DRAFT

Amendment 16

To the

Northeast Multispecies Fishery Management Plan

Including a

Draft Environmental Impact Statement and an Initial Regulatory Flexibility Analysis

Note: In the "Alternatives under Consideration" section, underlined text is new since November 19, 2008. . Shaded sections reflect Committee recommendations that have not been reviewed by the full Council. Revisions in other sections are not highlighted.

Intentionally Blank

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:

Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950
(978) 465 – 0492

TYPE OF STATEMENT:

(X) 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 DEIS 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: ____________________

Intentionally Blank

1.0 Executive Summary

(to be completed)

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) off the New England and Mid-Atlantic coasts. 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.

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 the amendment to reduce mortality where necessary are 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, five framework adjustment actions (Frameworks 40A, 40B, 41, 42, and 43) were adopted. These 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, adjusted measures to meet mortality targets, and limited the catch of groundfish in mid-water trawls.

Amendment 13 adopted a schedule for periodic reviews of groundfish stock status to make certain that fishing mortality targets are achieved. The first adjustment was scheduled for May 1, 2006. In order to provide information on stock status for that action, groundfish stock assessments were performed in August 2005. Of nineteen managed groundfish stocks, the assessments found that fishing mortality for seven stocks exceeded Amendment 13 targets. FW 42 was designed to reduce mortality on these stocks so that rebuilding will continue. In addition, it modifies several other programs to meet the objectives of the M-S Act. Because of delays in developing this framework adjustment, the proposed management measures were not implemented on May 1, 2006. As a result, the Secretary of Commerce implemented measures that took effect on May 1, 2006, and remained in effect until Framework 42 was implemented on November 19, 2006.

Amendment 16 is being developed to adjust measures as necessary to continue the groundfish rebuilding plans adopted in Amendment 13.

2.0 Contents

2.1 Table of Contents

2.2 Tables

2.3 Figures

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, 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.

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.

3.1.1.2 Harbor Porpoise Take Reduction Plan

NMFS published the rule implementing the Harbor Porpoise Take Reduction Plan on December 1, 1998. The HPTRP includes measures for gear modifications and area closures, based on area, time of year, and gillnet mesh size. In general, the Gulf of Maine component of the HPTRP includes time and area closures, some of which are complete closures; others are closures to gillnet fishing unless pingers (acoustic deterrent devices) are used in the prescribed manner. The Mid-Atlantic component includes time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Based on an increase in harbor porpoise takes in the overall sink gillnet fishery in recent years, the Harbor Porpoise Take Reduction Team is currently developing options to reduce takes.

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 white-sided dolphins in several trawl gear fisheries operating in the Atlantic Ocean. Incidental takes of pilot whales, common dolphins and 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.

3.2 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.

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	• Measures to reduce effort, including DAS reductions, trip limit reductions, and area closures • If necessary, adjust mortality targets for rebuilding programs
End overfishing	• Implement Annual Catch Limits and Accountability Measures • Adjust effort controls as necessary to reduce fishing mortality
Implement additional tools to meet mortality objectives	• 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	• Implement additional sectors • Consider increases in trip limits
Provide options for reducing harvesting capacity	• Measures to reduce effort, including DAS reductions, trip limit reductions, and area closures
Address numerous issues with respect to the administration of the fishery	• 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 will be made after assessments scheduled for 2008, but these assessments have been postponed and were 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 range 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.

4.0 Alternatives Under Consideration

4.1 No Action Alternative

The NEPA requires that the No Action alternative be included. 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. 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 alterative 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.

The most recent amendment to the Northeast Multispecies FMP 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)

Amendment 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

ReferenceXXX). 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 Table 1.

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, xxxthough 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. The DAS that are transferred 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.

Measure to Meet Rebuilding Mortality Targets

The multispecies fishery

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, 2008.

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. In addition, the vessel selling DAS must exit all state and federal fisheries and any non-groundfish permits expire. 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, and there wouldn't be any changes to existing sector policies.

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, 2008r, 2006. Incidental catch TACs would not be specified for FY 2010 and beyond, since they have only been specified through FY 2009.

4.2 Updates to Status Determination Criteria and Formal Rebuilding Programs

4.2.1 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 if determined appropriate to do so. This information is not yet available but preliminary information is included in this draft amendment.

4.2.1.1 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 1. The numerical estimates of these parameters that were adopted by Amendment 13 are listed in Table 2.

Table 1 – 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 2 – Amendment 13 numerical estimates of status determination criteria. (XXXCHECK NOTES)

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

4.2.1.2 Option 2 – Revised 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 option 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 option adopts the status determination criteria determined by GARM III (NEFSC 2008). The GARM III reports include a full description of the data and models used to determine the criteria. The parameters are described in Table 3. Numerical estimates for these parameters are shown in Table 4. 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 the four stocks shown, this is a three-year, centered average as described in the first Reference Point Working Group (NEFSC 2002) 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 B_{MSY} shown in Table 4.

Note that in this option a fishing mortality target is not specified, a change from Amendment 9 (NEFMC 2008). Section 4.3.1.2 describes the process for setting Annual Catch Limits. In effect, the fishing mortality target is the mortality that results from the defined ACL.

Table 3 – Option 2 status determination criteria

Stock	Biomass Target	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold
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	Internal	1/2 Btarget	F40% MSP

Table 4 - Option 2 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		SCALE	800 – 1000 mt	< 0.35	138 – 150 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 B_{MSY} as 158,873 mt (SSB) and MSY as 32,746 mt.

4.2.2 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. This information will be developed after the status determination criteria are evaluated and current stock status is determined. Mortality targets will be 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.

If a stock is determined to have reached the biomass target by the 2008 assessments, the completion of the formal rebuilding program will be noted in this section.

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)

4.2.2.1 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 5.

Table 5 – 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
	SNE/MA	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
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									

4.2.2.2 Option 2 – Revised rebuilding mortality targets

After the assessments of all regulated groundfish stocks are completed in August 2008, an evaluation was made as to whether adjustments to the rebuilding fishing mortality targets are necessary. 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 6.

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.

In the case of GOM cod and American plaice, the rebuilding fishing mortality exceeds F_{MSY}. Since fishing at a higher level than F_{MSY} constitutes overfishing , the mortality target shown in Table 6 is F_{MSY}.

In addition to these revisions to existing rebuilding programs, based on the results of GARM III, additional formal rebuilding programs will be required for:

- Witch flounder
- Georges Bank winter flounder
- Northern windowpane flounder

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 considering 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 considering 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 considering 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 as

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

Pollock is approaching an overfished condition. The results of the 2008 fall trawl survey will determine if this stock is overfished. If that is the case, the Council plans to adopt a formal rebuilding program for the stock in this action.

GOM Winter Flounder

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

> "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, this stock will be closely monitored and a plan will be developed as more information becomes available.

Table 6 – <u>Option 2 – revised rebuilding fishing mortality rates based on current stock status.</u>
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***			
	GOM	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 required*									
	GOM	2014/50%	*No formal rebuilding program required*									
Yellowtail Flounder	GB	2014/75%	0.109	0.109	0.109	0.109	0.109					
	SNE/MA	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		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 calculate rebuilding mortality*									
	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												
Windowpane Flounder	North		*Unable to calculate rebuilding mortality*									
	South	2014/50%	*Unable to calculate rebuilding mortality*									
Ocean Pout		2014/50%	*Unable to calculate rebuilding mortality*									
Atlantic Halibut		2056/50%	0.044 through 2055									

4.2.2.2.1 Mortality Reductions to Achieve Rebuilding Targets

Management measures in this action are designed to reduce fishing mortality to the target fishing mortality for each stock as shown in Table 6. The Council'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, 2007 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 7 summarizes the mortality reductions believed necessary to achieve the desired fishing mortality rates. Derivation of these values is explained in section XXXXX.

Table 7 – Summary of rebuilding reductions needed to achieve desired fishing mortality. When F rebuild is in grey font, it exceeds F_{MSY} and FMSY is used for all projections.

Species	Stock	2007 Fishing Mortality	Frebuild	Fmsy	2008 F from 2008 Estimated Catch	% Change in F necessary to achieve Frebuild using catch and F 2008
Cod	**GB**	0.300	0.184	0.2466	0.410	-55%
Cod	**GOM**	0.456	0.275	0.237	0.300	-21%
Haddock	**GB**	0.230	n/a	0.350	0.079	343%
Haddock	**GOM**	0.350	n/a	0.430	0.250	72%
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	0.238	0.239	0.289	-18%
American Plaice	**GB/GOM**	0.090	0.208	0.190	0.099	92%
Witch Flounder		0.290	0.162	0.200	0.296	-45%
Winter Flounder	**GB**	0.280	0.205	0.260	0.131	56%
Winter Flounder	**GOM**	0.417	N/A4	0.283	0.317	NA(1)
Winter Flounder	**SNE/MA**	0.649	0.000	0.248	0.265	-100%
Redfish		0.005	n/a	0.038	0.008	375%
White Hake	**GB/GOM**	0.150	0.084	0.125	0.065	29%
Pollock	**GB/GOM**	10.975	5.310	5.66	n/a	-48%
Windowpane	**GOM/GB**	1.960	n/a	0.50	n/a	-74%
Windowpane	**SNE/MA**	1.850	n/a	1.47	n/a	-21%
Ocean Pout		0.380	n/a	0.760	n/a	n/a

Atlantic Halibut	0.065	0.044	0.073	0.060	-27%

4.2.2.2.2 Approximate Catch Levels

In earlier Northeast Multispecies management actions, target total allowable catches (TTACs) were specified as a guide to evaluate the effectiveness of measures between stock assessments. This action will adopt requirements for ABCs and ACLs as mandated by recent changes to the M-S Act. The process for setting these levels is proposed in this action and is not yet implemented. To provide information to the public on approximate catches expected during the years following this action, the following table provides the median catch levels that result from the desired fishing mortality for each stock. It is likely that actual ACL values may be lower than shown in this table.

Table 8 – Approximate catch levels, FY 2010 – FY 2013

SPECIES	STOCK	2010	2011	2012	2013	Composition
Cod	GB	4,489	5,341	5,979	6,655	US, CA landings, discards
	GOM	11,366	11,434	11,003	10,821	Comm. landings, discards, rec. harvest
Haddock	GB					US, CA landings, discards
	GOM	1,505	1,345	1,084	1,067	Rec. harvest, Comm. landings, discards
Yellowtail Flounder	GB	2,765	3,435	3,942	4,516	US, CA landings, discards
	SNE/MA	472	651	96	1,339	Comm. landings and discards
	CC/GOM	1,035	1,226	,1,345	,1,463	Comm. landings and discards
American Plaice		3,846	4,101	4,216	4,227	Comm. landings and discards
Witch Flounder		1,046	1,488	1,766	1,896	Comm. landings, discards
Winter Flounder	GB	2,115	2,281	2,594	2,833	Comm. landings
	GOM					Comm. landings, discards, rec. harvest
	SNE/MA	0	0	0	0	Comm. landings, discards, rec. harvest
Redfish		9,536	10,432	11,457	12,163	Comm. landings, discards
White Hake						Comm. landings, discards
Pollock						US, CA Comm. landings
Windowpane Flounder	North					Comm. landings, discards
	South					Comm. landings, discards
Ocean Pout						Comm. landings, discards
Atlantic halibut						Comm. landings, discards

4.3 Fishery Program Administration

4.3.1 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).

4.3.1.1 Option 1 – No Action

If this option is selected, a process for implementing Annual Catch Limits (ACLs) will not be adopted in this action.

4.3.1.2 Option 2 – Annual Catch Limits

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. This section was prepared in the absence of guidance from the NMFS on the implementation of this requirement. Revisions may be considered after that guidance is published.

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.

4.3.1.2.1 Definitions

The following definitions define terms used in this section. Table 9summarizes 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 biological 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 9 – 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 $F_{control\ rule}$ or $F_{rebuild}$	Biological uncertainty over current stock size, estimate of F, or other parameters (growth, recruitment, etc.)
ACL	<=ABC	Uncertainty from other sources, evaluation of risk to achieving management goals if ABC is exceeded

4.3.1.2.2 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 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 9. 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 of updates.
- 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, 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 iks 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 biological 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 Trans-boundary Resource Assessment Committee (TRAC), a peer-review process as envisioned by the M-S Act. For these stocks, the Trans-boundary 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 recommendations of 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 recommended 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 15 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 Procedures Act (APA).

4.3.1.2.3 ACL Sub-Components

Once an overall ACL is determined, the Council may divide the ACL into 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 are attributed to specific fisheries, and second to refer to those smaller portions that are not considered ACLs and are not subject to AMs. 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.

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. 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.

For those sub-components that are not ACLs, there are broad categories. <u>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.</u> 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 16. In the case of trans-boundary stocks, 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 because they will be determined by the analyses in GARM III.

For the scallop dredge fishery, the specific value for an 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 SNE/MA yellowtail flounder ACL when CAI, CAI, or the NLCA access programs are in effect).

4.3.1.2.4 Impacts of an ACL Overage

Committee, December 17, 2008

ACLs will be set every two years. If an ACL is exceeded in year one, the amount of the overage needs to 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.

In order to address this issue, the Council proposes that the ACL/AM process will include the following concepts:

(a) If an ACL is exceeded, the annual SAFE report will review whether adjustments to future ACLs are required.

(b) If an adjustment is necessary, the SAFE report will contain a recommendation to adjust the ACL in subsequent years. There are timing issues with this suggestion. Whether an ACL overage in year one results in a reduced stock size will not be evaluated in a SAFE report delivered to the Council until some time late in year two, which makes it difficult to adjust the year two ACL. It is possible that an adjustment will not be possible until new ACLs are calculated for the following years.

(c) 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 10 – ACLs and sub-components for groundfish stocks. Recreational values will be determined after GARM III assessments, which will also determine the amount available for commercial groundfish. 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 and may change as a result.

	ACL					
Stock	**ACLs/Controlled by AM**				**Other Sub-Components**	
	Commercial Groundfish (1)	**Rec Gfish**	**Herring MWT**	**Scallops(2)**	**Other Non-Specified**	**State Waters(2)**
GB Cod	95% - X	X			5.0%	
GB Haddock	94.8%		0.2%		5.0%	
GB YTF	95.0% - X			X	5.0%	
SNE/MA YTF	95.0% - X			X	5.0%	
CC/GOM YTF	95.0% - X			X	5.0%	
GOM Cod	63.0% - X	X			5.0%	10.0%
Witch	95.0%				5.0%	
Plaice	95.0%				5.0%	
GOM WFL	77.0% - X	X			5.0%	
SNE/MA WFL	71.0% - X	X			5.0%	
GB WFL	95.0%				5.0%	
White Hake	95.0%				5.0%	
Pollock	95% - X	X			5.0%	
Redfish	95.0%				5.0%	
Pout	95.0%				5.0%	
GOM/GB Windowpane	70.0%				30.0%	
SNE/MA Windowpane	70.0%				30.0%	
GOM Haddock	94.8% - X	X	0.2%		5.0%	
Halibut	95.0%				5.0%	

In a change from earlier drafts, note scallops have ACLs for yellowtail flounder. This reflects a Council decision to specify ACLs when catch is more than minimal.

4.3.2 Addition of Atlantic Wolffish to the Management Unit

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 4.2.1.2. Essential fish habitat for this stock is proposed in section XXXX. Proposed management measures are in section 4.4. A description of the stock and stock status are provided in section XXXX.

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 XXX, 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. 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.

4.3.2.1 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 3 and Table 4.

4.3.2.2 Essential Fish Habitat

4.3.3 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).

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.

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.

4.3.3.1 Sector Definition/Formation of a Sector

A sector means a group of persons holding limited access vessel permits who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted 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 sector.

Participation in a self-selecting sector will be voluntary. Vessels that did not decide to join would 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 or effort 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).

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 Program as adopted in Amendment 13).

Option 2: 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 Program proposed in section 4.3.6.5).

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.

4.3.3.2 Preparation of a Sector Formation Proposal and Operations Plan

4.3.3.2.1 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, TACs, or DAS within the sector;
    - 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.

4.3.3.2.2 Option 2 - Additional Requirements

Under this option, a sector's operation plan must also include (in addition to the requirements specified in Amendment 13):

- Detailed information about overage penalties or other actions to be taken if the sector exceeds its ACE;
- 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 XXX).
- A list of all Federal and State permits held by vessels participating in the sector;
- 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. ***(Part of Council sector policy statement).***

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. The contracts drawn up for the whiting and pollock cooperatives on the West Coast and Alaska might serve as a guide for determining the form and content of these plans.

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 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.

4.3.3.3 Allocation of Resources

4.3.3.3.1 General

Sectors will be allocated a hard TAC of all regulated groundfish stocks with the exception of halibut, ocean pout, and windowpane flounder. 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.

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.

NMFS will withhold 20 percent of each ACE at the beginning of the fishing year for a period of forty–five 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 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).

4.3.3.3.2 Sector Overages

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.

- 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. The PDT recommends that 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. Two suggested ways to calculate this penalty are (one will be selected by the Council):
    - Option 1 - 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; *or*

- Option 2 - Each permit receives a flat DAS deduction based on the number of pounds of overage by the sector, divided by the number of vessels in the sector. Example: A sector of ten permits goes 10,000 pounds over on stock A and 20,000 pounds over on stock B. Each permit is responsible for 3,000 pounds of overage. If the penalty is 1 DAS for every 1,000 pounds each permit is penalized three DAS.

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.

4.3.3.3.3 U.S./Canada Area

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.

Option 2 - Separate Allocations

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.

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. 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.

4.3.3.3.4 Sector Baseline Calculations/Potential Sector Contributions

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. The present method for calculating PSC/history was developed in Amendment 13 and is described in the No Action Alternative. There are five alternatives under consideration to change the way history is calculated for each permit. Unless changed by a future action, once a permit's PSC is calculated in accordance with the selected PSC option, 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 catch history 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.

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.

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.

Option 1 - Landings History Only FY 1996 – FY 2006

Under this alternative, permit history 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.

Rationale: 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.

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. 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.

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. 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.

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.

Option 5 – Existing Sector Allocations

For the GB Cod Hook Gear Sectors and the Fixed Gear Sector, the allocation of GB cod will be done 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 the sector as of March 1, 2008. For any other past or future member of these sectors, the sector share will be calculated as adopted by this action. For all other stocks, the potential sector contribution will be calculated as adopted by this action.

If this option is not selected, the potential sector contribution for members of these sectors will be calculated as adopted by this action.

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.

4.3.3.4 Mortality/Conservation Controls

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 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 operation or cease of operations 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 4.3.3.2 for specific requirements of the sector Operations Plan.

Committee, December 17, 2008

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. If the groundfish 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 and windowpane flounder. Catches of ocean pout and windowpane flounder cannot be landed, which will discourage sectors from targeting these stocks.

4.3.3.5 Monitoring and 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.

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 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) as well as the system proposed below.

In conjunction with NMFS, the Council will develop the standards for reporting and monitoring systems that must be met by sectors. Once these standards are developed, they will be reviewed and implemented by NMFS consistent with the APA. In the absence of published standards, the process for using an assumed discard rate described above will be used to account for discards in the catch. The Council anticipates developing the standards and NMFS approval and implementation prior to FY 2010.

This may not be needed now.

4.3.3.5.1 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 ~~as well as any other applicable Federal regulations~~, 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.

Option 2: 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)

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

Option 3: 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.

4.3.3.5.2 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.

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 program will be implemented along with the use of electronic at-sea monitoring. The primary goal of observers 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 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 program will not replace the NMFS Observer Program. In the event a NMFS observer and a third party observer are assigned to the same trip, the NMFS observer will take precedence and the third party observer will stand down. Observers 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.

Dockside monitoring and observer coverage levels will be approved by NMFS for each sector. Coverage must be sufficient to ensure adequate monitoring to meet all the necessary requirements. For dockside monitoring:

Option 1: Less than 100% dockside monitoring and dealer reports will be required.

Option 2: 100% dockside monitoring will be required.

For observer coverage, minimum coverage levels must meet the coefficient of variation in the Standardized Bycatch Reporting Methodology.

Option 1: Less than 100% electronic monitoring and at-sea observation will be required.

Option 2: 100% electronic monitoring and less than 100% at-sea observation will be required.

Assumed discard rates will be applied to sectors unless a sector, through its own independent monitoring system, 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 but will be counted against the ACE during the fishing year.
- 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. 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.
- If a trip is observed, the discards reported by the observer on that trip till be counted as the discards for that trip. Unobserved trips will use a discard estimate calculated from the observed trips.
- Discards will be calculated for the gear/species combinations shown in Table 11.
- Discard rates used before sectors develop adequate monitoring systems will be determined in one of two ways:

Option 1: The discard rate used will be based on the most recent assessment for the stock, using a gear specific estimate if available. The term "gear" means trawl, longline, or gillnet, or other gear type and does not refer to specific gear configurations, such as a separator trawl, Ruhle trawl, etc.

Discard estimates are not included in the assessments for specific gear configurations. If a gear specific rate is not available, the overall observed discard rate will be used.

Discards will be estimated only for those combinations of species and gear where discards are expected. For details of these combinations, see section 4.3.4.3, Table 11. While that section applies to non-sector vessels, the same determinations will be used for sector vessels.

Option 2: A sector-specific discard rate would be calculated based on observer data from the previous year. If possible this will be calculated for each gear used in the sector. If this cannot be done, an overall rate will be used.

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.

Rationale: 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. 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.

4.3.3.5.3 Standards for Sector Monitoring and Reporting Service Providers

Committee, December 17, 2008

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.

Dockside 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 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, compare the estimated discard weights to reported discard weights on VTRs to utilize the most accurate source of discard data, 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 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

4.3.3.6 Sector Annual Reports

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.

4.3.3.7 Transfer of Annual Catch Entitlements (ACE)

4.3.3.7.1 Option 1 - No Action

If this option is selected, transfer of ACE between sectors will not be authorized.

4.3.3.7.2 Option 2 - Provisions for Transferring ACE

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 45 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 brief 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.

4.3.3.8 Sector Participation in Special Management Programs

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 an allocation for the stocks caught in this SAP in order to participate.

4.3.3.8.1 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.

Rationale: 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.

4.3.3.8.2 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, limits on the number and frequency of trips, and the catch limit for target species.
(2) Sectors are not subject to the cod or haddock trip limit.
(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.

4.3.3.8.3 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 4.3.7 for possible SAP changes).

4.3.3.9 Interaction of Sector with 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 sector does not exceed its ACE in a given fishing year, but other sectors or common pool vessels exceed the remaining TAC, 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 ACE, 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 ACE 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 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, 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); and
- Groundfish DAS restrictions.

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.

Relocated to this location for clarity.

Should this action adopt additional mortality controls, such as additional seasonal and year round closed areas, gear requirements, differential DAS counting, and/or <u>restricted gear areas,</u> sectors will not be required to adhere to these additional measures 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 4.3.3.8. For example, sectors will be required to adhere to the GOM rolling closures (unless a specific exemption is granted when the sector's operations plan is approved)

<u>Rationale</u>: 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.

4.3.3.10 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.

<u>Rationale</u>: 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.

4.3.4 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.

4.3.4.1 Option 1 – No Action

Under the No Action option, no additional reporting requirements are adopted that are not specified in other sections.

4.3.4.2 Option 2 – Area-specific reporting requirements

The measures in this section, if adopted, 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 1). 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 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.

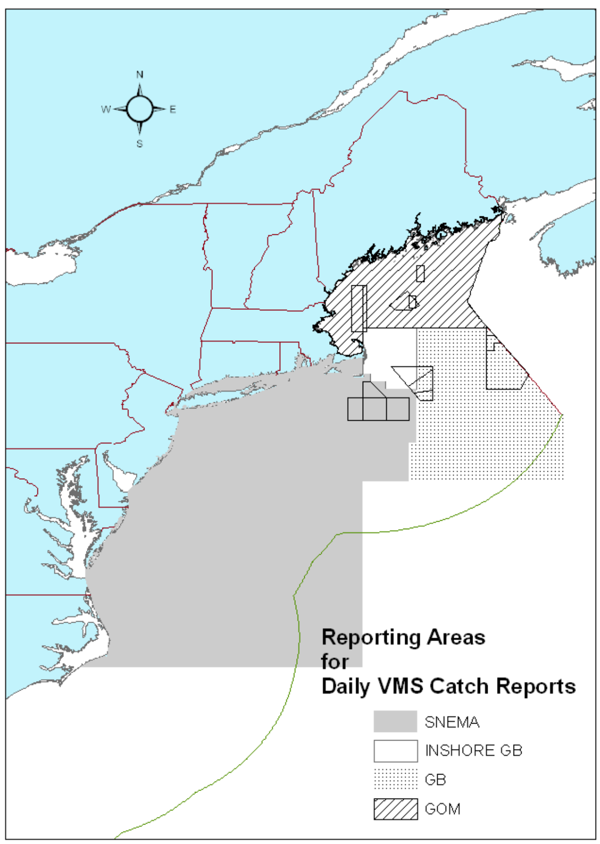
[1]The U.S.-Canada Maritime Boundary as it intersects with the EEZ.

