. July 1998.

NMFS. 1999. Federal Lobster Management in the Exclusive Economic Zone. FINAL Environmental Impact Statement and Regulatory Impact Review. National Marine Fisheries Service Northeast Region. April 28, 1999. 166 pp.

NMFS. 2002a. Endangered Species Act Section 7 Consultation on Shrimp Trawling in the Southeastern United States, under the Sea Turtle Conservation Regulations and as Managed by the Fishery Management Plans for Shrimp in the South Atlantic and Gulf of Mexico. December 2.

NMFS. 2002b. Endangered Species Action Section 7 Consultation on Federal Lobster Management in the Exclusive Economic Zone, October 31.

NMFS. 2003. Endangered Species Act Section 7 Consultation on the Atlantic Sea Scallop Fishery Management Plan. Biological Opinion, February 24.

NMFS. 2004a. Endangered Species Act Section 7 Reinitiated Consultation on the Continued Authorization of the Atlantic Pelagic Longline Fishery under the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP). Biological Opinion, June 1.

NMFS. 2004a. Endangered Species Act Section 7 Consultation on the Atlantic Sea Scallop Fishery Management Plan. Biological Opinion, December 15.

NMFS. 2004b. Endangered Species Act Section 7 Consultation on the Atlantic Sea Scallop Fishery Management Plan. Biological Opinion, February 23.

NMFS. 2004c. Endangered Species Act Section 7 Reinitiated Consultation on the Continued Authorization of the Atlantic Pelagic Longline Fishery under the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP). Biological Opinion, June 1.

NMFS. 2004d. Endangered Species Act Section 7 Consultation on the Proposed Regulatory Amendments to the Fisheries Management Plan for the Pelagic Fisheries of the Western Pacific. Biological Opinion, February 23.

NMFS. 2005a. Recovery Plan for the North Atlantic Right Whale (*Eubalaena glacialis*). National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2005b. Fisheries of the United States, 2004. Current Fishery Statistics No. 2004. 110 pp.

NMFS. 2006. Draft Environmental Impact Statement (DEIS) to Implement the Operational Measures of the North Atlantic Right Whale Ship Strike Reduction Strategy. National Marine Fisheries Service. July 2006.

NMFS. 2008. Endangered Species Act Consultation on the Atlantic Sea Scallop Fishery. Biological Opinion, March 14.

NMFS and U.S. Fish and Wildlife Service (USFWS). 1991a. Recovery plan for U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.

NMFS and USFWS. 1991b. Recovery plan for U.S. population of Atlantic green turtle. National Marine Fisheries Service, Washington, D.C. 58 pp.

NMFS and USFWS. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

NMFS and USFWS. 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, Maryland. 139 pp.

NMFS and USFWS. 1998a. Recovery Plan for the U.S. Pacific Population of the Leatherback Turtle (*Dermochelys coriacea*). National Marine Fisheries Service, Silver Spring, Maryland.

NMFS and USFWS. 1998b. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Silver Spring, Maryland.

NMFS and USFWS. 2007a. Loggerhead sea turtle (*Caretta caretta*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 65 pp.

NMFS and USFWS. 2007b. Leatherback sea turtle (*Dermochelys coriacea*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 79 pp.

NMFS and USFWS. 2007c. Kemp's ridley sea turtle *(Lepidochelys kempii*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 50 pp.

NMFS and USFWS. 2007d. Green sea turtle (*Chelonia mydas*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 102 pp.

NMFS and USFWS. 2008. Recovery plan for the Northwest Atlantic population of the loggerhead turtle (*Caretta caretta*), Second revision. Washington, D.C.: National Marine Fisheries Service. 325 pp.

NMFS Southeast Fisheries Science Center. 2001. Stock assessments of loggerheads and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S. Department of Commerce, National Marine Fisheries Service, Miami, FL, SEFSC Contribution PRD-00/01-08; Parts I-III and Appendices I-IV. NOAA Tech. Memo NMFS-SEFSC-455, 343 pp.

Northeast Region Essential Fish Habitat Steering Committee (NREFHSC). 2002. Workshop on the effects of fishing gear on marine habitat off the northeastern United States. October 23-25, Boston, Massachusetts. Northeast Fish. Sci. Center Ref. Doc. 02-01, 86pp.

Packer, D.B., L.M. Cargnelli, S.J. Greisbach, and S.E. Shumway. 1999. Essential Fish Habitat Source Document: Sea scallop, *Placopecten magellanicus*, life history and habitat characteristics. NOAA Tech. Memo. NMFS-NE-134.

Palka , D. 2000. Abundance and distribution of sea turtles estimated from data collected during cetacean surveys. *In*: Bjorndal, K.A. and A.B. Bolten. Proceedings of a workshop on assessing abundance and trends for in-water sea turtle populations. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-445, 83pp.

Payne, P.M., D.N. Wiley, S.B. Young, S. Pittman, P.J. Clapham, and J.W.Jossi. 1990. Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine in relation to changes in selected prey. Fish. Bull. 88 (4): 687-696.

Pearce, A.F. and B.W. Bowen. 2001. Final Report: Identification of loggerhead (*Caretta caretta*) stock structure in the southeastern United States and adjacent regions using nuclear DNA markers. Submitted to the National Marine Fisheries Service, May 7, 2001. Project number T-99-SEC-04. 79 pp.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.

Pritchard, P.C.H. 1982. Nesting of the leatherback turtle, *Dermochelys coriacea*, in Pacific, Mexico, with a new estimate of the world population status. Copeia 1982:741-747.

Pritchard, P.C.H. 1997. Evolution, phylogeny and current status. Pp. 1-28 In: The Biology of Sea Turtles. Lutz, P., and J.A. Musick, eds. CRC Press, New York. 432 pp.

Pritchard, P.C.H. 2002. Global status of sea turtles: An overview. Document INF-001 prepared for the Inter-American Convention for the Protection and Conservation of Sea Turtles, First Conference of the Parties (COP1IAC), First part August 6-8, 2002.

Putrawidaja, M. 2000. Marine turtles in Irian Jaya, Indonesia. Marine Turtle Newsletter. 90:8-10.

Rankin-Baransky, K., C.J. Williams, A.L. Bass, B.W. Bowen, and J.R. Spotila. 2001. Origin of loggerhead turtles stranded in the northeastern United States as determined by mitochondrial DNA analysis. Journal of Herpetology, v. 35, no. 4, pp 638-646.

Rebel, T.P. 1974. Sea turtles and the turtle industry of the West Indies, Florida and the Gulf of Mexico. Univ. Miami Press, Coral Gables, Florida.

Robbins, J., and Mattila, D., 2004. Estimating humpback whale (*Megaptera novaeangliae*) entanglement rates on the basis of scar evidence: Report to the Northeast Fisheries Science Center, National Marine Fisheries Service. Order number 43EANF030121. 21 p.

Rolland, R.M, K.E. Hunt, G.J. Doucette, L.G. Rickard and S. K. Wasser. 2007. The Inner Whale: Hormones, Biotoxins, and Parasites. Pp 232-272. *In*: S.D. Kraus and R.M. Rolland (eds) *The Urban Whale*. Harvard University Press, Cambridge, Massachusetts, London, England. vii-xv + 543pp.

Ross, J.P. 1996. Caution urged in the interpretation of trends at nesting beaches. Marine Turtle Newsletter 74:9-10.

Ruben, H.J., and S.J. Morreale. 1999. Draft Biological Assessment for sea turtles in the New York and New Jersey Harbor Complex. Unpublished Biological Assessment submitted to the National Marine Fisheries Service.

Sarti, L., S. Eckert, P. Dutton, A. Barragán, and N. García. 2000. The current situation of the leatherback population on the Pacific coast of Mexico and central America, abundance and distribution of the nestings: an update. Pp. 85-87 *in* Proceedings of the Nineteenth Annual Symposium on Sea Turtle Conservation and Biology, 2-6 March, 1999, South Padre Island, Texas.

Schevill, WE., WA Watkins, and KE Moore. 1986. Status of *Eubalaena glacialis* off Cape Cod. Report of the International Whaling Commission, Special Issue 10: 79-82.

Schmid, J.R. and W.N. Witzell. 1997. Age and growth of wild Kemp's ridley turtles (*Lepidochelys kempi*): cumulative results of tagging studies in Florida. Chel. Cons. Biol. 2(4): 532-537.

Schmidly, D.J., CO Martin, and GF Collins. 1972. First occurrence of a black right whale (Balaena glacialis) along the Texas coast. The Southwestern Naturalist.

Schultz, J.P. 1975. Sea turtles nesting in Surinam. Zoologische Verhandelingen (Leiden), Number 143: 172 pp.

Seipt, I., P.J. Clapham, C.A. Mayo, and M.P. Hawvermale. 1990. Population characteristics of individually identified fin whales, *Balaenoptera physalus*, in Massachusetts Bay. Fish. Bull. 88:271-278.

Seminoff, J.A. 2004. *Chelonia mydas*. *In*: IUCN 2004. 2004 IUCN Red List of Threatened Species. Downloaded on October 12, 2005 from www.redlist.org.

Seney, E. E., and J.A. Musick. 2005. Diet analysis of Kemp's ridley sea turtles (*Lepidochelys kempii*) in Virginia. Chel. Cons. Biol. 4(4):864-871.

Shamblin, B.M. 2007. Population structure of loggerhead sea turtles (*Carettta caretta*) nesting in the southeastern United States inferred from mitochondrial DNA sequences and microsatellite loci. M.Sc dissertation. University of Georgia. 59pp.

Shoop, C.R. and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6: 43-67.

Smolowitz, R. 1998. Bottom Tending Gear Used in New England. Pp. 46-52 In: Dorsey, E.M., and J. Pederson, eds., Effects of Fishing Gear on the Sea Floor of New England. Conservation Law Foundation.<http://www.clf.org/pubs.effect_of_fishing_gear.htm>.

Snover, M.L., A.A. Hohn, L.B. Crowder, and S.S. Heppell. 2007. Age and growth in Kemp's ridley sea turtles: evidence from mark-recapture and skeletochronology, p. 89-106. *In*: P.T. Plotkin (ed.). Biology and Conservation of Ridley Sea Turtles. John Hopkins University Press, Baltimore, MD.

Spotila, J.R., A.E. Dunham, A.J. Leslie, A.C. Steyermark, P.T. Plotkin and F.V. Paladino. 1996. Worldwide population decline of *Dermochelys coriacea*: are leatherback turtles going extinct? Chelonian Conservation and Biology 2: 209-222.

Spotila, J.R., P.T. Plotkin, and J.A. Keinath. 1998. In water population survey of sea turtles of Delaware Bay. Unpublished Report. Final Report to NOAA Fisheries Office of Protected Resources for work conducted under Contract No. 43AANF600211 and NMFWS Permit No. 1007 by Drexel University, Philadelphia, Penna., 21 pp.

Spotila, J.R., R.D. Reina, A.C. Steyermark, P.T. Plotkin, and F.V. Paladino. 2000. Pacific leatherback turtles face extinction. Nature. 405(6786):529-530.

Stabenau, E.K., T.A. Heming, and J.F. Mitchell. 1991. Respiratory, acid-base and ionic status of Kemp's ridley sea turtles (*Lepidochelys kempi*) subjected to trawling. Comp. Biochem. Physiol. v. 99a, no.½, 107-111.

Stephens, S.H. and J. Alvarado-Bremer. 2003. Preliminary information on the effective population size of the Kemp's ridley (*Lepidochelys kempii*) sea turtle. *In*: Seminoff, J.A., compiler. Proceedings of the Twenty-Second Annual Symposium on Sea Turtle Biology and Conservation. NOAA Tech. Memo. NMFS-SEFSC-503, 308p.

Stevick P.T., J. Allen, P.J. Clapham, N. Friday, S.K. Katona, F. Larsen, J. Lien, D.K. Matilla, P.J. Palsboll, J. Sigurjonsson, T.D. Smith, N. Oien, P.S. Hammond. 2003. North Atlantic humpback whale abundance and rate of increase four decades after protection from whaling. Marine Ecology Progress Series. 258:263-273.

Stone, G.S., L. Flores-Gonzalez, and S. Cotton. 1990. Whale migration record. Nature. 346: 705.

Suárez, A. 1999. Preliminary data on sea turtle harvest in the Kai Archipelago, Indonesia. Abstract appears in the 2 nd ASEAN Symposium and Workshop on Sea Turtle Biology and Conservation, held from July 15-17, 1999, in Sabah, Malaysia.

Suárez, A., P.H. Dutton and J. Bakarbessy. Leatherback (*Dermochelys coriacea*) nesting on the North Vogelkop Coast of Irian Jaya, Indonesia. *In*: Kalb, H.J. and T. Wibbels, compilers. 2000. Proceedings of the Nineteenth Annual Symposium on Sea Turtle Biology and Conservation. U.S. Dept. Commerce. NOAA Tech. Memo. NMFS-SEFSC-443, 291p.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mamm. Sci. 9: 309-315.

Teas, W.G. 1993. Species composition and size class distribution of marine turtle strandings on the Gulf of Mexico and southeast United States coasts, 1985 - 1991. NOAA Tech. Memo. NMFS-SEFSC-315, 43 pp.

Tillman, M. 2000. Internal memorandum, dated July 18, 2000, from M. Tillman (NMFS-Southwest Fisheries Science Center) to R. McInnis (NMFS - Southwest regional office).

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

Turtle Expert Working Group (TEWG). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the wester North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-444, 115 pp.

Turtle Expert Working Group (TEWG). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555, 116 pp.

USFWS. 1997. Synopsis of the biological data on the green turtle, *Chelonia mydas* (Linnaeus 1758). Biological Report 97(1). U.S. Fish and Wildlife Service, Washington, D.C. 120 pp.

USFWS and NMFS. 1992. Recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). NMFS, St. Petersburg, Florida.

USFWS and NMFS. 2003. Notice of Petition Finding (Fed Register) September 15, 2003.

Vargo, S., P. Lutz, D. Odell, E. Van Vleep, and G. Bossart. 1986. Final report: Study of effects of oil on marine turtles. Tech. Rep. O.C.S. study MMS 86-0070. Volume 2. 181 pp.

Waring, G.T., J.M. Quintal, S.L. Swartz (eds). 2000. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2000. NOAA Technical Memorandum NOAA Fisheries-NE-162.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2006, 2nd edition, US Department of Commerce, NOAA Technical Memorandum NMFS -NE - 201.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley. 2008. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2007. NOAA Technical Memorandum NMFS NE 205; 415pp.

Watkins, W.A., and W.E. Schevill. 1982. Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. Fish. Bull. 80(4): 875-880.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, Megaptera novaeangliae, in the mid-Atlantic and southeast United States, 1985-1992. Fishery Bulletin 93(1):196-205.

Winn, H.E., C.A. Price, and P.W. Sorensen. 1986. The distributional biology of the right whale (*Eubalaena glacialis*) in the western North Atlantic. Reports of the International Whaling Commission (Special issue). 10: 129-138

Wise, J.P, S.S. Wise, S. Kraus, R. Shaffley, M. Grau, T.L. Chen, C. Perkins, W.D. Thompson, T. Zhang, Y. Zhang, T. Romano and T. O'Hara. 2008. Hexavalent chromium is cytotoxic and genotoxic to the North Atlantic right whale (Eubalaena glacialis) lung and testes fibroblasts. Mutation Research - Genetic Toxicology and Environmental Mutagenesis. 650(1): 30-38.

Witherington, B., P. Kubilis, B. Brost, and A. Meylan. 2009. Decreasing annual nest counts in a globally important loggerhead sea turtle population. Ecological Applications 19:30-54.

Witt, M.J., A.C. Broderick, D.J. Johns, C. Martin, R. Penrose, M.S. Hoogmoed, and B.J. Godley. 2007. Prey landscapes help identify potential foraging habitats for leatherback turtles in the NE Atlantic. Mar. Ecol. Prog. Ser. 337: 231-243.

Witzell, W.N. 1999. Distribution and relative abundance of sea turtles caught incidentally by the U.S. pelagic longline fleet in the western north Atlantic Ocean, 1992-1995. Fish. Bull., U.S. 97:200-211.

Witzell, W.N. 2002. Immature Atlantic loggerhead turtles (*Caretta caretta*): suggested changes to the life history model. Herpetological Review 33(4): 266-269.

Wynne, K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant, Narragansett. 115pp.

Zemsky, V., A.A. Berzin, Y.A. Mikhaliev, and D.D. Tormosov. 1995. Soviet Antarctic pelagic whaling after WWII: review of actual catch data. Report of the Sub-committee on Southern Hemisphere baleen whales. Rep. Int. Whal. Comm. 45:131-135.

Zug, G. R. and J.F. Parham. 1996. Age and growth in leatherback turtles, *Dermochelys coriacea*: a skeletochronological analysis. Chelonian Conservation and Biology. 2(2): 244-249.

Zurita, J.C., R. Herrera, A. Arenas, M.E. Torres, C. Calderon, L. Gomez, J.C. Alvarado, and R. Villavicencio. 2003. Nesting loggerhead and green sea turtles in Quintana Roo, Mexico. Pp. 125-127. I*n:* J.A. Seminoff (compiler). Proceedings of the Twenty-Second Annual Symposium on Sea Turtle Biology and Conservation. NOAA Tech. Memo. NMFS-SEFSC-503, 308 p.

Appendix V

Response to Public Comments

Received on the

Amendment 16 Draft EIS

Response to Comments

Public comments on the Amendment 16 Draft Environmental Impact Statement (DEIS) were accepted during a formal comment period, April 24 through June 8, 2009. Comments were accepted at public hearings or received at the Council offices by letter, email, or facsimile. The Council held a meeting June 24 and 25 to review the comments. The responses below are based on all comments received up to the date of that meeting. Comments, or revisions to comments, received after that date are not addressed.

Numerous comments were received in support of or in opposition to various alternatives. Those comments were summarized, tallied, and presented to the Council at its June meeting, but are not addressed in the following discussion.

On June 27, 2009, Councilmember Mr. David Goethel submitted a dissenting minority report to the amendment after the conclusion of the public comment period. That report, along with the Executive Committee's response, is included elsewhere in the amendment submission package.

In accordance with NEPA and Section 309 of the Clean Air Act, the Environmental Protection Agency has a special duty to review documents on proposed federal agency actions and prepare written comments. Because of this responsibility, the EPA's comments are highlighted before other public comments below.

EPA Comment Responses

The "Needs" enumerated in the "Purpose and Need" section are overly general and should include the specific regulatory requirements that form the basis for the measures developed to meet those requirements.

• This section has been revised to cite relevant regulatory requirements.

Additional guidance for developing acceptable NEPA assessments and documents should be provided in Amendment 16

• NMFS Northeast Region NEPA staff developed specific guidance for sectors on the preparation of EAs. They are providing assistance to sector leadership in writing documents and developing sector plans that meet the relevant requirements of the law. Language to this effect has been added to the amendment.

The EIS does not explain how matching the minimum size limit of Atlantic halibut to that of haddock is expected to increase spawning opportunities for halibut.

• This comment was based on a typographical error in the draft document. The minimum size for halibut is linked to the median length at maturity for female halibut, not haddock.

If the Atlantic wolffish is added to the multispecies FMU, then the unique use of designated EFH for the Atlantic wolffish egg life stage should be given special *consideration in future FMPs given the poor status of the stock. The vulnerability of Atlantic wolffish eggs to disturbance from mobile gear should be discussed in the FEIS if this species is selected for inclusion under the multispecies FMU.*

• The discussion of wolffish biology has been updated to highlight the potential vulnerability of Atlantic wolffish eggs to mobile gear based on recent discussions with Canadian scientists.

Describing and identifying EFH does not alone have any direct environmental impacts, but could lead to indirect impacts because EFH designation would trigger Magnuson-Stevens Act requirements to minimize adverse effects of fishing on EFH and to consider the effects of non-fishing actions on EFH. The effects of designating EFH are difficult to analyze because they are indirect and dependent on separate future actions by a variety of entities in addition to NMFS and the Council (e.g., federal agencies that may impose conditions on permits they issue for actions that could harm EFH). Those future actions and the associated environmental consequences are hard to predict. The Council is currently developing an Omnibus Habitat amendment that may consider measures designed to minimize the adverse impacts of fishing on EFH for all managed stocks, including Atlantic wolffish.

The DEIS uses the acronym "VEC" multiple times before the term is defined. It would be helpful to have this acronym spelled out in the FEIS at first use in the text, and included under the list of acronyms and the glossary.

• These changes were made to the document.

§4.1 SDC/Rebuilding

There is a shifting baseline problem where current numbers seem to be normal even though they fall short of historical numbers

• Stock assessments are completed by the NEFSC based on many factors including catch surveys and historical data. Details of the methods used to calculate baselines are outside of the scope of issues considered by the Council in this amendment.

Develop plans that have a better than 50/50 chance of rebuilding; a 75% probability rebuilding target should be used for all stocks

• The Council has determined rebuilding plans for all groundfish stocks based on a combination of factors including biological and economic impacts of rebuilding targets. For some stocks, this results in selection of a target that has the minimum 50% chance of rebuilding, whereas for others the rebuilding target carries a higher level of certainty. Legal requirements mandate that rebuilding be balanced with the impacts on communities and other national standards; choosing different rebuilding probabilities is one way to address these concerns.

Halibut needs a broader range of rebuilding options beyond the setting of a target F

• This comment indicates a misunderstanding of the rebuilding strategy. The choice of the strategy is based on the time period and probability of success; this allows a rebuilding F to be calculated. The strategy is then implemented through the adoption of specific measures. For halibut, these include the overall effort reductions adopted by the amendment as well as limits on halibut catches and increases in the minimum size. ACLs and AMs are also proposed that will assist in halibut rebuilding.

The Council should adopt a detailed strategy to achieve habitat gains for winter flounder stocks; The Council should reprioritize the omnibus habitat amendment

• These comments are outside of the scope of measures considered by the Council. The Council is developing a habitat amendment to address these and other habitat issues.

Targets should be developed to recover age structure for rebuilding stocks

• The population structure is not included as a factor for setting ACLs in Amendment 16 because the amendment does not list criteria for setting ACLs. Any comments on such criteria should be included during the formulation of the specs package.

The targets need to be adjusted to be consistent with SSC recommendations

• The targets have been adjusted in the final document. The National Standard 2 guidance dictates that, if new information becomes available after an EIS is approved, it may be included so long as it does not substantially alter the measures in the action.

Keeping SNE/MA winter flounder catch to "as close to zero as possible" is not acceptable

•SNE/MA winter flounder is projected to be unable to rebuild in ten years even with zero fishing mortality. Take of this stock has been limited to a bycatch-only fishery, and further steps may be taken to reduce mortality through gear modifications or other measures.

The pollock assessment is faulty and should be revisited

• The assessment was accepted by an independent peer review. A new assessment may be performed in 2010.

Most management problems arise from the faulty setting of TACs; NMFS stock survey vessels tow infrequently and in areas with no fish; other sources of mortality, such as pollutants, should be considered in determining appropriate fishing levels

• These comments are outside the scope of issues considered by the Council. However, the TACs are based on assessments by NEFSC, which are subject to independent peer review. Catch levels are then reviewed again by the SSC. The numbers are therefore based upon the best available science and the most thorough and up-to-date information possible.

§4.2.1 Annual Catch Limits

Science-based ACLs should be implemented in this amendment; all fishermen and all components of the fishery should be subject to them; ACLs should be calculated *conservatively; ACLs should be set for wolffish if added to the management unit; failure to control catch is a direct violation of the M-S Act*

• Science-based ACLs are implemented for all groundfish stocks in this action in accordance with the Magnuson-Stevens Act.

It is difficult to know whether to sign up for sectors if the actual ACLs will not be calculated until after the sector enrolment deadline

• Any person who signs up for a sector by the September 1st, 2009 deadline will be permitted to leave the sector to fish in the common pool until March 30th, 2010. Actual numbers for ACLs could not be included in the amendment because of time limitations with the availability of assessments and deadlines for amendment submission.

The amendment should address why fishing mortality rates have been exceeded in recent years on some stocks for which the target TACs have not been met

• Stock assessments are based on the most recent data, and sometimes previous assessments must be adjusted due to new information and retrospective patterns in stock size calculation. It is possible that a fishing mortality rate can be exceeded when an assessment (and corresponding TAC) is deemed to have been set too high in subsequent years. For further discussion of this matter, see §6.2.2.

ACLs should be updated as part of the biennial adjustment process and should be set as early in the year as possible

• This provision was adopted by the Council.

The administrative process for setting ACLs should be explained more thoroughly in the amendment

• The amendment includes a detailed description of ACL-setting procedures, which is believed to define all aspects of the process. Any questions about the process should be directed to the Council office.

Uncertainty should consider errors in data; a vulnerability analysis is needed; too many layers of uncertainty are starving the fishery of quota; Analysis should take into account environmental factors such as climate change

• Scientific uncertainty is considered by the SSC when it sets the ABC for groundfish stocks. There are many areas of science that could be the basis for further research. For that reason, a "buffer" is included in the setting of TAC to prevent overages caused by scientific uncertainty.