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 1 – Proposed reporting areas



4.3.4.3 Option 3 – Accounting for discards for non-sector vessels

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 4.3.3.5. 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 be applied only for those combinations of species and gear where discards are expected..

Committee December 17, 2007

Table 11 – Discard estimates will be applied to the species/gear combinations shown

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

The discard rate will be determined in one of two ways:

Option 1: The discard rate used will be based on the most recent assessment for the stock, using a gear specific estimate if available. The term "gear" means trawl, longline, or gillnet, or other gear type and does not refer to specific gear configurations, such as a separator trawl, Ruhle trawl, etc. Discard estimates are not included in the assessments for specific gear configurations. If a gear specific rate is not available, the overall observed discard rate will be used. If a discards were not included in the assessment they will not be applied to monitor the ACL.

Option 2: A discard rate would be calculated based on observer data from the previous year by vessels that are not in sectors. If possible this will be calculated for each gear used in the sector. If this cannot be done, an overall rate will be used.

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.

4.3.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

4.3.5.1 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.

4.3.5.2 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 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. The time periods that are being considered are shown in Table 12. It is not yet clear if all of these stocks will meet the requirement for an allocation. This table also lists an estimate of the allocations that will result – this estimate has not yet been adjusted for state waters catches. The expectation is that an allocation will not be made for either winter flounder stock once this calculation is completed, as almost all the winter flounder caught by recreational fishermen is harvested within state waters.

Table 12 – 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 Cod (2)	2001 - 2006	33.7%
GB Cod (1)	1996 - 2006	6.9%
GB Cod (2)	None	No Allocation Between Components
GOM Haddock (1)	1996 - 2006	17.6%
GOM Haddock (2)	2001 - 2006	27.5%
Pollock (1)	1996 - 2006	6.2%
Pollock (2)	2001 - 2006	6.7%
GOM Winter Flounder (1)	1982 - 2006	17.9%
GOM Winter Flounder (2)	None	50%
SNE/MA Winter Flounder	1982-2006	21.0%

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. Different time periods are used for different stocks. A longer period is used for winter flounder stocks in recognition that recent recreational catches are low due to depressed stock conditions and recreational catches were much higher in the past than in recent years.

4.3.6 Changes to the DAS Transfer and DAS Leasing Programs

4.3.6.1 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.

4.3.6.2 Option 2 - DAS Transfer Program Conservation Tax

The Council will consider changing or 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 A: No adjustment will be made for permits previously charged the conservation tax.

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

4.3.6.3 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.

4.3.6.4 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.

4.3.6.5 Option 3 – Eligibility of Permits in the Confirmation of Permit History (CPH) Category to Participate in the DAS Leasing Program

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 4.3.3.3.1). In addition, these permits do not need to be activated prior to participation in the DAS transfer Program.

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 activate prior to participating in a DAS transfer.

4.3.7 Special Management Programs

4.3.7.1 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, the specific stocks subject to incidental catch TACs and the allocations to SAPs are revised as provided below.

GB yellowtail flounder and GB cod are trans-boundary stocks, and management is coordinated with Canada. The U.S. and Canadian share of the TAC for these stocks is determined annually and cannot be predicted in advance. Values will be calculated in the future and announced through procedures consistent with the Administrative Procedures 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 X (Total GB cod target TAC (see Table 13) - CA GB cod TAC)

The incidental catch TACs in this program are calculated based on the commercial fishery ACL (see section 4.3.1) 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 4.3.3.8.

Table 13 – 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. <u>Values are dependent on ACLs, which have not yet been determined.</u>

		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 14 - 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%	

4.3.7.2 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.

4.3.7.2.1 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 2. 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.

4.3.7.2.2 Option 2 – Closed Area I Hook Gear Haddock SAP Revisions

If selected, this Option will revise 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.

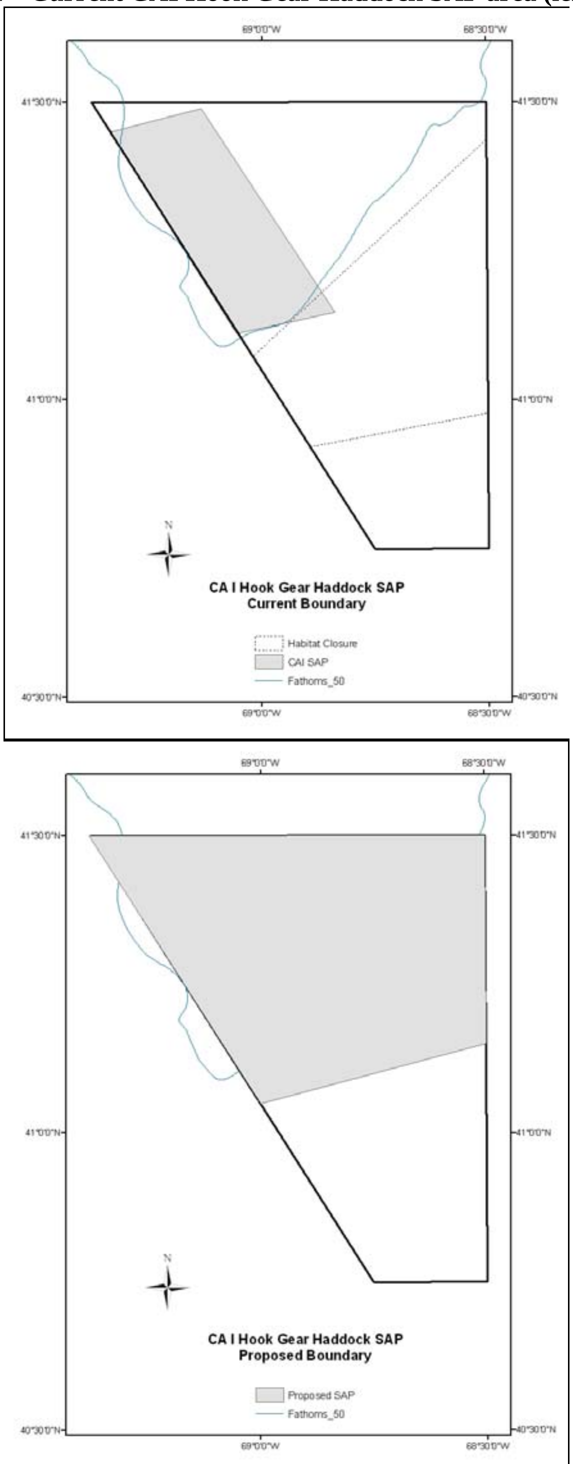
Area: The area of the SAP would be expanded to include the northern portion of CAI, as shown in Figure 2. The coordinates for the revised SAP area would be:

41-09 N	68-30 W
41-30 N	68-30 W
41-30 N	69-23 W
41-04 N	69-01.75 W

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.

Figure 2 – Current CAI Hook Gear Haddock SAP area (left) and proposed area (right)



4.3.7.3 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.

4.3.7.3.1 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.

4.3.7.3.2 Option 2 – Reauthorization of the Eastern U.S./Canada Haddock SAP

This option 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. All provisions of the SAP remain and are not changed.

4.3.7.4 Closed Area II Yellowtail Flounder SAP

4.3.7.4.1 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.

4.3.7.4.2 Option 2 – Closed Area II SAP Modification

This option 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. 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 may be opened to target GB haddock subject to the provisions in this section.

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

<u>Opening Criteria</u>: 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 SAP. 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 0), they can fish in this SAP as long as they have ACE remaining for the stocks caught in this SAP, even if the SAP is closed to non-sector vessels.

<u>Trip Limits</u>: 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, Atlantic halibut, or ocean pout, unless required to do so by regulations implementing sectors. 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, five-point 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.

4.3.7.5 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.

Rationale: 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.

4.3.7.6 Category B DAS Program

4.3.7.6.1 Option 1 – No Action

There are no changes to the Category B DAS Program.

4.3.7.6.2 Option 2 – Program Revisions Due to Updated Stock Status

Committee, December 17, 2009

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 approaching an overfished condition, catches of pollock in this program are limited to the incidental catch limit of 100 lbs./DAS.

Trawl gear requirements: Vessels fishing in the Category B (regular) DAS program, 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.

4.3.8 Periodic Adjustment Process

The periodic adjustment process is modified as follows:

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

Membership of the Groundfish Plan Development Team (PDT) is revised to be consistent with Council policy that all members should be technical personnel. The Chair of the Groundfish Advisory Panel, and one other interested person, will no longer be appointed to the PDT.

4.3.9 Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel

4.3.9.1 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.

4.3.9.2 Option 2 – Removal of restriction

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.

4.4 Measures to Meet Mortality Objectives

4.4.1 Introduction

4.4.2 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).

4.4.2.1 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.

Note: Option numbers are matched to PDT reports describing the options to facilitate discussion at the November 2008 Council meeting. They will be revised in the final document.

4.4.2.2 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.

Trip limits: 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.

Cod (both GOM and GB stocks):

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 trip limit 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 175 lbs./trip. The automatic adjustment mechanism is retained.

CC/GOM yellowtail flounder and SNE/MA yellowtail flounder: 500 lbs./DAS up to a maximum of 3,000 lbs./trip.

SNE/MA winter flounder: Landing of this stock is prohibited in any fishery.

Windowpane flounder: Landing of windowpane flounder is prohibited in any fishery.

Atlantic halibut: The trip limit remains one fish per trip.

Effort controls:

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). If a vessel crosses into a different differential DAS area between two successive VMS pollings, such that one polling is in one area and the following is in a different area, differential DAS for the time between the pollings will be charged at the higher rate.

(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 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 are likely to be used before the vessel uses all of its monkfish DAS. Once the vessel's groundfish DAS are used, it can only fish on a monkfish DAS in a monkfish exempted fishery unless a regulatory change is made to account for the difference between monkfish and groundfish DAS.

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 69-30W

42-00N 69-30 W

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

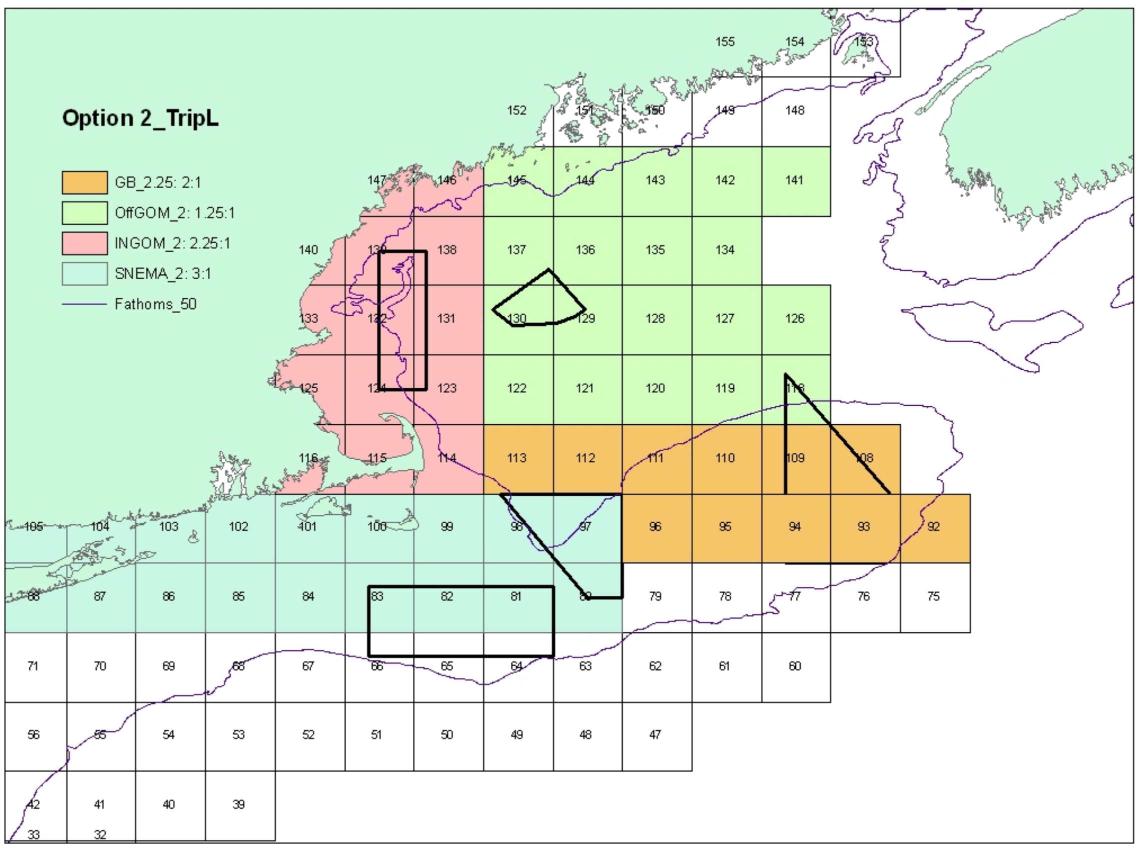
40-30N and the shoreline

Shoreline at 70-00W

41-30N 70-00W

Figure 3 – Option 2A proposed differential DAS areas

Committee, December 17, 20078



(This chart needs to be cleaned up to reflect habitat closed areas, blocks 115-116 south of Cape Cod in SNE/MA differential DAS area)

4.4.2.3 Non-sector vessels Option 3A – 24 hour clock, Restricted Gear Areas

This option 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.

Trip limits would be:

Cod: 2,000 lbs./DAS; maximum 12,000 lbs/trip in GOM, 20,000 lbs/trip GB; 500 lbs./DAS/5,000 lbs/trip in the Eastern US/CA Area

YTF maximum based on six days of the daily limit.

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 stock is prohibited in any fishery.
Atlantic halibut: One fish per trip

Two restricted gear areas are established: 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:
Shoreline at 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

Gears being considered include:

Trawl Gear: Haddock separator trawl, eliminator trawl, five-point trawl, raised-footrope trawl, rope trawl. The haddock separator trawl, eliminator trawl, and raised footrope trawl are described in the 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.

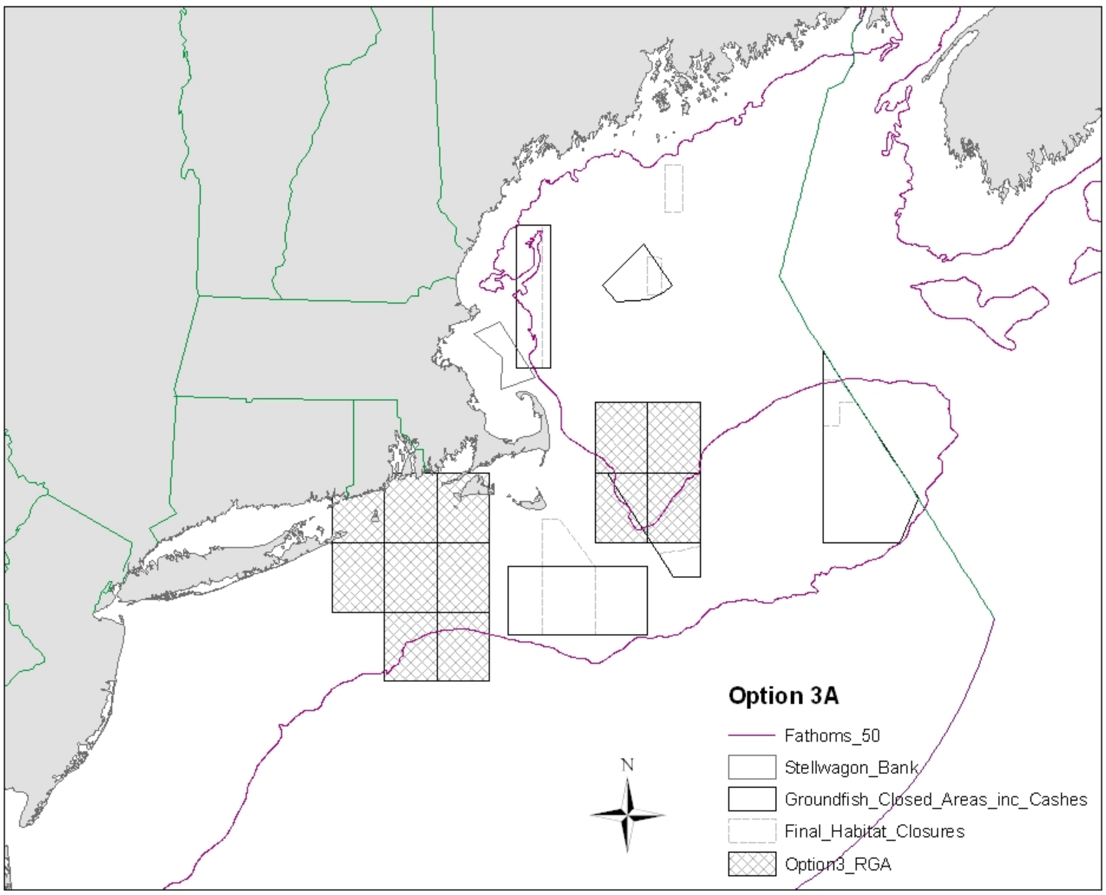
Five-point trawl: A modified three-bridle, four-panel box trawl based on a sweepless raised footrope trawl design that separates fish by exploiting differences between the behaviors of cod and haddock. The net flies over cod while retaining haddock, which generally move upward as the trawl approaches. Specifically, the net only contacts the bottom with 5 "drop chains" along the footrope.

Sink gillnets: No tiedown nets allowed unless using mesh over eight inches

Longline/tub trawls

Handgear

Figure 4 – Option 3, 24-hour clock, restricted gear areas, offshore GOM closed area



4.4.2.4 Option 4 – Non-Sector Vessels 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. Trips limits are:

GOM cod: 2,000 lbs./DAS; maximum 12,000 lbs/trip

GB cod: 1,000 lbs./DAS, maximum 10,000 lbs./trip, except 500 lbs./DAS, maximum 5,000 lbs./trip in the eastern US/CA area

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.

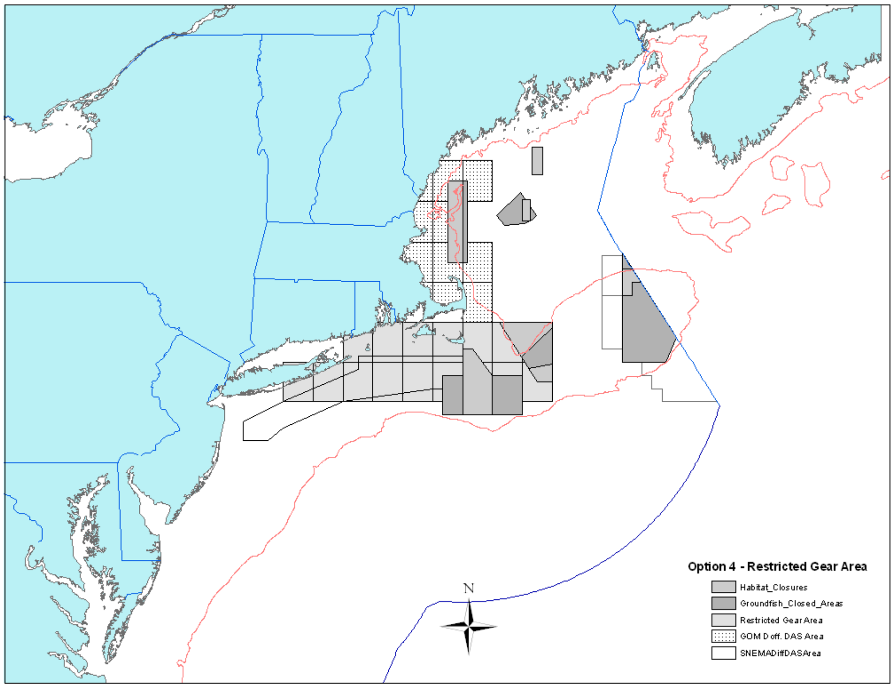
Coordinates of proposed area:

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 5– Option 4, restricted gear area



4.4.2.5 SNE/MA Small Mesh Fisheries Gear Requirement

In the portion of the stock area for SNE/MA winter flounder shown below (to be developed), 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, is required to use 12-inch drop chains on the footrope (exact text to be developed). The purpose of this requirement is to raise the footrope off the bottom and reduce catches of winter flounder.

{Exact measures are under development}

4.4.2.6 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.

Location: Gulf of Maine regulated mesh area

Gear: Six inch gillnets. A day gillnet vessel participating in this program cannot fish with, possess, haul, or deploy more than thirty nets. There are not 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.

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

Effort controls: 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.

4.4.2.7 Haddock Minimum Size

The minimum size for haddock (both GOM and GB) is changed to 18 inches. This measure applies to commercial groundfish vessels.

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.

4.4.3 Recreational Management Measures

Recreational measures will be designed consistent with the allocations adopted in section 4.3.4 and any necessary adjustments in fishing mortality.

4.4.3.1 Provisions for Landing Fillets

Option 1: Recreational (including party/charter) fishermen will be allowed to land fillets with the skin off. 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.

Option 2: Recreational (including party/charter) fishermen will be allowed to land fillets as long as 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.

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.

4.4.3.2 Removal of the Limit on Hooks

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.

4.4.3.3 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 4.3.5.2 and the mortality changes needed for GOM cod and GOM haddock, the necessary mortality reductions for the recreational fishery are shown in Table 15. If the selected allocation years are 2001-2006, additional measures will not be needed for the recreational fishery. If the selected allocation years are 1996-2006, additional measures will be required.

Table 15 – 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%
GOM haddock	NA	-18%	Increase	Increase	Increase

4.4.3.3.1 GOM Cod Options

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

4.4.3.3.2 GOM Haddock Options

Three options 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 XX 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 4: The minimum size for GOM haddock is reduced to 18 inches. There is no bag limit and no change in seasons.

4.4.4 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).

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

4.4.5 Prohibition on Retention of Atlantic Wolffish

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 a quickly as possible. Two options are being considered for this measure:

Option 1: Retention of Atlantic wolffish by any vessel is prohibited year-round.

Option 2: Retention of Atlantic wolffish by any vessel is prohibited from September 1 through March 31.

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. Option 1 provides year-round protection. Option 2 is designed to allow landings of some wolffish during spring and summer. Because this species is caught rarely in the NMFS trawl survey, the major source of information for monitoring the status of the stock comes from landings. If landings are prohibited year-round, it will be difficult to monitor the effectiveness of protective measures. Option 2 ties the retention prohibition to the limited information on spawning and reproductive behavior that is available. Atlantic wolffish are believed to spawn in the early fall in New England, and males guard egg nests for an undetermined period. In addition, discard survival tends to be higher when air temperatures are cooler. Because of the limited information available on Atlantic wolffish life history and reproductive behavior, the time period selected in Option 2 is only weakly supported by the limited data available and may need to be refined in the future.

4.4.6 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.

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 would need a Council decision. 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. Some sectors asked to be exempt from year-round closed areas – since that is not consistent with existing or proposed sector policies, that request is listed. Almost all sectors asked for allocations of specific groundfish stocks, but the 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.

4.4.6.1 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.
- The sector asks for exemptions from the following regulations. These are not authorized by existing or proposed sector provisions:
    - Paper VTRs
    - Annual closures
    - Treatment of catch history
    - Sector will be credited with catching 20 percent of TAC regardless of actual percentage of TAC achieved (*this provision was in the proposal submitted; the sector has informally said it will remove this request*).
    - Catch histories will remain constant within the sector.
    - The sector will be exempt from compensating NMFS for administrative burden (*this may not be germane since sectors do not appear to be subject to cost-recovery provisions*).