ACL subcomponents are necessary to protect one segment of the fishery from overfishing in another; they should be also be set for the other fisheries including the herring and scallop fleets

• The use of ACL subcomponents is proscribed in this amendment. The exact calculation of ACL subcomponents will be addressed in a forthcoming specifications plan and its corresponding EA.

ACLs are not necessary for the component of the fishery that is on a DAS system

• ACLs on “all stocks in the fishery” are an absolute requirement of the Magnuson-Stevens Act

ACLs should be completed with stand-alone NEPA documents; further specification should be included on what implementing actions require full environmental review

• Actual numbers for ACLs will be determined in a forthcoming specifications package and its corresponding EA. Details of what levels of environmental review are required for various implementing actions are described in the amendment (including actions that can be revised by framework action) and by NMFS and CEQ guidance.

This section should be amended to include the SSC’s recommendations on ABCs and the control rule; the SSC should have the authority to set the ABC

• The SSC has the responsibility to set the ABCs under the Magnuson-Stevens Act. The amendment has been modified to include the SSC’s recent control rule recommendation.

ACLs should take into account differing levels of management uncertainty for each stock

• The exact calculation of ACL subcomponents will be addressed in a forthcoming specifications plan and its corresponding EA. The amendment includes the possibility that management uncertainty may be different for ACL subcomponents.

The use of ACTs should be considered as an alternative

• The Council has determined that ACTs are redundant in the setting of groundfish ACLs, and that the concepts of ACL, ABC, and TAC can be used to set catch levels in accordance with the Magnuson-Stevens Act.

State waters catches should be taken “off the top” when setting ACLs

• According to the ACL process described in this amendment, state waters catches of regulated groundfish stocks will be included in the determination of ACLs.

ACL overages on rebuilding stocks should be paid back the following year

• This provision was generally adopted by the Council. Overages by a sector will be deducted from the sector’s TAC in the following year, and overages by common pool vessels will come out of the subsequent year’s TACs after the hard TAC AM is implemented in FY 2012. Such “repayments” will apply to all fish stocks, not only those in rebuilding programs.

It should be explained that for stocks that are not landed, the ACL is for bycatch only

• This comment is correct and is explained in the ACL section of the amendment.

The common pool is not protected from overages by other subcomponents

• This statement is generally correct. In the long-term, if the common pool is impacted by overages in other components of the fishery, the Council will consider whether those other components should be subject to an ACL and have their own AMs to address this issue.

§4.2.2 Atlantic Wolffish

Atlantic wolffish should be added to the management plan; retention should be prohibited

• This provision was adopted by the Council.

Atlantic wolffish should not be added to the management plan until the population status can be better determined; EFH should not be designated until more information is collected

• Despite the data-poor status of this species, there is consensus among the scientific community that strong management measures must be in place for its protection. Further research is necessary to determine more information about the wolffish, but the Council chose to take action using the best available science to prevent further population decline.

§4.2.3 Sector Management Generally

Sectors should promote economic and administrative efficiencies, and costs should not outweigh benefits

• Measures related to sectors were created with the intent to promote flexibility and efficiency for the industry. It is expected that sector organizers will attempt to create business plans that provide a cost-effective means of fishing under a hard allocation of sector ACE.

Sectors are actually ITQs/LAPPs and should be subject to relevant M-S Act provisions

• According to an August 22, 2007 letter from NMFS NERO, sectors are not ITQs because they are not issued permits for harvesting quota and the allocation to a sector is not held for exclusive use. A subsequent letter (dated September 12, 2007) specified that sectors are not considered LAPPs because they do not involve the issuance of a "federal permit, issued as part of a limited access system under §303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery that may be received or held for exclusive use by a person." Additionally, a sector cannot qualify as a "person" eligible to hold a LAPP under §303A(c)(1)(D) because the definition of "person" is limited to a U.S. citizen, corporation, partnership, or other entity established under Federal or state law, or a permanent resident alien. Sectors are groups of vessels under voluntary contract-arrangements and do not fall under any of those categories.

Sectors provide opportunities and should be quota-based

• This provision was adopted by the Council.

Costs of sector membership may be prohibitive

• It is expected that sector organizers will attempt to create business plans that provide a cost-effective means of fishing under a hard allocation of sector ACE. If the cost of joining sectors is too high for an industry member to afford, that person can choose to remain in the common pool under effort control measures.

It is difficult to find a sector to join in certain areas, including New York

• The creation of individual sectors is outside the scope of Council management. Sectors are not required to limit membership to certain regions, and new sectors can be considered in future actions.

There is not enough information available on which to base the decision whether to join a sector

• This amendment provides a thorough description of sector and common pool measures. Information about individual sectors should be disseminated by their organizers and is outside the scope of Council involvement.

There should be strong incentives to encourage sector participation

• Sectors are exempt from many of the effort control measures to which the common pool will be subjected. The ultimate decision about whether it will be more desirable to fish in the common pool or in a sector is left to individual fishermen.

Sectors will lead to consolidation; sectors will destroy small businesses

• It is difficult to accurately forecast the impacts of sector implementation, and the lack of knowledge about sector participation is a major factor driving the uncertainty of the analysis. After the initial period of sector implementation, in-depth analyses will become much more practical and are expected to be included in future actions. If consolidation occurs against the Council's wishes, corrective management tools could be implemented at a later date. Amendment 16 does not allocate excessive shares of the fishery to any one group.

The industry is opposed to sectors; sectors are driven by NGOs with no connection to the fishery

• Sectors were developed with the extensive assistance of a multitude of industry members as well as representatives from a wide array of interests within the fishery. Members of the industry who do are opposed to sector management may remain in the common pool.

Privatization does not work for public resources

• Amendment 16, and specifically the implementation of sectors, does not constitute a privatization of natural resources. Sector ACE is not owned by permit holders and does not constitute any sort of property right, but rather is simply a way of determining catch allowances. The M-S Act explicitly states that even individual allocations such as ITQs do not carry any property rights.

Involuntary partnerships should not be forced upon the industry

• Industry members who do not wish to join sectors may remain in the common pool under the DAS system as before.

Open access vessels should be allowed into sectors

• The Council did not adopt this provision. If open access permits were allowed into a sector and took their history into that sector, and subsequently another open access permit was granted, there would be the possibility of an increase in fishing effort. The current design of the sector system was intended to be "effort-neutral".

The sector development/implementation process is rushed

• The process of sector development occurred over a period of years, involving a large number of Council and Committee meetings that were open to the public. Sectors were originally slated to be implemented in FY 2009, but that date was pushed back one year during the development process. Because of several legally-mandated deadlines, the amendment cannot be further delayed without evoking emergency management actions.

Sectors have not been proven to work in any mixed trawl fishery

• Sectors, as designed in this amendment, are a novel concept that has not been explicitly tested elsewhere. Management measures have been designed to maximize their effectiveness, but it is believed that "fine-tuning" of measures may need to occur in the first few years of sector implementation.

The amendment should facilitate the creation of a leasing-only sector

• This is a detail of sector operations that is outside the scope of issues considered by the Council, but this action does not prohibit lease-only sectors.

If sectors fail, there will be long-term damage to fishing infrastructure

• It is difficult to accurately forecast the impacts of sector implementation, and the lack of knowledge about sector participation is a major factor driving the uncertainty of the analysis. After the initial period of sector implementation, in-depth analyses will become much more practical and are expected to be included in future actions. If consolidation or loss of infrastructure occurs against the Council's wishes, corrective management tools could be implemented at a later date.

Sectors create a major safety issue

• Industry members who do not feel that they can operate safely in sectors may remain in the common pool under the DAS system as before. This comment is difficult to understand, since sector vessels have more flexibility than vessels in the common pool to choose how and when they fish.

The allocation numbers are too small to make sectors work

• Fishing mortality levels are scientifically determined in order to prevent overfishing and rebuild overfished stocks. Sectors are allocated a part of the allowable catch based on the history of members.

Sectors are a hopeful way to maintain community fishing

• It is difficult to accurately forecast the impacts of sector implementation, and the lack of knowledge about sector participation is a major factor driving the uncertainty of the analysis. It is hoped that the flexibility provided for creating effective business plans will prove useful for many participants in the fishery.

Large vessels must not be able to use the quota that is assigned to small vessels

• This comment is an issue for sector operations that is outside the scope of topics considered by the Council. It is not clear why this limit should be considered. Such decisions would be made internally by individual sectors, and the Council does not choose to manage internal sector operations.

Sectors and the common pool should operate under a similar set of management requirements

• All requirements of the law, including the use of ACLs and AMs, apply to both sectors and the common pool. However, the two systems were developed differently to provide a meaningful choice to fishermen that may benefit from selecting one management structure over the other.

Sectors should not be approved since single-species management, and not DAS management, is the main problem in New England

• The topic of single-species management was outside the scope of issues considered by the Council.

§4.2.3.1 Sector Definition and Formation

"Sectors" should be formally defined and recognized in the amendment

• This provision was adopted by the Council.

The definition of sectors should be modified to include a minimum number of participants; overly small sectors may effectively be an IFQ

• This issue was recognized by the Council and adopted at their June 2009 meeting.

Sectors do not have enough time to develop their operations plans, and people will not have enough time to decide whether to join before the September 1st deadline

• Sectors could develop operations plans sooner than September 1st if the timeline presents an issue for choosing whether to join. If operations plans are not ready in time or not acceptable to potential members, people have the right not to join sectors and to remain in the common pool. This is an internal sector issue that is not addressed in the amendment.

Additional guidance should be provided for developing NEPA assessments

• The NMFS is working with sector representatives in order to ensure that each sector has the necessary knowledge and resources to meet all the requirements of NEPA.

Transparency is required during the sector formation process and in the operations plans

• Sector formation is approved by the Council, and sectors operations plans must be completed through an EA process. These processes are both subject to NEPA requirements and provide ample opportunities for public comment and the open dissemination of information.

The EA requirement violates the Regulatory Flexibility Act and is essentially a tax on sectors

• Sector operations plans are required to be submitted as an EA in accordance with NEPA.

Proposed operations plans should be approved by the Council

• The Council decided not to review individual sector operations plans due to time concerns and possible delays in implementation that could result from such a measure. Also, the Council retains several methods of reviewing sectors, since they hold the authority to approve the formation of new sectors and can submit comments to NMFS during the public comment period on the EAs that include sector operations plans.

Reviews of operations plans should consider the ability of a sector to prevent large-scale closures

• Operations plans are reviewed by NMFS, and any comments on their review should be submitted as part of the EA process.

Individual permit holders should be allowed to vote on the adoption of sector management options

• This category of details about sector membership and operations are outside of the scope of issues considered by the Council.

CPH permits should not need to be activated in order to join sectors

• This provision was adopted by the Council.

§4.2.3.3 Ownership Cap (Sector Allocation)

Further justification is needed for removing the 20% cap; the cap should not be removed in the absence of an alternative proposal to prevent undue market control; similar restrictions used by the North Pacific Council should be investigated

• The Council has never identified management objectives associated with the imposition of a cap on a sector's allocation of a stock. If excessive ownership occurs against the Council's wishes, the cap may be reinstated at a later date or other management tools could be used to prevent fleet overconsolidation. There are also other safeguards in place that could prevent such an outcome. For example, sectors' allocations will be monitored by NMFS through their rosters and operations plans, and the agency could disapprove a sector with inordinate market control for reasons including fairness and equity. Amendment 16 does not allocate excessive shares of the fishery to any one group. The removal of the cap is included to provide maximum flexibility for fisherman to create the best business plan for themselves.

§4.2.3.3.1 Sector Mortality Controls

SNE/MA winter flounder should be added to the list of stocks that are not allocated to sectors

• This provision was adopted by the Council.

There should be a penalty for discarding of species that are not allocated to sectors, including ocean pout and windowpane flounder

•This concept was not discussed by the Council but is a valid point. Since sectors do not have an allocation of these stocks, there is little incentive to control catches. Should this prove to be a problem, NMFS could require additional Operations Plan measures to reduce catches of these species, or the Council could adopt limits in a future management action.

Sectors should have an increased trip limit on monkfish

• This comment was outside the scope of issues considered by the Council. The monkfish plan may consider changes to facilitate participation in sectors.

§4.2.3.3.2 Sector Overages

Overages should be allocated to each permit holder in the sector on a pound-by-pound basis

• This provision was adopted by the Council for vessels that leave the sector in the year following an overage. How a sector deals with this situation internally is a matter for the sectors to decide in their operations plans and is outside of the scope of Council involvement.

Sector members causing an overage should not be able to escape accountability by joining the common pool, and the reverse situation also needs to be addressed in A16

• The reverse situation is not addressed because there is no way in the common pool to attribute an overage to a specific vessel, and vessels in the common pool have not made an agreement that they are responsible for the actions of the whole.

§4.2.3.3.4 PSC/Allocation

Allocation should be based on 100% history; allocation should use the longest time frames

• This provision was adopted by the Council.

Catch history should remain frozen with the original permit

• The Council addressed this issue by adopting a provision to freeze groundfish catch history in Amendment 16, until modified by a future action, at their June 2009 meeting.

The individual PSC calculations sent by NMFS are not accurate; the calculations were sent too late to make a decision

• This comment is outside the scope of issues considered by the Council.

The existing sectors should keep their original allocations

• This provision was adopted by the Council.

The same baseline should apply to all sectors

• The Council's choice of Option 5 was consistent with their intent to not change allocations for additional sectors in the future. For further discussion, see the response to Councilman Goethel's minority report.

There should be another alternative that applies history to stocks caught; there should be an option that applies A days to stocks landed; DAS alone should be converted to an allocation unit; there should be more alternatives based on the size of boat, DAS, catch history, or a combination of those elements; none of the options are fair

• Other options for calculating PSCs were outside the scope of issues considered by the Council. The development of PSC alternatives took place over a period of nearly two years. There are possibly an infinite number of ways to calculate PSCs. The Council selected a range of alternatives that was believed to provide an adequate choice for final selections. The alternatives considered included those that applied history only for stocks caught, as well as for all stocks, those that considered DAS, and those that considered vessel size. It is not clear that any other formulations would have provided meaningful alternatives to those that were considered.

The No Action alternative should be chosen because the data is more accurate and it mirrors the allocation for the existing sectors

• The Council opted to select the option with a longer timeframe in order to smooth out inconsistencies in management measures over the previous years so that history would be as representative of the fleet as possible. In addition, the No Action alternative's use of a rolling time period was recognized as creating administrative difficulties in calculating the PSCs.

Using any capacity component in the calculation is discriminatory

• The Council did not adopt any PSC formula that included a capacity component.

Allocations of GB haddock and redfish should be spread amongst the industry so that the benefits of rebuilt stocks can be shared and to alleviate cuts in other stocks

•This idea was discussed but not adopted by the Council. .

Landings from leasing should not be included in the PSC calculations; people who actually did the fishing should be entitled to the history

•Amendment 13 established the policy that landings history accrues to the permit that lands the catch. PSC calculations adhered to this principle.

All of the allocation formulas favor large vessels; the formulas are designed to eliminate small vessels

• The allocation formula does not discriminate on its fact between industry participants and geographic areas, nor does it allocate excessive shares to any one group.

An allocation based on history alone should allow each vessel to retain a PSC that is equivalent to its historical proportion of catch.

History from the last five years should not be used since Southern New England had a lower trip limit

• The years chosen for allocation covered a time period in which management measures changed often. Although those measures sometimes differed across geographical areas, there was no perfect allocation formula and the Council deemed straight history to be the most fair and equitable allocation method. The allocations are stock-specific, and all permit holders were subject to the same trip limits at the same time.

History should go back as far as a vessel can document

• The Council did not choose history dating from earlier than 1996 for several reasons, including poor data quality and the desire not to use history that departed from the current composition of the fleet.

Allocation should not be based on history alone, since Mid-Atlantic vessels had low DAS and were forced to lease days

• The years chosen for allocation covered a time period in which management measures changed often. Although those measures sometimes differed across geographical areas, there was no perfect allocation formula and the Council deemed straight history to be the most fair and equitable allocation method.

The allocation process is flawed by the lack of a complete and accurate landings history for all vessels; this problem is more acute in smaller ports

• Issues involved with landings history data and appeals of PSC calculations distributed in May 2009 should be directed toward NMFS.

§4.2.3.5.2 Sector Enforcement

Joint liability should be limited as much as possible

• This provision was adopted by the Council within the scope of options considered.

Sectors should have the flexibility to address liability options in their operations plans

• Liability issues are relevant to law enforcement and should be standardized across sectors.

Discarding of legal-sized fish and misreporting of catch should not carry joint liability

• Liability for these two practices goes to the heart of sector management. One of the chief differences between sectors and ITQs is that sectors are a partnership where fishermen share an allotment of ACE. Direct violations of trust associated with the management of that ACE are enforcement concerns that are considered to be within the purview of the sector to prevent.

Sector members with high PSCs will not be turned in for violations

• This is an internal sector issue that is not addressed in the amendment.

There should be some room for first-year overages as the system adapts and sectors fine-tune their operations

• This provision would not satisfy the Magnuson-Stevens Act, which requires that ACLs cannot be exceeded and that overages in any segment of the fishery must incur AMs.

§4.2.3.5.3 Sector Monitoring

All fish caught should be counted through dockside monitoring and at-sea observing

• The Council intended to make a monitoring program that would provide a statistically significant indicator of total sector catch and discards. One of the major reasons cited for not approving 100% dockside and at-sea monitoring was cost prohibition.

Ineffective monitoring programs undermine the effectiveness of ACLs

• The Council adopted additional monitoring requirements for sectors to address this issue.

The SBRM is inappropriate to use for calculating observer coverage rates for sectors

• The NEFSC has stated that the SBRM levels are the best available science. The SBRM provides analytic techniques for estimating the level of coverage needed to achieve a given CV for discard estimates. These techniques have been peer reviewed and found to be valid. The amendment makes this the absolute minimum level of coverage needed but notes that actual coverage levels required will be specified by NMFS. Actual coverage levels can thus consider other information, such as the need for higher levels of coverage to account for the possibility of observer bias or to ensure that quotas are adequately monitored. SBRM coverage is additive to NEFOP observer program coverage.

It will be impossible to give weighout data in New York, since vessels there box at sea

• Sector organizers are given considerable flexibility in adopting monitoring schemes. If catch is boxed at sea, it is possible that the number of boxes and a sample weight could be used for weighout data, or the weight could be used that is determined by the dealer. Other responses may be developed by those more familiar with the operations, and the reporting program is flexible enough to allow a sector to get such a system approved.

Increased monitoring is too expensive; Costs will prevent people from joining sectors; Monitoring costs cannot be afforded except by fishermen that are supported by NGOs

• Monitoring needs to be adequate for the task it serves, and sectors will need higher levels because they are fishing on a hard TAC and have many unknowns. The NMFS is expecting to secure funding for sector monitoring for at least several years. If federal money is not available, it is anticipated that the ability to create sound business plans and cost-effective sectors should offset increased monitoring costs.

Dockside monitoring is unnecessary, since dealer reports already verify the same information

- Dockside monitoring is an enforcement tool to ensure that sectors are not exceeding their ACE. Sector implementation is fraught with uncertainty, and dockside monitoring adds one more layer of information by which to measure its success and weaknesses.

Increased monitoring standards should be applied to the common pool as well as sectors

- This comment is outside the scope of alternatives considered by the Council.

Real-time monitoring data should be used to apply actual discard rates; sectors should be able to have specific discard rates used if they opt for a higher level of monitoring

- This provision was adopted by the Council, within the limitations of current reporting capabilities, and will become effective when sectors implement their own independent at-sea monitoring programs.

§4.2.3.6 Sector Annual Reports

Specific requirements should be included to evaluate performance of the sector program

- The sector program is under close public scrutiny and it is expected that evaluation will be ongoing.

Annual reports should include locations and harvest levels of other species

- This provision was adopted by the Council in section §4.2.3.6

§4.2.3.7 ACE Transfer

Transfer within and between sectors must be allowed

- This provision was adopted by the Council.

History must be frozen with the original permit

- The Council addressed this issue by adopting a provision to freeze groundfish catch history in Amendment 16, unless modified by a future action, at their June 2009 meeting

Insufficient allocations paired with the necessity of transferring ACE add a lot of complexity to management

- Sector management is designed to allow participants to maximize efficiency and to make profitable business choices. This system creates more flexibility than was previously in place with DAS management. If industry members feel that they cannot operate profitably or comfortably in a sector, they may opt to remain in the common pool.

ACE transfer should not carry unintended consequences or endanger the resource

• It is difficult to determine the future nature and extent of ACE transfer between sectors. Since sectors are subject to a hard TAC, transfer of ACE between sectors is not expected to lead to higher fishing mortality or overfishing. ACE transfer will be monitored and any problems with the program will be revisited in a future action.

§4.2.3.8 Sector Participation in SAPs

Sectors should be exempt from closures in the Eastern U.S./Canada area if they have ACE remaining

• Sectors can only fish in the corner of CAII (within SAP boundaries) during the season of the SAP. However, they are exempt from gear requirements in the SAP because they will be operating under hard TACs. Justification for this measure is provided in §4.2.3.8.2.

All options that encourage sector participation in SAPs should be approved in order to facilitate sector membership and allow flexibility for sectors to catch their ACE

• All provisions related to sector participation in SAPs were adopted by the Council.

§4.2.3.9 Interaction of Sectors with Common Pool

Sectors should be protected by overharvesting from the common pool

• This provision was adopted by the Council. Sectors will not receive a deduction in ACE due to overages from common pool vessels.

Allowing sectors to avoid trip limits complicates the setting of state landing limits

• This provision was adopted by the Council.

Sectors should have a universal exemption that allows them to fish in rolling closure areas

• The Council intended sectors to be exempt from all effort control measures that could be reasonably replaced by the assumption of a hard TAC. The Council voted at their June meeting that this should include all rolling closures except those that were designed to protect spawning stocks.

§4.2.4 Reporting Requirements

Area-specific reporting requirements should apply to any vessel that catches groundfish, including scallop vessels

• All vessels, including those fishing for scallops, have area-specific requirements and additional requirements when they enter a special access area. The monitoring requirements for the scallop fishery are developed in the scallop FMP.

There needs to be more accurate and unbiased accounting for discards

• The SBRM established a system for monitoring discards. Additional requirements for sectors are being implemented which should improve discard monitoring.

More effective electronic reporting programs should be adopted

• Amendment 13 authorizes the implementation of electronic reporting when the technology is available. The NMFS can adopt and implement electronic reporting when they are ready to do so.

Daily reporting should be a reality for the groundfish fleet

• Currently, trip-based reporting is considered to be adequate for its current usage. NMFS has not determined the necessity for daily reporting to date.

§4.2.5 Commercial/Recreational Allocation

Baseline years should be the same for all segments of the fleet (i.e. sectors, commercial, and recreational)

• The recreational allocation and the sector PSC formula are completely separate issues, and the Council provided rationales for choosing the selected measures for each. For further discussion, see the response to Councilman Goethel's minority report below.

The allocation is unfair since the recreational fishery has less regulations; the longer timeframe smoothes out some of the management inconsistencies

• The more recent timeframe (2001-2006) for calculating the commercial and recreational allocations was chosen by the Council because of concerns over the quality of earlier data. Also, the more recent information was considered to be more representative of the current makeup of the fishery. Although there were arguments in favor of both options, the Council decided that the use of the later timeframe was more equitable.

The 2001-2006 timeframe more closely represents the current fishery

• This provision was adopted by the Council.

§4.2.6 DAS Transfer and Leasing

The Council should remove the cap on DAS leasing

• This provision was adopted by the Council.

There should be a conservation tax and/or a transfer tax on DAS leasing

• The Council opted not to include a conservation or transfer tax in order to promote flexibility and efficiency in the industry.

The conservation and/or transfer taxes should be eliminated

• This provision was adopted by the Council.

Tax previously charged for DAS transfers should be refunded

• The Council opted not to refund previous DAS transfer taxes because it would lead to a small increase in fishing effort. In addition, business decisions made under earlier regulatory schemes cannot be constantly revisited.

Inshore boats should not be able to lease or stack days, while offshore boats should be allowed to continue to do so

• This comment is outside the scope of issues considered by the Council. Such an action would lead to criticism of unfair treatment of permit holders.

Size restrictions on transfers should be continued until a careful analysis of the impacts can be performed

• This provision was adopted by the Council.

§4.2.7 Special Management Programs

Sectors should have year-round access to the Closed Area II Yellowtail Flounder SAP

• Seasonal access to CAII was adopted in order to target healthy haddock stocks but to deter targeting of yellowtail flounder. Year-round access was not adopted because the area still serves as a tool for effort control for non-sector vessels.

Revisions to the CAII YTF SAP could lead to the premature closing of the Eastern U.S./Canada Area to non-sector vessels and trigger AMs for GB winter flounder

• This should not occur. Sectors have their own ACE, separate form the ACL for common pool vessels, and catches of stocks by sector vessels should not impact common pool vessels as long as adequate monitoring is in place.