4.4.6.2 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.
- The sector asks for exemptions from the following regulations. These are not authorized by existing or proposed sector provisions:
    - Paper VTRs
    - Annual closures
    - Treatment of catch history
    - Sector will be credited with catching 20 percent of TAC regardless of actual percentage of TAC achieved (*this provision was in the proposal submitted; the sector has informally said it will remove this request*).
    - Catch histories will remain constant within the sector.
    - The sector will be exempt from compensating NMFS for administrative burden (*this may not be germane since sectors do not appear to be subject to cost-recovery provisions*).

4.4.6.3 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 Harborm ME, Portland, ME, Portsmouth, NH, Boston, MA, Gloucester, MA, New Bedford, MA, Newport, RI
Primary unloading ports: Cundy's Harborm 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.4 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 . 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
Pr**imary 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.5 New Bedford Deep Water Trawl Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily on Georges Bank or in Southern New England. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: New Bedford, MA.
Pr**imary unloading ports anticipated**: New Bedford, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, <u>and any other gear allowed by regulations</u>
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) as proposed by Amendment 16

4.4.6.6 New Bedford and Southern New England Fixed Gear Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily, fishing primarily on Georges Bank and in Southern New England. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: New Bedford, MA.
Pr**imary unloading ports anticipated**: New Bedford, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: gillnet, bottom longline
Potential secondary gear: 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) as proposed by Amendment 16

4.4.6.7 New Bedford Channel Trawl Sector

This sector will be formed of vessels that fish primarily on Georges Bank and in Southern New England. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: New Bedford, MA.
Pr**imary unloading ports anticipated**: New Bedford, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline
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) as proposed by Amendment 16

4.4.6.8 New Hampshire and Southern Maine Fixed Gear Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Portsmouth, NH, Seabrook, NH, and Portland, ME
Pr**imary unloading ports anticipated**: Portsmouth, NH, Seabrook, NH, and Portland, ME
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: gillnet, bottom longline
Potential secondary gear: otter trawl, and any other 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.9 New Hampshire and Southern Maine Trawl Gulf of Maine Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Portsmouth, NH, Seabrook, NH, and Portland, ME
P**rimary unloading ports anticipated**: Portsmouth, NH, Seabrook, NH, and Portland, ME
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, and any other 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.10 Gloucester Trawl/Western Gulf of Maine Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Gloucester, MA.
P**rimary unloading ports anticipated**: Gloucester, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, and any other 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.11 Gloucester Fixed Gear Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Gloucester, MA
P**rimary unloading ports anticipated**: Gloucester, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: gillnet, bottom longline
Potential secondary gear: otter trawl, and any other 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 regulated groundfish stocks (except Atlantic halibut, ocean pout, windowpane flounder) as proposed by Amendment 16

4.4.6.12 Gloucester/Boston Trawl Gulf of Maine and Georges Bank Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine and Georges Bank. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Gloucester and Boston, MA.
Pr**imary unloading ports anticipated**: Gloucester and Boston, MA.
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline<u>, and any other gear allowed by regulations</u>
Primary fishing areas: Gulf of Maine, Georges Bank
Potential other fishing areas: Southern New England
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) as proposed by Amendment 16

4.4.6.13 South Shore Trawl Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Green Harbor, MA, Scituate, MA, Plymouth, MA, and Sandwich, MA
Pr**imary unloading ports anticipated**: Green Harbor, MA, Scituate, MA, Plymouth, MA, and Sandwich, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline<u>, and any other gear allowed by regulations</u>
Primary fishing areas: Gulf of Maine, Georges Bank
Potential other fishing areas: Southern New England
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) as proposed by Amendment 16

4.4.6.14 South Shore Fixed Gear Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in the Gulf of Maine. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Green Harbor, MA, Scituate, MA, Plymouth, MA, and Sandwich, MA
Pr**imary unloading ports anticipated**: Green Harbor, MA, Scituate, MA, Plymouth, MA, and Sandwich, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: gillnet, bottom longline
Potential secondary gear: otter trawl, and any other gear allowed by regulations
Primary fishing areas: Gulf of Maine, Georges Bank
Potential other fishing areas: Southern New England
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) as proposed by Amendment 16

4.4.6.15 Point Judith and Southern New England Offshore Trawl Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily on Georges Bank and in Southern New England. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Point Judith, RI, Stonington, CT, and New Bedford, MA
Pr**imary unloading ports anticipated**: Point Judith, RI, Stonington, CT, and New Bedford, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, 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) as proposed by Amendment 16

4.4.6.16 Point Judith and Southern New England Trawl Sector

Working with the Northeast Seafood Coalition, this sector will be formed of vessels that fish primarily in Southern New England. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Point Judith, RI, Stonington, CT, and New Bedford, MA
Pr**imary unloading ports anticipated**: Point Judith, RI, Stonington, CT, and New Bedford, MA
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, 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) as proposed by Amendment 16

4.4.6.17 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. These are not authorized by existing or proposed sector provisions:

- Paper VTRs
- Annual closures
- Treatment of catch history.
- Sector will be credited with catching 20 percent of TAC regardless of actual percentage of TAC achieved (*this provision was in the proposal submitted; the sector has informally said it will remove this request*).
- Catch histories will remain constant within the sector.
- The sector will be exempt from compensating NMFS for administrative burden (*this may not be germane since sectors do not appear to be subject to cost-recovery provisions*).

4.4.6.18 Pier 6 Initiative

Working with the Northeast Seafood Coalition, this sector will be formed of up vessels that fish primarily in the Gulf of Maine and Georges Bank. Requested exemptions are consistent with existing or proposed sector policies.

Primary hailing ports anticipated: Boston, MA.
Pr**imary unloading ports anticipated**: Boston, MA.
(Other hailing or unloading ports may be specified in the operations plan.)
P**rimary gear**: otter trawl
Potential secondary gear: gillnet, bottom longline, and any other gear allowed by regulations
Primary fishing areas: Gulf of Maine, Georges Bank
Potential other fishing areas: Southern New England
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) as proposed by Amendment 16

4.4.6.19 Martha's Vineyard Sector

A sector is proposed based in Martha's Vineyard. An initial application suggested this group was interested in using regulatory discards to stock a cod hatchery on the island. Cod would then be released in designated areas protected by closures in an attempt to increase cod stocks near the island. At a subsequent meeting, the proponent asked to be exempt from the permit history qualification criteria, to receive an allocation of one million pounds of cod, haddock, and pollock, and to be allowed to have members who have open access permits join the sector.

4.4.7 Accountability Measures

While this action will specify the process for accountability measures, they will be implemented as required by the M-S Act (FY 2010 or 2011).

4.4.7.1 Commercial Groundfish Common Pool Accountability Measures

4.4.7.1.1 Common Pool Vessels Accountability Measure Alternative 1 – "Hard" Total Allowable Catch (TAC)

This alternative proposes a "hard" TAC backstop for common pool vessels in the commercial groundfish fishery as the accountability measure (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 cloure 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 4.4.2. 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).

The Council directed the Groundfish Committee to incorporate measures in this alternative that would avoid Olympic fishing and hard shutdowns.

Affected Stocks

TACs will be determined for all stocks in the multispecies FMP. TACs will be specified and monitored for the commercial fishery. If enough information is available, TACs 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 is specified for and based on landings.

There will be a separate TAC for each of the stocks managed under the multispecies plan. Each TAC 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 based on recent landings patterns. 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 16. At implementation, the initial calculations will be based on the period FY 2002-2006, the most recent period with data complete as of the date of the draft of Amendment 16. 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 initial apportionment of stock to trimester is shown in Table 16.

Table 16 – 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			

Setting the TAC and TAC Adjustment

The TACs 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 set each year will either be altered from the previous year's TAC based on a review process or renewed unchanged. If the Council does not recommend a change to a TAC, there is no requirement for submission of a Council document or a new NEPA document.

For the purposes of determining this TAC, 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.
- 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 are not exceeded

Stock Area Closures

In any trimester, when it is projected that ninety percent of the TAC 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 t 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 17**Error! Reference source not found.**. 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.

Catching ninety percent of a TAC 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 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 from being exceeded prior to the end of the fishing year.

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

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

A different approach is used for four stocks with small landings. 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, the Regional Administrator if given the ability to establish trip limits to further discourage any possible targeting of these stocks if necessary to reduce the likelihood the TAC will be exceeded.

Table 17 – Gears prohibited in specific areas when a TAC is caught.

SPECIES	STOCK	Area/Gear Prohibited When TAC 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 (all)	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	521,522,562	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

Rationale: 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 is caught. This may also encourage development of more selective fishing techniques so that fishing can continue when the TAC for one species is caught.

White Hake Possession Limit

If this AM is chosen, 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 17). Because the TAC is expected to be small while white hake is rebuilt, there is a concern that approaching this TAC could result ins 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

- All offloads of all regulated groundfish 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.

- 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.

4.4.7.1.2 Common Pool Vessels Accountability Measure Alternative 2 – Differential DAS/DAS Adjustment

In March, NMFS will estimate total catches based on ten months of catch data (catch data through February). Using this information, NMFS will adjust DAS counting for the following fishing year based on whether ACLs are exceeded or not. If an ACL for any stock is exceeded, NMFS will calculate the differential DAS rate change needed to prevent the ACL from being exceeded the following year. 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 (defined as thirty-minute squares) where specific stocks are caught. The exact areas selected may be modified in the final amendment to be consistent with the overall effort control program so that a complex mosaic of DAS counting areas is avoided as much as possible. In general, the areas that apply for each stock are shown in Table 18. These areas may be modified in the final amendment document in order to match the administration of the AMs with the overall effort control measure that is selected. Differential DAS factor changes will be based o Table 19. This table will show 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, the mixed stock exception will be applied.

Committee, December 17, 2009

Table 18 – 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

Table 19 – 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 6.2.3.6).

4.4.7.2 Recreational Fishery Accountability Measures

4.4.7.2.1 Option 1

Committee, December 17 2009

ACLs for the recreational fishery will be established as described in section 4.3.1, consistent with the commercial/recreational allocation of groundfish stocks described in section 4.3.4. 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

Council 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. Council decisions will be forwarded to NMFS which will initiate the process for implementation of the measures. 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.

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 determine 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.

4.4.7.2.2 Option 2

ACLs for the recreational fishery will be established as described in section 4.3.1, consistent with the commercial/recreational allocation of groundfish stocks described in section 4.3.4. 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 ot 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.

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.

4.4.7.3 Multispecies Sector Accountability Measures

The sector administration provisions defined in section 4.3.1 incorporate 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 4.3.1). 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 4.3.1).

4.5 Alternatives Considered and Rejected

4.5.1.1 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.

5.0 Affected Environment

5.1 Physical and Biological Environment

The Northeast U.S. Shelf Ecosystem (Figure 6) 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 the text of Section 3.1. 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.

5.1.1 Gulf of Maine

5.1.1.1 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 7). 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 6 - Northeast U.S Shelf Ecosystem

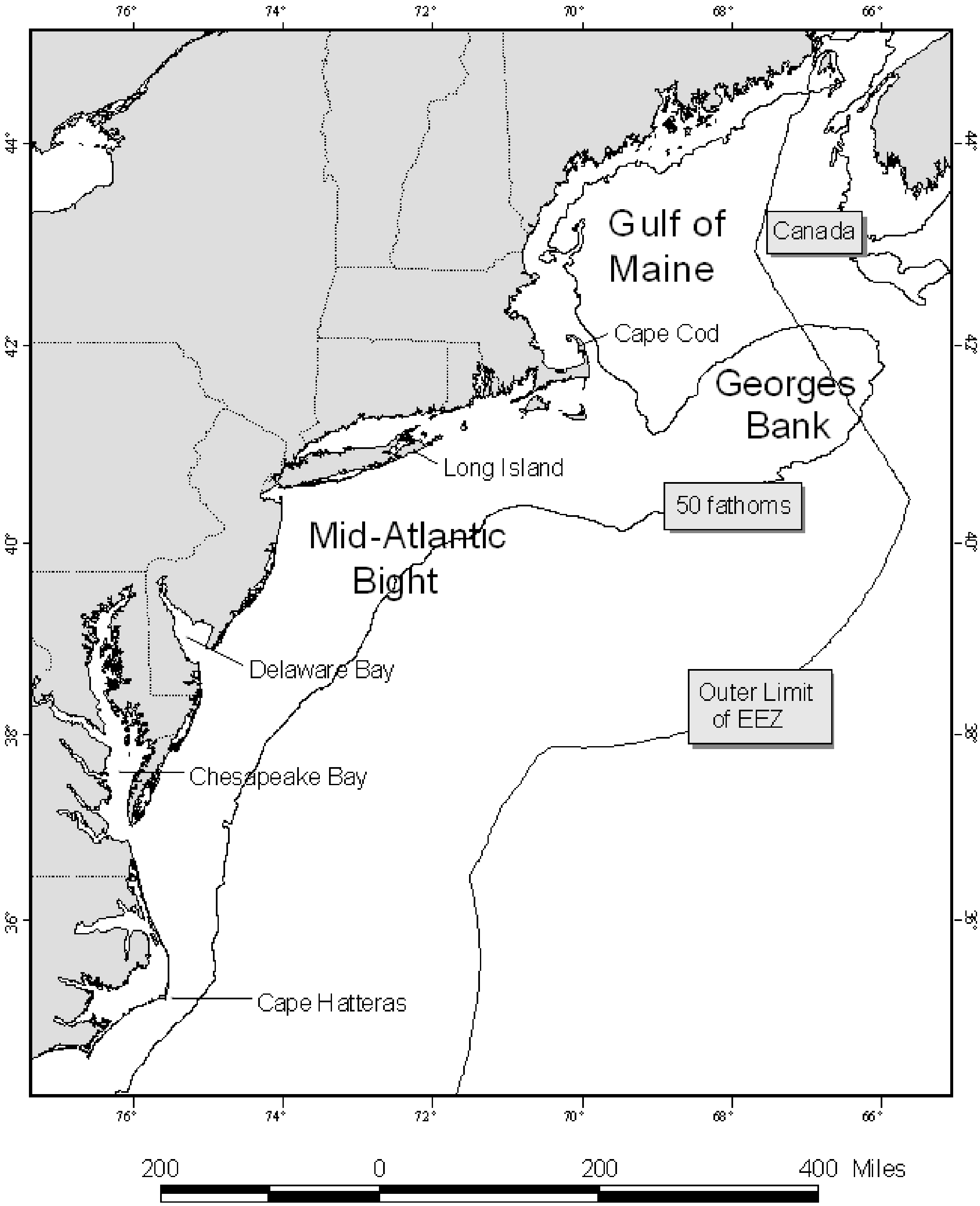
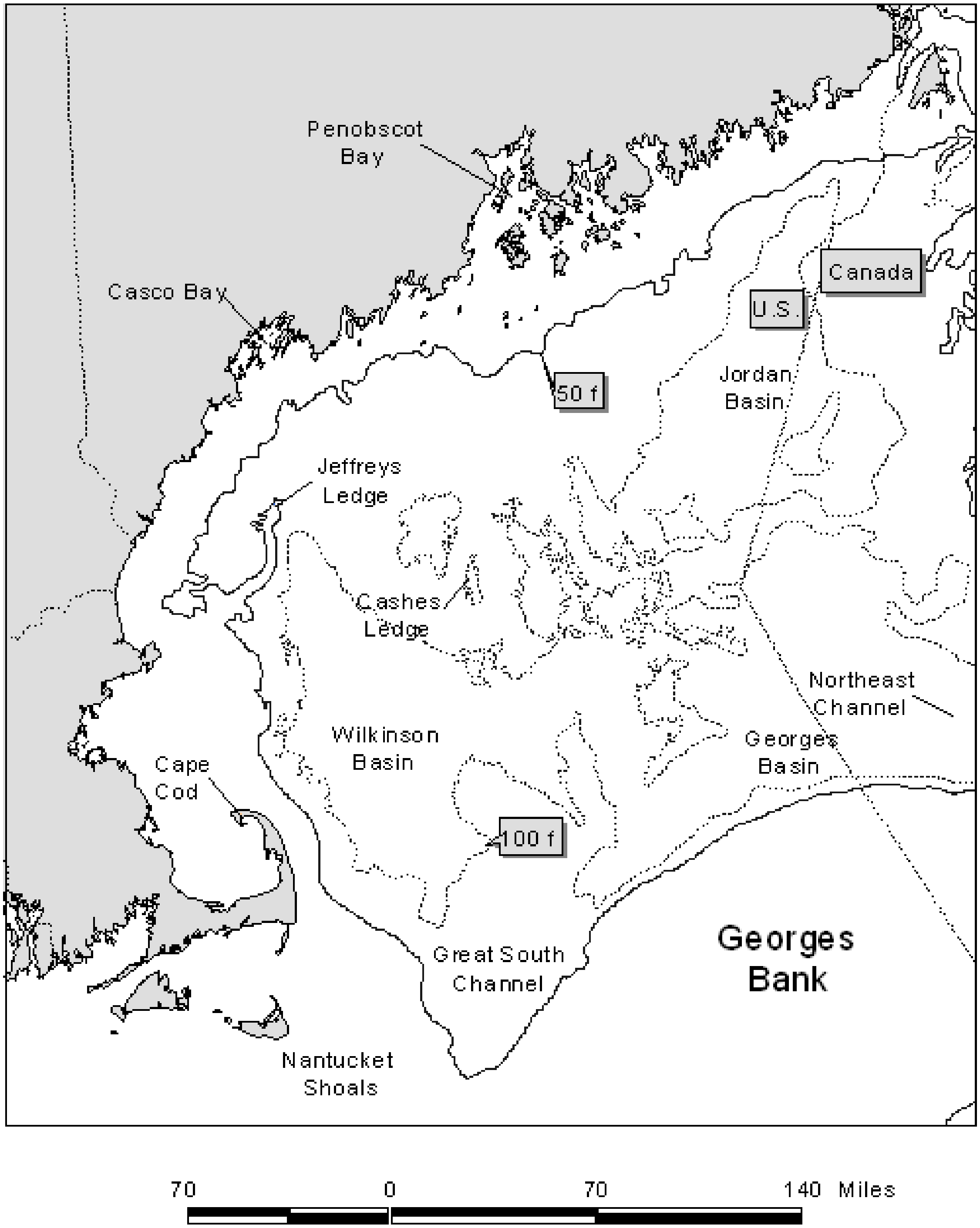


Figure 7 - Gulf of Maine



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 8). 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 9). 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 8 - Northeast region sediments, modified from Poppe *et al*. (1989a and b)

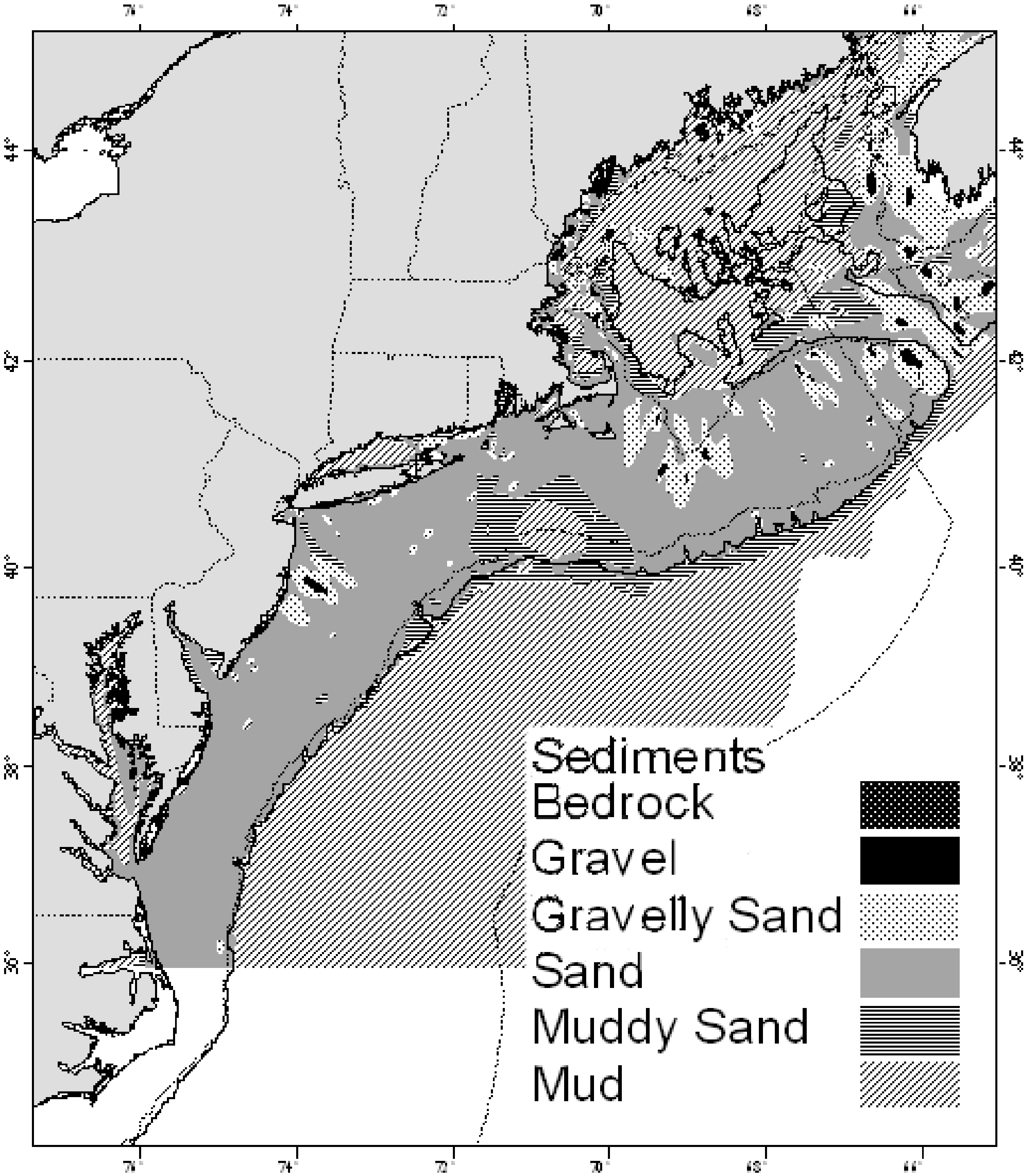
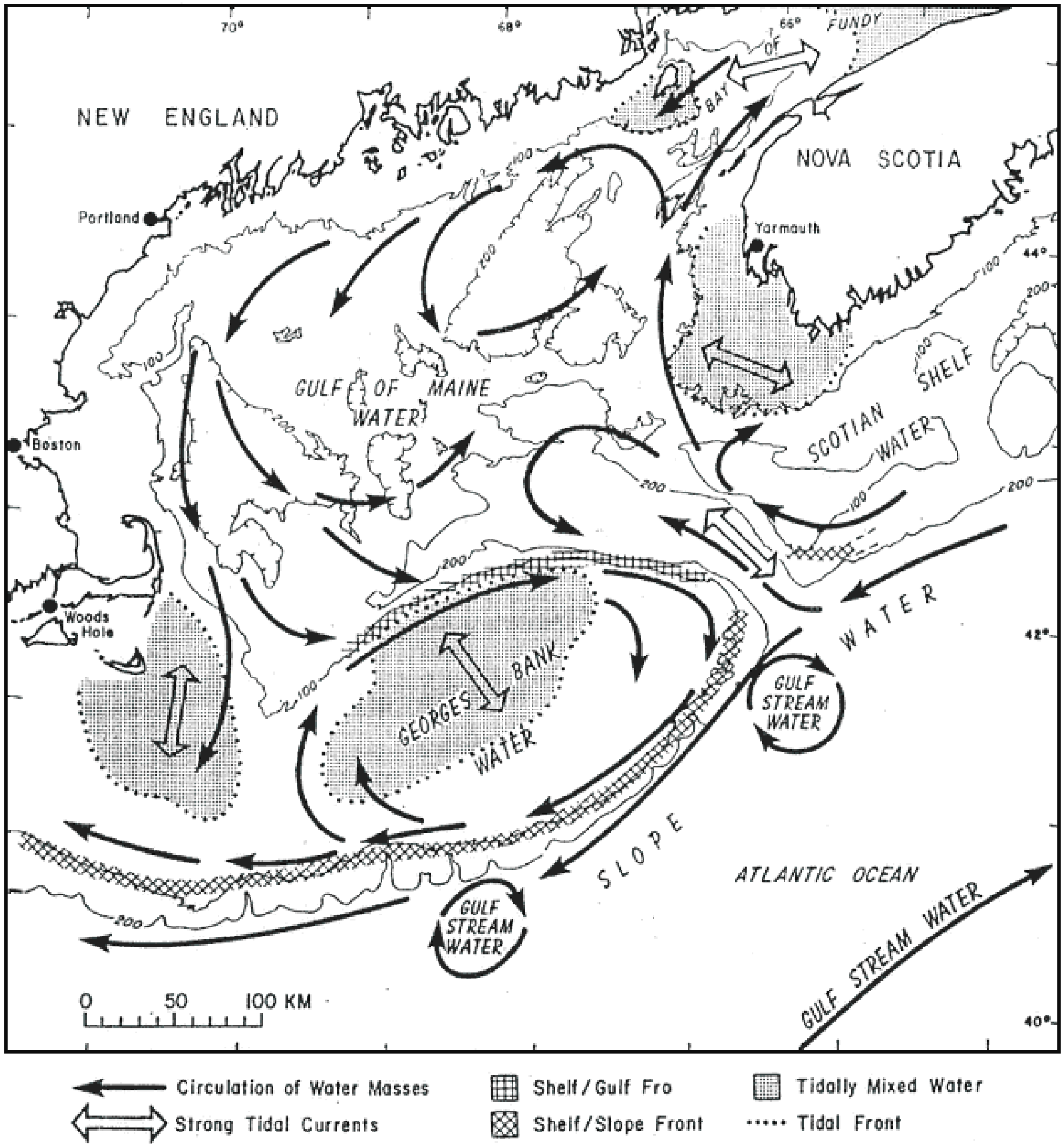

Sediments
Bedrock
Gravel
Gravelly Sand
Sand
Muddy Sand
Mud

Figure 9 - 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.