The Eastern U.S./Canada Haddock SAP should be reauthorized; sectors should have year-round access

• This provision (renewal) was adopted by the Council, but year round access was not authorized.

The Hook Gear Haddock SAP should be expanded; herring vessels should not be able to enter without an observer on board; dumping of unsampled catch should be prohibited

• The provision expanding the hook gear SAP was adopted by the Council. Herring monitoring provisions are being considered in a herring action.

The Regional Administrator should have the authority to approve programs in conservation engineering

• This provision already exists and does not require council action.

Revisions to the Category B program should be implemented due to changes in stock status

• This provision was adopted by the Council.

§4.2.9 Scallop and GF Permit Ownership

Allowing a vessel to possess both permits will foster efficiency and reduce costs

• This provision was adopted by the Council.

If possession of both is allowed, the scallop industry will liquidate the groundfish industry

• There is no way to predict with certainty what the effects of this measure will be. The conservative nature of the common pool effort controls, combined with a hard TAC on sectors, will serve as a buffer for any increased mortality on stocks associated with this measure. The measure is expected to have similar effects as those for DAS leasing. The analysis does indicate that it is more likely that scallop vessels will acquire groundfish permits given the relative performance of the industries.

§4.3.2 Common Pool Effort Controls

The Closed Area Model is uncertain and needs to predict effort shifts, and it should be better explained

• The Closed Area model used to design effort controls has been used for numerous management actions. The model has been subjected to at least two separate peer reviews and was the subject of litigation that determined it represented the best available science for the design of groundfish management measures. Explanations of the model have been included in Amendment 13 and Framework 42, and evaluations of the model's performance have been included Framework 42 and this action. Appendix II of this action includes a description of the model. The model is designed to account for effort shifts.

Common pool effort controls should not turn it into a "cesspool"

• The common pool effort controls are designed to achieve mortality controls targets in the most effective way possible. It should be seen as a viable alternative to sector membership for those who would prefer to fish under DAS.

Restricted Gear Areas are too expensive

• Restricted gear areas are generally used to compliment other management measures to meet mortality targets. The Council has determined that benefits accrued from their designation outweigh increased costs and any other hardship. Often, such areas would be closed entirely if the restricted gears were not allowable.

Differential DAS counting is ineffective and too complicated

• Differential DAS counting areas for the common pool as an effort control measure were not adopted by the Council.

Option 2A is not adequately described and would lead to a tremendous loss in yield

• This provision was not adopted by the Council.

All of the effort control options have proven to be ineffective

•The effort control options are new to this amendment and have not yet been implemented. Those who have concerns about the DAS system can choose to fish under a catch share system in a sector. Analyses in the amendment indicate that effort control measures have generally achieved the relative changes in mortality that were targeted.

The 24-hour clock is a safety concern

• The Council received comments on both sides of this issue. Day gillnetters already have a similar system in place and do not take major safety risks in order to maximize time fishing. There is nothing in the proposed measure that directly creates a safety issue, since fishermen can choose when and where to fish with safety in mind. No person will be forced to stay on a boat in unsafe conditions. If a specific operations' customary practice would lead to safety issues when fishing under a 24-hour clock, that operator has the option of joining a sector to mitigate those concerns. Comments on the record from industry members both support and deny the existence of safety issues associated with this measure.

There should be expanded options for the handgear fleet; the number of allowed hooks should be increased; handgear fishermen should be exempted from rolling closures and allowed to use mechanical devices

• These comments were outside the scope of issues considered by the Council.

§4.3.2.2 GOM Sink Gillnet Pilot Program

This program should be implemented to allow targeting of a healthy species; it should be incorporated with adequate research analogous to a SAP

• This provision was adopted by the Council.

§4.3.2.3 Haddock Minimum Size

The minimum size should not be reduced in order to conserve the stock

• The Council opted to reduce the minimum size in response to the improved stock status of this fish and in response to testimony from fishermen about discard rates and fishing practices.

The minimum size should be reduced

• The rationale for reducing the minimum size has been clarified in the final version of the EIS.

§4.3.3 Recreational Measures

A 6-cod bag limit would hurt business, and an April 15th season opening would be a preferable effort reduction measure; recreational bag limits and size restrictions have great economic impacts than shortened seasons

• The April 15th season opening was adopted by the Council.

There are plenty of large haddock to catch, so raising the size limit on haddock would not be overly cumbersome

• The Council reduced the minimum size for haddock so that recreational fishermen can benefit from haddock rebuilding.

Recreational anglers should not be limited by further effort controls since the commercial fishery is driving stock reduction; the recreational impact to the fishery is minimal

• The recreational fishery is required by law to have ACLs and AMs. Effort control measures must be drafted in order for the fishery to meet mortality targets. Any necessary reduction in effort has typically been shared between the recreational and commercial fisheries, and the Council has continued this policy with this amendment. Arguments that the recreational fishery has minimal impact on stocks ignore the fact that, for some stocks, recreational fishing constitutes one third or more of the catch. Such a large share cannot be characterized as a 'minimal" impact.

The recreational fishery should operate on mortality limits rather than input controls

• All fisheries are subject to ACLs and AMs under the most recent revisions to the Magnuson-Stevens Act. Management regimes for the recreational fishery other than output-control measures were outside the scope of topics considered by the Council in this action.

Reporting measures need to be improved to track mortality in the recreational fishery

• This comment was outside the scope of topics considered by the Council.

§4.3.4 Halibut Minimum Size

Halibut minimum size should be increased; minimum size should be increased for the recreational sector only

• This provision was adopted by the Council for all components of the fishery

Halibut minimum size should not be increased

• The Council opted to increase the minimum size in order to better match the age of maturity for females and to promote rebuilding of the resource.

§4.3.6 Additional Sectors

The new proposed sectors should be approved provided they meet all the requirements

• This provision was adopted by the Council.

There should be state-based "default" sectors for those who are unable to join on their own

• This category of details about sector membership and operations are outside of the scope of issues considered by the Council.

§4.3.7 Accountability Measures

Implement strong AMs using hard TACs for the common pool and sectors; AMs should be in-season

• In-season hard TAC AMs were implemented in this action for the common pool starting in FY 2012, and for sectors in FY 2010. The Council chose to use a differential DAS AM for the common pool in the years 2010 and 2011 in order to provide time for a transition to sector management and a hard-TAC backstop.

Alternative 2 using differential DAS adjustments is legally deficient and cannot be approved

• The M-S Act requirements for ACLs and AMs, and the NS guidance on implementing these requirements, give extensive latitude to Councils in meeting the requirements. The NS Guidelines make it clear that no specific AM is required. The statute requires ACLs and measures to end overfishing. The differential DAS system proposed in Alternative 2 will end it. The effort control system has reduced mortality on a number of stocks over time, so DAS controls have been shown to be effective and should end overfishing. Additionally, the DAS system being implemented for the common pool has many buffers in place, including adjustments for uncertainty such as the 75% F_{msy} fishing level, that will provide extra security for ending overfishing. This system is only in place for 2 years and will be replaced by a hard TAC AM in FY 2012.

Use of a hard TAC will create a derby fishery; in-season AMs will create a derby; trends to derby fisheries are affecting markets; if a hard TAC is used, there should be a warning before the fishery shuts down, or the TAC should be spread to avoid derbies

• These concerns are recognized in the analyses of the hard TAC AM for non-sector vessels. Measures are in place to attempt to reduce the derby effects: DAS limits, trip limits, seasonal distribution of the quota, etc.

Recreational harvest needs to be capped; the recreational fishery should be subject to the same AMs as the commercial fishery

• During discussion on this topic at the June 2009 Council meeting, the RA stated that various issues, including problems collecting data for the recreational fishery, make it difficult to adopt the same types of AMs for this component as those used for the commercial fishery. The implementation of in-season AMs will not be possible until these concerns are addressed.

Credit should be given for an underharvested ACL to compliment penalties for an overharvested one

• ACLs are calculated in advance to determine the maximum allowable removals from the fishery. Although the Magnuson-Stevens Act requires penalties for an overharvested ACL, there is no similar latitude for an increased ACL in the case of an underage. However, underharvested ACL should lead to increased stock size, thus bolstering assessments and leading to higher ACLs when they are calculated in subsequent years.

§5.3.2.4 Drop Chain Requirement

The drop chain requirement should be implemented in Southern New England in order to selectively protect at-risk stocks

• The drop chain proposed in this amendment shows some promise for selective fishing. However, this provision was not implemented due to concerns over the lack of peer-reviewed research on the effectiveness of the gear and its possible interactions with other fisheries. It is possible that the gear requirement will be revisited if scientific studies are completed.

There is a lack of scientific support showing that this gear configuration will be effective

• This provision was not implemented due to concerns over the lack of peer-reviewed research on the effectiveness of the gear and its possible interactions with other fisheries.

This gear requirement will have a negative impact on other fisheries, including many that do not overlap with the winter flounder

• This provision was not implemented due to concerns over the lack of peer-reviewed research on the effectiveness of the gear and its possible interactions with other fisheries.

§5.4.3 Alternative Management Systems

Allocations should be distributed on a finer scale and there should be dedicated allocations to traditional fishing communities

• This comment is outside the scope of issues considered by the Council.

ITQs should be implemented as soon as possible; sector management should be bypassed in favor of ITQs

• These comments are outside of the scope of issues considered by the Council.

§6.1 Stocks in the Fishery

Cusk should be added to the management plan

• This comment was outside the scope of issues considered by the Council. The Council noted in scoping the possibility that cusk would be added to the management plan. But in order to manage a stock, an assessment is needed so that stock status and reference points can be determined. Cusk has not yet been assessed by the NEFSC and the information is not available to add it to the management unit.

Do something about monkfish; monkfish should be integrated into output-controlled management; limited access monkfish permit holders should be allowed to join sectors
• This amendment can only regulate the groundfish fishery. Any rules about the creation of sectors in other fisheries, or sectors' fishing on other species, need to be promulgated through separate actions.

There is a lack of analysis of impacts on the lobster resource
• The amendment does include such an analysis.

Fluke, seabass, and scup should be managed with sectors
• This amendment can only regulate the groundfish fishery. Any rules about the creation of sectors in other fisheries need to be promulgated through separate actions.

Sectors should not remain on DAS to regulate effort on other species
• This amendment can only regulate the groundfish fishery. Any rules about fishing on other species need to be promulgated through separate actions.

Open-access boats should be able to combine trips for groundfish with those for other species
• This is allowed by the groundfish FMP as long as gear is being used that is consistent with the groundfish plan.

There should be a discussion of ecosystem component species
• This amendment did not adopt any ecosystem component species at this time. According to the National Standard Guidelines, the inclusion of such species in management plans is optional.

§7 Impacts

There is no analysis on the possible transformation of the industry
• The EIS recognizes that there may be changes in composition of the industry as a result of the expansion of sectors. The extent and nature of those changes are difficult to predict because it is uncertain which permits will choose to join sectors.

There is no analysis on the effects of an unrestricted ACE transfer system on EFH
• There is no existing database that can be used to efficiently characterize groundfish permit ownership because of the ability of permit holders to establish corporations. NMFS personnel have contracted for creation of such a database so that the future changes in the industry (if any) can be identified.

The amendment lacks information on ownership of groundfish permits

• The effects of ACE transfer on EFH are discussed in the analysis. These provisions are not expected to have any different impacts on EFH than current permitting regulations, which allow almost all vessels to use any legal gear to participate in the fishery.

Uncertainty over sector and common pool participation weakens the impacts analyses

• It is difficult to accurately forecast the impacts of sector implementation, and the lack of knowledge about sector participation is a major factor driving the uncertainty of the analysis. However, notions of fairness require that decisions about sector enrollment cannot be compelled until the measures are published in the amendment. After the initial period of sector implementation, in-depth analyses will become much more practical and are expected to be included in future actions.

Uncertainty should be quantified in each of the impacts analyses

• Uncertainty is quantified to the extent possible in the analyses and other calculations. Due to the amorphous nature of uncertainty, a precise number cannot always be gauged.

The benefits of improved reporting are underestimated in the analyses

• The amendment includes much discussion on reporting and monitoring measures. As noted above, precise impacts are difficult to calculate but information is included as to the projected benefits to the extent that they are known.

Amendment 16 Miscellaneous Comments

Overfishing must be ended

• This amendment seeks to implement management actions to end and prevent overfishing in accordance with the Magnuson-Stevens Act.

Catch share management is the best way forward; a move away from input controls is needed; input controls have degraded data

• Sectors are a form of catch share management that the Council has implemented in this action.

Ecosystem health should be restored; the amendment should explain the transition to ecosystem-based management

• This comment is outside of the scope of comments considered by the Council. Ecosystem issues are being appropriately addressed in other Council actions.

There need to be public hearings in New York/New Jersey; New York should be represented by a Council member

• The composition of the Council is outside of the scope of issues considered in this action. The low attendance of public hearings on the amendment should be noted. Hearings were held in locations that were chosen to maximize participation and accessibility.

Amendment 16 is a form of rationalization; the Council should address the future composition of the fishery so it can be debated explicitly and transparently; the amendment should address the impact of sectors on consolidation of the dayboat fishery

- The impacts of sector implementation are extremely difficult to forecast. The Council has never identified management objectives associated with fleet consolidation. If the composition of the fishery appears poised to change against the Council's wishes, new management tools could be used at a later date to prevent fleet overconsolidation. There are also other safeguards in place that could prevent such an outcome. For example, sectors' allocations will be monitored by NMFS through their rosters and operations plans, and the agency could disapprove a sector with inordinate market control for reasons including fairness and equity. Amendment 16 does not allocate excessive shares of the fishery to any one group, nor does it discriminate on its face between industry participants and geographic areas.

None of the alternatives preserve community access; the measures are unfair to small boats

- The impacts of sector implementation are extremely difficult to forecast. The amendment does not discriminate on its face between industry participants and geographic areas. The Council has never identified management objectives associated with community access. Measures to preserve community access could be considered in a future action.

Gillnet tending should be a requirement in federal waters

- This comment is outside the scope of issues considered by the Council.

Public access to the resource is being cut off, particularly for new entrants to the fishery; the Council should consider a set-aside program with default allocations to state programs for new entrants

- This comment is outside the scope of issues considered by the Council.

A permit bank should be created as a repository of fishing rights

- This comment is outside the scope of issues considered by the Council.

The Council should recognize Community Fishing Associations in Amendment 16

- This comment is outside the scope of issues considered by the Council.

If CFAs are recognized, there should be a cap on their ownership

- This comment is outside the scope of issues considered by the Council.

RECORD OF DECISION

FINAL ENVIRONMENTAL IMPACT STATEMENT

AMENDMENT 16 TO THE NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

National Marine Fisheries Service Northeast Region

This document comprises the record of decision (ROD) for approval/disapproval of Amendment 16 to the Northeast (NE) Multispecies Fishery Management Plan (FMP), as prepared by NOAA's National Marine Fisheries Service (NMFS) pursuant to the National Environmental Policy Act (NEPA). The ROD is based on and incorporates, as described below, the Amendment 16 Final Environmental Impact Statement (FEIS) and all other decision and analytical documents prepared for this action.

Background

The FMP specifies the management measures for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, and ocean pout) off the New England and Mid-Atlantic (MA) coasts. There are distinct populations or stocks of cod, haddock, yellowtail flounder, winter flounder, and windowpane flounder that are associated with more than one geographic region, resulting in 19 individual stocks that are managed under the FMP. Amendment 16 to the FMP is the result of the biennial adjustment process established in the FMP to update status determination criteria for all NE multispecies (groundfish) stocks; adopt rebuilding programs for groundfish stocks newly classified as being overfished and subject to overfishing; and revise management measures necessary to end overfishing, rebuild overfished groundfish stocks, and mitigate the adverse economic impacts of increased effort controls based upon updated information regarding stock status and other information. On November 6, 2006, a notice of intent to prepare an EIS and hold scoping meetings to solicit public input on any revisions to management measures necessary to continue rebuilding overfished groundfish stocks was published in the *Federal Register* (71 FR 64941). Eight scoping meetings were held in November/December 2006 from Maine to New York City. In January 2007, shortly after these scoping meetings ended, Congress passed, and President Bush signed into law, revisions to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) that required, among other things, that FMPs include a mechanism for establishing annual catch limits (ACLs) and measures to ensure accountability (accountability measures (AMs)).

Based upon input from scoping meetings and other public meetings, the New England Fishery Management Council (Council) began to develop Amendment 16 for implementation in fishing year (FY) 2009, to not only achieve the objectives outlined for the biennial adjustment process, but also to comply with the new requirements of the Magnuson-Stevens Act. The latest stock assessment (Groundfish Assessment Review Meeting (GARM III)) was completed in August

2008, and concluded that 11 stocks were still subject to overfishing, and that 11 stocks were overfished, with 9 stocks classified as both overfished and subject to overfishing. Updated data available in January 2009 revealed that pollock is also overfished and subject to overfishing. These data indicated that draft effort control measures under development for Amendment 16 were not targeting the correct stocks. As a result, the Council requested that NMFS implement an interim action for the duration of FY 2009 (May 1, 2009-April 30, 2010) to provide sufficient time to revise draft management measures in Amendment 16 to meet the updated biological objectives. It was during this time that NMFS published updated National Standard 1 Guidelines to assist Councils in complying with the new requirements of the Magnuson-Stevens Act (January 16, 2009; 74 FR 3178). A proposed rule to implement interim management measures for FY 2009 published on January 16, 2009 (74 FR 2959), with final interim measures published on April 13, 2009 (74 FR 17030) and effective on May 1, 2009.

The Council finished developing Amendment 16 in early 2009, adopting draft management measures and presenting an associated draft EIS (DEIS) at its February 2009 meeting. A notice of availability for the DEIS, which analyzed the impacts of all of the measures under consideration in Amendment 16, was published on April 24, 2009 (74 FR 18705), with public comments accepted through June 8, 2009. Final measures for Amendment 16 were adopted by the Council at its June 2009 meeting, with revisions to the discard provisions adopted at its September 2009 meeting. A notice of availability under the Magnuson-Stevens Act for Amendment 16, as submitted by the Council for review by the Secretary of Commerce (Secretary), was published in the *Federal Register* on October 23, 2009 (74 FR 54773). The comment period on the Amendment 16 and its associated FEIS ended on December 22, 2009. A notice of availability under NEPA for the Amendment 16 FEIS was published on October 30, 2009 (74 FR 56194), soliciting public comments through November 30, 2009. A proposed rule soliciting public comment on regulations to implement measures in Amendment 16 was published on December 31, 2009 (74 FR 69382), with comments accepted through January 20, 2010.

The following sections briefly describe the alternatives considered in Amendment 16 and highlight the measures that were adopted. Additional discussion regarding the environmentally preferred alternatives, the factors considered in making a decision on the final action, and compliance with National Standards, are included in the following text.

Alternatives Considered in Amendment 16

Amendment 16 includes revisions to a substantial number of measures in the FMP. Unlike previous actions, Amendment 16 did not group different options for all measures into distinct alternatives. Instead, the Amendment 16 DEIS considered and analyzed several options for each measure to be revised under this action. These options are summarized below in the order in which they are discussed in the Amendment 16 FEIS. For a complete description of the options considered, see Sections 4 and 5 of the FEIS for the preferred action and alternatives to the proposed action, respectively. For a full analysis of these alternatives, please see the corresponding sections of Section 7 of the FEIS.

- **Status Determination Criteria** – Two options for status determination criteria were considered: (1) Revised status determination criteria based upon the results of GARM

III, and (2) the existing Amendment 13 status determination criteria (no action). Both options utilize a biomass target based upon spawning stock biomass at maximum sustainable yield (MSY), but the revised status determination criteria specify a fishing mortality rate (F) threshold at 40 percent of maximum spawning potential, while the Amendment 13 criteria retain a F threshold at 75 percent of F_{MSY}.

- **Allowable Biological Catch (ABC) Control Rule** – The ABC control rule is guidance used by the Council to develop ABCs for each stock pursuant to the ACL process detailed further below. Two options were considered: (1) A new ABC control rule based upon catch at 75 percent of F_{MSY} or $F_{rebuild}$, whichever is lower, the level of incidental bycatch for stocks that cannot rebuild absent all fishing mortality after considering reduction in the bycatch rate, or on a case-by-case basis for stocks with unknown status; and (2) the Amendment 13 MSY control rule (no action) based upon a 75 percent of F calculated to rebuild the stock in 10 years when the biomass is greater than 1/2 biomass at MSY.
- **Revised Mortality Targets and Rebuilding Programs** – Two options were considered: (1) Revised mortality targets for all stocks based on the updated information in GARM III, including new rebuilding programs for stocks newly classified as being overfished (witch flounder, Georges Bank (GB) winter flounder, northern widowpane flounder, pollock, and Atlantic wolffish); and (2) the existing mortality targets and rebuilding programs established for individual stocks in Amendment 13 or Framework Adjustment 42 (no action).
- **ACL Process** – The Magnuson-Stevens Act requires each FMP to establish a mechanism or process to specify ACLs for each stock managed in the FMP. Two options were considered to develop such a process for the FMP to maintain compliance with the Magnuson-Stevens Act: (1) A process to specify acceptable biological catch (ABC) and ACLs for stocks in the fishery, including the distribution of ACLs among components of the fishery that catch groundfish; and (2) no process to establish ACLs (no action).
- **Incorporation of Atlantic Wolffish –** Updated stock assessment data indicated that Atlantic wolfish was overfished and subject to overfishing. Consistent with the Magnuson-Stevens Act, the Council was required to develop management measures to end overfishing and rebuild this stock within one year of being informed that the stock is overfished. Two options to incorporate wolffish were considered: (1) To include Atlantic wolffish as a managed stock within the FMP, and (2) not to include this species as a managed stock (no action). In addition, three options were considered regarding the designation of essential fish habitat (EFH) for this species: Designating no EFH for this species (no action), designating the entire U.S. exclusive economic zone (EEZ) as EFH, or basing the designation of EFH on the NMFS trawl survey.
- **Definition of a Sector** – Sectors were established by Amendment 13 and Framework 42 as voluntary, co-operative groups within the multispecies fishery that elect to fish under a common set of rules in exchange for more flexibility in fishing operations and an agreement to abide by such rules. A clear and updated definition of "sector" was needed with the establishment of 16 additional sectors. Three options were considered for defining a sector: (1) Not specifically defining what constitutes a sector (no action), (2) defining a sector as three or more persons none of whom have an ownership interest in one another that voluntarily enter into a contract and agree to certain fishing regulations

for a certain period of time, and (3) allowing permits currently held in confirmation of permit history (CPH) to participate in sectors.

- **Sector Operations Plan Requirements** – Sectors must submit operations plans to NMFS prior to approval. Two options were considered to revise the requirements for such operations plans: (1) Maintaining the existing sector operations plan requirements, or (2) requiring that sector operations plans include additional provisions such as detailed information about an independent third-party weighmaster system, detailed information about a monitoring program for discards, and information about overage penalties.
- **Sector Overage Provisions** – If sectors exceed their allocation in a given year, a provision to account for an incidental overage was considered necessary. Two options were considered: (1) Maintaining the Amendment 13 guidance regarding sector overages specifying that overages are simply deducted in the following year (no action), and (2) specific measures to address an overage should a sector that has exceeded its allocation for a quota not be able to address such overage during the following year due to insufficient allocation during the next year, or because the sector disbands and vessels join other sectors or the common pool (i.e., do not participate in another sector). Two sub-options were considered to identify the overage penalty if participating vessels enter the common pool: A day-at-sea (DAS) penalty proportional to the overage for that sector (i.e., a 20 percent DAS reduction for a 20 percent overage), or a flat DAS reduction based upon the overage divided by the number of vessels in the sector (i.e., 1 DAS for every 1,000 lb overage).
- **Sector Allocations** – Several options were considered for sector allocations. First, two options were considered regarding whether to specify separate allocations for stocks managed by the U.S./Canada Resource Sharing Understanding (Understanding) (i.e., Eastern GB cod and Eastern GB haddock), or not to specify separate allocations for such stocks (no action). Secondly, each sector's allocation of a particular stock (i.e., annual catch entitlement (ACE)) is based upon the cumulative potential sector contributions (PSCs) of vessels participating in that sector. Sectors would be allocated ACE for all stocks except ocean pout, windowpane flounder, Southern New England (SNE)/MA winter flounder, and Atlantic wolffish. Six options were considered regarding the calculation of PSCs for each stock for each vessel, including:
    - Option 1 (no action): This option would maintain the existing allocation of stocks based upon the catch histories of participating vessels over the previous five FYs.
    - Option 2: This option would determine PSCs for each vessel based upon the landing history of each vessel between FYs 1996-2006.
    - Option 3: This option would determine PSCs for each vessel based upon an equal consideration of landings history between FYs 1996-2006 and vessel baseline capacity (i.e., landings history would contribute 50 percent towards the PSC, while capacity would account for the other 50 percent of the PSC) for stocks landed by the permit. A vessel baseline capacity would be calculated using the following formula:

      Baseline capacity = (10 x length + horsepower) x (allocated Category A DAS)

    - Option 4: This option would determine PSCs for each vessel based in the same manner as Option 3, but the vessel baseline capacity would apply to all stocks allocated to sectors.

- Option 5: This option would determine PSCs for each vessel based upon an equal consideration of landings history between FYs 1996-2006 and allocated Category A DAS (i.e., landings history would contribute 50 percent towards the PSC, while allocated Category A DAS would account for the other 50 percent of the PSC) for all stocks allocated to sectors.
    - Option 6: For vessels that committed to participate in one of the existing sectors as of March 1, 2008, this option would calculate the PSC for GB cod based upon the landings history of each permit between FYs 1996-2001. The PSCs for other stocks for these vessels would be calculated based upon one of the other options listed above.
- **Sector Mortality Controls** – Mortality controls would be needed to ensure that sectors do not exceed sector ACEs on a yearly basis. Two options were considered: (1) No changes to existing sector mortality controls (no action) that include hard quotas for allocated stocks and a requirement to cease fishing once such quotas were harvested; and (2) revisions to existing sector mortality controls to include a cessation of fishing operations once a sector's allocation is harvested, specification of which types of trips would contribute to the catch of a sector's allocation, and prohibitions of the retention of specific stocks (i.e., ocean pout, windowpane flounder, SNE/MA winter flounder).
- **Sector Joint/Several Liability** – This measure determines legal responsibility for any violation of regulations. Four options were considered: (1) Sectors and participating vessels could be held joint and severally liable for any violation of any regulation; (2) sectors and participating vessels would only be jointly/severally liable for violations of the sector operations plan requirements; (3) sectors and participating vessels would be jointly/severally liable only for violations of ACE overages, discarding of legal-sized fish, and misreporting of catch; and (4) sectors and participating vessels would only be jointly/severally liable for ACE overages.
- **Sector Monitoring Requirements** – Monitoring would be needed to require sectors to accurately monitor catch in relation to ACE. Two main options were considered for revising sector monitoring requirements: (1) Maintaining the existing sector monitoring requirements, including monthly sector catch reports and a yearly sector report; and (2) several revisions to existing monitoring requirements, including weekly sector catch reports, an expanded yearly sector report with additional detail regarding sector operations, a dockside monitoring program beginning in FY 2010, an at-sea/electronic monitoring program beginning no later than FY 2012, a requirement to land all legal-sized stocks allocated to sectors, and standards for approving/certifying dockside and at-sea monitoring service providers. Two options were considered for dockside monitoring coverage: 100-percent dockside monitoring, and less than 100-percent dockside monitoring with the precise coverage levels to be determined by sectors and approved by NMFS. Further, two options were considered for at-sea/electronic monitoring coverage, including 100-percent electronic monitoring and less than 100-percent at-sea observation, and less than 100-percent at-sea/electronic monitoring with the precise coverage levels to be determined by sectors and approved by NMFS.
- **ACE Transfers** –ACE is the term given to the allocation each sector would receive, based on the ABC and ACL established for each groundfish stock and the PSC of participating vessels. ACE trading would be necessary if the PSCs of participating vessels is insufficient to cover anticipated catch by sector vessels. Two options were

considered: (1) Allowing sectors to transfer ACE up to and including 2 weeks after the end of the FY and carry over up to 10 percent of unused ACE for each stock for use in the next FY, with 20 percent of each sector's ACE allocation held in reserve until July 1 of each year; and (2) no allowance for transfer of ACE between sectors (no action).

- **Universal Sector Exemptions** – Universal exemptions granted to all sectors would result in sector vessels not being subject to restrictions otherwise applicable to vessels that are not participating in sectors. Two options were considered regarding universal sector exemptions. Option 1 (no action) would maintain the existing requirement for sectors to request exemptions from specific regulations via the approval of the yearly operations plans. Option 2 would exempt all sectors from several key provisions, including trip limits for stocks allocated to sectors, portions of the GOM Rolling Closure Areas, the GB Seasonal Closure Area, DAS restrictions adopted under Amendment 16, and the requirement to use 6.5-inch mesh on GB, provided sectors use 6-inch mesh in selective fishing gear.
- **Area-specific Reporting Requirements** – Two options were considered: (1) No additional area-specific reporting requirements, and (2) a requirement for all operators to declare their intent to fish in one or more broad stock areas prior to each groundfish trip.
- **Assumed Discard Rate Calculations** – Two options were considered for determining the assumed discard rate to be used for trips that were not observed. These options would either be an overall discard rate specific to stock and gear based upon the most recent stock assessment, or a sector-specific discard rate (i.e., a rate for each individual sector and the common pool) calculated for each gear type used in the sector based upon observer data from the previous FY.
- **Commercial/recreational Allocation** – Two overall options were considered regarding the commercial/recreational allocation of groundfish stocks, with two sub-options if an allocation is adopted. Option 1 (no action) would not allocate groundfish stocks between the commercial and recreational fisheries, while Option 2 would allocate stocks that are being fully harvested (i.e., no allocation would be made for stocks in which the yearly ACL is not being harvested) for which recreational harvest is at least 5 percent of overall harvest after considering state-waters catch (currently only GOM cod and GOM haddock). If an allocation is adopted, two options for allocating such stocks were considered based upon catch during either FYs 1996-2006 or catch during FYs 2001-2006.
- **Revisions to the DAS Leasing/Transfer Programs** – Several options were considered regarding revisions to the DAS Leasing and Transfer Programs, including:
    - Option 1 (no action): This option would not revise either program.
    - Option 2: This option would eliminate the DAS conservation tax in the DAS Transfer Program, with sub-option A retaining DAS already lost during previous transfers and sub-option B refunding DAS lost to the DAS conservation tax during previous transfers.
    - Option 3: This option would impose a 20-percent tax on DAS transferred in the DAS Leasing Program.
    - Option 4: This option would eliminate the DAS conservation tax in the DAS Transfer Program for a specific period of between 3 months and 1 year.
    - Option 5: This option would allow permits in CPH to participate in both the DAS Leasing and Transfer Programs.

- **Revisions to Special Management Programs and Special Access Programs (SAPs):** Two main options were considered regarding revisions to these programs: (1) Revisions to existing programs, and (2) no revisions to existing programs (no action). Proposed revisions include:
    - Revised incidental catch total allowable catches (TACs) to include pollock;
    - Revisions to the Closed Area I Hook Gear Haddock SAP, including expanded area and season and elimination of the sector and non-sector season and TAC allocation;
    - Renewal of the Eastern U.S./Canada Haddock SAP, including an exemption from the gear requirements for sector vessels and allowing trawl vessels to use 6-inch mesh codends;
    - Revisions to the Closed Area II Yellowtail Flounder SAP to facilitate the harvest of haddock, including an expanded season, addition of the rope trawl as an approved gear for this SAP, prohibition of the use of a flounder net when there is insufficient ACL to support a targeted yellowtail flounder fishery in this SAP, and an exemption of sector vessels from limits on the number or frequency of trips into this SAP;
    - Suspension of the SNE/MA Winter Flounder SAP;
    - Revisions to the Regular B DAS Program, including a pollock trip limit of 100 lb per DAS, up to 1,000 lb per trip, and allowing trawl vessels to use a 6-inch mesh codend; and
    - Expanded authority of the Regional Administrator (RA) to approve additional gear in any program that requires the use of selective gear.
- **Concurrent Issuance of a Limited Access NE Multispecies and Scallop Permit** – Two options were considered: (1) Restricting the issuance of both a limited access NE multispecies permit and a limited access scallop permit to those vessels already qualified to be issued a NE Multispecies Combination permit (no action), and (2) allowing the concurrent issuance of such permits to all vessels and vessels issued a limited access scallop trawl permit to change to a dredge permit without surrendering their limited access NE multispecies permit.
- **Common Pool Measures** – Four main alternatives were considered regarding common pool measures, including:
    - <u>Option 1 (no action)</u>: This option would maintain the existing DAS allocation scheduled for implementation in FY 2009; the current trip limits for specific stocks, including cod, yellowtail flounder, winter flounder, white hake, and Atlantic halibut; gear requirements; and differential DAS counting measures, as implemented under Amendment 13 and Framework Adjustment 42.
    - <u>Option 2A</u>: This option would maintain the existing DAS allocation scheduled for implementation in FY 2009 and gear requirements, as implemented under Amendment 13 and Framework Adjustment 42, but would increase the possession limits for cod and yellowtail flounder; prohibit the possession of SNE/MA winter flounder, windowpane flounder, and ocean pout; and implement revised differential DAS counting areas throughout the Northeast, with DAS charging rates ranging from 1.25:1 to 3:1 (see Section 5.3.2 of the FEIS for more details).
    - <u>Option 3A</u>: This option would reduce the Category A DAS allocation for each vessel by 50 percent compared to 2006 DAS allocations, count DAS used in 24-

hour increments; increase trip limits for cod and yellowtail flounder and eliminate trip limits for most other stocks; prohibit the possession of SNE/MA winter flounder, windowpane flounder, and ocean pout; and establish two restricted gear areas (RGAs) on GB and SNE that only allow the use of selective gear that reduces the catch of flatfish (see Section 4.3.2 of the FEIS for more details).
    - Option 4: This option would reduce the Category A DAS allocation for each vessel by 40 percent compared to 2006 DAS allocations, increase trip limits for cod and yellowtail flounder; prohibit the possession of SNE/MA winter flounder, windowpane flounder, and ocean pout; and establish one RGA in SNE that only allow the use of selective gear that reduces the catch of flatfish (see Section 5.3.2 of the FEIS for more details).
- **SNE/MA Gear Requirement** – Two options were considered regarding revising the gear requirements in SNE/MA: (1) Requiring that all vessels using bottom trawl gear within a specific area use a net configured with drop chains to reduce the catch of flatfish species (an exemption is provided for nets with extra-large mesh), and (2) not imposing additional gear restrictions within SNE/MA (no action).
- **GOM Haddock Sink Gillnet Pilot Program** – Two options were considered: (1) Not establishing a new GOM Haddock Sink Gillnet Program (no action), and (2) establishing a 2-year pilot program that would allow vessels to use 30, 6-inch mesh gillnets in the GOM between January through April, provided such vessels declare their intent to participate in this program each year, notify the observer program prior to each trip, and carry a letter of authorization issued by the RA.
- **Size Limits for Haddock and Atlantic Halibut** – Two options were considered for revising the minimum size limits for these species: (1) Maintaining the existing size limits of 19 inches and 36 inches, respectively; and (2) reducing the minimum size limit for haddock to 18 inches and increasing the minimum size limit for halibut to 41 inches.
- **Recreational Measures** – Several options were considered for revising recreational measures, including a no action option for each measure. Revisions to the hook limit would remove the existing two-hook per mainline restriction, and allow recreational vessels to fish with an unlimited number of hooks on one mainline per angler. Revisions to fillet provisions included two options apart from the no action option, including: (1) Allowing recreational anglers to land fillets without skin, and (2) allowing recreational anglers to land fillets with at least 2 inches of contiguous skin that would allow the identification of fish species. Revisions to the GOM cod measures included three options other than no action, including an increased minimum size limit of 26 inches, a reduced possession limit of six cod per angler per trip, and an extension of the GOM cod seasonal prohibition through April 15. Revisions to the GOM haddock measures included four options other than no action, including increasing the minimum size limit to 21 inches, establishing a possession limit of nine fish per angler per trip, a reduction of the minimum size limit to 18 inches and a seven-fish possession limit, and a reduction of the minimum size limit to 18 inches without a possession limit.
- **Retention of Atlantic Wolffish** – In addition to the no action option that would allow vessels to possess an unlimited amount of wolffish, Amendment 16 includes a prohibition on the retention of wolffish.

- **Adoption of Additional Sectors** – Amendment 16 considered not adopting any new sectors (no action) and adopting each of the 17 new and 2 revised sectors under this action.
- **AMs** – Amendment 16 considered three alternative AMs for common pool vessels and four options for recreational AMs, as further listed below. Sector AMs are incorporated into the operations plan requirements and include cessation of fishing operations, an overage deduction, and ACE trading to balance harvest with allocations of ACE.
  - Common pool AMs: Options considered for common pool AMs include no AMs (no action), a trimester TAC AM, and a differential DAS counting AM. The trimester TAC AM included trimester TACs for each stock, with inseason closure areas and trip limit adjustments, a white hake trip limit, and 50-percent dockside monitoring by an independent third-party service provider. The differential DAS counting AM included a projection of common pool catch of each stock in February of each year, with a proportional adjustment to the DAS counting rate in certain areas during the following year based upon the percentage of overage/underage of the common pool quotas for each stock.
  - Recreational AMs: Options considered for recreational AMs include no AMs for the recreational fishery (no action), a process that would require the Council to develop appropriate AMs for the recreational fishery once recreational catch data from the previous FY are available; a process that would require NMFS to develop appropriate AMs for the recreational fishery in the form of changes to season, adjustments to minimum size, and adjustments to possession limits once recreational catch data from the previous FY are available; and a process that would require NMFS, in consultation with the Council, to develop appropriate AMs for the recreational fishery once recreational catch data from the previous FY are available.
- **Other Alternatives Considered** – Amendment 16 considered many other measures that were, ultimately, excluded from further development in this action. These alternatives are summarized in Section 5.4 of the FEIS and include a research set-aside program; an offshore closure area; an effort control that eliminated all trip limits and reduced DAS allocations; alternative management systems such as area-based management, an individual fishing quota (IFQ) regime, and a points-based system of effort control that allocated all vessels a common currency in the form of points and assigned point values for each pound of a stock landed to control effort; and further revisions to existing management measures.

Measures Adopted by the Council Under Amendment 16

At its June 2009 meeting, the Council adopted the following measures for inclusion in Amendment 16 after considering recommendations from the Groundfish Oversight Committee, Groundfish and Recreational Advisory Panels, the Council's Scientific and Statistical Committee (SSC), and public comments received during the public comment period on the DEIS:

1. Incorporation of Atlantic Wolffish into the FMP

Atlantic wolffish was recently determined to be overfished, with notice provided to the Council in February 2009. Amendment 16 would incorporate Atlantic wolffish into the NE Multispecies FMP, including incorporating status determination criteria, a rebuilding plan, and management measures to rebuild this species.

2. Status Determination Criteria

Amendment 16 would update the status determination criteria for existing groundfish stocks based upon the best available scientific information regarding stock status resulting from the latest stock assessment (GARM III).

3. Rebuilding Programs

GARM III indicated that witch flounder, GB winter flounder, northern windowpane flounder, and pollock are newly overfished. Amendment 16 proposes new rebuilding programs for these stocks, with a rebuilding end date of 2017, assuming the rebuilding programs would begin in FY 2010. For witch flounder and GB winter flounder, the rebuilding programs would rebuild these stocks with a 75-percent probability of success. The rebuilding programs proposed for pollock and northern windowpane flounder would not include a probability of success, because the status determinations for these stocks are based upon survey indices. It is not possible to determine a rebuilding period or a rebuilding F for Atlantic wolffish at this time.

4. ABC Control Rule

The ABC control rule would specify that the ABC for most stocks should be determined as the catch at 75 percent of F_{MSY}, or $F_{rebuild}$, whichever is lower. For stocks that cannot be rebuilt within existing rebuilding periods, the ABC would be based upon incidental bycatch, including a reduction in the existing bycatch rate. Finally, for stocks with unknown status, ABC would be determined on a case-by-case basis by the SSC.

5. ABC/ACL Specifications and Distribution Process

Under Amendment 16, ABCs/ACLs would be developed as part of the framework adjustment/specifications process established in the FMP, whereby the Groundfish Plan Development Team (PDT) would develop recommendations for setting an ABC, ACL, and overfishing level for each stock for each of the next 3 years following the implementation of the biennial adjustment, or yearly for stocks managed by the U.S./Canada Resource Sharing Understanding, based upon the ABC control rule. The Council's SSC would either approve the PDT's ABC recommendations, or provide alternative recommendations. The Council would then consider the recommendations of the SSC and PDT, and adopt ABCs and ACLs for each stock for implementation by NMFS. ACLs would then be distributed among the various segments of the fishery that catch groundfish, including the Atlantic sea scallop fishery, the Atlantic herring fishery, state-waters fisheries, exempted fisheries, and the directed NE multispecies commercial and recreational fisheries.

6. AMs

For the commercial fishery, separate AMs are proposed for vessels fishing under sectors and for non-sector vessels. For sector vessels, Amendment 16 would prohibit sectors from fishing in a particular stock area unless they are allocated or acquire ACE for each groundfish stock caught in that stock area. Any overages at the end of the FY would be deducted from that sector's allocation during the subsequent FY. Non-sector vessels would be subject to a differential DAS counting AM during FYs 2010 and 2011 that would adjust the DAS counting rate in particular stock areas proportional to the overage of any sub-ACL, and a hard-TAC AM in FY 2012 and beyond involving trip limit adjustments, area closures, and overage deductions. For the recreational fishery, the RA would evaluate whether recreational catch exceeded the recreational allocation for GOM cod or GOM haddock and propose adjustments to recreational measures for the following FY in consultation with the Council. If the overall ACL for a particular stock is exceeded by components of the fishery not subject to AMs (i.e., exempted fisheries, state-waters fisheries, etc.), excessive catch by such components would be proportionately distributed among the commercial and recreational groundfish fishery to determine if the AMs described above would be triggered.

7. Issuance of Limited Access NE Multispecies and Atlantic Sea Scallop Permits

Amendment 16 would allow a vessel to be issued both a limited access NE multispecies permit and a limited access Atlantic sea scallop permit at the same time. In addition, the owner of a vessel currently issued a limited access Atlantic sea scallop trawl permit would be able to convert the permit to a dredge gear permit without relinquishing his/her limited access NE multispecies permit.

8. Recordkeeping and Reporting Requirements

Amendment 16 would establish four broad stock areas for the purposes of providing more accurate and timely data that can be used to apportion catch to individual stock areas. Vessel operators would be required to declare their intent to fish in one or more of these areas prior to each trip to facilitate the attribution of species landings to specific stock areas. When fishing in more than one broad stock area, vessels would be required to submit a trip-level catch report via the vessel's vessel monitoring system (VMS) to specify the catch of each species in each broad stock area.

9. Effort Controls

Amendment 16 would reduce the DAS allocations for non-sector vessels by 50 percent compared to each vessel's 2006 DAS allocation, which is approximately a 32-percent reduction from each vessel's 2009 DAS allocation. All NE multispecies DAS used by non-sector vessels would be counted in 24-hr increments, based upon the time called into the DAS program. Amendment 16 would exempt sector vessels from the DAS allocation reductions because such vessels would be subject to hard TACs to control fishing effort. However, Amendment 16 would retain the existing 2009 DAS allocations for sector vessels for the purposes of participating in the monkfish fishery, which still requires the concurrent use of a groundfish DAS with a monkfish DAS, and to land skate wings. Unlike non-sector vessels, sector vessels participating in the monkfish fishery would be charged NE multispecies DAS to the nearest minute, based upon the time called into the DAS program.

Amendment 16 also proposes trip limits and two RGAs to control effort by non-sector vessels. RGAs are intended to reduce the catch of flatfish species (predominantly SNE/MA winter flounder and SNE/MA yellowtail flounder) through the required use of selective gear in areas where these species are caught. Trip limits proposed in Amendment 16 include:

- GOM cod: 2,000 lb per DAS, up to 12,000 lb per trip for vessels fishing under a NE multispecies DAS or under the Small Vessel permit exemption (Category C permit).
- GB cod: 2,000 lb per DAS, up to 20,000 lb per trip for vessels fishing under a NE multispecies DAS or under the Small Vessel permit exemption (Category C permit); the existing trip limit for GB cod caught within the Eastern U.S./Canada Area or the Eastern U.S./Canada Haddock SAP would remain the same at 500 lb per DAS, up to 5,000 lb per trip; and 1,000 lb per trip, respectively.
- Cod limit for Handgear A vessels: The possession limit would increase to 750 lb per trip.
- Cod limit for Handgear B vessels: The possession limit would increase to 200 lb per trip.
- Cape Cod/GOM and SNE/MA yellowtail flounder: 250 lb per DAS, up to 1,500 lb per trip.
- GB yellowtail flounder: Unlimited, unless revised by the RA.
- Atlantic halibut: The current trip limit of 1 fish per trip is maintained.
- SNE/MA winter flounder, windowpane flounder, ocean pout, and Atlantic wolffish: Landing of these species is prohibited in any fishery.

10. DAS Leasing and Transfer Programs

Amendment 16 proposes several revisions to the DAS Leasing and Transfer Programs that are intended to eliminate unnecessary administrative procedures that would impede participation in these programs, including allowing permits currently held in confirmation of permit history (CPH) to participate in both programs, and eliminating the DAS leasing cap in the DAS Leasing Program and the DAS conservation tax in the DAS Transfer Program.

11. Minimum Fish Size

Amendment 16 would reduce the minimum fish size for haddock from 19 to 18 inches for all vessels to reduce discards and increase landings of this healthy species. The minimum fish size for Atlantic halibut would be increased from 36 inches to 41 inches, for all vessels, to increase opportunities for halibut to spawn prior to capture, thereby increasing the likelihood that this stock will meet rebuilding objectives.

12. Special Management Programs and SAPs

Several revisions to special management programs and SAPs are proposed in Amendment 16 that would reduce the catch of pollock and SNE/MA winter flounder, but facilitate the catch of healthy stocks of haddock. In particular, the Closed Area (CA) I Hook Gear Haddock SAP would be revised to expand both the area and the season, while the CA II Yellowtail Flounder SAP would be revised to facilitate the targeting of GB haddock by revising the season and allowing selective gear to be used within CA II.

13. Recreational Measures

Amendment 16 would allocate an ACL of GOM cod and GOM haddock to the recreational fishery based upon recreational catch between FYs 2001-2006. To achieve the necessary F reductions for GOM cod, Amendment 16 would extend the existing seasonal GOM cod prohibition for recreational vessels for 2 weeks, to run from November 1 through April 15. Amendment 16 would also reduce the minimum size limit for haddock to 18 inches, increase the size limit to 41 inches for Atlantic halibut, and prohibit the retention of Atlantic wolffish.

14. Sector Measures

Amendment 16 would specify a minimum number of participants required to form a sector by defining a sector as a group of three or more persons, none of whom have an ownership interest in the other two persons in the sector. Sectors would be allocated portions of the ACLs for all groundfish stocks with the exception of Atlantic halibut, ocean pout, windowpane flounder, Atlantic wolffish, and SNE/MA winter flounder. Sector allocations would be in the form of an ACE for each stock, or the maximum amount of a particular stock that a sector could catch – including both landings and discards – on a yearly basis. Each individual sector's ACE for a particular stock would represent a share of that stock's ACL available to commercial NE multispecies vessels, based upon the PSC (an individual vessel's share of the total historical landings of each stock between FYs 2001-2006) of participating vessels. All or a portion of a sector's ACE for any stock may be transferred to another sector at any time during the FY, and up to 2 weeks into the following fishing year.

This action would increase the information that must be submitted by sectors to facilitate monitoring the sector TACs. Sector operations plans would be required to be submitted by September 1 of each year to ensure that the operations plans and associated analyses are reviewed in time to implement such operations by the start of the next FY on May 1. All sectors would be exempt from trip limits, seasonal closed areas, NE multispecies DAS restrictions, the requirement to use a 6.5-inch mesh codend when fishing with selective gear on GB, and portions of the GOM Rolling Closure Areas. Sectors could still request additional exemptions as part of their annual operations plans, subject to approval by the RA. Sectors would be required to submit an annual report to NMFS that details information necessary to evaluate the biological, economic, and social impacts of sectors.

Amendment 16 would require sectors to develop an independent, third-party dockside and at-sea/electronic monitoring program by FYs 2010 and 2012, respectively. During FY 2010, the offloads of 50 percent of trips by each sector would be randomly observed, with 20 percent randomly observed in future years. The at-sea monitoring program would be used to verify area fished and catch (landings and discards) by species and gear type, with coverage levels specified by NMFS on a yearly basis.

Sector vessels would be required to retain all legal-sized groundfish and could only discard undersized fish. All catch, including discards, would be counted against a sector's ACE for each stock. Once a sector's ACE for a particular stock is caught or exceeded, that sector would be required to cease fishing operations in that stock area until it could acquire additional ACE for that stock. If, in a FY, a sector exceeds its ACE for a particular stock, that sector's ACE for that stock would be reduced by the amount of the overage in the following FY. If insufficient ACE to cover the overage exists, a sector's ACE for that stock would be reduced to zero for the following FY. If the sector disbands, participating vessels would be subject to a reduction in ACE contribution if participating in another sector, or a reduction in allocated DAS if not participating in a sector. In addition to overage penalties, a sector and its participants could be held jointly and severally liable for discarding legal-sized fish or misreporting catch (both landings and discards).

Finally, Amendment 16 would authorize the creation of 17 new and 2 revised sectors. Operations plans for these sectors would still need to be approved on a yearly basis by NMFS, consistent with the sector approval process in Amendment 13.