5.1.1.2 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 20 and their distribution is indicated in Figure 10. This classification system considers predominant taxa, substrate types, and seawater properties.

5.1.1.3 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 21.

Table 20 - 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 10 - 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).

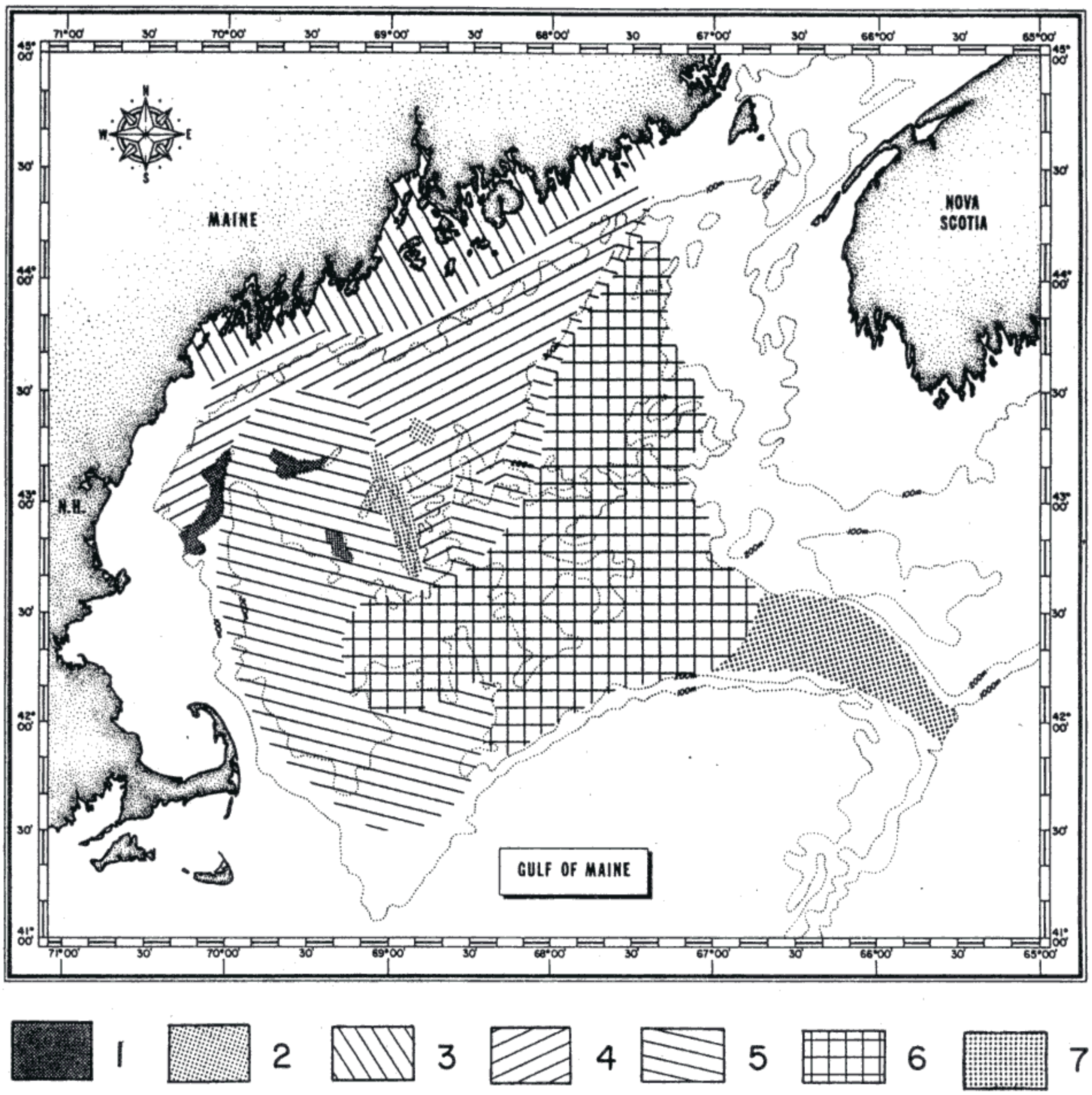


Table 21 - Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine

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*)

5.1.2 Georges Bank

5.1.2.1 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 22 and depicted in Figure 11. 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.

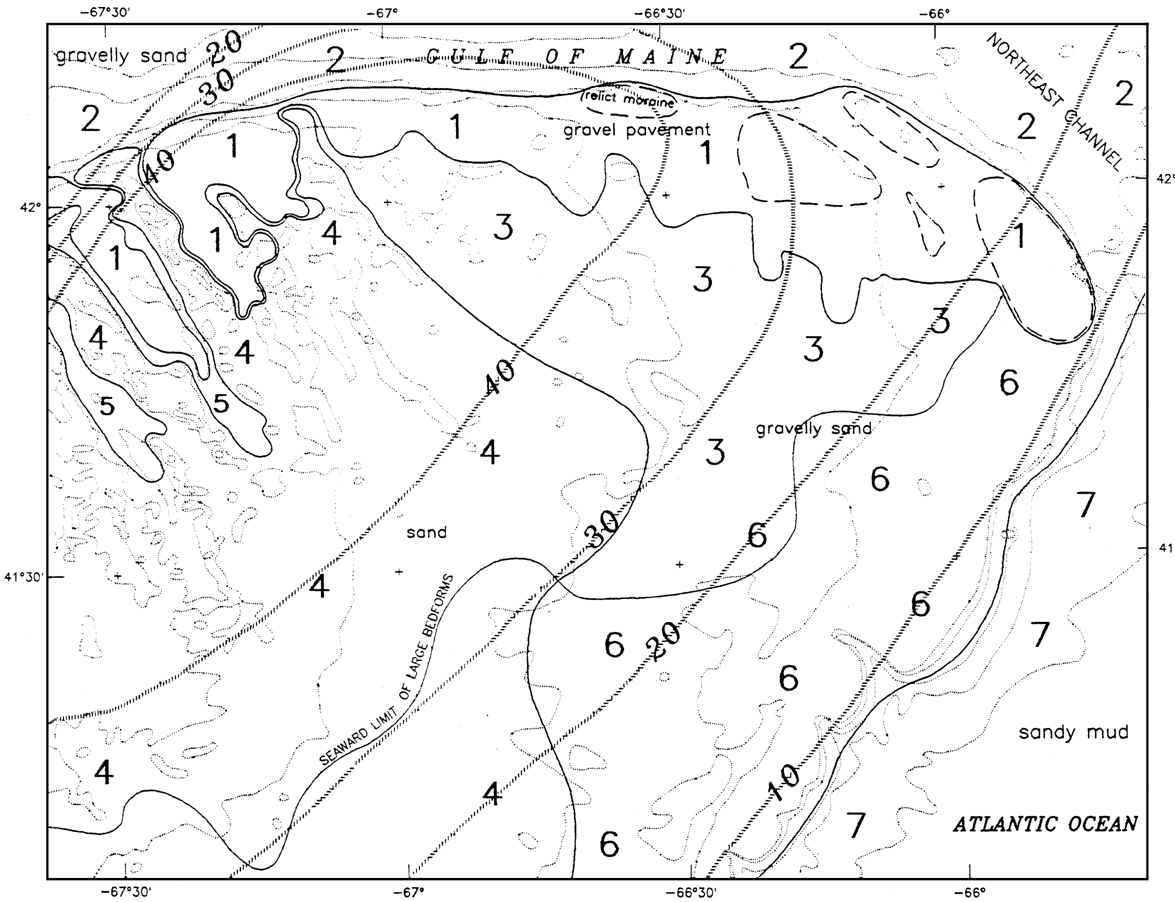
The area west of the Great South Channel, known as Nantucket Shoals (Figure 7), is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of travelling dune and swale morphology is also found in the Mid-Atlantic Bight, 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 22 - 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 11 - 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 9). 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.

5.1.2.2 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 22.

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 20, Figure 10).

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.

5.1.2.3 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.

5.1.3 Mid-Atlantic Bight

5.1.3.1 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 6). 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 12 and Figure 13).

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 12 and Figure 13). 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 12) 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 12 - Mid-Atlantic Bight submarine morphology. Source: Stumpf and Biggs (1988).

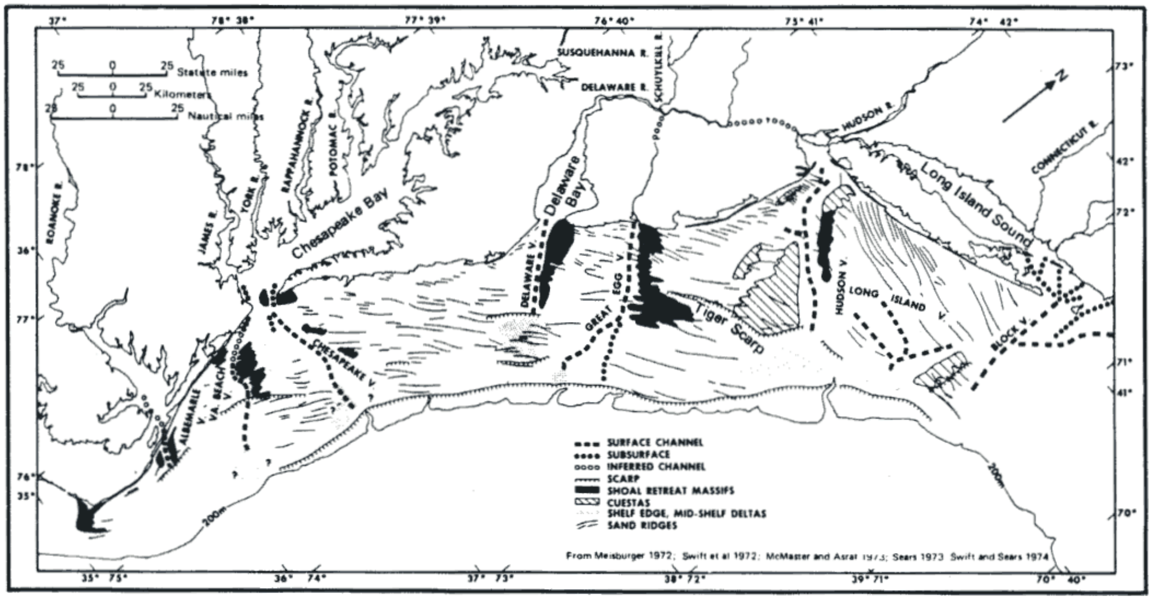
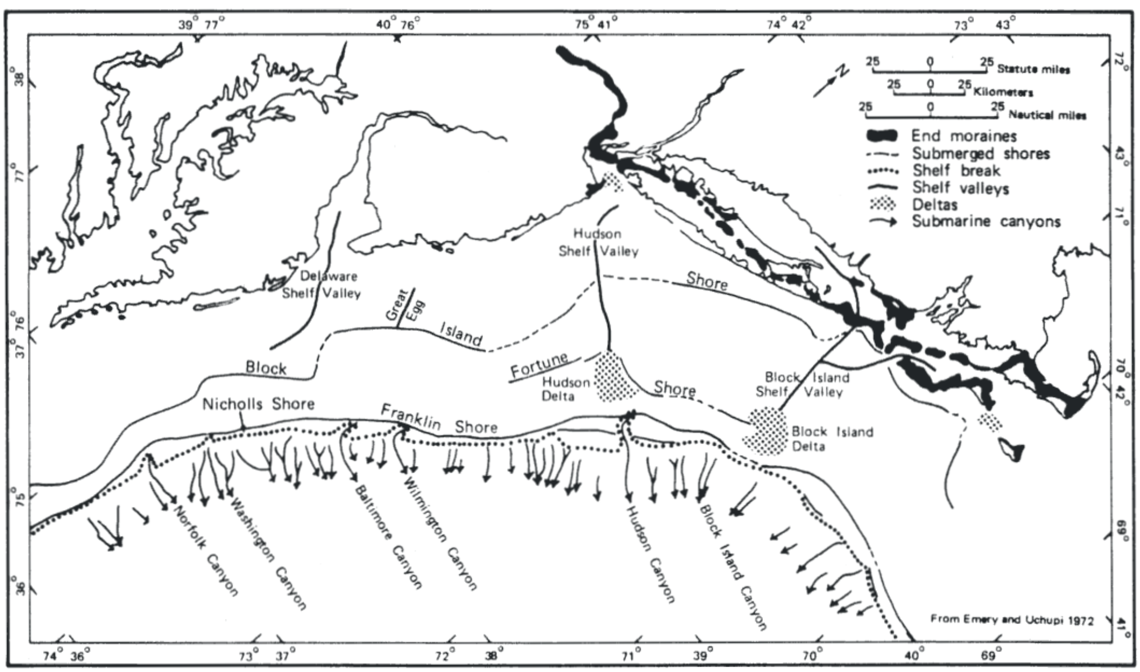


Figure 13 - Major features of the mid-Atlantic and southern New England continental shelf. Source: Stumpf and Biggs (1988).



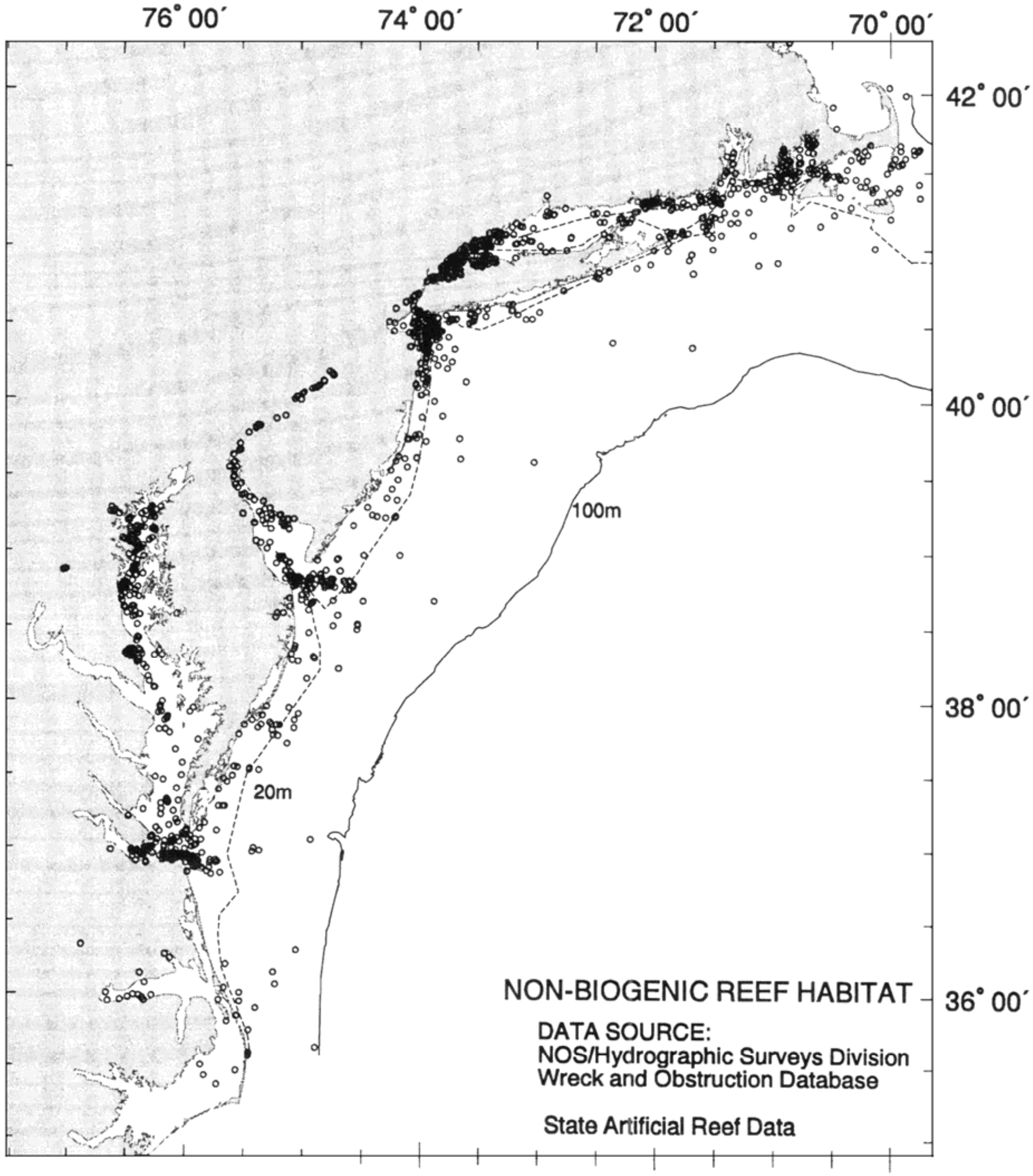
Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves 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 8). 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 8). 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 14).

Figure 14 - Summary of all reef habitats (except biogenic, such as mussel or oyster beds) in the Mid-Atlantic Bight.
Source: Steimle and Zetlin (2000).



5.1.3.2 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 23). 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.

5.1.3.3 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 23). 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 24).

Figure 15 - Schematic representation of major macrofaunal zones on the mid-Atlantic shelf. Approximate location of ridge fields indicated. Source: Reid and Steimle (1988).

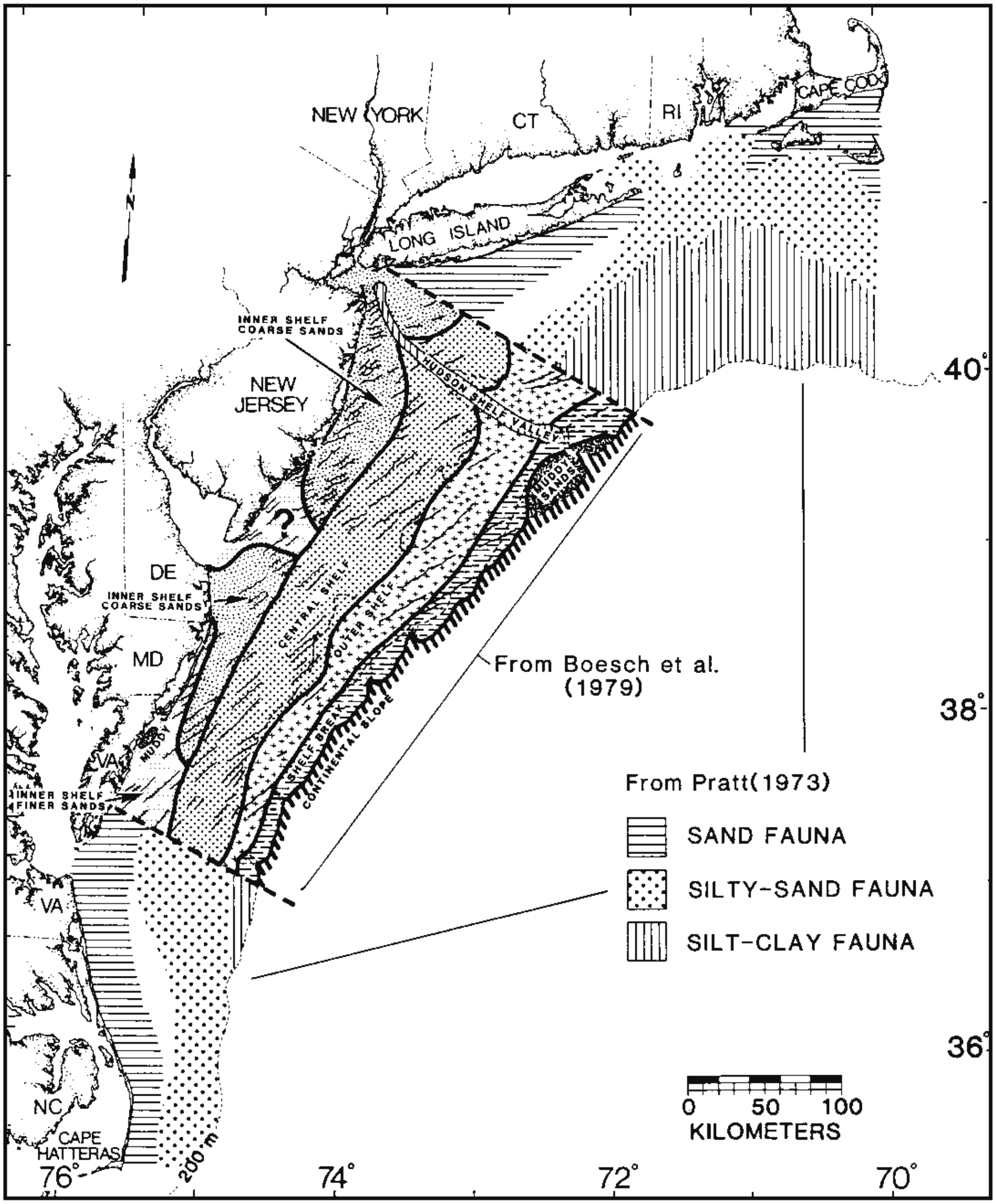


Table 23 - Mid-Atlantic habitat types.

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 24 - 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 25 - 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).

5.1.4 Continental Slope

5.1.4.1 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 16 and Figure 17) 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.