15. GOM Haddock Sink Gillnet Pilot Program

Under Amendment 16, the Council adopted a pilot program that would allow non-sector vessels to fish with 6-inch mesh stand-up sink gillnets in the GOM from January 1 through April 30 of each year, provided Day gillnet vessels do not deploy more than 30 nets per trip.

Environmentally Preferred Alternative

As required by the CEQ NEPA implementing regulations, NMFS shall identify the "alternative or alternatives which were considered to be environmentally preferable (40 CFR Part 15.05.2(b))." The environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment, and that best protects, preserves and enhances historic, cultural and natural resources. NMFS has determined that, overall, the measures being implemented represent the environmentally preferable alternative when considering the balance of environmental and economic effects that might accrue from these measures within the context and strictures of the Magnuson-Stevens Act and other applicable law.

The Amendment 16 FEIS evaluates the biological impacts of the options considered, including impacts to the groundfish fishery, other fisheries, marine mammals, endangered species, and EFH. Where sufficient information was available, the options were compared using quantitative criteria, including the Closed Area Model (CAM) described in Section 7.1 and Appendix II of the FEIS. In the case of measures designed to control F, the impacts of measures are analyzed by combining the measures as much as possible. Many of the proposed measures interact with each other, and analyzing the measures individually does not capture the true impact of adopting a suite of measures. However, it is not always possible to quantify the impacts of certain measures for various reasons, including insufficient quantitative information regarding the possible impacts of certain measures (e.g., RGAs); limitations of the CAM, such as the difficulty in identifying the precise impact of a particular measure when such a measure is impacted directly or indirectly by other measures included in this action; or uncertainty regarding the degree of participation in sectors. As a result, most options were analyzed through both quantitative and qualitative analysis, as appropriate. The analysis evaluates the impact of Amendment 16 measures relative to the no action alternative — i.e., a baseline scenario that assumes that the measures implemented by the 2009 interim action would expire and regulations would revert to those implemented under Framework Adjustment 42 in 2006.

In nearly every instance, the proposed revisions to existing management measures are considered the environmentally preferable option over the no action option. This is because the revised measures, as specified above, are intended to prevent overfishing and ensure that overfished stocks continue to rebuild to sustainable levels. The one exception to this is the option related to the GOM Sink Gillnet Pilot Program. In this instance, the no action option is the environmentally preferable option, as it would not allow the use of 6-inch gillnets in the GOM on a fishery-wide basis, which could increase the catch of GOM cod and pollock stocks that are currently overfished and subject to overfishing. This is particularly relevant when considering that other measures proposed in this action would reduce catch of these stocks. Other measures are purely administrative in nature and have minimal, if any, impact on the biological or physical environment. Examples of such administrative measures include the ACL process, definition of a sector, sector operations plan requirements, sector allocation and recreational measures, sector joint/several liability measures, ACE transfer provisions, DAS Leasing/Transfer Program revisions, concurrent issuance of a limited access scallop and NE multispecies permit, and the adoption of new and revised sectors. These administrative measures would have minimal impact because overall catch of groundfish would be limited to the ACLs specified in this fishery. Sector allocations could actually reduce fishing capacity and, therefore, mortality, by reducing the economic viability of vessels only marginally involved in the fishery. While ACE and DAS transfer provisions may change which vessels and, therefore, which gear types are used in this fishery, because any vessel can elect to use any gear type in each FY, there is no certainty regarding the possible future impacts to the physical environment of such changes, and an environmentally preferable option cannot be identified. At this time, it is also not possible to identify an environmentally preferable option for the SNE/MA gear requirement, as a study of the impacts for such gear has not been completed. It is possible that such gear could reduce impacts on flatfish species, but the impacts are uncertain at this time.

Most measures proposed in this action would have positive effects on the biological and physical environment over the no action option. Options to revise the status determination criteria, ABC control rule, and revised mortality targets are based upon updated information regarding stock status, size at maturity, growth rates, and recruitment patterns. This updated information reflects a better understanding of population dynamics. Thus, incorporating this information through revisions to existing measures increases the likelihood that measures implemented will achieve their goals of reducing F and rebuilding overfished stocks. Incorporation of Atlantic wolffish and designation of EFH for this species is environmentally preferable, as without such measures, there would be little protection for this species or its habitat. AMs for sectors, the common pool, and recreational vessels would all help prevent overfishing by ensuring that ACLs are not exceeded, deducting overages from subsequent ACLs, or reducing effort to prevent future ACLs from being exceeded. To the extent that revised sector and non-sector monitoring requirements increase the accuracy and timeliness of catch monitoring data, such revisions would be environmentally preferable in that they would increase the likelihood that AMs could be implemented in a timely manner and prevent ACLs from being exceeded. Calculation of assumed discard rates could be considered an environmentally preferable option because it is likely discard rates developed using previous data would be more conservative than future discard rates, as it is expected that sector provisions would reduce discarding overall. Revisions to SAPs would facilitate the targeting of haddock while maintaining measures meant to control impacts on stocks of concern. Among the options considered for common pool measures, Option 3A is the environmentally preferred option because it would meet the biological objectives of more stocks than any other option considered. Adjustments to minimum size limits would have a neutral impact on haddock, but would have a positive impact for Atlantic halibut, as it would make the minimum size limit consistent with median length at maturity for female halibut in the GOM, meaning that fish are more likely to spawn at least once before being harvested. Finally, revisions to recreational measures would either have neutral or positive impacts to the biological environment, as they would either maintain existing interim measures for haddock, or reduce catch of GOM cod.

Thus, with the exception of the GOM Sink Gillnet Pilot Program, the measures approved by the Council represent the environmentally preferable option. For additional information on the biological impacts of options considered in Amendment 16, see Section 7 of the FEIS.

Factors Considered in Making a Decision on the Final Action

The Council on Environmental Quality (CEQ)'s regulations for implementing the procedural provisions of NEPA require agencies to not only state the outcome of the decisions, but also to discuss how the decision was affected by the preferences among alternatives and to identify and discuss all factors that led to the decision. In making a decision regarding approval of the measures in Amendment 16, NMFS considered the analysis of alternatives in the FEIS, associated environmental impacts, the extent to which the impacts could be mitigated, and the agency's consideration of the objectives of the final action as they relate to the Magnuson-Stevens Act and other applicable law. NMFS has also considered the public and agency comments received during the NEPA comment periods.

The goals and objectives of the FMP are described in Section 3.4 of the FEIS; the main goals of Amendment 16 are to end overfishing, rebuild overfished stocks, and mitigate the adverse economic impacts of recent reductions in fishing effort consistent with the requirements of the Magnuson-Stevens Act. Since 1996, the number of DAS, the primary means of controlling fishing effort, has been continually decreased in an effort to eliminate overfishing and rebuild overfished stocks. In general, these efforts have been successful at reducing F for many stocks, but most stocks remain overfished with overfishing still occurring. Without additional reductions in F, the fishery is unlikely to eliminate overfishing and rebuild overfished stocks. Further reductions in F lead to adverse economic and social impacts, along with a reduced chance of obtaining optimum yield (OY) for all stocks, particularly due to the commingled nature of this fishery, where it is often difficult to selectively harvest healthy stocks without catching stocks in need of F reductions. Therefore, Amendment 16 seeks to mitigate such economic impacts by facilitating access to healthy haddock resources and increasing the efficiency and reducing the costs of existing measures. Finally, this action must include a mechanism to establish ACLs and AMs consistent with the Magnuson-Stevens Act. Thus, NMFS considered the relevance of the Amendment 16 measures to the goals and objectives of both the FMP and this action, and the effectiveness of each option in achieving such goals and objectives.

In addition to the effectiveness of alternatives relative to the amendment's goals, NMFS must consider the approval of an FMP amendment relative to the requirements of the Magnuson-Stevens Act. The Magnuson-Stevens Act states that "Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the ... National Standards for fishery conservation and management." As required, NMFS evaluated Amendment 16 relative to the National Standards described in section 301 of the Magnuson-Stevens Act, and found the action to be consistent with these standards. To the extent that there may be absence of a measure to meet the Magnuson-Stevens Act provisions for a groundfish stock, NMFS has determined that such a failing is not grounds to disapprove all other Amendment 16 measures for other stocks. A summary of the rationale for the determination of compliance is in Section 9.1.1 of the FEIS.

In addition to the National Standards, section 303(a) of the Magnuson-Stevens Act includes 15 required provisions for FMPs. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, must comply with these requirements. Section 9.1.2 of the FEIS describes these requirements and the basis for determining that the measures included in Amendment 16 comply with the required provisions.

Section 303(b) of the Magnuson-Stevens Act also includes discretionary provisions for FMPs that the Council can decide to include if it determines the provisions are necessary and appropriate for the management of the fishery. Several discretionary provisions relevant to Amendment 16 are described below:

Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, may:

- Designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;
- For closure areas that prohibit all fishing, ensure that such closure –
  - Is based on the best scientific information available;
  - Includes criteria to assess the conservation benefit of the closed area;
  - Establishes a timetable for review of the closed area's performance that is consistent with the purposes of the closed area; and
  - Is based on an assessment of the benefits and impacts of the closure.
- Establish a limited access system for the fishery in order to achieve OY if, in developing such a system, the Council and Secretary take into account –
  - Present participation in the fishery;
  - Historical fishing practices in, and dependence on the fishery;
  - The economics of the fishery;
  - The capability of fishing vessels used in the fishery to engage in other fisheries;
  - The cultural and social framework relevant to the fishery and any affected fishing communities; and
  - Any other relevant considerations.

- Require that one or more observers be carried on board a vessel of the United States engaged in fishing for species that are subject to the plan, for the purpose of collecting data necessary for conservation and management of the fishery;
- Include, consistent with the other provisions of this Act, conservation and management measures that provide harvest incentives for participants within each gear group to employ fishing practices that result in lower levels of bycatch or in lower levels of the mortality of bycatch;
- Include management measures in the plan to conserve target and non-target species and habitats, considering the variety of ecological factors affecting fishery populations.

NMFS has determined that the measures developed in Amendment 16 comply with these Magnuson-Stevens Act discretionary provisions, as described further below.

In addition to the Magnuson-Stevens Act and NEPA, NMFS also considers other laws that relate to the implementation of FMPs and FMP amendments. NMFS evaluated Amendment 16 relative to the laws described below and has determined that the all of the approved Amendment 16 measures, singly and combined, comply with the following laws and minimize impacts relevant to these laws. The basis for NMFS's determination of compliance with these laws, and information to meet the requirements relative to these laws, is provided in Section 9.0 of the FEIS and in the RA's decision memorandum included with this ROD for the approval of Amendment 16.

Decision on the Final Action: Measures Approved/Disapproved Under Amendment 16

NMFS approves all measures adopted by the Council under Amendment 16 and listed above with the exception of the GOM Sink Gillnet Pilot Program. The decision to partially approve Amendment 16 is based on the rationale contained in the RA's decision memorandum that accompanies this ROD, the analyses prepared for Amendment 16 and the FEIS, and all other analytical documents prepared for this action during the course of its development. In making the decision to partially approve Amendment 16, NMFS evaluated the proposed action relative to the Magnuson-Stevens Act, including the national standards, associated guidelines, and required and discretionary provisions, in addition to all other applicable law listed above. The FEIS contains detailed discussion and analysis of the basis for NMFS's determination that the action complies with all of these laws and provisions. It is important to note that the no action option for many measures listed below would not achieve the objective of preventing overfishing, rebuilding overfished stocks, or mitigating the economic impact of further effort reductions. Further, the no action option would not ensure that the NE Multispecies FMP maintained compliance with the Magnuson-Stevens Act requirements for FMPs to immediately prevent overfishing and establish a mechanism for specifying ACLs and AMs. A summary of the rationale and justification for approving or disapproving the measures is provided below.

1. GOM Sink Gillnet Pilot Program

This pilot program proposed to allow vessels to target haddock on a fishery-wide basis while using 6-inch mesh gillnets, which is less than the minimum mesh size currently required, from January through April. As specified in earlier letters to the Council, this pilot program is analogous to a SAP, as defined in Section 3.4.5 of the Amendment 13 Final Supplemental EIS, because it would allow vessels on a fishery-wide basis to fish in a manner that would otherwise be prohibited. Contrary to assertions in Section 4.3.2.2 of the Amendment 16 FEIS, nothing in Amendment 13 suggests that a SAP was intended to only facilitate access to closed areas, or allow the use of a Category B DAS. According to Amendment 13, SAPs are intended to facilitate the targeting of healthy stocks, without compromising efforts to end overfishing or rebuild overfished stocks by using selective gear or fishing when interaction with stocks of concern (i.e., stocks that must have fishing mortality reduced to end overfishing or rebuild the overfished stock) are minimized. Although recent actions have adopted SAPs based upon peer-reviewed research, this is not a formal criterion for the approval of SAPs. However, such research helps identify the expected impacts of proposed measures. Further, public comments received during the public comment period on the Amendment 16 notice of availability requirement of the Magnuson-Stevens Act support the use of peer-reviewed research prior to the approval of any new or revised SAPs.

Research cited to support this pilot program in the Amendment 16 FEIS has several limitations that preclude its ability from adequately supporting the proposed pilot program. First, the work was not conducted throughout the season proposed for this pilot program (January through April), with research trips only being conducted in March and May. Secondly, research trips were conducted in an area not accessible to NE multispecies vessels (the Western GOM Closure Area), resulting in catch rates by experimental vessels that are not directly comparable to those expected under this pilot program. Finally, and most importantly, the catch of the target species (haddock) was too low to adequately evaluate the selectivity of gillnets for haddock, while the catch of cod and pollock was too high to reasonably conclude that this pilot program would not have an adverse impact on these overfished stocks. For example, during this experiment, only 71 haddock were caught, while 264 cod and 873 pollock were caught. The report concludes that "bycatch of cod is likely to be a challenge for a directed springtime haddock fishery on this portion of Jeffreys Ledge," that "make(ing) a regulatory change based upon this study alone (is) unwise," and that "further work must be done on avoiding cod bycatch if a haddock gillnet fishery is to be reestablished in this area" (Marciano, et. al, 2005). Researchers suggest gear modifications that raise the webbing of gillnets several feet off the bottom would enhance the selectivity of gillnet gear and promote the objectives of this pilot program. While this work was reportedly conducted in 2006, a final report of such work has not been made available, and has not been used to enhance the effectiveness of this pilot program, as proposed in Amendment 16.

As this research demonstrates, gillnets are effective at catching both pollock and cod, stocks that require reductions in fishing mortality to rebuild under existing/proposed rebuilding programs. Section 7.2.1.3.1.4 of the Amendment 16 FEIS indicates that, if the catch rates of these species remain the same or increases under this proposed pilot program, mortality on these species could increase. While the FEIS also indicates that mortality might decrease if catch rates decrease, the FEIS does not provide any evidence that catch rates of cod and pollock would actually decrease as a result of using smaller mesh in this program. Recent landings data indicate that haddock catches by gillnet gear in the GOM are minimal in January and February, and peak in March. However, large amounts of both cod and haddock are regularly landed in January and February. This suggests that this pilot program, as proposed, would encounter larger amounts of cod and pollock early in the proposed season, while haddock catch rates would not increase until later in the proposed season. As a result, the proposed pilot program could either maintain or increase catches of these species compared to current measures, particularly considering the proposed use of smaller mesh would likely catch smaller fish, as also suggested in the Amendment 16 FEIS. Thus, there is the possibility that this program could undermine rebuilding programs for these stocks without substantially increasing the catch of haddock – the stated objective of this measure.

Based upon the above rationale, the proposed pilot program is inconsistent with National Standards 1 and 9 and with other provisions of the FMP, including the SAP provisions in Amendment 13 and Objectives 3 (constrain fishing mortality to levels compliant with the Sustainable Fisheries Act), 4 (prevent overfishing), and 10 (minimize bycatch) of the FMP. Therefore, this pilot program is disapproved under Amendment 16. The Council could chose to revise the proposed pilot program in a future action to better reflect months when low catch rates of cod and pollock correlate with higher catch rates of haddock (i.e., March and April) to maximize opportunities to increase the catch of haddock, without unnecessarily increasing mortality on cod and pollock.

2. Incorporation of Atlantic Wolffish into the FMP

Atlantic wolffish is occasionally caught by both commercial and recreational groundfish vessels. In October 2008, a petition was submitted to NMFS to list wolffish under the Endangered Species Act (ESA). In February 2009, wolffish was determined to be overfished which, under the Magnuson-Stevens Act, requires that action be taken to end overfishing and implement management measures to rebuild the stock. Thus, Amendment 16 adds this species to the FMP and prohibits possession to help rebuild this overfished species. Because there is little information and a high degree of uncertainty regarding population status and the reliability of survey data for this stock according to the Amendment 16 FEIS, designation of EFH throughout the EEZ was considered appropriate at this time until further information could be acquired to narrow the scope of the EFH, as necessary.

3. Status Determination Criteria

Updated status determination criteria listed in Amendment 16 were derived from data used in the GARM III and the Data Poor Working Group, which represent the best scientific information available. Because Amendment 16 would update the status determination criteria for all groundfish stocks, and further management measures would be based upon such data, this action is consistent with National Standard 2 (best available science) of the Magnuson-Stevens Act. The no action option was rejected because it would not be consistent with National Standard 2 to use older status determination criteria in the face of new, better information from GARM III.

4. Rebuilding Programs

Available data, including GARM III and updated survey data, indicate that witch flounder, GB winter flounder, northern windowpane flounder, and pollock are overfished, and that overfishing is occurring on these stocks. The Magnuson-Stevens Act and National Standard 1 (preventing overfishing) and its associated guidelines require that Councils immediately end overfishing and develop management measures to rebuild these stocks in as short a period as possible, not to exceed 10 years, unless otherwise allowed due to the biology of the stock. The no action option would not have adopted rebuilding programs for stocks newly classified as being overfished and subject to overfishing, which would be inconsistent with requirements of the Magnuson-Stevens Act. Instead, Amendment 16 proposes new rebuilding programs for these stocks, with a rebuilding end date of 2017, assuming the rebuilding programs begin in FY 2010. These rebuilding programs are less than 10 years in duration and would immediately end overfishing for these stocks, consistent with the Magnuson-Stevens Act.

The rebuilding program for SNE/MA winter flounder was established under Amendment 13 in 2004. This rebuilding program intended to gradually reduce F for this stock and rebuild the stock by 2014. According to updated information in GARM III, the recruitment assumptions used to support the Amendment 13 rebuilding program for this stock were overly optimistic. As a result, GARM III determined that this stock would not rebuild by 2014, even if F was reduced to zero, but could rebuild by 2015 or 2016 with an F of zero. Fishing mortality on SNE/MA winter flounder would be reduced to as close to zero as practicable under Amendment 16. Although the Amendment 16 measures would end overfishing on this stock, they will not result in it rebuilding by Amendment 13's objective of 2014. However, even a closure of the entire SNE/MA winter flounder stock area would not result in rebuilding this stock by the end of 2014, and would only marginally shorten the date of rebuilding by 1 or 2 years, at the cost of closures of many of the high-value fisheries and substantial adverse economic impacts to vessels and associated fishing communities in the area. It is not possible, therefore, under any scenario, including a complete closure to fishing in the affected stock area, to make adequate progress to meet the 2014 rebuilding timeline. The Magnuson-Stevens Act in Section 304(e)(7) recognizes that in a situation where an FMP amendment may not be able make adequate progress to achieving rebuilding objectives, a Council is allowed an opportunity to recommend other measures to make adequate progress. The Council chose the proposed Amendment 16 measures because it would not result in appreciable delays in rebuilding and, by avoiding a region-wide closure, provide for the sustained participation of fishing communities and minimize the adverse economic impacts on such communities, consistent with National Standard 8. Based on these reasons, therefore, approving the measure to reduce fishing mortality on SNE/MA winter flounder to as close to zero as possible is reasonably justified and legally permissible under Section 304(e)(7).

5. ABC Control Rule

The Amendment 16 DEIS referenced the F control rule in Amendment 13 as a means to develop ABCs and ACLs in this action, but did not specifically include an option to revise the control rule or reclassify it as the ABC control rule. This approach, represented by the no action option, would be consistent with the new requirements of the Magnuson-Stevens Act. However, the SSC reviewed an analysis of the effectiveness of this control rule and recommended a simpler approach to incorporate scientific uncertainty when specifying ABCs. This revised approach, as described above, relies upon setting ABCs at 75 percent of F_{MSY}, or $F_{rebuild}$, whichever is lower, along with considerations for stocks that cannot rebuild within the rebuilding timeline or stocks with unknown status. Although the ABC control rule recommended by the SSC was not developed in time for incorporation into the DEIS, the public had several opportunities to consider and comment on the application of this control rule in Amendment 16 before the Council formally adopted measures under Amendment 16 in June 2009. Further, the public had an opportunity to comment on this provision during the comment period for the Amendment 16 and the FEIS, as described below. Therefore, because the SSC has considered the ABC control rule in Amendment 16 to be more appropriate than the Amendment 13 F control rule approach in the DEIS, the application of the ABC control rule under Amendment 16 is consistent with the use of the best scientific information available. Further, because the public had several opportunities to comment on this ABC control rule prior to a final decision on the action by both the Council and NMFS, this measure is consistent with the NEPA and the Administrative Procedure Act (APA). Finally, this measure would meet the goals of the FMP and this action by maintaining compliance with the Magnuson-Stevens Act.

6. ABC/ACL Specifications and Distribution Process

The Magnuson-Stevens Act requires that FMPs contain a mechanism for specifying ACLs at such a level that overfishing does not occur. Amendment 16 adopts a process for specifying ABCs/ACLs as part of the framework adjustment/specifications process in the FMP, including the development of ABC/ACL recommendations by the PDT for formal review and approval by the SSC and Council. Under this process, the ACLs adopted by the Council could not exceed the ABC recommendations of the SSC. Accordingly, this measure is consistent with the Magnuson-Stevens Act requirements to develop ACLs that may not "exceed the fishing level recommendations of its scientific and statistical committee." The no action alternative would have failed to adopt a process to specify ACLs in the fishery, which is not consistent with the Magnuson-Stevens Act.

ACLs developed under this process would be distributed among the segments of fisheries that catch groundfish, including the Atlantic sea scallop fishery, the Atlantic herring fishery, state-waters fisheries, exempted fisheries, and the directed NE multispecies commercial and recreational fisheries. By distributing ACLs among the various components of the fishery that catch groundfish, it is possible to more precisely develop management measures that effectively regulate harvest groundfish, while preventing the overall ACLs from being exceeded. This is necessary to ensure that measures in Amendment 16 accommodate catch of groundfish by other fisheries, and to maintain consistency with Objective 8 of the FMP to "develop biological, economic, and social measures of success for the groundfish fishery and resource that ensure accountability in achieving fishery management objectives." For certain segments of the fishery, neither the Council nor the NE Multispecies FMP have the authority to regulate catches or revise management measures. Accordingly, the sub-component of the ACL distributed to such fisheries is not considered an ACL and, therefore, not subject to AMs. While such catch would still count towards the overall ACL for each stock, Amendment 16 notes that controls on the segments of the fishery that are subject to AMs (i.e., the directed groundfish fishery) must be sufficient to prevent overfishing of the stock as a whole. Further, the amount of ACL distributed to each sub-component of the fishery would be reevaluated every 2 years as part of the biennial adjustment process. Should catch of groundfish by such components exceed the amount distributed to these fisheries, the Council could revise the amount distributed to that sub-component. Thus, this measure in Amendment 16 is consistent with both the FMP and the Magnuson-Stevens Act.

7. AMs

As noted above, Amendment 16 specifies AMs in the directed groundfish fishery, with separate AMs for sector vessels, common pool vessels, and the recreational fishery. Sector vessels would be required to cease fishing when the ACE for a particular stock is caught, and to deduct any overages from the ACE allocated to that sector during the subsequent FY. Common pool vessels would transition to a similar hard-TAC AM system in 2012, but would first be subject to differential DAS counting if it is projected that the ACLs allocated to common pool vessels would be exceeded. The differential DAS counting AM for common pool vessels would apply to all groundfish stocks, but the hard TAC AM would not apply to ocean pout, windowpane flounder, or Atlantic halibut; stocks that, with the exception of halibut, cannot be possessed by any groundfish vessel. Closures associated with either sector or common pool AMs in Amendment 16 are based upon the best scientific information available, including stock areas used in GARM III, and upon the areas that accounted for 90 percent of landings for each stock in recent years based upon vessel trip reports. Such areas would be evaluated regularly and could be revised based upon the biennial adjustment process in the FMP, consistent with discretionary provisions of the Magnuson-Stevens Act. Due to the delayed availability of catch data for the recreational fishery, it is not possible to develop inseason AMs for this component of the fishery. Therefore, Amendment 16 would require NMFS to develop appropriate AMs for the recreational fishery for the following FY if the ACLs for GOM cod or GOM haddock are exceeded during a FY, after consultation with the Council. Consultation with the Council is considered necessary to develop recreational AMs, as a majority of recreational fishing effort is conducted in state waters, and coordination of Federal and state recreational fishing measures can best be accomplished through the Council process, where the directors of state fishery management agencies participate as Council members. As stated above, for segments of the fishery that are not subject to AMs such as state waters fisheries, exempted fisheries, and the scallop fishery, excessive catch of groundfish by these components would be accounted for by controls on the directed groundfish fishery, including the AMs described above, to ensure that overfishing does not occur. In doing so, all groundfish catch is accounted for under the ACLs developed pursuant to the process described in Amendment 16.