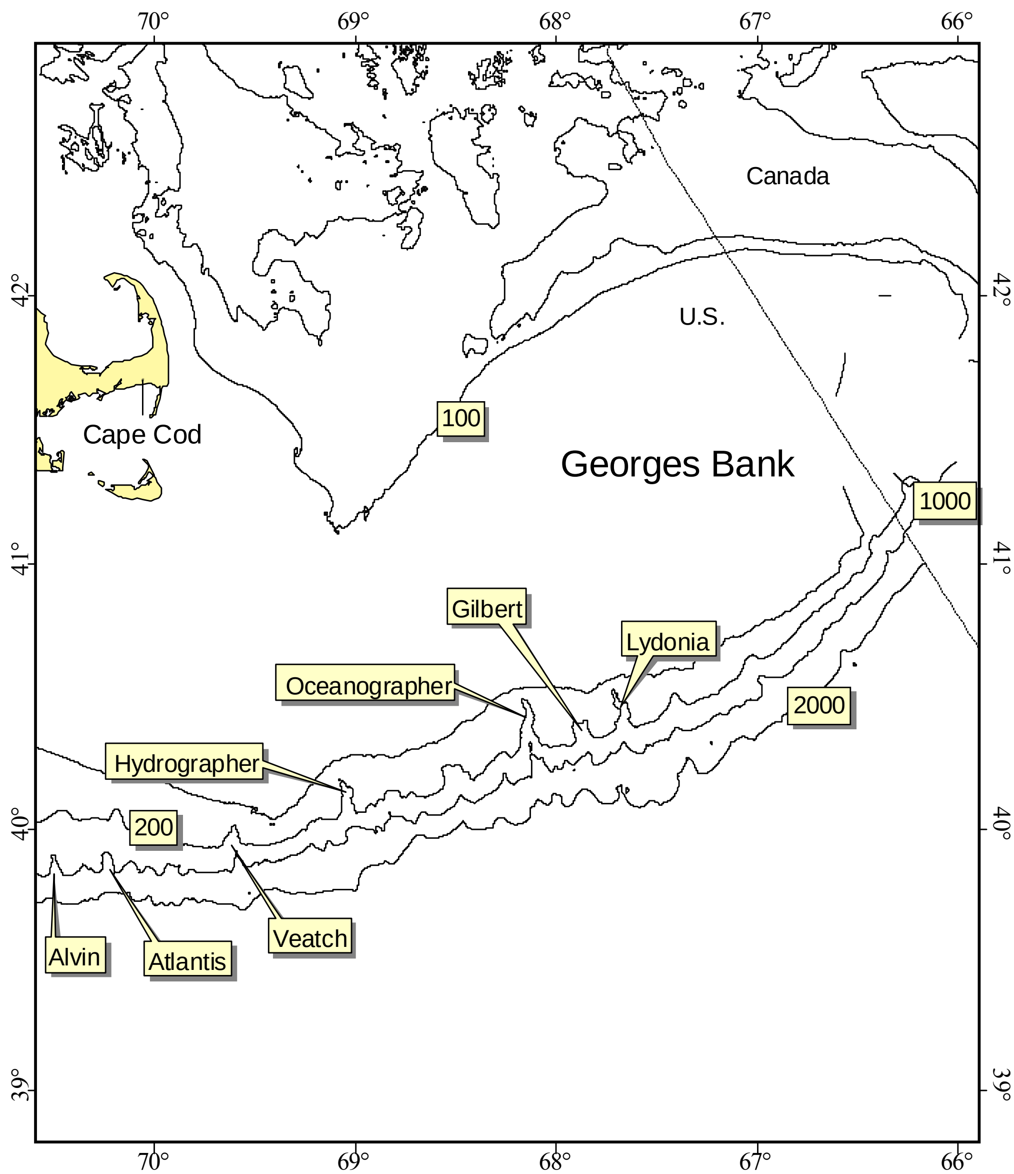
A “mud line” occurs on the slope at a depth of 250 - 300 m, below which fine silt and clay-size particles predominate (Figure 8). Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope because of glacial rafting. Sand pockets may also 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).

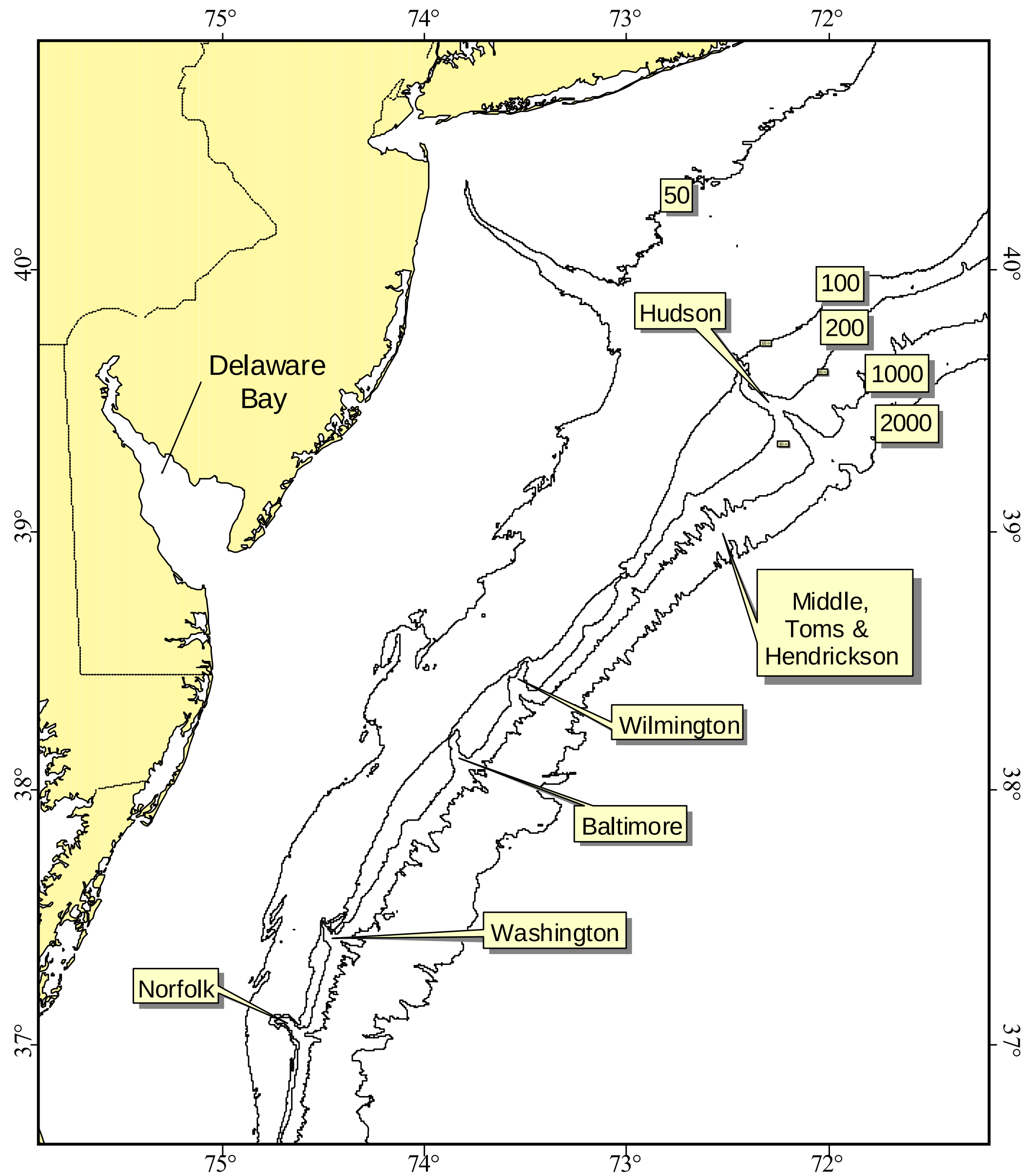
Canyons can alter the physical processes in the surrounding slope waters. Fluctuations in the velocities of the surface and internal tides can be large near the heads of the canyons, leading to enhanced mixing and sediment transport in the area. Shepard *et al.* (1979) concluded that the strong turbidity currents initiated in study canyons were responsible for enough sediment erosion

Figure 16 - Principal submarine canyons on southern flank of Georges Bank. Depths in meters.



•

Figure 17 - 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.

5.1.4.2 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 25).

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).

5.1.4.3 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 26). 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 26 - 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 27 -

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.

5.1.5 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 28 - 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	10 - 150	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	< 50	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	10 - 130	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	GOME and GB	18 - 2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	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

5.1.6 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 (changes are always permanent 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 (changes may be permanent 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 (changes are not likely to be permanent);

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 (changes are not likely to be permanent).

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

5.1.6.1 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.

5.1.6.1.1 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.

5.1.6.1.2 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.

5.1.6.2 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.

5.1.6.2.1 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.

5.1.6.2.2 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.

5.1.6.3 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.

5.1.6.3.1 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.

5.1.6.3.2 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.

5.1.6.4 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.

5.1.6.4.1 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.

5.1.6.4.2 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.

5.1.6.5 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.

5.1.6.5.1 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.

5.1.6.5.2 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.

5.1.6.6 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.

5.1.6.6.1 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.

5.1.6.7 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.

5.1.6.7.1 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.

5.1.6.7.2 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.

5.1.6.8 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.

5.1.7 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/.

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.

5.1.7.1 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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 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 (Colette and Klein-MacPhee 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; Collete and Klein-MacPhee 2002). Hatching may take 3 to 9 months depending on temperature (Collete and Klein-MacPhee 2002).

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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 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 (Collete and Klein-MacPhee 2002; Pavlov and Novikov 1993). Fasting does occur for several months while replacing teeth, spawning and nest guarding occurs (Collete and Klein-MacPhee 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.

5.1.8 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 29). A total of thirteen stocks were overfished (B less than ½ B_{MSY}) while six stocks were not overfished. Similarly, a total of thirteen stocks were experiencing overfishing (F greater than F_{MSY}) while six 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 experiencing overfishing.

Of the fourteen groundfish stocks assessed in GARM III using an analytical assessment model, seven 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.

Table 29 - 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.

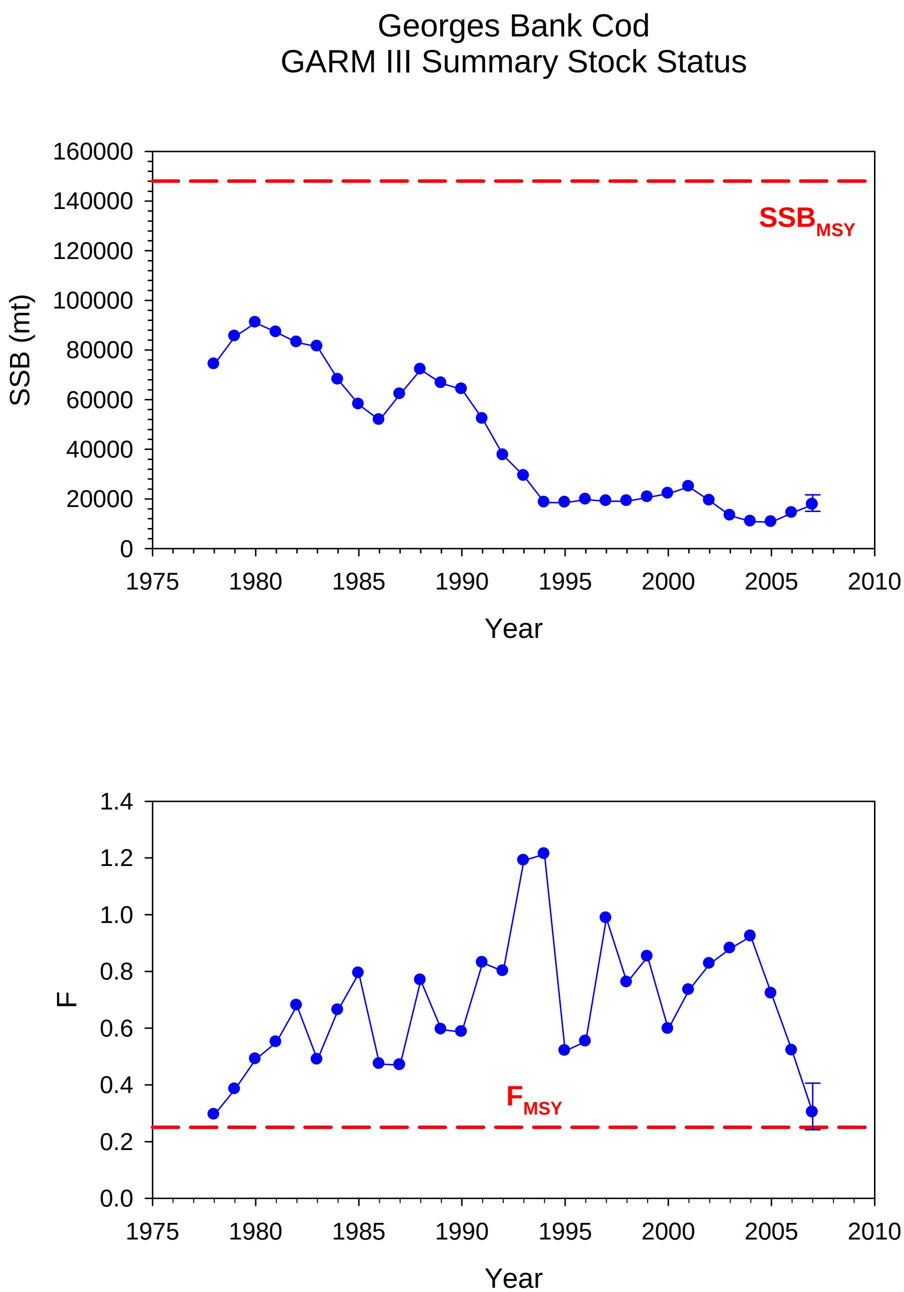
[2] GARM III values are equal to the catch in 2007 / average 2006 & 2007 indices (Updated relative F using the average of 2005, 2006 & 2007 is 6.64).

[3] Index point estimates are in the table. Status determination is made using the 3 year average (pollock = 1.42, 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.

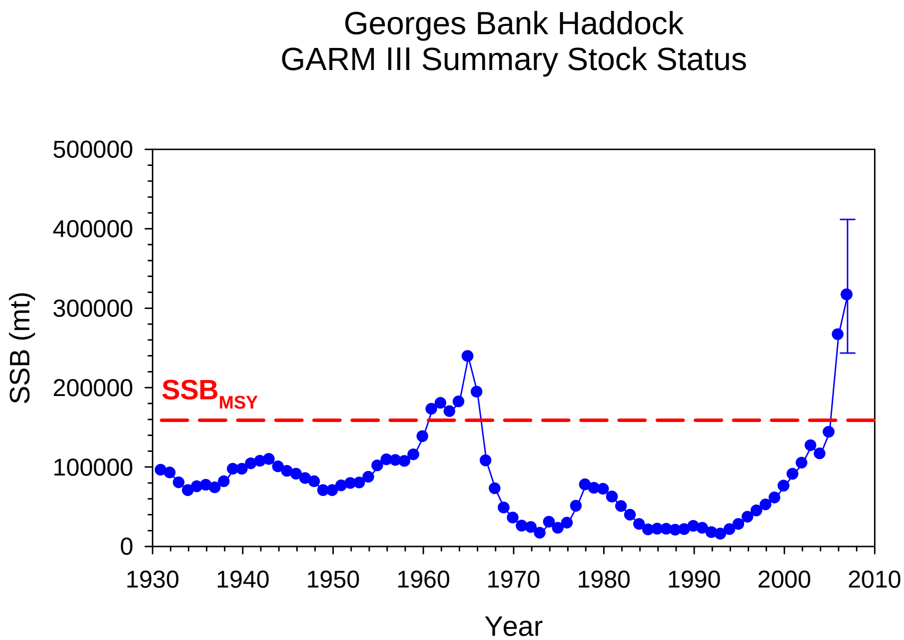
A. Georges Bank cod was overfished and was experiencing overfishing in 2007. Spawning biomass has remained low since 1994. Fishing mortality has been decreasing since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

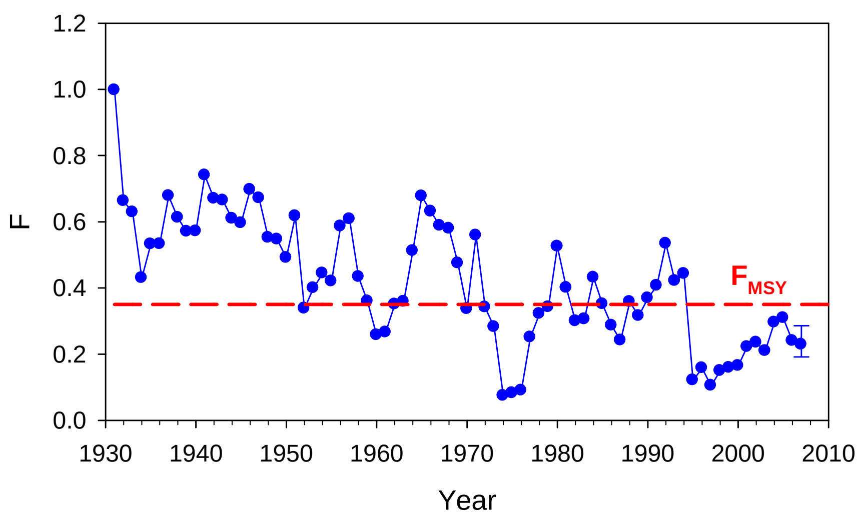
Figure 18 - Georges Bank cod spawning stock biomass (SSB) and fishing mortality (F) estimates during 1978-2007 reported in GARM III along with 80% confidence intervals for 2007 estimates.



B. Georges Bank haddock was not overfished and was not experiencing overfishing in 2007.
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 19 - 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.

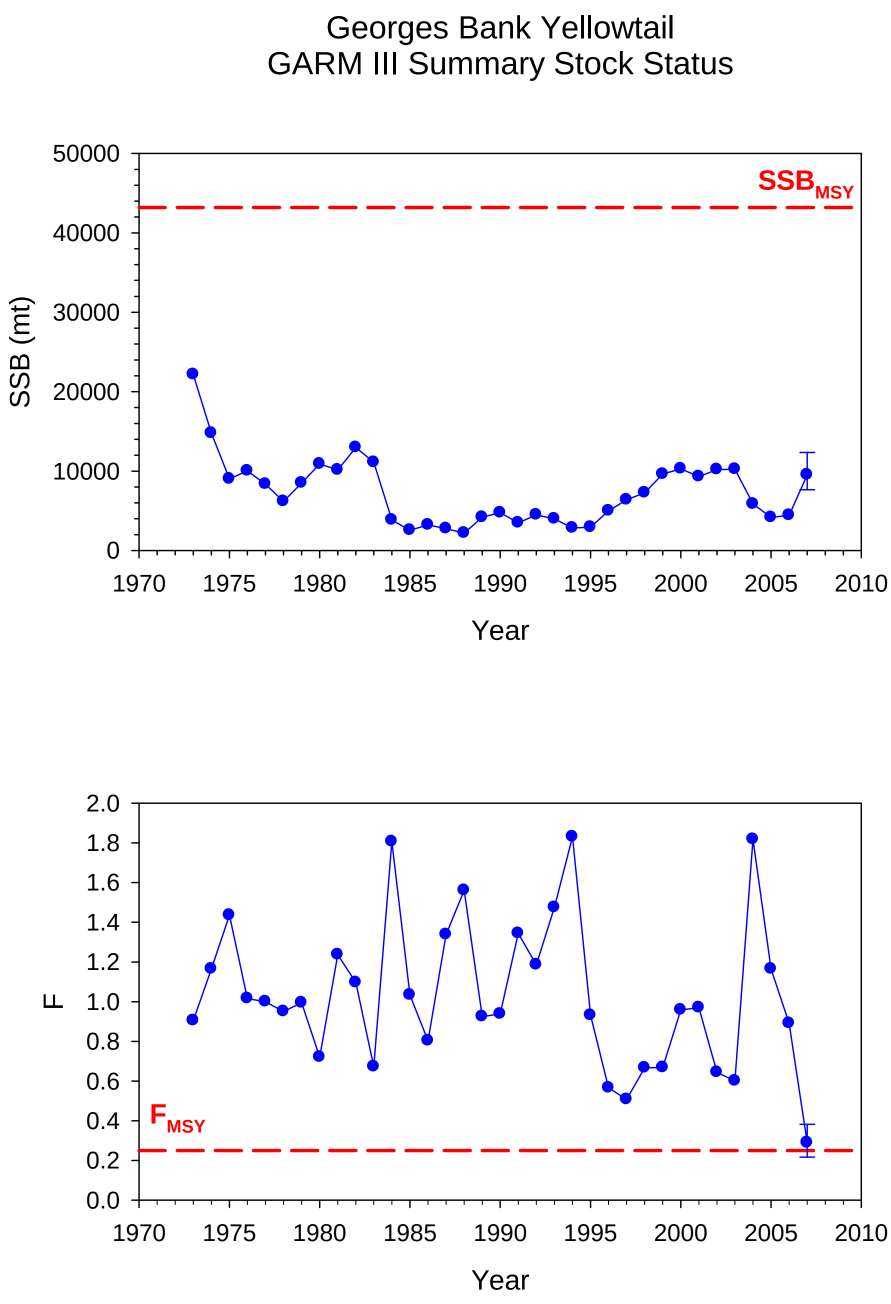




C. Georges Bank yellowtail flounder was overfished and was experiencing overfishing in 2007.
Spawning biomass has been relatively low since 1984. There has been a slight increase in

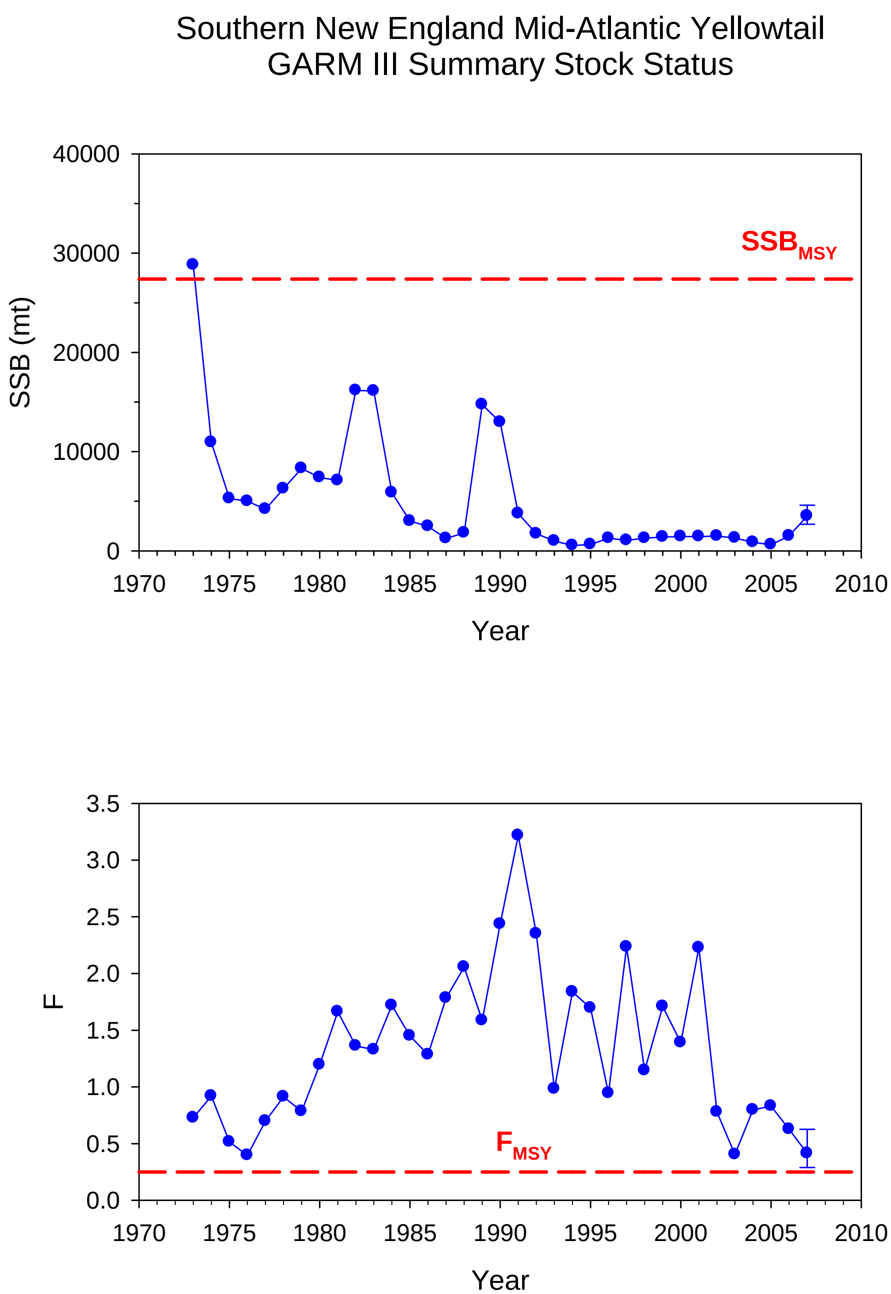
spawning biomass since the late 1980s. Fishing mortality has had a decreasing trend since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 20 - 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.