Although ACLs are specified for all stocks, several stocks (SNE/MA winter flounder, ocean pout, windowpane flounder, and wolffish) are not specifically allocated to sectors because these stocks are likely to have small ACLs and vessels have very limited landing history for these predominantly non-directed catch stocks. It would be very difficult to accurately monitor such small ACLs. Rather than further complicate the monitoring requirements for sectors by allocating such stocks to sectors, Amendment 16 would instead prohibit the retention of these stocks to discourage targeting and, therefore, reduce the likelihood that the ACLs for these stocks would be exceeded. Because there would not be a formal allocation of these stocks to sectors, Amendment 16 did not include specific sector AMs for these stocks. In addition, ocean pout, windowpane flounder, and Atlantic halibut would not be subject to the common pool hard-TAC AM beginning in 2012. This approach is intended to maintain vessel access to all stock areas, as allocating such small bycatch TACs to sectors and incorporating such stocks under the hard-TAC AM would likely result in unnecessarily closing large areas and substantial adverse economic impacts to vessels and associated fishing communities due to excessive catch of these stocks. Although these stocks would not be subject to stock-specific AMs upon the implementation of Amendment 16, it is likely that other measures in Amendment 16 are sufficient to prevent overfishing. Such measures include AMs specified for other stocks that overlap with the distribution of these stocks, restrictive management measures such as DAS reductions and RGAs where only selective gear that avoids catch of particular stocks can be used, further revisions to the FMP as part of the biennial adjustment process, RA authority to approve/disapprove sectors on a yearly basis due to excessive bycatch of these stocks, and inseason adjustments to management measures for common pool vessels to slow or eliminate bycatch of these stocks in particular areas, as proposed in Framework Adjustment 44 (to be implemented at the same time as Amendment 16). Because Amendment 16 includes AMs and other measures for all stocks that should prevent overfishing from occurring on any one stock, NMFS has determined that the lack of specific AMs for these few stocks is not inconsistent with the National Standard 1 Guidelines and rebuilding and overfishing objectives of Amendment 16. Because the Secretary is restricted by the Magnuson-Stevens Act to only approve, disapprove, or partially approve an amendment to an FMP, NMFS cannot insert AMs for these stocks into Amendment 16, and cannot conceptually disapprove the lack of appropriate AMs. It would be non-sensible and be contrary to the requirement of the Magnuson-Stevens Act to immediately end overfishing and rebuild overfished stocks for the Secretary to disapprove the entire amendment or send the amendment back to the Council to address possible shortcomings for a few stocks. Moreover, it is not practicable or even possible that an emergency action could be developed in time to address these shortcomings and implement the full suite of measures included in Amendment 16 before the start of FY 2010 on May 1, 2010. Instead, NMFS intends to inform the Council of the need to revisit the lack of specific AMs for these few stocks.

8. Issuance of a Limited Access NE Multispecies and Atlantic Sea Scallop Permits

Many vessels issued a limited access scallop permit are also issued an open access NE multispecies permit that allows the vessel a limited amount of groundfish when fishing for scallops. Similarly, many vessels issued a limited access NE multispecies permit are also issued a general category scallop permit that allows the vessel to land small amounts of scallops. Amendment 16 would allow a vessel to be issued both a limited access NE multispecies permit and a limited access Atlantic sea scallop permit at the same time. This would increase the economic efficiency of vessels by allowing the vessel to operate in a more profitable manner and reducing operational costs of having to purchase, operate, and maintain multiple vessels to participate in both fisheries. In doing so, Amendment 16 would also increase the value of such permits. The no action option would not contribute to the objectives of this action to increase efficiency of vessel operations and also mitigate the economic impacts of management measures. While this measure is intended to increase the efficiency of management measures, it has no direct detrimental impacts on allocations within or between fisheries, and does not compromise the conservation measures of the fishery, as existing effort controls for both permits would be maintained. Only landings history of limited access NE multispecies permits would be used to contribute to sectors, not the landings history under an open access permit. Further, only in a limited circumstance would a vessel be able to fish for both scallops and groundfish on the same trip. In this circumstance, the vessel would be required to fish with trawl gear and comply with the applicable regulations in both the NE Multispecies and Atlantic Sea Scallop FMPs.

Amendment 16 includes a full analysis of the expected impacts of this measure in Section 7.0 of the FEIS. Although this analysis indicates that this measure may shift effort from New England states to MA states because the scallop fishery is predominantly based in SNE, the analysis notes that such shifts in effort are difficult to predict. If this measure does result in different fishing patterns than previously experienced, F on either groundfish or scallops could change. Because conservation controls in both fisheries are maintained, there is little chance that this measure would adversely impact the F in either fishery. Therefore, NMFS determines that this measure is consistent with the Magnuson-Stevens Act, including National Standard 5 (efficiency in utilization of resources), and other applicable law.

9. Recordkeeping and Reporting Requirements

The reporting requirements included in Amendment 16 are necessary to ensure that accurate and timely data are available to effectively monitor the catch of groundfish toward the harvest of ACLs. Collection of these data is consistent with the provisions of the Magnuson-Stevens Act because the data would be used to implement AMs and help prevent ACLs from being exceeded and overfishing from occurring. Failure to collect such information under the no action option would result in delays in implementing AMs, which could lead ACLs to be exceeded and overfishing to occur in contrast to the objectives of this action and the requirements of the Magnuson-Stevens Act. The Office of Management and Budget is currently reviewing the recordkeeping and reporting requirements outlined in Amendment 16 and the associated proposed rule for consistency with the Paperwork Reduction Act (PRA).

10. Effort Controls

In Amendment 16, the Council adopted Option 3A to control the effort of common pool vessels. Option 3A utilizes further DAS reductions, 24-hr DAS counting, and trip limits, instead of the current differential DAS counting measures, to reduce F for these vessels. This option also includes RGAs that are intended to reduce bycatch of flatfish stocks most in need of additional F reductions. Analysis of these measures is in Section 7.0 of the FEIS. Although the RGAs in Amendment 16 were not relied upon as a means to achieve the conservation objectives, based on existing data regarding the use of gear allowed into these areas, the RGAs would likely reduce bycatch of flatfish species, reducing mortality on these species and increasing incentives for vessels to fish more selectively. Possession prohibitions and gear requirements in this option are intended to reduce incentives to fish for or retain non-target species such as SNE/MA winter flounder, ocean pout, windowpane flounder, and wolffish to continue rebuilding these stocks without unnecessarily reducing the potential to achieve OY for other groundfish stocks and fisheries prosecuted in the same area. Thus, these measures are consistent with the discretionary provisions of the Magnuson-Stevens Act.

Due to uncertainty regarding participation in sectors, the analysis in Amendment 16 for this measure assumes that all limited access NE multispecies vessels would participate in the common pool. This is a conservative approach that is necessary to ensure that the common pool measures are sufficient to prevent overfishing and minimize the possibility that ACLs would be exceeded during a FY. For some stocks, this option achieves more than the necessary reductions in F. To compensate for this, this option increases the trip limits for cod and yellowtail flounder stocks, and white hake. Other measures in Amendment 16 are intended to help mitigate these impacts, such as SAPs designed to facilitate the targeting of healthy haddock stocks, revisions to the DAS Leasing and Transfer Programs to reduce barriers to participation in these programs, and sectors, which could increase the economic efficiency of vessel operations. Increased trip limits for some stocks under this option would not only increase fishing revenue, but also help reduce bycatch, consistent with National Standard 9. Overall, this option would better achieve the conservation objectives than any other option considered, as described in Section 7.2 of the FEIS. In addition, apart from the no action option, the option adopted by the Council would result in the least reduction to total fishing revenue among the options considered, as described in Section 7.5 of the FEIS. Thus, this measure balances conservation objectives with economic objectives, in compliance with National Standards 1 and 8 of the Magnuson-Stevens Act. As noted above, the no action option is inconsistent with the Magnuson-Stevens Act, as it would not prevent overfishing on overfished stocks.

The Amendment 16 analysis indicates that small gillnet vessels would be more affected by this measure than other types of vessels. In addition, these measures may have localized impacts that differ between communities, based upon the type of vessels that operate out of such communities and the fish stock conditions in areas near such communities. Because overfished stocks are found in all areas managed by the FMP, and stocks are not distributed evenly, there will be distributive impacts associated with any measures designed to end overfishing and rebuild overfished stocks, especially considering the commingled nature of the stocks managed by this FMP. Despite the disparate impacts between vessels of different size and location, all vessels would be subject to the same effort controls, and this measure would not discriminate between permit holders of different states. Thus, NMFS has determined that this measure is consistent with National Standard 4, as it does not discriminate between residents of different states.

Some have claimed that the 24-hr DAS counting provision in Amendment 16 would compromise vessel safety by encouraging vessels, particularly smaller vessels, to fish longer hours and in inclement weather to maximize the value of each DAS charged, in violation of National Standard 10. Similar claims were made for previous actions regarding the differential DAS areas, in that there may be incentives for vessels to fish farther from shore. However, there is no direct evidence to support or refute claims that changes in DAS counting rates directly affect fishing behavior regarding safety, and there is no evidence that the measures adopted in this action would compromise safety any more than previous management measures, as described in Section 7.6 of the FEIS. Examples in the Day gillnet fleet suggest that, despite being charged more DAS than fished, many vessels elect to return to port early, despite being charged more DAS, to reduce operational costs, suggesting that it is not likely that the 24-hr DAS counting measure would compromise vessel safety. Therefore, NMFS concludes that this measure is consistent with National Standard 10.

11. DAS Leasing and Transfer Programs

Since their implementation in 2004, the DAS Leasing and Transfer Programs have enabled vessels to continue fishing for groundfish despite reductions in DAS allocations and the imposition of differential DAS counting. Proposed revisions to the DAS Leasing and Transfer Programs under Amendment 16 are intended to help mitigate the economic impacts of further effort controls and increase opportunities for vessels to acquire sufficient DAS to remain economically viable by removing barriers to participation in such programs, including the elimination of the DAS leasing cap, the DAS transfer conservation tax, and the prohibition on the participation of permits in CPH in these programs. This is consistent with the goals and objectives of this action and the FMP, as it would help maintain the economic viability of a diverse fleet. Although the removal of the DAS leasing cap was not included in the DEIS, it was adopted by the Council in the FEIS based upon comments received on the DEIS, and it was debated at several meetings accessible to the public.

The other options considered for these measures would fail to achieve the objectives of this action and the FMP. First, the no action option would maintain the existing barriers in these programs that fail to increase participation in these programs or offer an alternative way for vessels to acquire sufficient DAS to remain economically viable following continued effort reductions. Option 2, sub-option B, would have removed the DAS conservation tax in the DAS Transfer Program, but would have refunded DAS lost to the conservation tax in previously approved transfers. This would eliminate all capacity reductions gained as a result of the conservation tax, thereby undermining the primary objective of the conservation tax when first implemented in Amendment 13. Such resurrected DAS could also increase F in the fishery if activated and used to harvest groundfish, in opposition to the objectives of this action and the FMP. Option 3 would have imposed a 20-percent tax on DAS leased. This would add a barrier for participation in this program that did not previously exist. It would likely result in less participation in this program and greater negative economic impacts to groundfish vessels, as less DAS would be available to maintain the economic viability of vessels remaining in the fishery. Finally, while Option 4 would have eliminated the conservation tax for a period of time, that window was never explicitly defined by the Council. Once that window expired, the conservation tax would have been reinstated and would have reduced incentives to participate in this program.

12. Minimum Fish Sizes

Due to slow growth rate of the large 2003 yearclass of haddock, bycatch and associated discards of undersized haddock have increased. According to GARM III, slow growth rates for this stock are apparent across all ages of haddock. Amendment 16 would reduce the minimum fish size of haddock from 19 to 18 inches to reduce discards and increase landings of this healthy species. This would increase revenues, while minimizing bycatch to the extent practicable, consistent with National Standards 8 and 9 of the Magnuson-Stevens Act. Maintaining a 19-inch minimum size limit under the no action option would likely increase discards of haddock, particularly if slow growth rates persist for this species, which would be inconsistent with National Standard 9, and would unnecessarily sacrifice yield for this rebuilt stock, which would be inconsistent with National Standard 1.

GARM III updated data relative to the median size at maturity for Atlantic halibut. Unlike the no action option, by increasing the minimum fish size for this species from 36 inches to 41 inches, Amendment 16 would increase opportunities for halibut to spawn prior to capture, thereby increasing the likelihood that this stock will meet rebuilding objectives, consistent with National Standard 1.

13. Special Management Programs and SAPs

Revisions to special management programs and SAPs are intended to facilitate access to healthy stocks of haddock and redfish without undermining efforts to rebuild overfished stocks. By requiring the use of selective fishing gear or allowing access only during particular seasons, these programs attempt to reduce bycatch and associated mortality on stocks of concern such as cod, pollock, and most flatfish. Such efforts attempt to achieve OY for all stocks and minimize the adverse economic impacts on fishing communities, as required by National Standards 1 and 8, benefits that could not be achieved under the no action options for such programs.

14. Recreational Measures

Amendment 16 would allocate portions of the ACLs of GOM cod and GOM haddock to the recreational fishery based upon the proportion of recreational catch between FYs 2001-2006. Both commercial and recreational catch were evaluated using the same time period, a period in which both fisheries were subject to restrictions on the catch of such stocks, to determine the amount of these stocks caught by each fishery. The data used to determine this allocation were peer reviewed by GARM III. Therefore, this measure is consistent with National Standards 2 and 4. To achieve the necessary F reductions for GOM cod, Amendment 16 would extend the existing seasonal GOM cod prohibition for recreational vessels by 2 weeks, to run from November 1 through April 15. This is considered to be the most effective means to reduce F based on previous analysis of possession or size limits, and is necessary to achieve the required reductions in F to end overfishing and rebuild the stock, consistent with National Standard 1. Failure to allocate stocks between these fisheries or implement measures to reduce GOM cod mortality under the no action options for these measures would be inconsistent with the objectives of the FMP and this action, and National Standard 1.

15. Sector Measures

Amendment 16 includes revisions to existing sector measures designed to achieve the conservation and economic objectives of the FMP by increasing the efficiency of vessel operations, reducing discards, and promoting selective fishing practices. By specifying a minimum number of participants required to form a sector, concerns regarding consistency with National Standard 4 and the possibility that one entity may acquire an excessive share of the resource are mitigated. Eligibility of permits in CPH to participate in sectors eliminates an unnecessary administrative barrier to sector participation that can be easily overcome through existing measures. Additional requirements for sector operations plans outline elements considered by the Council to be necessary to implement sector measures effectively. Such elements help identify effort that would be deployed in each sector and how such effort could affect catch in relevant fisheries. Elements such as the weekly sector reports, and dockside and at-sea/electronic monitoring programs, are necessary to collect information regarding the landings and discards of groundfish by all sector vessels to ensure that all catch is accurately accounted for and that cease fishing orders can be implemented and enforced once sector ACEs have been harvested or projected to be harvested. Such reporting requirements are currently under review by OMB for consistency with the PRA. The timing requirements associated with sector operations plans and associated NEPA analyses are necessary for NMFS and the Council to evaluate the impact of sector operations, provide for public review of proposed sector operations, and approve and implement sector operations plans by the start of each FY on May 1, consistent with NEPA and the APA.

Sector allocations of ACE for each stock are based upon the fishing histories of participating vessels during two periods. For all stocks except GB cod, the PSC of each sector vessel would be based upon landings history during FYs 1996-2006. However, for GB cod, the PSC of each vessel that elected to participate in one of the existing sectors would be based upon individual vessel landing histories during FYs 1996-2001, while the GB cod PSC for all other vessels would be based upon the landings histories between FYs 1996-2006. These two allocation windows were intended to preserve the business plans developed by participants in the existing sectors and to maintain the value of investments in permits made by such participants based upon previous Council decisions regarding the allocation of GB cod. In a similar manner, the Council indicated its intent to freeze catch history as of the implementation of Amendment 16 to preserve the allocation decisions made in Amendment 16 and promote economic stability in the fishery by increasing the confidence that allocations are unlikely to change in the future. In doing so, Amendment 16 treats future participants in sectors in the same manner as participants in the existing sectors by indicating its intent to preserve existing allocations in future management actions to offer more stability in the fishery that will enable the development of longer-term business plans. Existing sectors require participants to land at particular ports, thereby preserving local fishing communities and shoreside infrastructure, consistent with Goal 4 of the FMP. In addition, because these sectors represent cohesive groups of smaller vessels fishing with hook and gillnet gear, preserving existing sector allocations promotes the continuation of a diversified fishery in both size and gear type near Chatham, MA, consistent with Objective 7 of the FMP. Revising existing sector allocations by selecting another sector allocation option could reduce fishing opportunities for these sectors and adversely affect associated communities. Therefore, NMFS has determined that sector allocations under Amendment 16 are consistent with the goals and objectives of the FMP, are fair and equitable, and are reasonably calculated to promote conservation consistent with National Standard 4.

The allocation options adopted in Amendment 16 are intended to reflect current participation in the fishery. The 11-yr period for allocation of most stocks is meant to minimize the impact on catch history that result from changes to groundfish regulations during this period. At the time these options were developed, the Council was attempting to implement Amendment 16 by the start of FY 2009 on May 1, 2009, and complete landings data were only available through FY 2006. Therefore, these data represented the best scientific information available at the time they were first developed. Other options considered for sector allocation included either vessel capacity and/or allocated DAS as part of the allocation formula. These factors would have resulted in all vessels being allocated at least some PSC for some or all stocks, even though not all vessels actually fished for and landed groundfish during this period. As a result, such options do not reflect current participation in the fishery and would be inconsistent with the objectives of the FMP and the discretionary provisions of the Magnuson-Stevens Act cited above.

Based upon the proportional allocations of overall stocks of GB cod and GB haddock, sectors would be allocated portions of the Eastern U.S./Canada Area TACs for GB cod and GB haddocks stocks. This measure ensures that access to the Eastern U.S./Canada Area by common pool and sector vessels is not adversely affected by the actions of other sectors or the common pool. This is consistent with Objective 8 of the FMP to insure accountability in achieving fishery management objectives and to distribute fishery access based upon recent participation in the fishery.

Amendment 13 first implemented an allocation cap that prevents sectors from being allocated more than 20 percent of the yearly TAC for a particular stock, due to concerns that one sector could control an excessive share of a particular stock. Acquiring an excessive share of a resource relates to the ability of one entity to exert market control for that resource. Analysis by the PDT during the development of Amendment 16 suggests it is unlikely that any one sector could acquire a sufficient share of a stock to exercise market power over the rest of the fishery. Further, because sector ACEs are temporary in nature and depend upon the collective PSCs of participating vessels, no one sector would be allocated a permanent share of any resource. This further limits the ability of a sector to influence market conditions for a particular stock over the long term. Finally, Amendment 16 would allow sectors to trade ACE for use during that FY. This would minimize the influence of the sector allocations regarding market control, as a sector could acquire ACE from another sector. While ACE trading is optional, and sectors are not required to trade with one another, trading is likely to occur on some level, as sectors would need to rely upon one another to acquire additional ACE for stocks for which their allocations may be insufficient. Therefore, Amendment 16 would eliminate this cap to increase the flexibility and efficiency of sector operations, without allowing one entity to acquire an excessive share of a fishing resource, consistent with National Standard 4.

ACE transfers are considered important to not only increasing the economic efficiency of sector operations, but to decrease incentives to discard fish and, therefore, increase F on individual stocks. Analysis from other similar management regimes in other countries detailed in Section 7.0 of the FEIS suggests that ACE trading after the end of the fishing year, and carry-over provisions included in Amendment 16, should reduce incentives to fish aggressively toward the end of the FY to fully utilize allocations of each stock and, therefore, reduce the likelihood that an overage would occur. Selecting the no action options for these measures would likely increase incentives to discard and misreport, undermining the conservation objectives and increasing management uncertainty in the fishery due to non-compliance with existing provisions, in contrast to the options adopted in Amendment 16.

Several options were considered for sector joint/several liability. Under Amendment 16, sectors and participating vessels would be jointly/severally liable only for violations of ACE overages, discarding of legal-sized fish, and misreporting of catch. This measure would reduce concerns that sector vessels would be held liable for any violation by any other sector member. In doing so, this measure is likely to increase participation in sectors, which is likely to result in benefits to both the environment and fishery participants, as discussed throughout this ROD and the FEIS. The no action option would retain the existing language regarding joint/several liability, leaving open the possibility that sector vessels could be held liable for any violation of any sector rule or other Federal regulation and, thus, depress participation in sectors, in conflict with the objectives of this action.

Under the sector approval process first implemented in Amendment 13, sectors are required to request and analyze exemptions to existing regulations as part of yearly review and approval process of sector operations plans by NMFS. To reduce the costs and burden associated with such analysis, Amendment 16 classifies several measures as universal sector exemptions that would not require any additional analysis by sector proponents. Instead, the analyses for these exemptions are included in Section 7.0 of the Amendment 16 FEIS. Because F for sector operations is limited by the amount of ACE allocated to the sector for each stock, such exemptions would not compromise the conservation objectives of this action, but would serve to increase the economic efficiency of sectors by reducing operational costs and allowing sector vessels to operate in a more profitable manner. Further, these exemptions would also encourage the use of selective gear and, thus, reduce discards and associated mortality. Finally, the public has the opportunity to comment on these universal exemptions through the notice of availability of Amendment 16 and its FEIS, as well as through the proposed rule for this action. Therefore, NMFS has determined that this measure is consistent with the objectives of this action and applicable law. Failure to implement universal sector exemptions under the no action option for this measure would fail to reduce costs and burdens to sectors and would not be consistent with the objectives of this action.

Amendment 16 would authorize the creation of 17 new and 2 revised sectors. This expansion of sector management would create a dual management system where vessels could elect to fish under sectors and be subject to hard TACs for most groundfish stocks, or fish under the existing DAS effort controls of the common pool. The approval of additional sectors offers more opportunities for vessels to work cooperatively with other like-minded vessels to more effectively manage allocated stocks. As stated above, this should increase the economic efficiency of participating vessels by reducing operational costs and increasing catch per unit effort due to exemptions from existing effort controls such as trip limits, area closures, and gear restrictions, while restricting F to that associated with ACE allocated to each sector. The no action option would fail to achieve these benefits and would be inconsistent with the objectives of this action. As a result, NMFS has determined that authorization of additional sectors is consistent with the goals and objectives of this action and the FMP, and with the Magnuson-Stevens Act and other applicable law.

For a description of the approved action, see Section 4 of the FEIS. For a full analysis of the measures adopted by the Council in this action, see the corresponding sections in Section 7 of the FEIS.

Mitigation

CEQ NEPA regulations require that agencies identify in the ROD whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why. The regulations further state that a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation. Mitigation measures are the practical means to avoid, minimize and reduce impacts, and compensate for unavoidable impacts.

No significant environmental harm relative to the status quo is expected to result from the implementation of Amendment 16. Therefore, specific management measures to mitigate environmental impacts are not necessary. NMFS worked closely with NMFS Office of Law Enforcement (OLE) to ensure that enforcement considerations were incorporated throughout the development of management measures in the Council process. In addition, the U.S. Coast Guard (USCG) sits on the Council and provides similar input during Council deliberations. Once final measures are adopted by the Council, NMFS continues to seek OLE input to ensure that measures can be enforced, as implemented. Further, NMFS conducts outreach sessions with Federal and state enforcement personnel, including our state partners through Joint Enforcement Agreements (JEA) and the USCG, to ensure that enforcement agents understand proposed measures and what will be necessary to enforce them. Quarterly meetings between NMFS's Northeast Region Sustainable Fisheries Division, NMFS OLE, and the USCG continue this dialogue and help identify enforcement priorities and concerns. Once implemented, NMFS OLE, JEA partners, and USCG work together to monitor the fishery for compliance with measures adopted in recent actions through at-sea boardings, dockside intercepts, examination of catch records, VMS data for area violations, and other available information, as necessary.

Response to Comments

NMFS issued the notice of availability for the FEIS on October 30, 2009 (74 FR 46218), with a 30-day comment period through November 29, 2009. NMFS received 1,192 letters from commenters on the FEIS via letter, fax, and email. Of these, 1,169 were of one type of form letter commenting on the FEIS via email. Many of the comments received on the FEIS reflected comments submitted to the Council during the development of Amendment 16 at Council and Groundfish Oversight Committee meetings, public hearings during the DEIS comment period, and formal comments submitted during the notice of availability for the DEIS (these comments are summarized and responded to in Appendices V and VI of the FEIS and incorporated herein). Two comments by representatives of the Mashpee Wampanoag tribe stated that tribal input was not solicited during the development of Amendment 16, and requested more direct involvement in future management actions. In addition, a number of comments recommended adopting measures that were not included in Amendment 16. As a general matter, NMFS responds that the Magnuson-Stevens Act restricts its discretion by only allowing it to approve, disapprove, or partially approve measures. NMFS cannot unilaterally add substantive measures to Amendment 16. The following is a summary of comments relevant to Amendment 16 submitted during the FEIS comment period, followed by NMFS's responses:

Comment 1: As part of a mass mailing campaign by an environmental group (PEW), 1,169 comment letters supported efforts in Amendment 16 to end and prevent overfishing and rebuild overfished stocks by implementing science-based ACLs and promoting sectors. Two other comments as a result of this mass mailing letter also suggested that effective enforcement is critical to the success of this action.

Response: The goals of the FMP and Amendment 16 are to end and prevent overfishing and to rebuild overfished stocks, as mandated by the Magnuson-Stevens Act. While there are many ways to accomplish these goals, the Council chose to further develop sectors, while maintaining the existing DAS management regime as a means to transition to the long-term goal of implementing an output-based system that the Council intends to further develop in Amendment 17 to the FMP. Amendment 16 establishes a process to specify ACLs, but the quantitative ACLs for 2010 through 2012 were developed in Framework Adjustment 44 to the FMP and, if approved, are scheduled to become effective on May 1, 2010. This latter action utilizes the best scientific information available from the GARM III, Transboundary Resource Assessment Committee, and other sources to establish science-based ACLs for FYs 2010-2012. NMFS OLE and the USCG have been directly involved throughout the development of Amendment 16, offering input to enhance the ability of enforcement agents and boarding officers to enforce Amendment 16 measures. Coordination of enforcement efforts and outreach with state JEA partners will further enhance the capacity to effectively enforce these measures.

Comment 2: The 1,169 letters associated with the PEW mass mailing campaign urged the implementation of comprehensive monitoring and reporting systems across all fishery participants. Two other environmental groups, The Nature Conservancy (TNC) and Conservation Law Foundation (CLF), the two existing sectors, one industry organization (Cape Cod Commercial Hook Fisherman's Association (CCCHFA)), and one commercial fisherman also indicated that comprehensive at-sea and dockside monitoring programs are important to the success of this action. Another environmental group (Oceana) that Amendment 16 did not specify the monitoring standards and specific data collection and reporting requirements.

Response: Amendment 16 and the associated proposed rule greatly expand upon the existing monitoring and reporting systems and should provide sufficient and timely data that are to effectively monitor catch of groundfish, as detailed throughout Section 4.0 of the FEIS. In addition, NMFS has hosted a series of catch monitoring administration and implementation workshops since the Council's adoption of Amendment 16 to work with industry to better develop and communicate the monitoring standards and data collection and reporting requirements necessary to effectively administer Amendment 16. NMFS agrees that comprehensive monitoring programs are critical to the success of Amendment 16. Accordingly, Amendment 16 requires sectors to develop dockside monitoring programs as part of their yearly operations plans beginning in 2010 and at-sea monitoring programs beginning in 2012. Fifty percent of trips landed by sector vessels are required to be observed by dockside monitors during FY 2010, with 20 percent of trips monitored thereafter. The level of at-sea monitoring would be determined by NMFS on a yearly basis after considering the number of vessels and types of gear participating in each sector in a manner consistent with the standardized bycatch reporting methodology (SBRM) established by the Council in 2008. This level of coverage must be sufficient to at least meet the level of precision outlined in the SBRM. For FY 2010, NMFS has made available sufficient funding to provide approximately 38-percent at-sea monitoring coverage for sector trips and 30-percent coverage for common pool trips. Beginning in FY 2012 with the transition to hard-TAC AMs, common pool vessels would be subject to 20-percent dockside monitoring for all groundfish trips.

Comment 3: Several commenters, including Oceana, CLF, PEW, CCCHFA, the Island Institute (a community-based organization), the Midcoast Fisherman's Association (an industry group), the Port Clyde Sector and the two existing sectors, the North Atlantic Marine Alliance (NAMA) (an environmental group), and one commercial fisherman suggested that observer coverage should be 100 percent for all groundfish vessels. If there is insufficient Federal funding to provide such coverage, funds should be shifted from supporting dockside monitoring coverage to providing observer coverage. Most of these commenters recommended that such coverage should be maintained for at least the first 2 years of Amendment 16 implementation to provide baseline data on discard rates and sector performance. Oceana further claimed that Amendment 16 does not specify the precise level of observer coverage in the FMP, as alleged in a lawsuit brought against NMFS based on the approval of Amendment 13 to the FMP.

Response: When the Council adopted Amendment 16, the Council neither selected the option to require 100-percent observer coverage, nor required sectors or the common pool to be subject to an at-sea monitoring program in 2010. However, NMFS agrees with the basic concept advocated by the commenters that higher levels of observer coverage are more effective at collecting the data necessary to monitor groundfish landings and discards under Amendment 16. As stated in the response to comment 2, NMFS has funding to provide approximately 38-percent at-sea monitoring coverage for sector vessels, and about 30-percent at-sea monitoring coverage for common pool vessels, in addition to fully funding 50-percent dockside monitoring coverage. Such coverage levels should provide sufficient information to more than meet the minimum requirements of the SBRM, while providing the additional coverage suggested by commenters to monitor sector operations under Amendment 16. Distribution of such funds was intended to accomplish the dual goals of monitoring both at-sea catch and dockside landings to ensure that discards are accurately estimated and landings data are validated. Shifting resources to emphasize one over the other would not be consistent with the objectives of this action. Additional coverage would provide more data on groundfish catch, but even if available funds were shifted to emphasize at-sea monitoring over dockside monitoring, there may not be sufficient funding to provide 100-percent observer coverage across the entire fishery. Further, there is no guarantee that such funding will be available for future years. Requiring 100-percent coverage would, therefore, require the fishing industry to bear such costs, absent additional funding for NMFS to pay for such coverage. Finally, the Court's findings in the Amendment 13 lawsuit required that FMPs establish SBRM's, but does not mandate the inclusion of specified levels of observer coverage. As referenced in the response to Comment 3, because Amendment 16 is in compliance with the omnibus amendment which implemented SBRMs for all FMPs managed in the NE in January 2008, Amendment 16 is not at odds with the Court's findings in the lawsuit referred to by the commenters.

Comment 4: Three commenters associated with the CCCHFA and existing sectors opposed the use of assumed discard rates under Amendment 16, advocating the use of actual discard data derived from observer data whenever possible, including species-specific discard mortality data. These commenters also supported the use of electronic vessel trip reports (VTRs).

Response: NMFS agrees that actual observer data are likely more accurate than the assumed discard rates proposed in Amendment 16. Amendment 16 would apply discard rates derived from observer data for observed trips, and would extrapolate observer-derived discard rates to unobserved trips once sufficient data are available to do so. However, until there are sufficient observer data to develop sector-specific observed discard rates for particular gear/species combinations identified in Section 4.2 of the FEIS, NMFS must apply an assumed discard rate to all landings to ensure that catch, including both landings and discards, can be accurately monitored in the fishery. Species-specific discard mortality rates are already incorporated into each updated stock assessment based upon observer data. Current regulations allow the RA to authorize the use of electronic VTRs instead of the conventional paper VTRs. To date, the RA has not authorized the use of such electronic VTRs, as the existing technology has not been determined to be adequate. Should efforts to develop and test new electronic VTR systems that meet the goals of the FMP and the existing regulations be determined to be successful, the RA can authorize the use of such systems.

Comment 5: The CCCHFA and the existing sectors supported the broad stock area requirements in Amendment 16, but suggested that such areas should be smaller to reflect different fishing areas, and that vessels should not be allowed to fish in multiple areas without 100-percent observer coverage. These commenters also cautioned about the adequacy of using self-reported data.

Response: The broad stock areas in Amendment 16 are aggregations of statistical areas that reflect the existing regulated mesh areas and stock boundaries to the extent possible. These areas were intended to be defined as large as possible to accommodate stock boundaries without overly complicating administration of the proposed reporting requirements. These broad stock areas would be used only for attributing species caught to the proper stock area. Nothing in Amendment 16 would restrict a vessel from fishing in more than one broad stock area, and the Council did not adopt the restriction that vessels fishing in multiple areas must have an observer on board. Specifying smaller stock areas would not affect vessel operations, but would complicate the proposed reporting requirements. The Council did consider restricting vessels to fish in only one broad stock area per trip to simplify administration, but concluded that such an approach would be overly restrictive on vessel flexibility and efficiency of vessel operations. Various sources of data are used to validate one another, including self-reported catch data. Accordingly, VMS positional data would be used to validate self-reported catch data by stock area to increase the accuracy of monitoring data and enforce the proposed Amendment 16 measures.

Comment 6: The 1,169 letters associated with the PEW mass mailing campaign recommended that Amendment 16 implement strong AMs that end fishing once limits are reached across all fishery participants. The CCCHFA and another individual also supported the implementation of hard quotas and fishery closures for all components of the fishery. Several commenters, including Oceana, CLF, PEW, and the CCCHFA, suggested that similar AMs across the entire fishery are necessary to comply with National Standard 4 and that different AMs for sectors and the common pool are unfair and inequitable, because not every segment of the fishery is subject to hard TAC backstops, and common pool vessels are not limited in the amount of fish they can catch.

Response: Neither the Magnuson-Stevens Act, nor the National Standard 1 Guidelines mandate the use of fishery closures as AMs. As outlined in the National Standard 1 Guidelines, reactionary AMs are just as valid as inseason AMs. Amendment 16 would use a combination of accepted approaches to implement AMs beginning in 2010, shifting to area closures for the entire directed groundfish fishery by 2012 to transition from a full effort-controlled fishery to one managed by hard TACs and fishery closures. Although fishery closures would not be triggered upon the catch of common pool ACLs during FYs 2010 and 2011, management measures would be revised through the implementation of differential DAS counting if these ACLs are exceeded to prevent overfishing and exceeding such ACLs in the future – the purpose of the new requirements of the Magnuson-Stevens Act. Further, if measures adopted under Framework Adjustment 44 are approved, the RA would have the authority to revise common pool trip limits and DAS charging rates inseason to offer further assurance that common pool catch rates would be restricted and would not exceed ACLs for all stocks. NMFS disagrees that all segments of the fishery must be subject to the same measures to be fair and equitable. The AMs in Amendment 16 reflect a balancing of different factors regarding the multiple types of management measures to be implemented, are reasonably calculated to promote conservation, and would not allocate fishing privileges among fishery participants, or discriminate between residents of different states. All AMs proposed in Amendment 16 would apply to all vessels in all states, even though the AMs applicable to individual vessels may be different. Each vessel owner has the choice to fish under hard TACs and fishery closure AMs in sectors, or fish under the current DAS system and its associated differential DAS counting AM. Thus, all vessel owners would be treated equally based upon their choice of the preferred management system. Under Amendment 16, common pool vessels would be subject to hard-TAC management and restricted in the amount of fish that they could catch in the form of ACLs for each stock beginning in FY 2012.

Comment 7: NAMA supported the participation of community fishing associations in permit banks, recommending that such associations be formally recognized in Amendment 16. This group stated that these associations are necessary to help ensure that sectors do not lead to the elimination of community-based fisheries, consistent with, and furthering the purposes of, the Magnuson-Stevens Act.

Response: As the group pointed out in their comment, the current regulations do not prohibit community fishing associations from forming or participating in the current DAS Leasing/Transfer Programs or in an approved sector. NMFS agrees that such organizations are consistent with the Magnuson-Stevens Act, but notes that formally recognizing such associations in Amendment 16 or any other action would not affect their ability to participate in the fishery or achieve their goals. Such organizations were not formally recognized by the Council in Amendment 16. Because NMFS can only approve/disapprove measures adopted by the Council in Amendment 16, NMFS cannot unilaterally recognize such organizations through this action.

Comment 8: Two environmental groups (Oceana and CLF) suggested that the ABC control rule in Amendment 16 is not lawful, in that the FEIS does not consider a reasonable range of alternatives for this measure, and does not rigorously explore and objectively evaluate the alternatives considered. CLF specifically suggested that Amendment 16 should specify the scientific basis for the SSC's recommendation. These groups indicated that the Amendment 16 ABC control rule should specify a probability that an actual catch equal to the ABC for each stock would result in overfishing, consider whether F should be reduced as stock size declines, identify a stock biomass level below which no fishing should occur, and incorporate uncertainty associated with stock assessments.

Response: NMFS does not agree that the ABC control rule is unlawful. Given that the FEIS considered the revised ABC control rule and the existing MSY control rule (i.e., the no action alternative), Amendment 16 did consider a reasonable range of alternatives under NEPA. Initially, Amendment 16 was going to rely upon the existing MSY control rule to specify ABCs as part of the process to establish ACLs for all stocks. As a result, the DEIS did not anticipate specifying an ABC control rule as a separate measure. However, as highlighted in Section 4.1.2 of the FEIS, the National Standard 1 Guidelines were published just before the Council adopted the DEIS. These guidelines emphasize that FMPs should establish specific ABC control rules. Further, in May 2009, the SSC recommended an alternative ABC control rule to be used in the absence of a quantitative approach that would allow for a more explicit determination of scientific uncertainty for specific stocks. The SSC made its recommendation after evaluating analysis prepared by the Groundfish PDT regarding the efficacy of the existing MSY control rule in preventing overfishing when used to specify ABCs for previous FYs. The SSC concluded that there was insufficient information currently available to quantify scientific uncertainty for each groundfish stock and that the MSY control rule would not have ended overfishing for several stocks if it had been used to set ACLs for previous FYs. Based upon the SSC's advice and the National Standard 1 Guidelines, the Council adopted the SSC's recommendations as the ABC control rule in Amendment 16 in June 2009. Even though the PDT analysis is not formally incorporated into the Amendment 16 FEIS, this analysis is part of the administrative record for this action and contributed to the decisions made by the Council when adopting Amendment 16. Further, Section 7.2.1.1.2 of the FEIS provides a qualitative assessment of the impacts of the ABC control rule on overfishing. As proposed, the ABC control rule would specify the ABC of a particular stock at the median catch associated with 75 percent F_{MSY} or $F_{rebuild}$, whichever is lower. This approach relies upon the most recent assessment, an effort that was subject to substantive peer-review, and is the subject of other peer-reviewed research, as detailed in Section 7.2.1.1.2 of the FEIS. Because the ABC for most stocks is set at the median catch associated with a level of F that is already below the level associated with overfishing (i.e., at 75 percent of F_{MSY}), the ABC control rule would always result in ABCs with at least a 50-percent probability of avoiding overfishing. Thus, the ABC control rule would specify a level of catch such that the resulting F will always be less than the maximum F threshold when the stock is less than the biomass at MSY or its proxy, especially when additional information is not available to more accurately estimate uncertainty. This provides a measure of caution even before the ACL is determined, after the consideration of management uncertainty. Since ACLs cannot exceed the ABC, the risk that overfishing will occur is even further reduced. Although the Amendment 16 FEIS does not include a systematic evaluation of the probability that the proposed ABC control rule will result in overfishing for each stock, such a precise analysis is not necessary for the ABC control rule, as it is an administrative measure. Instead, it is more appropriate to evaluate whether the actual catch amounts that result from the application of that ABC control rule would have at least a 50-percent probability of avoiding overfishing, or whether there is sufficient information to more accurately estimate scientific uncertainty for a particular stock using another method. Therefore, because Framework Adjustment 44 is the Council action that would actually apply the ABC control rule included in Amendment 16, the analysis of the scientific uncertainty associated with the ABC control rule is included in the environmental assessment (EA) supporting that action. In general, if stock size declines below the biomass threshold, a rebuilding plan must be developed that would reduce F to ensure the stock rebuilds within a specified period of time. Even stocks that are not overfished and not subject to overfishing may experience declines in stock size, but that would not necessarily require reductions in F. Analysis included in the EA prepared for Framework Adjustment 44 indicates that although probabilities that overfishing would occur cannot be determined for all stocks, the FY 2010-2012 ABCs that result from the application of the control rule proposed in Amendment 16 would have between a zero and 20-percent chance of resulting in overfishing for stocks for which such a probability can be calculated. Thus, the application of the Amendment 16 ABC control rule has less than a 50-percent chance of resulting in overfishing, and is consistent with applicable court rulings. Therefore, NMFS disagrees that fishing mortality must be decreased, unless doing so is necessary to rebuild an overfished stock. Finally, as specified in the response to comments in the final rule promulgating National Standard 1 Guidelines (74 FR 3190, January 16, 2009), NMFS does not agree that the ABC control rule must stipulate a level of biomass below which fishing is prohibited. Although ABC control rules could specify such a threshold, failure of this ABC control rule to specify such a threshold does not mean that the ABC control rule is inconsistent with National Standard 1.

Comment 9: Oceana claimed that Amendment 16 delays implementation of yellowtail flounder AMs until 2011 and fails to analyze the impacts of yellowtail flounder allocation to the Atlantic sea scallop fishery consistent with National Standards 4 and 9 of the Magnuson-Stevens Act.

Response: Amendment 16 would establish AMs for all stocks of yellowtail flounder in 2010. However, the groundfish fishery would be responsible for any overages by the scallop fishery until appropriate AMs for the scallop fishery are implemented via Amendment 15 to the Atlantic Sea Scallop FMP in 2011. Amendment 16 would establish the process for distributing ACLs for all groundfish stocks among the various segments of the fishery that catch groundfish, but would not allocate any specific amount of any stock to any fishery. Instead, such allocations are a part of Framework Adjustment 44 to the FMP. The EA for that action, not Amendment 16's FEIS, includes the analysis of impacts of the ACL distributions to various fisheries. Therefore, this comment is relevant to that action, not Amendment 16. The Amendment 16 FEIS does consider the relevant impacts associated with the process to establish and distribute the ACL among various fisheries that catch groundfish to the extent that it can, with Sections 7.2.1.2.1 and 7.5.1.2.1 including a qualitative description of the biological and economic impacts of this measure, respectively.

Comment 10: Oceana suggested that Amendment 16 exempts components of the total catch from the ACL, stating that Amendment 16 fails to specify ACLs and AMs for stocks that are prohibited from being landed. Further, Oceana claims that Amendment 16 does not evaluate reasonable alternatives for these stocks, and does not identify the rationale or provide analysis for treating catch by other fisheries as other non-specified components of the ACL. CLF agreed, stating that an absence of AMs for these fisheries reduces incentives for them to reduce bycatch.

Response: All catch of groundfish stocks, including both landings and discards by all vessels, count toward the total ACL for each stock. The rationale for the distribution of ACL among the various fisheries that catch groundfish is detailed in Section 4.2.1.3 of the FEIS. As stated in this section, for segments of the fishery that are not subject to AMs such as state waters fisheries, exempted fisheries, and the scallop fishery, excessive catch of groundfish by these components would be accounted for by controls on the directed groundfish fishery, including the AMs described above, to ensure that overfishing of groundfish stocks does not occur. In doing so, all groundfish catch is accounted for under the ACLs developed pursuant to the process in

Amendment 16. It is possible that the absence of AMs for fisheries outside the control of the NE Multispecies FMP may reduce incentives for such fisheries to reduce bycatch. However, alternatives to implement AMs in those fisheries could not be considered in Amendment 16. Neither the Council, nor NMFS has authority over state-waters fisheries and cannot impose regulations or incentives for those fisheries to reduce bycatch. For these fisheries, participation on the Council by the leaders of state marine resource agencies increases the likelihood that state groundfish regulations will continue to reflect Federal regulations and constrain catch to existing levels. For fisheries subject to Council jurisdiction, the Magnuson-Stevens Act requires reduction of bycatch to the extent practicable, under National Standard 8. Similar to yellowtail flounder AMs in the scallop fishery, AMs can be developed within those other FMPs to minimize the bycatch of groundfish. Although ACLs are specified for all stocks, several stocks (SNE/MA winter flounder, ocean pout, windowpane flounder, and wolffish) are not specifically allocated to sectors because these stocks are likely to have small ACLs and vessels have very limited landing history for these predominantly non-targeted stocks. Because there would not be a formal allocation of these stocks to sectors, Amendment 16 did not establish specific sector AMs. In addition, ocean pout, windowpane flounder, and Atlantic halibut would not be subject to the common pool hard-TAC AM beginning in 2012, although these stocks would be subject to the differential DAS counting AM during FYs 2010-2011. This approach is intended to maintain vessel access to all stock areas, as allocating such small bycatch TACs to sectors and incorporating such stocks under the hard-TAC AM would likely result in unnecessarily closing large areas and substantial adverse economic impacts to vessels and associated fishing communities due to excessive catch of these stocks. Although these stocks would not be subject to stock-specific AMs upon the implementation of Amendment 16, it is likely that other measures in Amendment 16 are sufficient to prevent overfishing. Such measures include AMs specified for other stocks that overlap with the distribution of these stocks, restrictive management measures such as DAS reductions and RGAs where only selective gear that avoids catch of particular stocks can be used, further revisions to the FMP as part of the biennial adjustment process, RA authority to approve/disapprove sectors on a yearly basis due to excessive bycatch of these stocks, and inseason adjustments to management measures for common pool vessels to slow or eliminate bycatch of these stocks in particular areas, as proposed in Framework Adjustment 44 (to be implemented at the same time as Amendment 16). Because Amendment 16 includes AMs and other measures for all stocks that should prevent overfishing from occurring on any one stock, NMFS has determined that the lack of specific AMs for these few stocks is not inconsistent with the National Standard 1 Guidelines and rebuilding and overfishing objectives of Amendment 16. Because the Secretary is restricted by the Magnuson-Stevens Act to only approve, disapprove, or partially approve an amendment to an FMP, NMFS cannot insert AMs for these stocks into Amendment 16, and cannot conceptually disapprove the lack of appropriate AMs. It would be non-sensible and be contrary to the requirement of the Magnuson-Stevens Act to immediately end overfishing and rebuild overfished stocks for the Secretary to disapprove the entire amendment or send the amendment back to the Council to address possible shortcomings for a few stocks. Moreover, it is not practicable or even possible that an emergency action could be developed in time to address these shortcomings and implement the full suite of measures included in Amendment 16 before the start of FY 2010 on May 1, 2010. Instead, NMFS intends to inform the Council of the need to revisit the lack of specific AMs for these few stocks. The biological impacts of distributing the ACL among such fisheries are described in Section 7.2.1.2.1 of the FEIS.

Comment 11: An individual fisherman indicated that the ACEs derived from the ACL process adopted in Amendment 16 are insufficient to maintain a viable fishery and do not reflect recent catches. This individual also noted that the 2010 ACEs do not include quota set aside for research. Three other commenters, including CLF, the existing sectors, and the CCCHFA, support the overall ACL process established in Amendment 16.

Response: The ACE for each stock that results from the ACL process included in Amendment 16 was developed and analyzed by the Council under Framework 44 to the FMP and, therefore, not technically part of this action. As detailed in that action and its associated EA, the ACEs that result are based upon the best scientific information available and reflect the ABC recommended by the SSC and the ACLs adopted by the Council. It is true that ACLs specified for fishery at large and the resulting ACEs to individual sectors are not likely to be similar to recent catches, because F for many stocks must be reduced during FY 2010, and the ABCs/ACLs specified must incorporate consideration of both scientific and management uncertainty, as required by the Magnuson-Stevens Act. NMFS believes that the ACL process in Amendment 16 is necessary and consistent with the requirements of the Magnuson-Stevens Act. The Council considered a research set-aside quota for groundfish, but ultimately chose not to include that measure in Amendment 16.

Comment 12: Oceana stated that Amendment 16 is unlawful because the FEIS does not identify target stocks or stocks in the fishery, discuss catch and discards of such stocks, or fully analyze the impacts of proposed measures on stocks in the fishery.

Response: Amendment 16 specifies the stocks in the fishery in Section 6.1.7. These stocks reflect the stocks already managed by the fishery, as revised since the FMP was first developed. According to the National Standard 1 Guidelines (74 FR 3204, January 16, 2009), all stocks listed in a FMP are considered to be in the fishery, unless otherwise specified as ecosystem component species. Therefore, Amendment 16 is fully consistent with the National Standard 1 Guidelines. Moreover, a full description of the catch and discards of groundfish stocks is included in Section 6.0 of the FEIS, with analysis of the impacts of proposed measures on groundfish stocks and other species detailed in Section 7.0 of the FEIS. Therefore, NMFS disagrees that Amendment 16 is unlawful as claimed by the commenter.

Comment 13: CLF and CCCHFA suggested that small gillnet boats are disproportionately burdened by the 24-hr DAS counting measure for the common pool. They also indicate that this measure would cause safety concerns, which would make this measures inconsistent with National Standard 10.