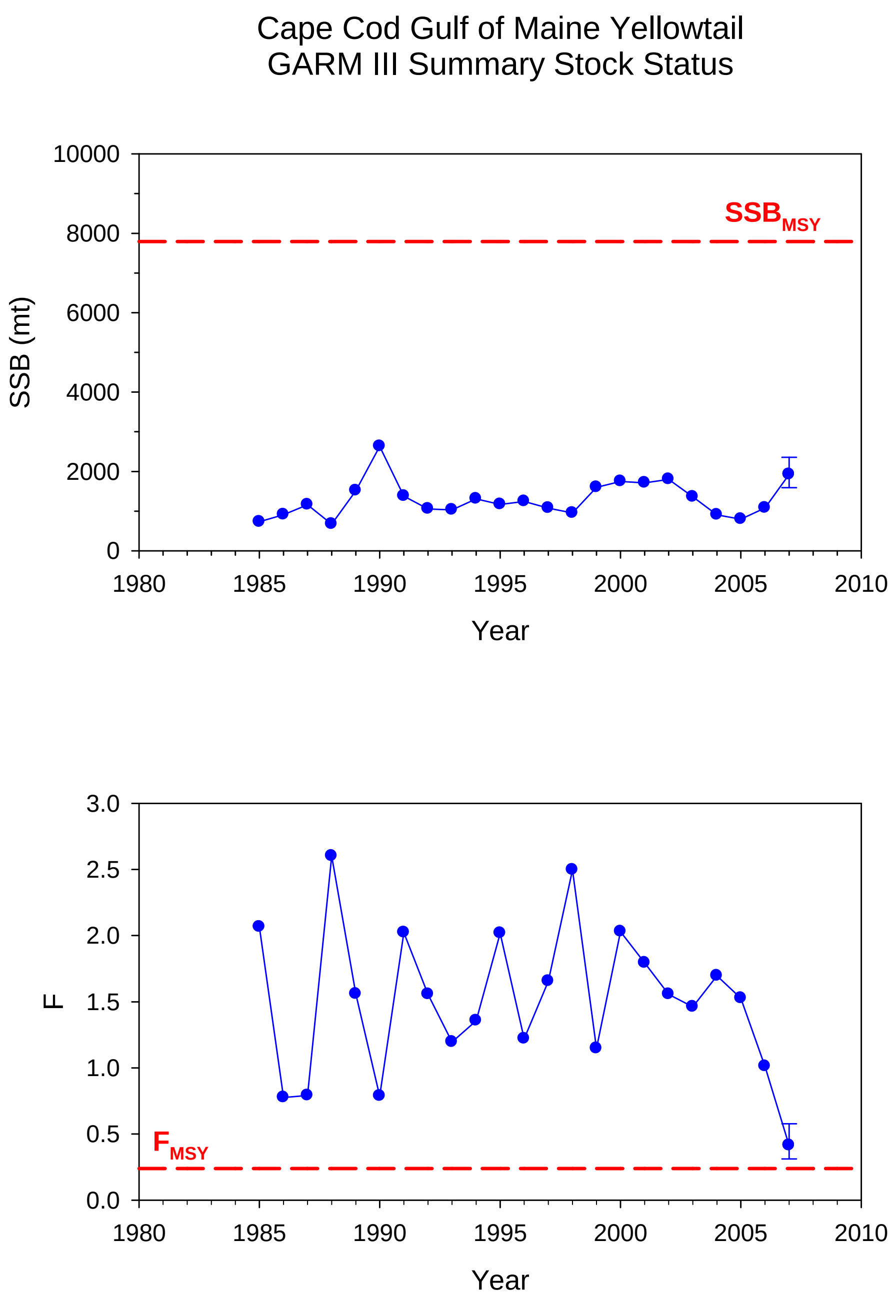
D. Southern New England/Mid-Atlantic yellowtail flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has been low since 1991. There are some signs of rebuilding from a strong 2005 year class. Fishing mortality has had a decreasing trend since 2001 but remains slightly above F_{MSY}. No retrospective adjustment was made for SNE/Mid-Atlantic yellowtail flounder.

Figure 21 - 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.



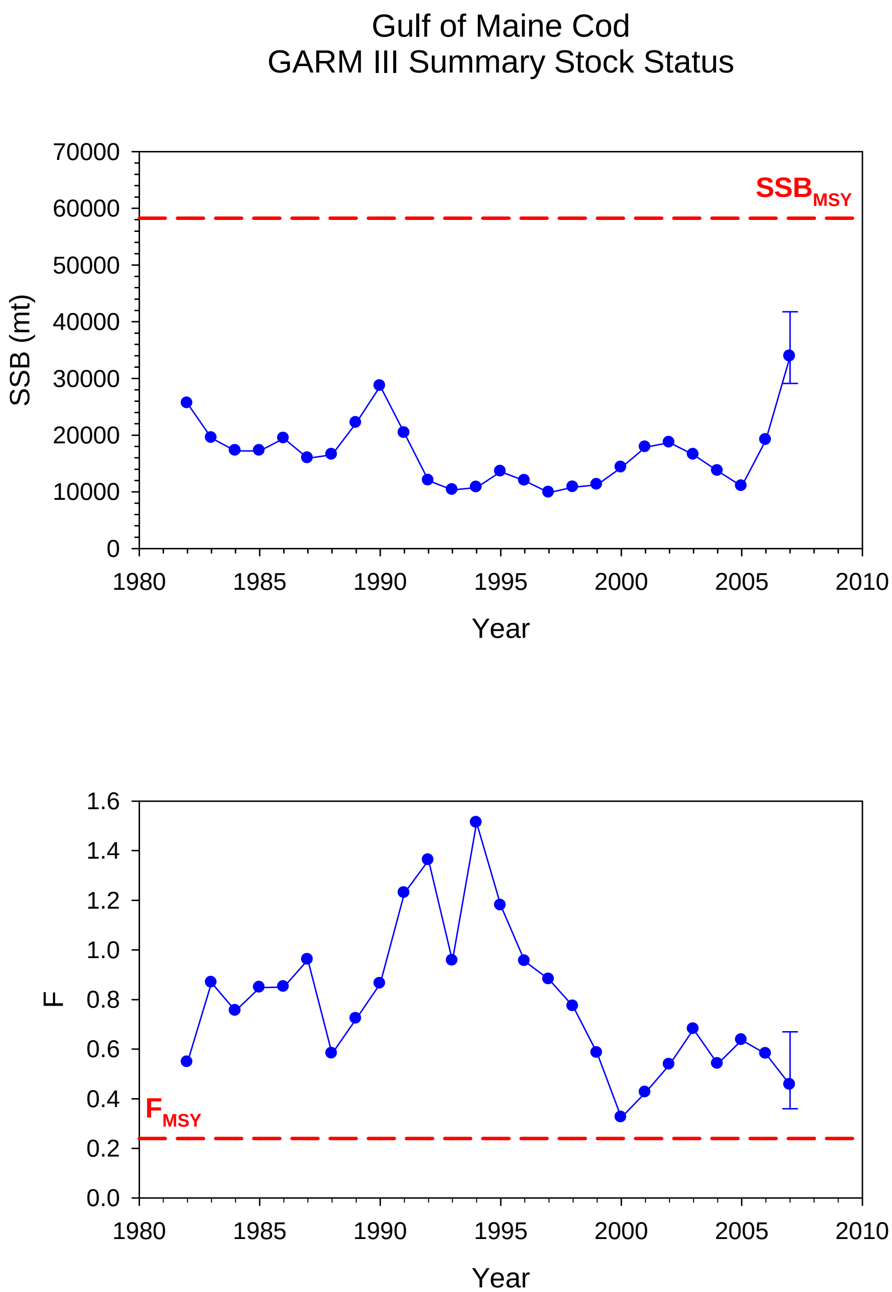
E. Cape Cod/Gulf of Maine yellowtail flounder was overfished and was experiencing overfishing in 2007. Spawning biomass been relatively low over the time series. There appears to be a moderately strong 2005 year class. Fishing mortality has decreased since 2004. No retrospective adjustment was made for Cape Cod/Gulf of Maine yellowtail flounder.

Figure 22 - 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.



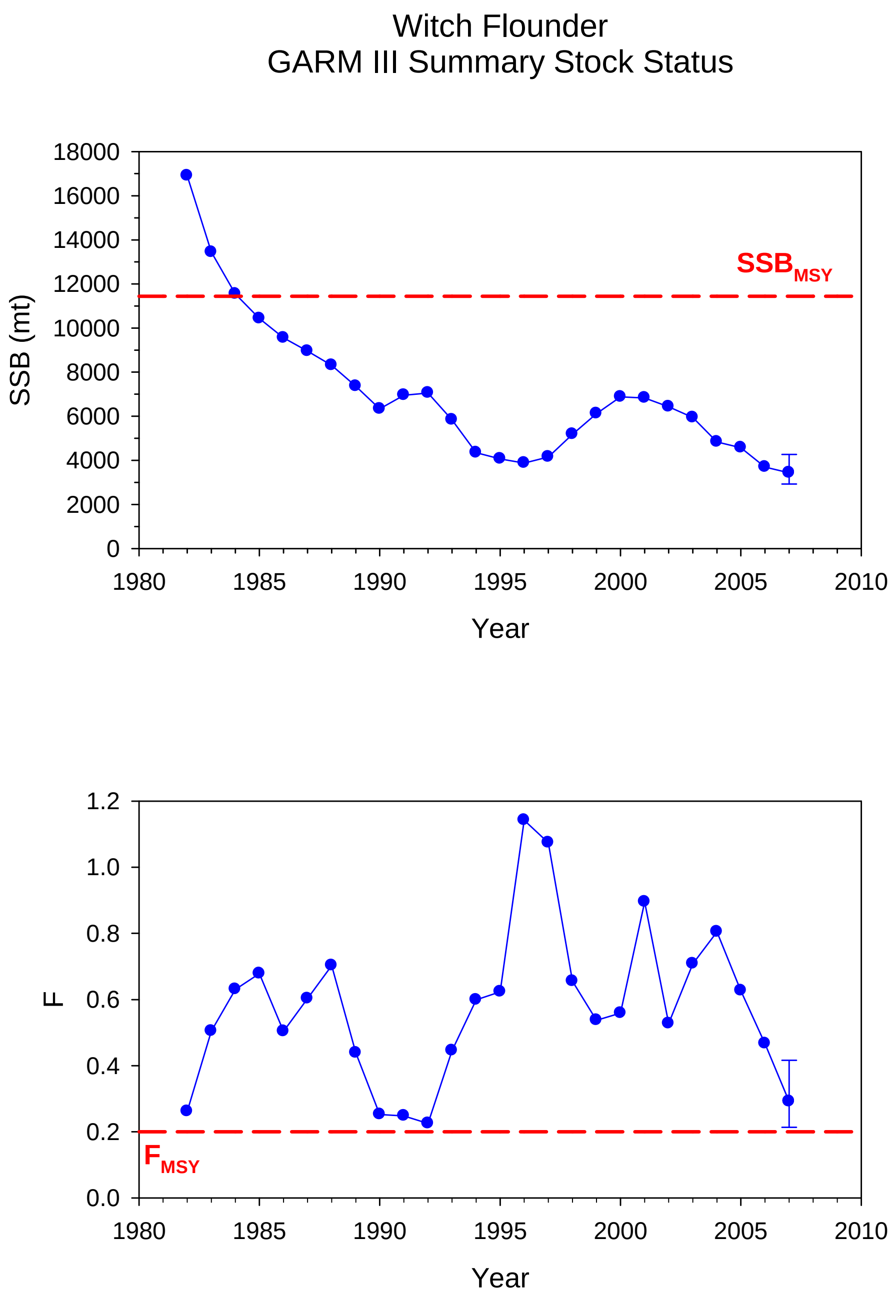
F. Gulf of Maine cod was not overfished but was experiencing overfishing in 2007. Spawning biomass increased in 2006 and 2007. An above average 2005 year class was estimated. Fishing mortality decreased from 1994 to 2000 but has remained above F_{msy} since then. No retrospective adjustment was made for Gulf of Maine Cod.

Figure 23 - 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.



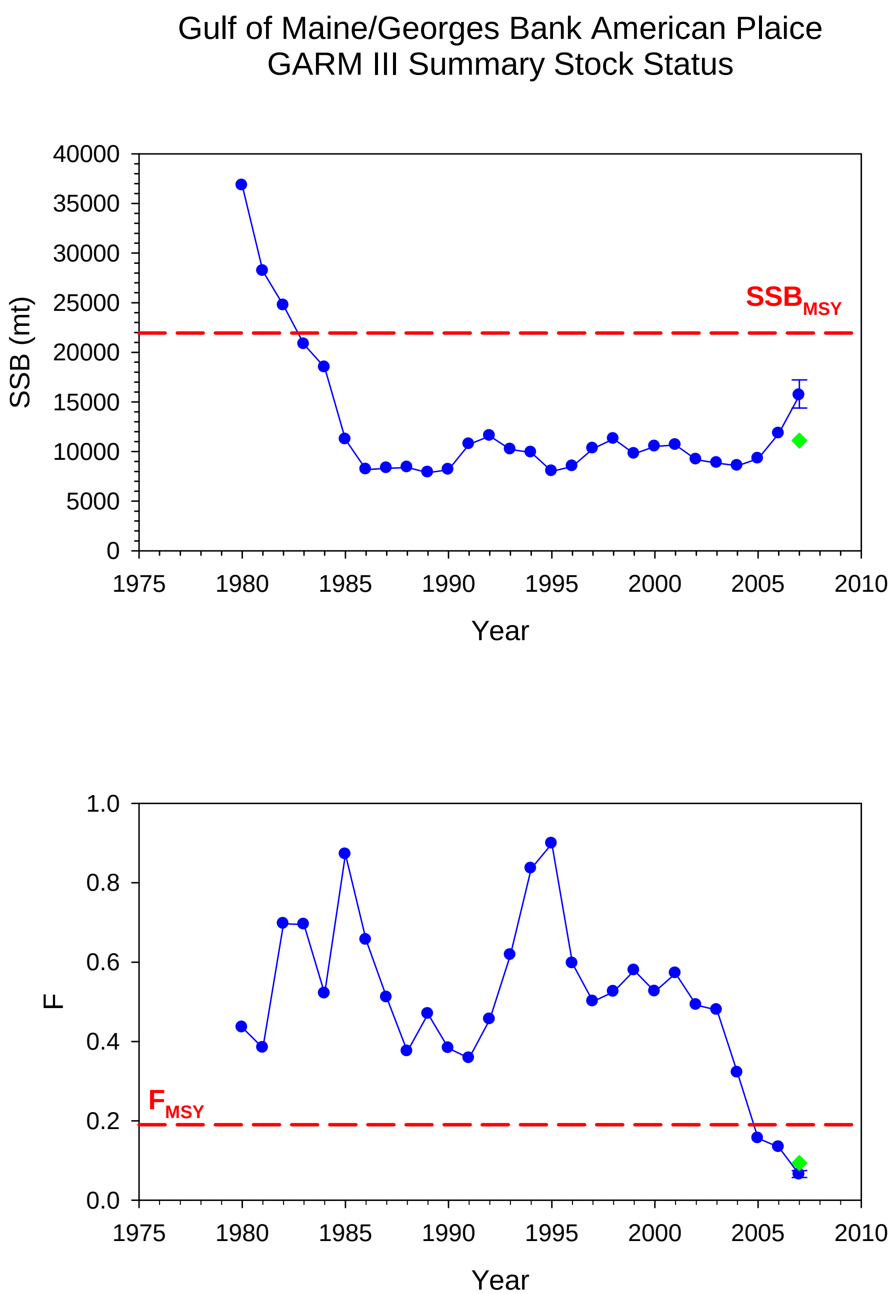
G. Witch flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has declined since 2001 to a record low in 2007. Fishing mortality has decreased since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 24 - 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.



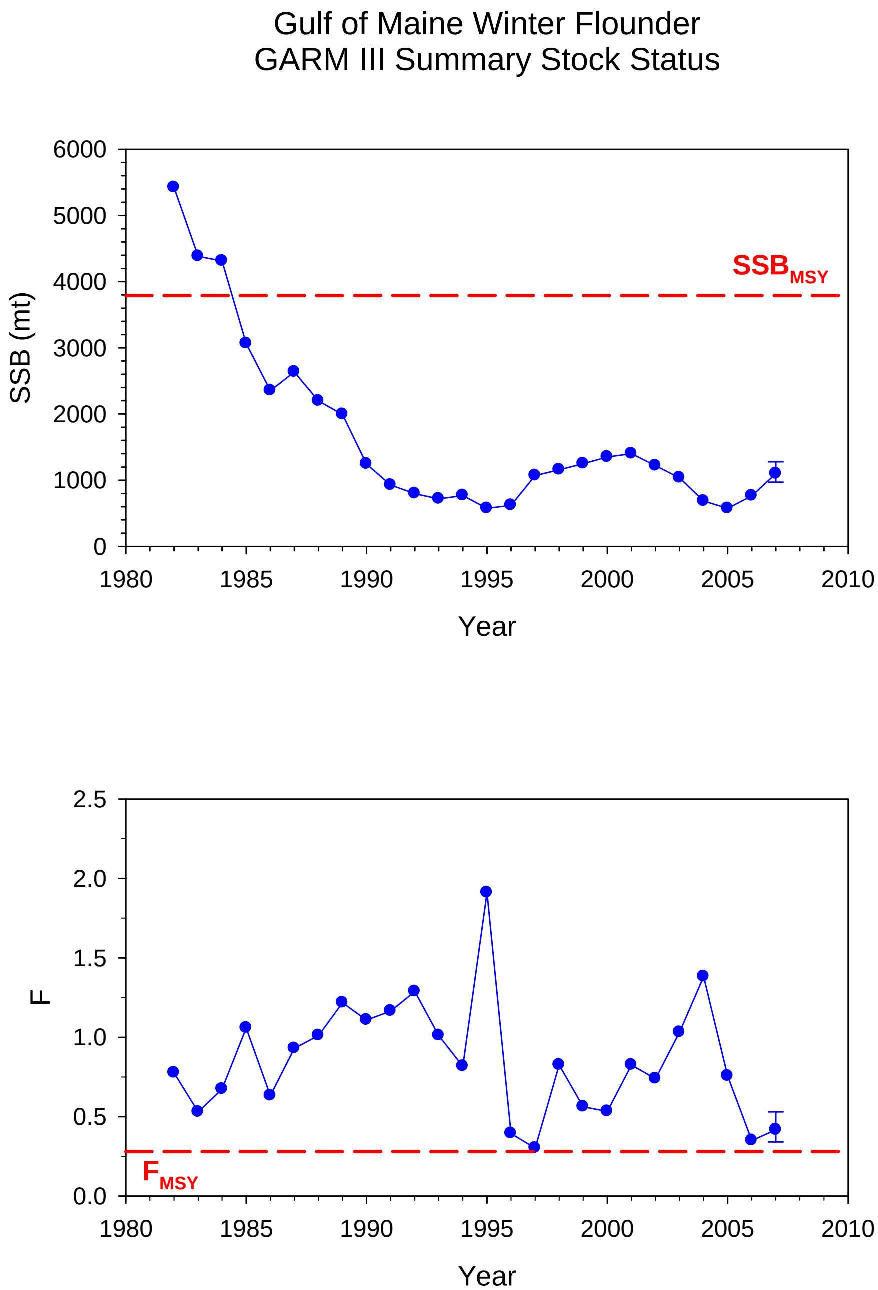
<u>H. American plaice was not overfished and was not experiencing overfishing in 2007.</u> Spawning biomass has been low with a slight increasing trend since 1986. Fishing mortality has had a decreasing trend since 1995. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 25 - 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.



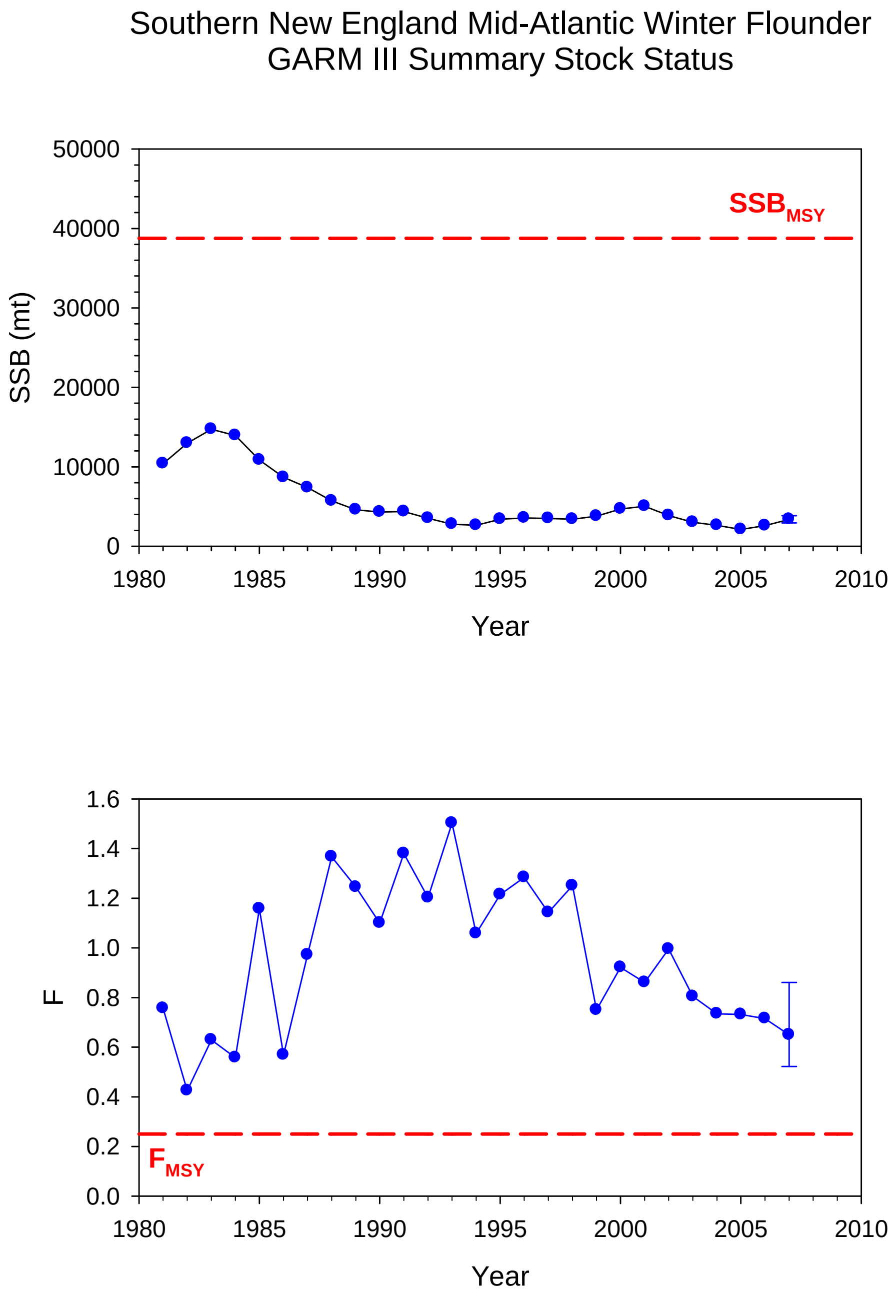
<u>I. Gulf of Maine winter flounder status determination is unknown.</u> Status determination from the split survey run suggests the stock is overfished and overfishing is occurring in 2007. Exact status determination was unknown due to the severity of the retrospective pattern and the magnitude of the change with a retrospective adjustment. However SSB appears to be well below B_{msy} and fishing mortality is likely above F_{msy}.

Figure 26 - 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.