Response: The Amendment 16 analysis indicates that small gillnet vessels would be more affected by 24-hr DAS counting than larger vessels and vessels using other gear types. Despite the disparate impacts between vessels of different sizes and gear types, all vessels would be subject to the same effort controls, and this measure would not discriminate between permit holders from different states. The 24-hr DAS counting measure more accurately reflects the manner in which DAS allocations were first calculated in the FMP, and is designed to end overfishing and rebuild overfished stocks consistent with the conservation objectives of the FMP and the requirements of the Magnuson-Stevens Act. Based upon this, NMFS has determined that this measure is consistent with National Standard 4. During previous actions, safety concerns were raised regarding differential DAS areas because vessels could be encouraged to fish farther from shore. There is no evidence to support or refute claims that changes in DAS counting rates affect fishing behavior related to safety concerns, and there is no evidence that the measures adopted in this action would compromise safety any more than previous management measures, as described in Section 7.6 of the FEIS. Examination of historical fishing patterns in the Day gillnet fleet suggest that, despite being charged more DAS than fished, many vessels elect to return to port early, even though they are charged for more DAS to reduce operational costs, suggesting that it is not likely that the 24-hr DAS counting measure would compromise vessel safety. Moreover, there is nothing in this measure that requires a vessel to operate in an unsafe manner to catch or harvest fish. Therefore, NMFS concludes that this measure is consistent with National Standard 10.

Comment 14: One industry organization (the New Hampshire Commercial Fisherman's Association (NHCFA)) stated that Amendment 16 does not adequately describe the economic impacts of proposed measures.

Response: NMFS disagrees. The expected economic impacts of proposed measures are detailed in Section 7.5 of the FEIS. While this analysis notes that there is a great deal of uncertainty regarding the economic impacts of proposed measures, more precise estimates of likely impacts are not possible, given the fact that sector rosters continue to change, and that the ABCs/ACLs for 2010 and beyond in Framework Adjustment 44 were not adopted by the Council until months after final measures in Amendment 16 were adopted in June 2009. A more accurate description of the expected economic impacts for FY 2010 is included in the analysis of Framework Adjustment 44 based upon updated sector rosters and the ABCs/ACLs adopted by the Council.

Comment 15: Ten commenters supported the development of sectors and their implementation in 2010, including 1,169 letters associated with the PEW mass mailing campaign. NAMA recommended that the Council encourage future sectors to form based on the concept of area management. However, two commenters, including one commercial fisherman and the NHCFA, suggested that development of sector measures in Amendment 16 was rushed, and that sector implementation should be delayed.

Response: Sectors may form for any number of reasons and may adopt area-specific management measures if they so choose. In fact, the existing sectors were originally restricted to fishing in specific areas surrounding the communities in which they were based. The Council did not mandate similar area-based restrictions in Amendment 16 to provide the maximum flexibility for the formation of sectors. Sector measures have been under development as part of Amendment 16 for over 3 years. Sector measures were the subject of extensive debate during this time, including numerous meetings open to the public. Therefore, NMFS disagrees that the implementation of sectors has been rushed and should be delayed. In fact, the Council was originally scheduled to implement Amendment 16 at the start of FY 2009 on May 1, 2009, but delayed the action to further develop Amendment 16, including its sector measures. Therefore, further delay of sector implementation is not warranted to further develop sector provisions.

Comment 16: CLF and the two existing sectors recommended that sectors should be categorically excluded from future NEPA analysis based upon the analysis already contained in the Amendment 16 FEIS, and that NMFS should prepare the appropriate analysis of environmental impacts with the assistance of individual sectors.

Response: The analysis of sector formation in the Amendment 16 FEIS was never intended to address the particular operations of individual sectors, but rather to evaluate the overall impacts of the formation of sectors and their compliance with other sector-specific measures proposed in this action. Another, more detailed analysis of the specific impacts associated with the intended operations plans and rosters of participating vessels for each FY is required to allow the Council, NMFS, and the public to evaluate the expected impacts of these sectors and to comply with NEPA. Information on the vessels participating in each sector or the intended operations was not available at the time the Amendment 16 FEIS was being prepared and finalized. Therefore, a supplemental analysis is necessary to fully comply with NEPA. To assist new sectors in developing such analysis, NMFS hired contractors to work directly with NMFS and individual sectors to prepare EAs for sector operations in FY 2010. In addition, NMFS worked very closely with sector proponents to ensure that such documents complied with the NEPA and other applicable law. NMFS will continue to offer support in the future, although funding to draft future EAs may not be available. Upon the completion of this initial analysis of sector operations, if sector participants and operations in future years are similar to those incorporated in the original analysis, more abbreviated NEPA compliance may be possible in future FYs.

Comment 17: Four commercial fishermen, along with the two existing sectors and the CCCHFA, supported the sector allocation measures in Amendment 16, including using landings history for all stocks except GB cod between FYs 1996 – 2006 and landings history between FY 1996 – 2001 for existing sectors. One of these fisherman, the existing sectors, and CCCHFA supported sector-specific allocations for stocks managed by the Understanding. Two of these fishermen and the existing sectors opposed incorporating capacity into the sector allocation decisions, stating that it would redistribute allocation from those vessels that caught the fish to those who were less active in the fishery.

Response: The allocation options adopted under Amendment 16 are intended to reflect recent participation in the fishery in the form of recent landings of groundfish. The 11-yr period for allocation of most stocks is meant to minimize the impact on catch history that results from changes to groundfish regulations, such as trip limits and area closures during this period. Based upon the proportional allocations of overall stocks of GB cod and GB haddock, sectors would also be allocated portions of the Eastern U.S./Canada Area TACs for GB cod and GB haddock stocks. This measure ensures that access to the Eastern U.S./Canada Area by common pool and sector vessels is not adversely affected by the actions of other sectors or the common pool. This is consistent with Objective 8 of the FMP to insure accountability in achieving fishery management objectives, and to distribute fishery access based upon recent participation in the fishery. Other options considered for sector allocation included either vessel capacity and/or allocated DAS as part of the allocation formula. These factors would have resulted in all vessels being allocated at least some PSC for some or all stocks, even though not all vessels actually fished for and landed groundfish during this period. As a result, such options do not reflect current participation in the fishery and would be inconsistent with the objectives of the FMP and the discretionary provisions of the Magnuson-Stevens Act relied upon to develop measures in Amendment 16.

Comment 18: One other commercial fisherman and NHCFA suggested that sector allocation measures were inconsistent with National Standards 4 and 8 because such measures were based upon fishing history that advantaged one group over another and would jeopardize the continued participation of traditional fishing communities. Five commenters, including TNC, CLF, the Island Institute, the Midcoast Fisherman's Association, and the Port Clyde Sector supported the Amendment 16 commitment to freeze catch history upon implementation of this action.

Response: Under Amendment 16, all vessels would be subject to the same sector allocation measures (i.e., PSC calculations) for all stocks with the exception of GB cod. For that stock, a different allocation window was adopted to preserve the business plans developed by participants in those existing sectors and to maintain the value of investments in permits made by such participants by maintaining Council decisions regarding the allocation of GB cod from previous management actions. In a similar manner, the Council indicated its intent to freeze catch history for newly formed sectors as of the implementation of Amendment 16 to preserve the allocation decisions made in Amendment 16 and promote economic stability in the fishery by increasing the confidence that allocations are unlikely to change in the future. In doing so, Amendment 16 treats current participants in sectors in the same manner as participants in the existing sectors regarding allocation decisions. Existing sectors require participants to land at particular ports, thereby preserving local fishing communities and shoreside infrastructure, consistent with Goal 4 of the FMP. In addition, because these sectors represent cohesive groups of smaller vessels fishing with hook and gillnet gear, preserving existing sector allocations promotes the continuation of a diversified fishery in both size and gear type near Chatham, MA, consistent with Objective 7 of the FMP. Revising existing sector allocations by not treating GB cod sector allocations differently than other stocks could reduce fishing opportunities for these sectors, increasing costs and economic impacts to such sectors, and adversely affect associated communities. Therefore, the decisions made under Amendment 16 are justified based upon furthering the goals and objectives of the FMP, providing for the sustained participation of fishing communities, and minimizing the economic impacts on such communities consistent with National Standard 4 and 8 Guidelines. Finally, sector allocations would be calculated in such a manner that only 100 percent of the GB cod ACL would be allocated in any FY, thereby ensuring that sector measures achieve the conservation measures of the FMP. Based on the above, NMFS has determined that sector allocations under Amendment 16 are consistent with the goals and objectives of the FMP and the Magnuson-Stevens Act, including National Standards 4 and 8.

Comment 19: NHCFA claimed that sectors are analogous to an IFQ program and require a referendum under the Magnuson-Stevens Act. Therefore, this group claimed that Amendment 16 is in violation of the Magnuson-Stevens Act because it failed to develop a referendum to implement sectors. This group also opposed the need to comply with sector deadlines prior to the implementation of Amendment 16 in May 2010.

Response: The Magnuson-Stevens Act explicitly states that a sector allocation is not an IFQ for the purposes of the referendum requirement. Moreover, NMFS has determined that the sector program, as currently implemented in the FMP and revised in Amendment 16, is not an IFQ program and, therefore, is not subject to a referendum under the Magnuson-Stevens Act. The sector-related deadlines in Amendment 16 and communicated to the public since the Council adoption of Amendment 16 are necessary to ensure that sector measures can be implemented by the start of the 2010 FY on May 1, 2010. While these deadlines are not mandatory, NMFS has made the industry aware that failure to comply with these deadlines could result in the delayed implementation of individual sectors beyond the start of the 2010 FY.

Comment 20: NHCFA believes that the economic impacts of sector allocations do not consider the impacts to vessels heavily invested in permits with many DAS, but little landings.

Response: Section 7.5.1.2.3.3 of the FEIS discusses the economic impacts of PSC options adopted in Amendment 16 on those vessel owners that invested in permits to increase their access to DAS under the existing DAS effort controls. This discussion acknowledges that vessel owners may have invested in permits with allocated DAS, but little landings history in the area in which the owner has traditionally operated. Thus, the value of such permits may be lower if the owner elects to participate in sectors. Part of this reduced value due to lower sector ACE can be reconciled through acquiring additional ACE through the ACE transfer provisions in Amendment 16. In addition, owners who invested heavily in DAS could also continue to participate in the common pool and be regulated by DAS instead of sector allocations. Thus, owners must make decisions as to which management system is most advantageous to them based upon opportunities presented by either management system. Therefore, NMFS believes that Amendment 16 has adequately considered the impacts on such vessels.

Comment 21: Three industry organizations (NHCFA, CCCHFA, and Midcoast Fisherman's Association), both existing sectors and the Port Clyde Sector, CLF, the Island Institute, and one individual fisherman were concerned that the removal of the 20-percent sector allocation cap under Amendment 16 could compromise small-vessel operations due to consolidation of fishing effort by larger corporations. NAMA was concerned about consolidation in general, indicating that consolidation reduces diversity of the fleet and threatens biological diversity in the ecosystem.

Response: Amendment 13 first implemented an allocation cap that prevented sectors from being allocated more than 20 percent of the yearly TAC for a particular stock due to concerns over the possibility that one sector could control an excessive share of a particular stock and exert market control for that resource. Analysis by the PDT during the development of Amendment 16 suggests it is unlikely that any one sector could acquire a sufficient share of a stock to exercise market power over the rest of the fishery. Further, because sector ACEs are temporary in nature and depend upon the collective PSCs of participating vessels, no one sector would be allocated a permanent share of any resource. This further limits the ability of a sector to influence market conditions for a particular stock over the long term. Amendment 16 would allow sectors to trade ACE for use during that FY. This would minimize the influence of the actual sector allocation regarding market control, as a sector could acquire ACE from another sector. Consolidation in the fleet has already occurred under the DAS management regime due to continued effort controls, DAS Leasing/Transfer Programs, and other provisions. It is possible to allow for consolidation in the fleet without compromising the diversity of the fleet. Maintaining a diverse fleet is one of the objectives of the FMP, and future Council actions could be directed to explicitly increase or at least maintain the existing diversity of the fleet.

Comment 22: Several commenters, including TNC, CLF, the two existing sectors, the Port Clyde Sector, the Island Institute, CCCHFA, Midcoast Fisherman's Association, and one commercial fisherman stated that ACE trading is critical to the success of sectors, would facilitate the accurate accounting of catch and discards, and would contribute to achieving OY in the fishery. TNC suggested that NMFS should develop a clearinghouse for ACE trading, while three other commenters indicated that allowing ACE to be traded within bins of vessel size, gear, or other criteria would help protect the small-boat fleet.

Response: NMFS agrees that ACE trading is critical to the success of sector management for the reasons stated by the commenters. Under Amendment 16, ACE could be freely traded between sectors without the restrictions recommended by three commenters. However, there is no reason that a sector could not stipulate such conditions as part of its negotiations to trade ACE with another sector. Further, the Council could implement such restrictions in a future action if data suggest that the small-boat fleet is being adversely affected by unrestricted ACE trading under Amendment 16. Because ACE trading is a private business arrangement between sectors, NMFS is not inclined to serve as a clearinghouse for ACE trades. NMFS is considering posting ACE balances online to provide the data necessary for various sector managers to negotiate ACE trades.

Comment 23: Both existing sectors and one commercial fisherman supported the Amendment 16 overage penalties for sectors. These commenters, along with CCCHFA, agree that sectors should be insulated from the overages of common pool vessels, but they also contended that Amendment 16 should include overage penalties that follow common pool vessels if they join a sector the FY after they contributed to an overage of the common pool allocations of a particular stock.

Response: Amendment 16 does not include any overage penalties for common pool vessels if they contributed to an overage of common pool allocations, but later join a sector to avoid the increase in DAS counting associated with the differential DAS counting AM. NMFS can only approve or disapprove Amendment 16 and cannot revise or add measures. However, the Council could consider adding such penalties in a subsequent action.

Comment 24: CCCHFA and the two existing sectors both expressed general support for the revisions to existing SAPs under Amendment 16. CCCHFA, however, would only support revisions to the CA II Yellowtail Flounder SAP if they were supported by similar standards of research as were required to approve revisions to the CA I Hook Gear Haddock SAP. Further, they support increased access to haddock, but only by gear proven to selectively harvest that species, specifically hook gear.

Response: The CA II Yellowtail Flounder SAP was originally approved under Amendment 13 based upon research reviewed by the Council prior to the approval of that action. That research evaluated the catch of yellowtail flounder, cod, haddock, and other species using trawl gear in the proposed SAP area. Other research to support the Eastern U.S./Canada Haddock SAP using a haddock separator trawl, the expansion of the CA I Hook Gear Haddock SAP, and the development of the Ruhle trawl demonstrate that such gears can selectively target haddock, while reducing the catch of cod and flatfish species. Although these gears had different successes at increasing the selectivity of the fishery, they were all evaluated in the same manner and all contribute to furthering the objectives of the FMP and the Magnuson-Stevens Act. Only gear supported by applicable research was approved for use by the Council in Amendment 16, as listed in Table 182 of the Amendment 16 FEIS.

Comment 25: CCCHFA supported continuing the delayed access to the Eastern U.S./Canada Area by trawl vessels until August 1, but recommended that the 5-percent cod bycatch TAC be eliminated for hook gear.

Response: The RA has the authority to modify access to the Eastern U.S./Canada Area under existing regulations. The RA will consider whether to continue delayed access to the Eastern U.S./Canada Area by trawl gear either unilaterally, or as part of Framework Adjustment 44, which would implement the 2010 ACLs and U.S./Canada Management Area TACs. Therefore, this comment is not relevant to Amendment 16, but may be applicable to a future action.

Comment 26: CLF is concerned about "inadequate measures" for SNE/MA winter flounder. They suggested that higher trip limits for other species under Amendment 16 may increase targeting of such species and lead to higher discards for SNE/MA winter flounder.

Response: Because sectors would be exempt from all trip limits under Amendment 16, CLF's concern that trip limits would increase discards of SNE/MA winter flounder is limited to common pool measures. Amendment 16 would increase the common pool trip limits for some species caught within the SNE/MA winter flounder stock area. Although trip limits for some stocks would increase, common pool vessels would also be subject to a further 50-percent reduction in their 2006 DAS allocations, 24-hr DAS counting, and two RGAs within the SNE/MA winter flounder stock area. These RGAs require the use of gear that has been proven to reduce the catch of flatfish stocks in particular, including the Ruhle trawl, the rope trawl, and hook gear. These areas are based upon areas of high catch rates of both SNE/MA winter flounder and other stocks requiring F reductions under Amendment 16 such as SNE/MA yellowtail flounder. Therefore, it is unlikely that high trip limits adopted under Amendment 16 would increase fishing effort to such a degree that the increased effort would overcome the substantial effort reductions also implemented under Amendment 16 and increase discards for SNE/MA winter flounder. In addition, if measures in Framework Adjustment 44 are approved, the RA would have the authority to adjust the DAS counting rates inseason to offer further protection, should increased trip limits for some stocks increase the bycatch of SNE/MA winter flounder. Finally, the two AMs in Amendment 16 would offer further protection that measures would compromise efforts to rebuild this stock, even if triggered by the excessive catch of another stock. Therefore, NMFS believes that there are sufficient measures in Amendment 16 to end overfishing and rebuild SNE/MA winter flounder.

Comment 27: NHCFA and one commercial fisherman suggested that there are equity concerns with the allocation of GOM cod and GOM haddock to the recreational fishery that makes

Amendment 16 inconsistent with National Standard 4. NHCFA also stated that this allocation is inconsistent with National Standard 8, as well.

Response: The National Standard 4 guidelines indicate that management measures must not discriminate between residents of different states, and that any allocations of fishing privileges must be fair and equitable to all fishermen and reasonably calculated to promote conservation. Amendment 16 would allocate portions of the ACLs of GOM cod and GOM haddock to the recreational fishery based upon the proportion of recreational catch between FYs 2001-2006. Both commercial and recreational catch would be evaluated using the same time period, a period during which both fisheries were subject to restrictions on the catch of such stocks, to determine the amount of these stocks caught by each fishery. These allocations are necessary to provide accountability to every segment of the fishery that catches groundfish, and to develop more segment-specific management measures that more effectively reduce F for such segments. Fishing communities affected by this measure include both commercial and recreational participants in the fishery. Measures affecting either groups have indirect economic impacts on supporting business within such communities, such as restaurants, marinas, fish processors, fuel suppliers, etc. An allocation of available resources among both groups facilitates the development of effective management measures for each group that can selectively address overages by one group, while avoiding unnecessarily penalizing the other group for such excessive catch due to implementing effort reductions on both groups, similar to previous actions. In doing so, this measure contributes to the overall effort of Amendment 16 to provide for the sustained participation of such communities in the groundfish fishery through the furtherance of sustainable fisheries, while minimizing the adverse economic impacts associated with broadly applied effort reductions for both groups that would result without an allocation of available resources to each group. Therefore, NMFS believes that this measure is consistent with National Standards 4 and 8, as described in Section 9.1.1 of the Amendment 16 FEIS.

Comment 28: CLF suggested that Amendment 16 should develop the tools necessary to increase estimates of recreational catch and improve inseason AMs.

Response: Recent amendments to the Magnuson-Stevens Act call for the development of an angler registry. Such a registry will identify the specific subset of the population that participates in the recreational fishery and allow the Marine Recreational Information Program to collect the data information it needs to more accurately estimate recreational catch. Once such data are available, the Council may be able to obtain more reliable inseason estimates of recreational catch and develop the appropriate inseason AMs, as necessary. However, such data are not currently available and could not be used to develop inseason AMs under Amendment 16.

Comment 29: Both CLF and TNC support adding Atlantic wolffish to the FMP. However, CLF and the existing sectors believe that Amendment 16 overstates the extent of the EFH for this species and that the Council should have a more restricted EFH based upon data from the trawl survey.

Response: Atlantic wolffish was added to the FMP to end overfishing and implement management measures to rebuild the species through a possession prohibition. Because the Amendment 16 FEIS notes that there is little information and a high degree of uncertainty regarding population status and the reliability of survey data for this stock, designation of EFH throughout the EEZ was considered appropriate at this time, until further information can be acquired to narrow the scope of the EFH, if necessary.

Comment 30: Six commenters, including NAMA, CCCHFA, the two existing sectors, the Island Institute, the Midcoast Fisherman's Association, and the Port Clyde Sector strongly opposed the measure in Amendment 16 that would allow the concurrent issuance of a limited access Atlantic sea scallop and a limited access NE multispecies permit, claiming that it would eliminate incentives to reduce scallop bycatch and turn the scallop fishery into a directed groundfish fishery. CLF opposed this measure because of concerns that it would have major allocation effects on the fishery by restricting access to the fishery, and because the Council did not perform a sufficient analysis under section 303(a)(9) of the Magnuson-Stevens Act.

Response: Many vessels issued limited access permits in either the Atlantic sea scallop or the NE multispecies fisheries are issued open access permits in the other fishery that allow a minimal harvest of managed stocks. Amendment 16 would allow a vessel to be issued both a limited access NE multispecies permit and a limited access Atlantic sea scallop permit at the same time to allow vessels to operate in a more profitable manner and reduce the costs of having to purchase, operate, and maintain multiple vessels to participate in both fisheries. In doing so, Amendment 16 would also increase the value of such permits. While this measure is intended to increase the efficiency of management measures, it has no direct impacts on allocations within or between fisheries, and does not compromise the conservation measures of the fishery, as existing effort controls and permit restrictions in both fisheries, including DAS allocations, gear restrictions, trip limits and permit-splitting provisions, would be maintained. Only landings history of limited access NE multispecies permits would be used to contribute to sectors, not the landings history associated with an open access NE multispecies permit. Further, only in a limited circumstance would a vessel be able to fish for both scallops and groundfish on the same trip. In this circumstance, the vessel would be required to fish with trawl gear and comply with the applicable regulations in both the NE Multispecies and Atlantic Scallop FMPs. A limited access scallop dredge permit vessel could not retain more groundfish than is already allowed. Further, the scallop fishery would still be subject to any groundfish ACLs distributed to the fishery, and limited in the amount of groundfish that could be caught. Therefore, this measure, by itself, would not eliminate incentives to reduce the catch of groundfish in the scallop fishery and would not have effects on the allocations detailed in Amendment 16 or Framework Adjustment 44. Because conservation controls in both fisheries are maintained, there is little chance that this measure would adversely impact the F in either fishery. A full analysis of the expected impacts of this measure is described in Section 7.0 of the FEIS. This analysis, along with the other analyses contained in the FEIS, complies with all of the elements of a fishery impact statement required by section 303(a)(9) of the Magnuson-Stevens Act and no further analysis is required.

Comment 31: Respondents offered general support for a number of other measures specified in Amendment 16, including revisions to status determination criteria, new rebuilding programs with a 75-percent probability of success, revisions to the DAS Leasing and Transfer Programs, universal sector exemptions, sector annual reports, revisions to sector joint/several liability measures, eligibility of permits in CPH to participate in sectors, and sector overage penalties.

Response: NMFS agrees that these measures are necessary to achieve the goals and objectives of the FMP, effectively administer and enforce measures included in Amendment 16, and to maintain compliance with the Magnuson-Stevens Act.

Comment 32: CLF suggested that cusk be added to the FMP.

Response: The notice of intent to prepare a SEIS seeking comment on measures to incorporate during the development of measures in Amendment 16 suggested that the Council was considering incorporating cusk and wolffish into the FMP, pending the results of stock assessments for both species. As part of the Data Poor Working Group, a stock assessment was completed for Atlantic wolffish, but a stock assessment for cusk was not completed. Therefore, there is not enough information available to add cusk to the FMP. Once this information becomes available, the Council could add that stock to the FMP through another Council action.

Summary

After careful review of the proposed measures, the associated analyses, and the public comments that NMFS received on Amendment 16 to the NE Multispecies FMP, NMFS is partially approving Amendment 16 by approving all proposed measures except for the GOM Sink Gillnet Pilot Program, as described above. This action is intended to immediately end overfishing, rebuild overfished groundfish stocks, comply with requirements of the Magnuson-Stevens Act to establish a mechanism to specify ACLs and AMs, and help mitigate the economic impacts of continued reductions to fishing effort required to rebuild overfished stocks. NMFS has determined that the measures being approved represent the environmentally preferable alternative when considering the balance of environmental and economic effects that might accrue from these measures within the context and strictures of the Magnuson-Stevens Act and other applicable law. In addition, NMFS has determined the preferred alternative will promote the national environmental policy as discussed in Section 101 of NEPA. NMFS also concludes that all practical and legally justifiable means to avoid, minimize, or compensate for environmental harm from the final action have been adopted.

The Council and NMFS have considered all applicable public comments received on Amendment 16. Responses to all comments on the Amendment 16 DEIS are available in Appendix V of the FEIS, with comments received on the Amendment 16 FEIS listed in this ROD.

Further information concerning this Record of Decision may be obtained by contacting George H. Darcy, NMFS Northeast Region, 55 Great Republic Drive, Gloucester, MA 01930, (978) 281-9331.

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Date