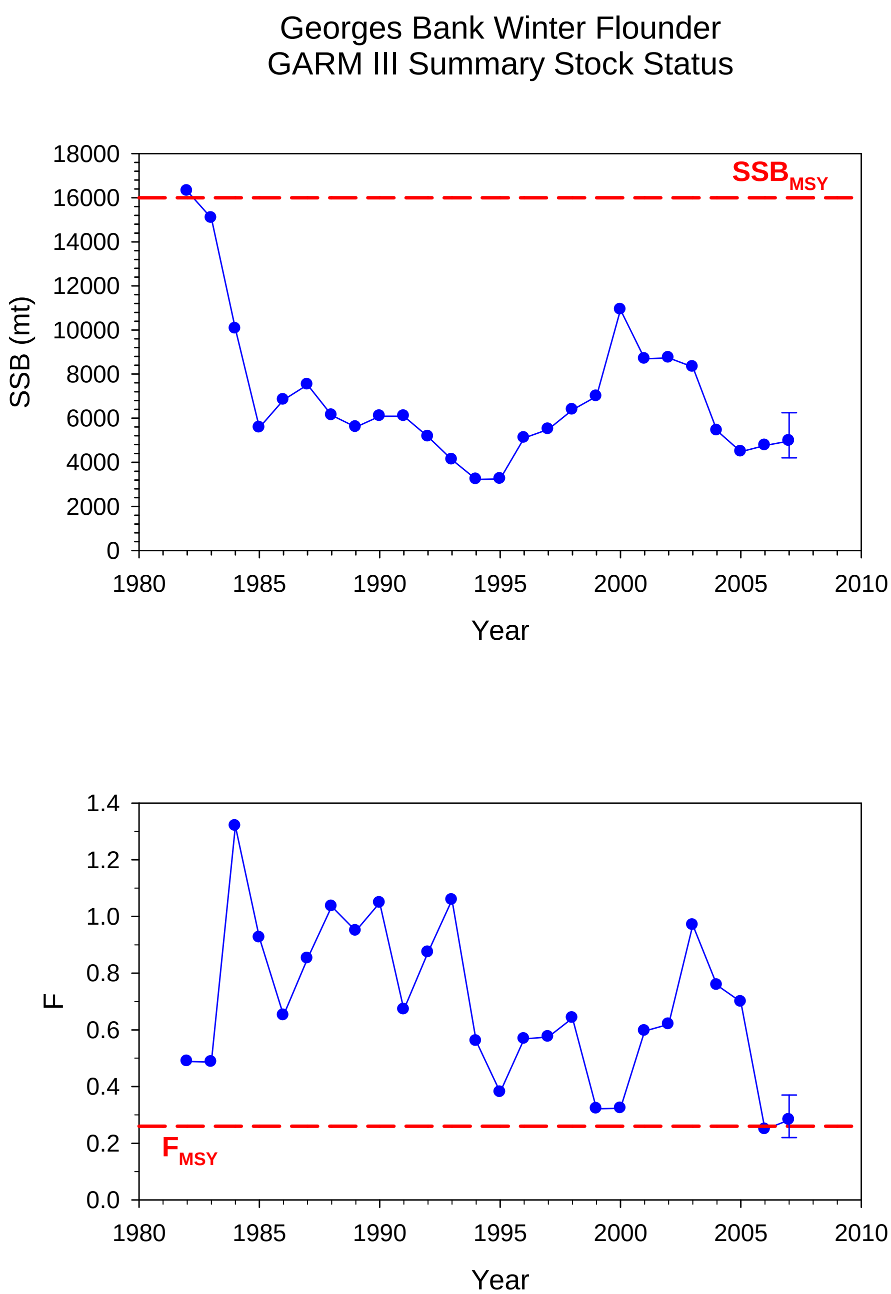
J. Southern New England/Mid-Atlantic winter flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has been very low since the late-1980s. Fishing mortality has been declining since 1993 but remain well above F_{msy}. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 27 - 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.



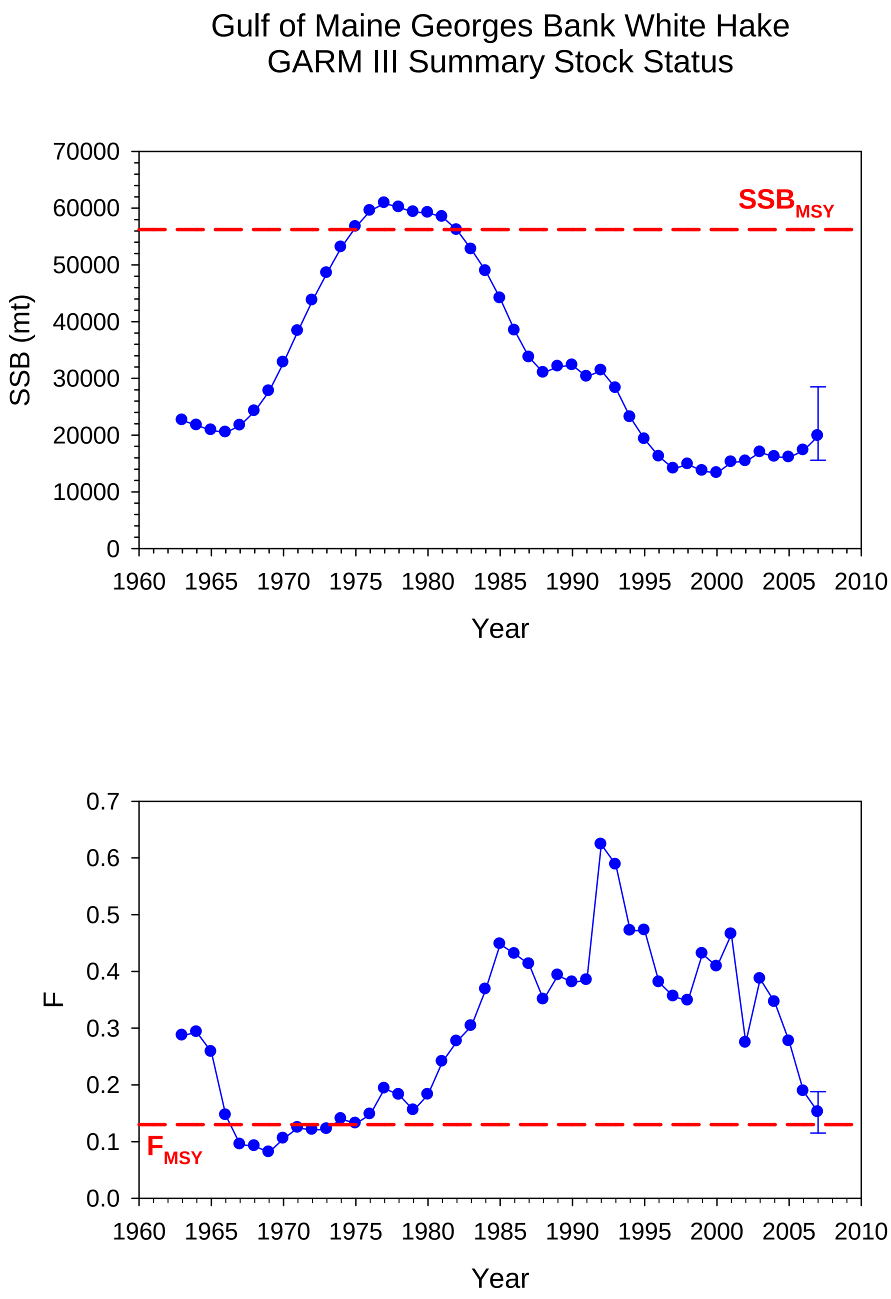
K. Georges Bank winter flounder was overfished and was experiencing overfishing in 2007. Spawning Biomass has declined since 2000. Fishing mortality declined from 2003 but was just above F_{msy} in 2007. No retrospective adjustment was made for Georges Bank winter flounder.

Figure 28 - 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.



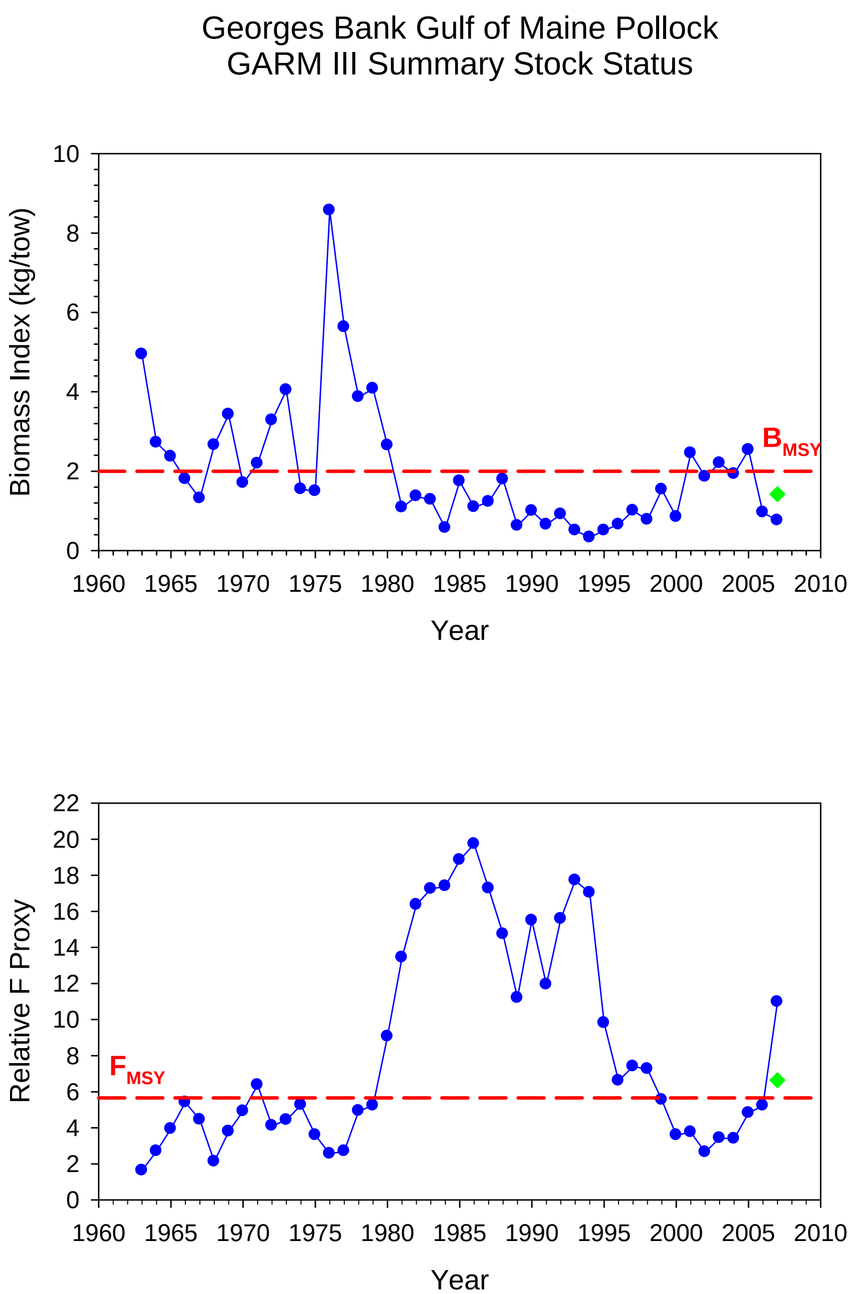
L. White hake was overfished and was experiencing overfishing in 2007. Biomass increased slightly during 2000-2007. Fishing mortality has declined since 2003. No retrospective adjustment was made for white hake.

Figure 29 - Georges Bank/Gulf of Maine white hake spawning stock biomass (SSB) and fishing mortality rate (F) during 1963-2007 reported in GARM III.



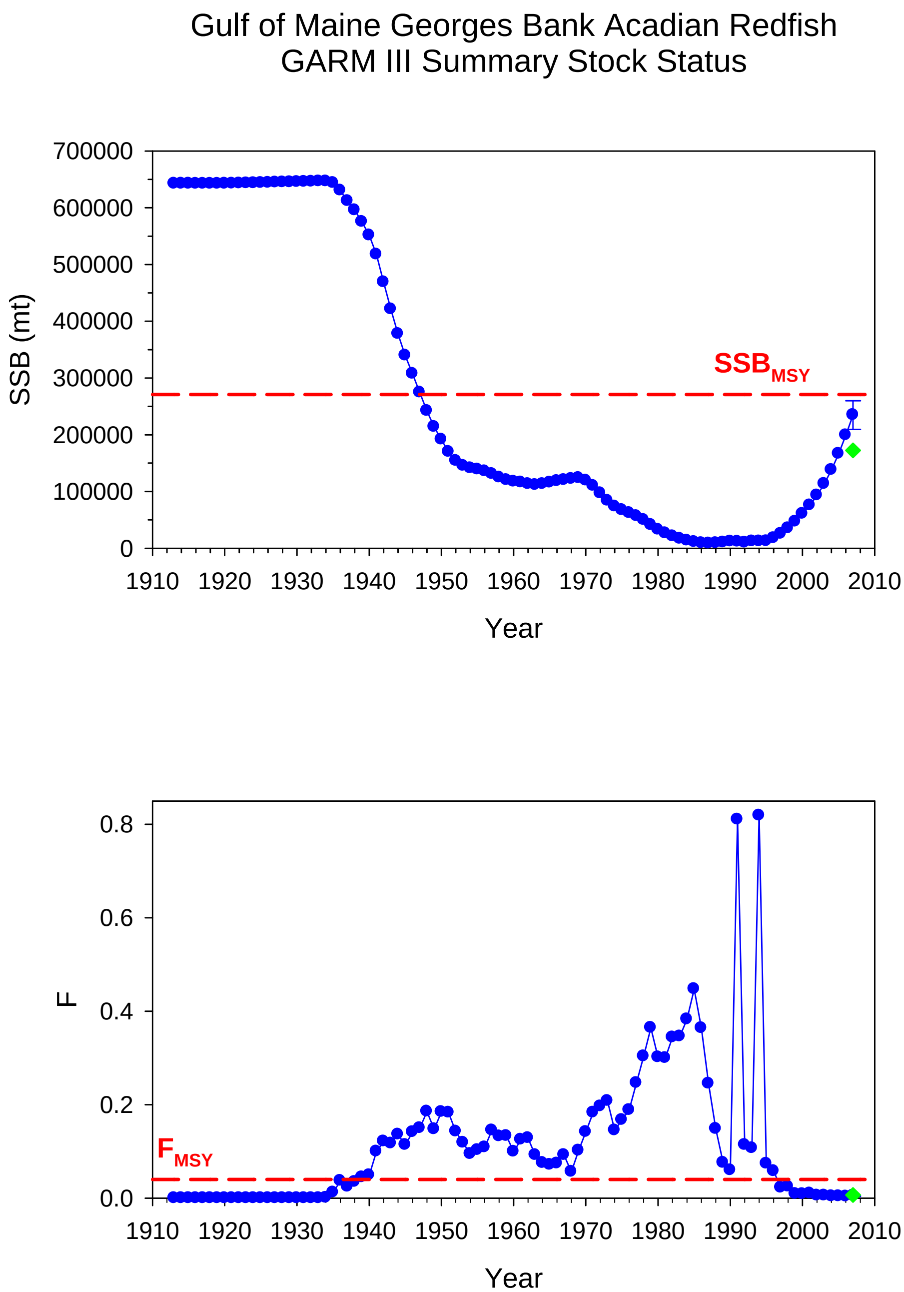
M. Pollock was not overfished and was experiencing overfishing in 2007. Biomass index has decreased since 2005. Biomass status determination is made using the three year moving average of the biomass index. Relative Fishing mortality has increased since 2002.

Figure 30 - Georges Bank/Gulf of Maine pollock biomass index (B) and relative exploitation rate (F) during 1963-2007 reported in GARM III. Status determination is based on the three year average plotted with a green diamond.



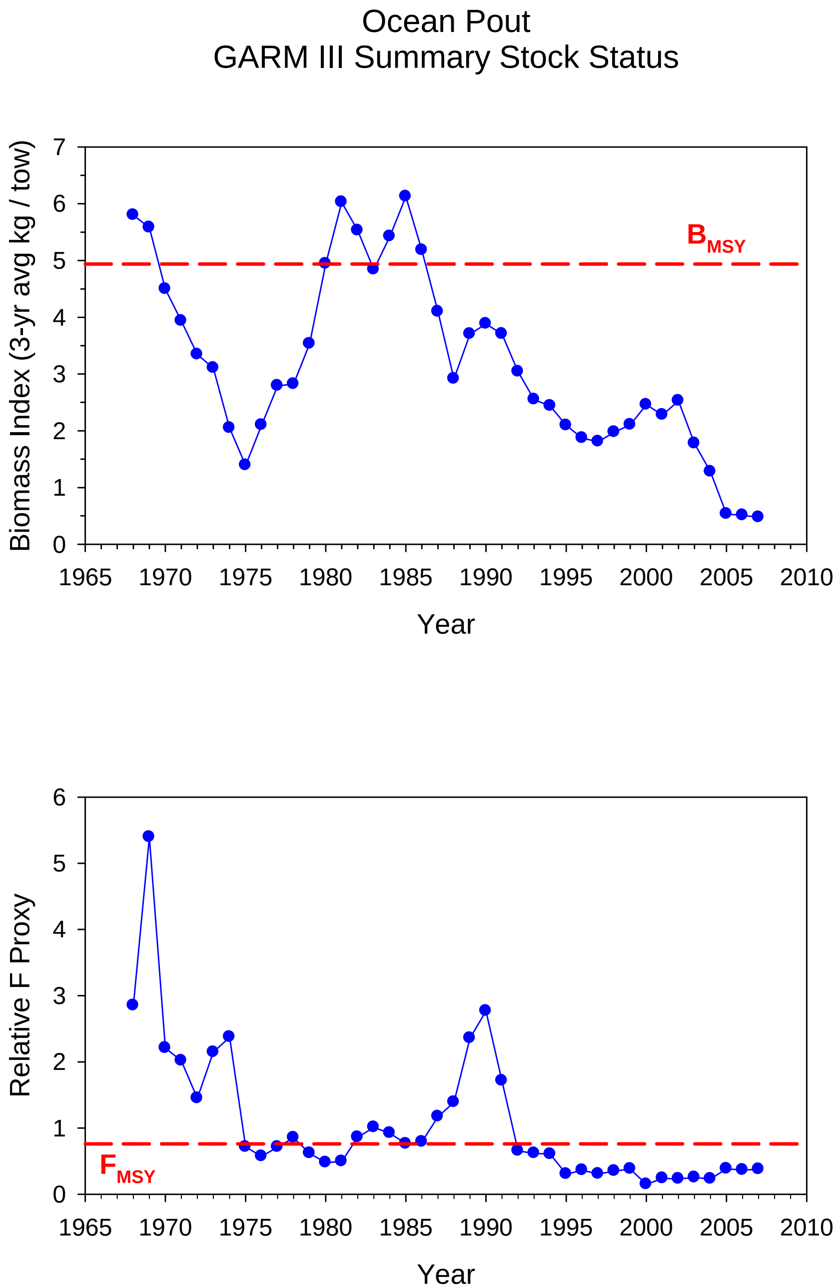
N. Acadian redfish was not overfished and was not experiencing overfishing in 2007. Spawning biomass has increased substantially since the mid-1990s. Fishing mortality has been below F_{msy} since 1997. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 31 - 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.



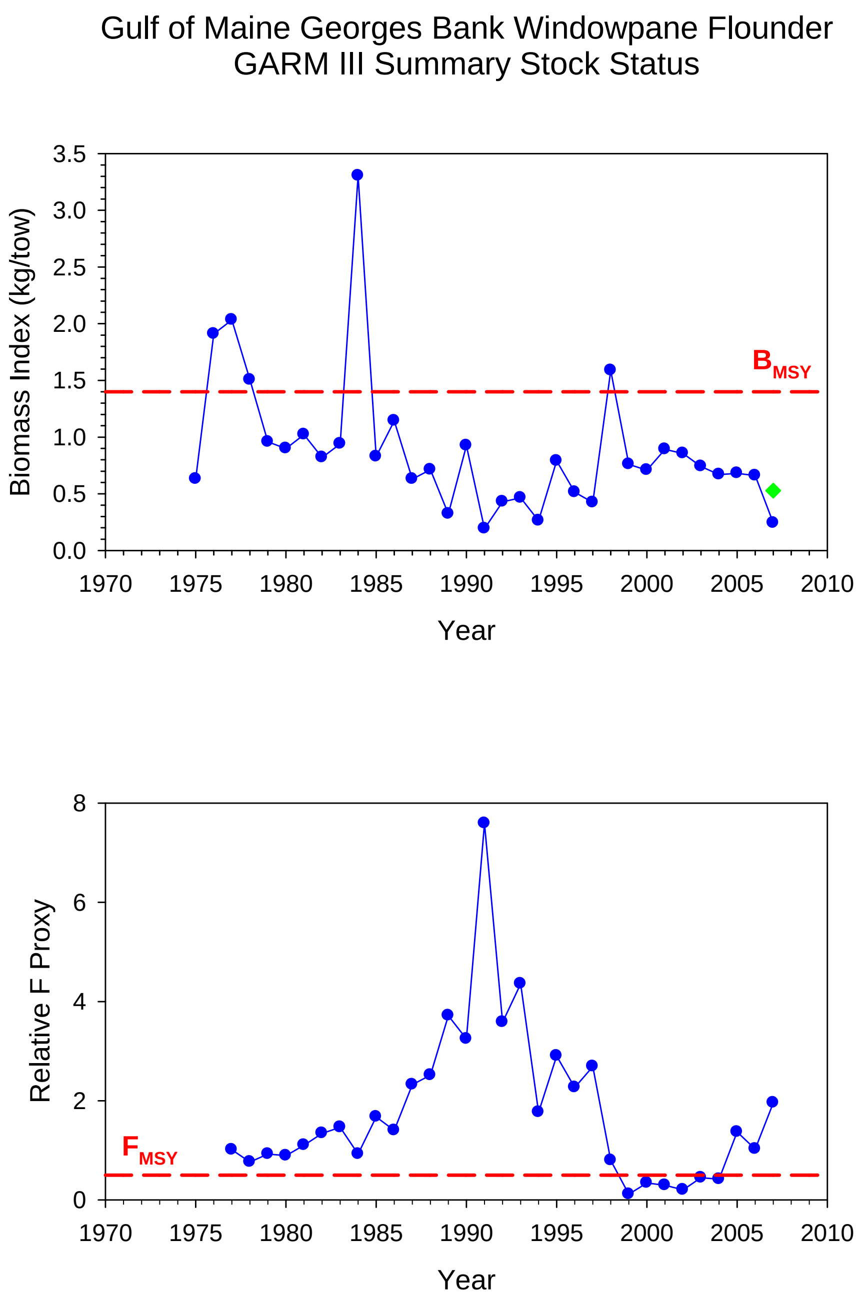
O. Ocean pout was overfished and was not experiencing overfishing in 2007. Biomass has had a decreasing trend since 2002. Fishing mortality has been well below F_{msy} since 1992. There are no signs of stock rebuilding despite that fishing mortality is relatively low.

Figure 32 - Ocean pout biomass index (B) and relative exploitation rate (F) during 1968-2007 reported in GARM III.



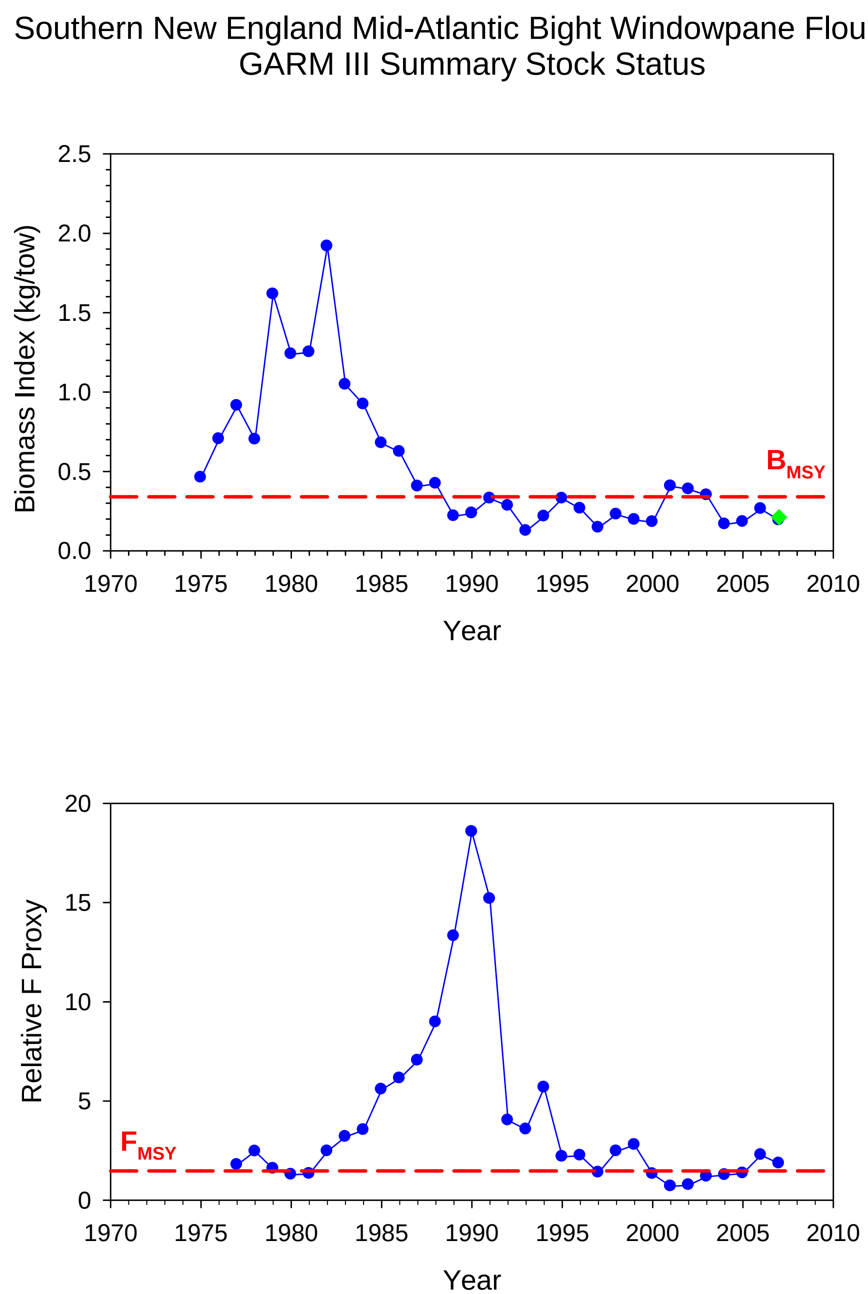
P. Northern windowpane flounder was overfished and was experiencing overfishing in 2007. Biomass has decreased since 2001. Fishing mortality has been increasing since 2002.

Figure 33 - 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.



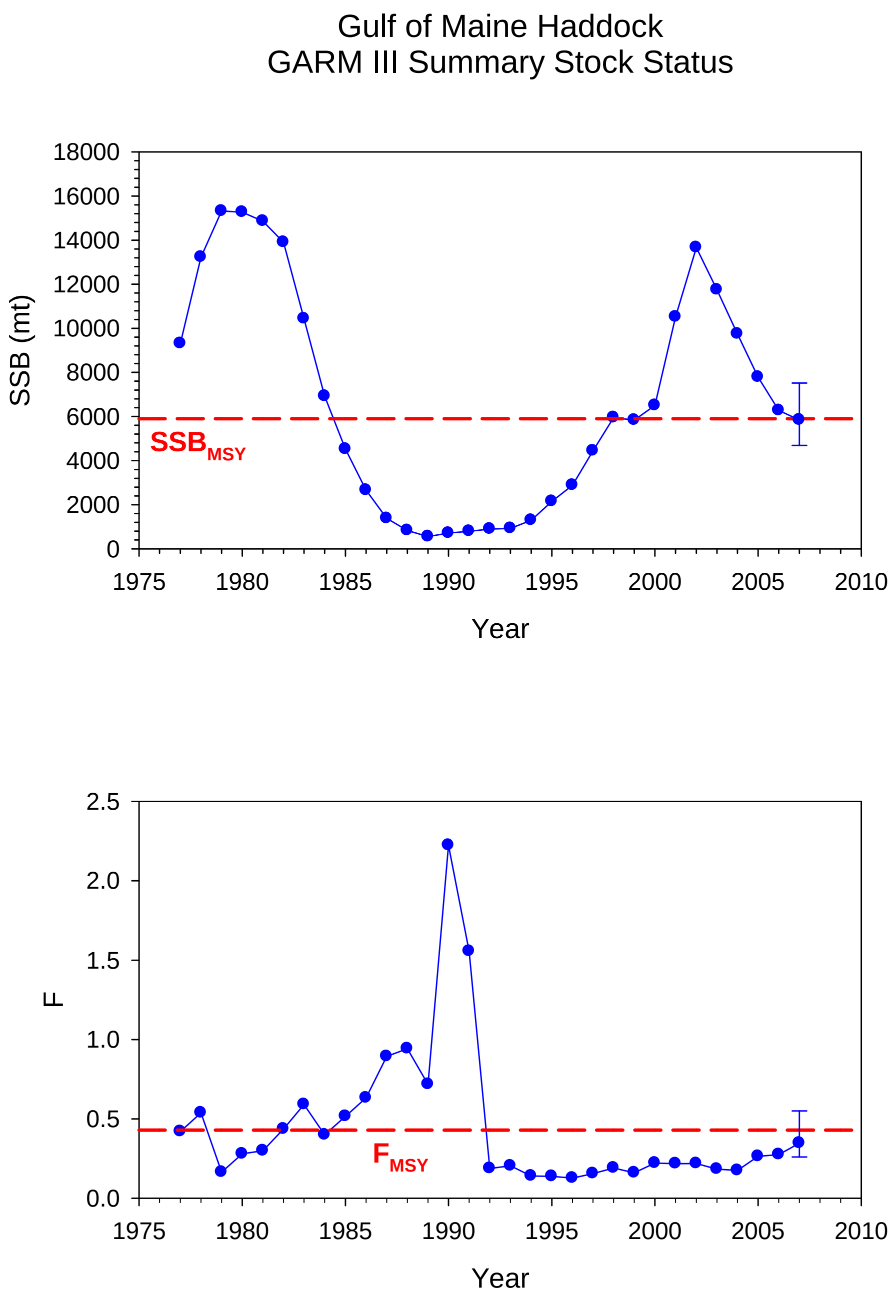
Q. Southern windowpane flounder was not overfished and was experiencing overfishing in 2007. Biomass has been low and fluctuated without trend since the late-1980s. The relative F has increased above F_{msy} in 2006 and 2007.

Figure 34 - 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.



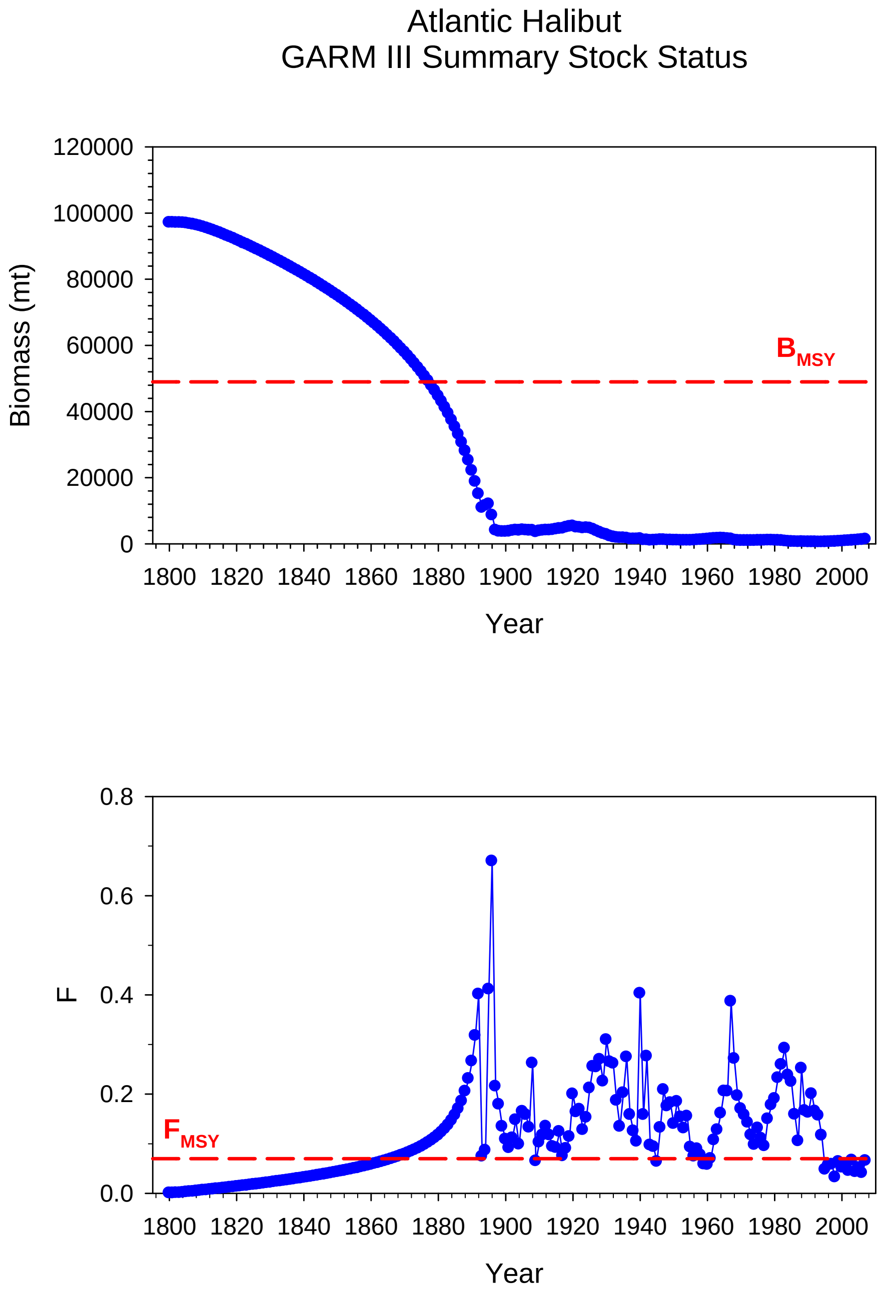
<u>R. Gulf of Maine haddock was not overfished and was not experiencing overfishing in 2007.</u> Spawning biomass increased from 1989 to 2002 and has decreased since then. Fishing mortality has been below F_{msy} since 1992. No retrospective adjustment was made for Gulf of Maine haddock.

Figure 35 - 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 36 - Atlantic halibut biomass (B) and fishing mortality rate (F) during 1800-2007 reported in GARM III.



5.1.9 Marine Mammals and Protected Species

The following protected species are found in the environment utilized by the groundfish fishery. A number of them are listed under the Endangered Species Act of 1973 (ESA) as "endangered" or "threatened", while others are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA). Actions taken to minimize the interaction of the fishery with protected species are described in Section 3.1.1.1 [Background Section mentioning HPRT, ALWTRP, etc.] of this document. Monthly reports of observed incidental takes are available on the NEFSC website at http://www.nefsc.noaa.gov/femad/fishsamp/fsb/.

Cetaceans	***Status***
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
Spotted dolphin (*Stenella frontalis*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Bottlenose dolphin: coastal stocks (*Tursiops truncatus*)	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Seals	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandica*)	Protected
Hooded seal (*Crystophora cristata*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered*
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered

**Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered.*

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 no later than October 1, 2009.

Although salmon belonging to the Gulf of Maine distinct population segment (DPS) of Atlantic salmon occur within the general geographical area covered by the Northreast Multispecies FMP, they are unlikely to occur in the area where the fishery is prosecuted given their numbers and distribution. Therefore, the DPS is not likely to be affected by the groundfish fishery.

It is expected that all of the remaining species identified have the potential to be affected by the operation of the groundfish fishery. However, given differences in abundance, distribution and migratory patterns, it is likely that any effects that may occur, as well as the magnitude of effects when they do occur, will vary among the species. Summary information is provided here that describes the general distribution of cetaceans, pinnipeds, and sea turtles within the management area for the Groundfish FMP as well as the known interactions of gear used in the groundfish fishery with these protected species. Additional background information on the range-wide status of marine mammal and sea turtle species that occur in the area can be found in a number of published documents. These include sea turtle status reviews and biological reports (NMFS and USFWS 2007; Hirth 1997; USFWS 1997; Marine Turtle Expert Working Group (TEWG) 1998 & 2000), recovery plans for Endangered Species Act-listed sea turtles and marine mammals (NMFS 1991; NMFS and USFWS 1991a; NMFS and USFWS 1991b; NMFS and USFWS 1992; NMFS 1998; USFWS and NMFS 1992; NMFS 2005), the marine mammal stock assessment reports (*e.g.*, Waring *et al*. 2006 and 2007), and other publications (*e.g.*, Clapham *et al.* 1999; Perry *et al.* 1999; Wynne and Schwartz 1999; Best *et al.* 2001; Perrin *et al*. 2002). Additionally, the Center for Biological Diversity and the Turtle Island Restoration Network has recently filed a petition to reclassify loggerhead turtles in the North Pacific Ocean as a distinct population segment (DPS) with endangered status and designate critical habitat under the ESA (72 *Federal Register* 64585; November 16, 2007). While this petition is geared toward the North Pacific, the possibility exists that it could affect status in other areas. NMFS has found that the petition presents substantial scientific information that the petition action may be warranted, and has published a notice and request for comments, available at: http://www.nmfs.noaa.gov/pr/pdfs/fr/fr72-64585.pdf.

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. 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).

Sea turtles are known to be captured in gillnet and trawl gear; gear types that are used in the groundfish fishery. According to the monthly reports on the NEFSC website for March 2006 – February 2008, one loggerhead turtle was taken in observed groundfish trips by a bottom trawl, and none were observed in sink gillnets.

Large Cetaceans (Baleen Whales and Sperm Whale)
The western North Atlantic baleen whale species (Northern right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf of 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. 2007). 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).

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*. 2005). However, sperm whales distribution in U.S. EEZ waters also occurs in a distinct seasonal cycle (Waring *et al*. 2007). 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*. 2005). 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).

Right whales and sei whales feed on copepods (Horwood 2002; Kenney 2002). The groundfish fishery will not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that will pass through groundfish fishing gear rather than being captured in it. Blue whales feed on euphausiids (krill) (Sears 2002) which, likewise, are too small to be captured in groundfish fishing gear. 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). Fish species caught in groundfish 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. Sperm whales feed on larger organisms that inhabit the deeper ocean regions (Whitehead 2002). The groundfish fishery does not operate in these deep water areas.

The groundfish fishery does not operate in low latitude waters where calving and nursing occurs for these large cetacean species (Aguilar 2002; Clapham 2002; Horwood 2002; Kenney 2002; Sears 2002; Whitehead 2002).

Gillnet gear is known to pose a risk of entanglement causing injury and death to large cetaceans. Right whale, humpback whale, and minke whale entanglements in gillnet gear have been documented (Johnson *et al*. 2005; Waring *et al*. 2007). However, it is often not possible to attribute the gear to a specific fishery. For the period March 2006 – February 2008, five incidents of whale takes were observed on trips targeting groundfish, all of which were taken in bottom trawl trips. Of those five takes, four were of whales that were in various states of decomposition, while one pilot whale was deemed "fresh". No takes were observed in groundfish sink gillnets.

Small Cetaceans (Dolphins, Harbor Porpoise and Pilot Whale)
Numerous small cetacean species (dolphins, pilot whales, 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). Information on the western North Atlantic stocks of each species is summarized in Waring *et al*. (2007). Small cetaceans are known be captured in gillnet and trawl gear, although the rate of bycatch of harbor porpoise in trawl gear is so low as to be considered 0 (Waring *et al*. 2007).

With respect to harbor porpoise specifically, the most recent Stock Assessment Reports show that the estimated number of harbor porpoise takes is increasing, moving closer to the Potential Biological Removal level calculated for this species rather than declining toward the long-term Zero Mortality Rate Goal (ZMRG), which is 10 percent of PBR (approximately 75 animals). The most recent stock assessment report states that the average annual estimated harbor porpoise mortality and serious injury in the Northeast sink gillnet fishery during 1994-1998, before the Harbor Porpoise Take Reduction Plan (HPTRP), was 1,163, and from 2000 to 2004 was 450 (Waring *et al.*, 2007). Observer information collected from January 2005 to June 2006 has indicated an increase in porpoise bycatch throughout the geographic area covered by the HPTRP in both the Gulf of Maine and Mid-Atlantic regions. The Harbor Porpoise Take Reduction Team is currently developing options to reduce takes.

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). Grey 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*. 2007). Pupping colonies for both species are also present in New England, although the majority of pupping occurs in Canada. Harp and hooded seals are less commonly observed in U.S. EEZ waters. Both species form aggregations for pupping and breeding off of eastern Canada in the late winter/early spring, and then travel to more northern latitudes for molting and summer feeding (Waring *et al*. 2007). However, individuals of both species are also known to travel south into U.S. EEZ waters and sightings as well as strandings of each species have been recorded for both New England and Mid-Atlantic waters (Waring *et al*. 2007). All four species of seals are known to be captured in gillnet and/or trawl gear (Waring *et al*. 2007).

5.2 Human Communities and the Fishery

5.2.1 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 XXX, "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 5.2.2 - 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 5.2.4 - 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 5.2.5 - 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.

5.2.2 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 5.1.6.

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 30). 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 30 – 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**

5.2.2.1 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.

5.2.2.2 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.

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 31). 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 32). 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 33. 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 34 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 31 – 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 32 – 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 33 – 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 34 – 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**

5.2.2.3 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 35. 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 35 – 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

5.2.2.3.1 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 37). 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 38). 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 36. These vessels are associated with groundfish landings (Table 38) and groundfish revenues (Table 40). 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 36 - 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 37 - 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 38 – 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 39 – 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 40 – 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 41 – 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.

5.2.2.3.2 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 44). 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 42 – 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 43 – 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 44 – 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 45 – 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**

5.2.2.3.3 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 XXX 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.

Data Caveats

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 46). 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 47). 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 46 – 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 47 – 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 48 – 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 49 – 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**

5.2.2.3.4 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 50 – 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 51 – 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 52 - 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 53 – 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

5.2.2.3.5 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 54 – 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 55 – 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 56 – 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 57 – 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**

5.2.2.3.6 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 a 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 58 – 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 59 – 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 60 – 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 61 – 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 62 – 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**

5.2.2.4 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 63 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 63 – 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

5.2.2.5 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 64. 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 65). 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 66). 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 67).

Table 64 – 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 65 – 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 66 **-** 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 67 – 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

5.2.2.6 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 69. 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 70. 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 71 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 72. 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 68 – 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 69 – 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 70 - 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 71 – 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 72 – 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

5.2.2.7 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.

5.2.2.7.1 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 73 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 73 - **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 74 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 75). 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 74 - 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 75 - **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 37 through Figure 39).

Figure 37 - Average Price and DAS Leased by Month During Fishing Year 2005

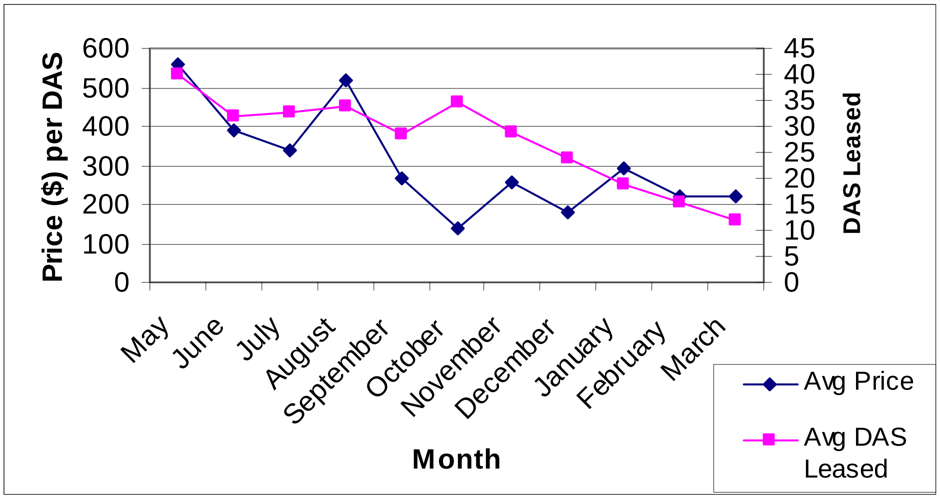


Figure 38 - Average Price and DAS Leased by Month During Fishing Year 2006

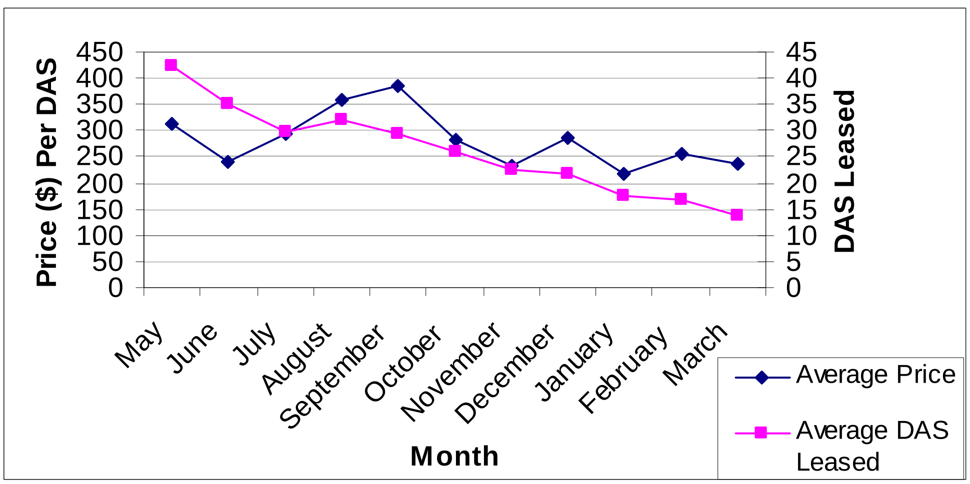
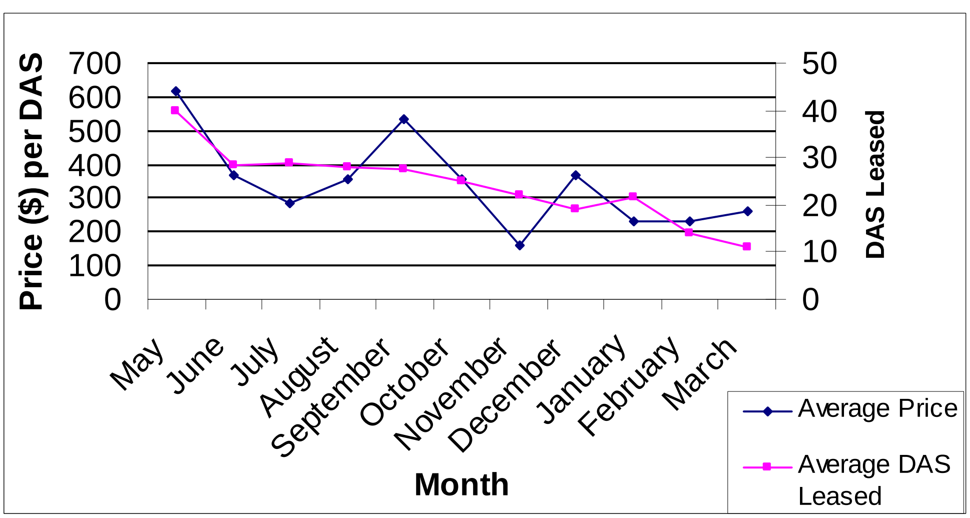


Figure 39 - Average Price and DAS Leased by Month During Fishing Year 2007

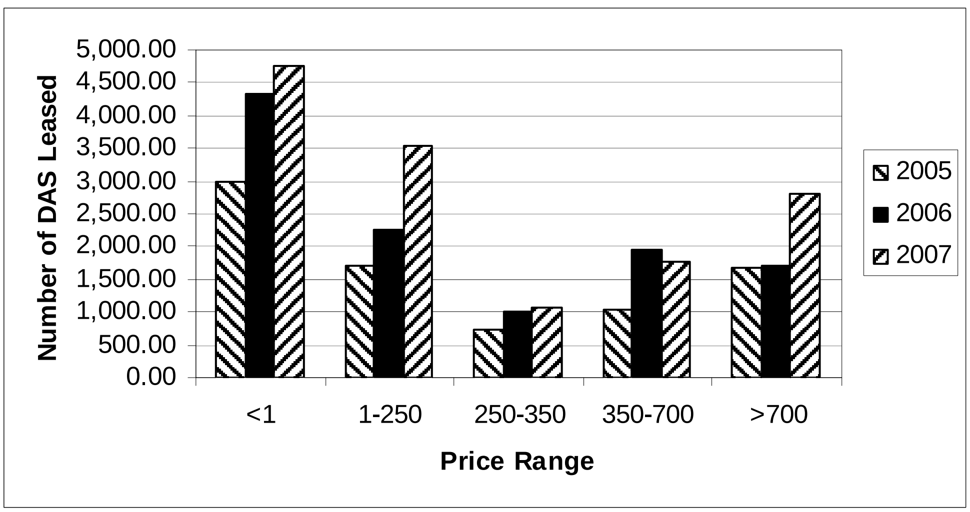


Overall, the average price paid for leased DAS has increased during FY 2005-2007 (Table 76). The maximum price per DAS observed during this time period ranged from $3,409 in 2005 to over $10,000 per DAS in 2007 (Table 73). Figure 40 shows the number of DAS leased within five price ranges as well as the 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 76 - Average Price per DAS Leased During Fishing Years 2005-2007

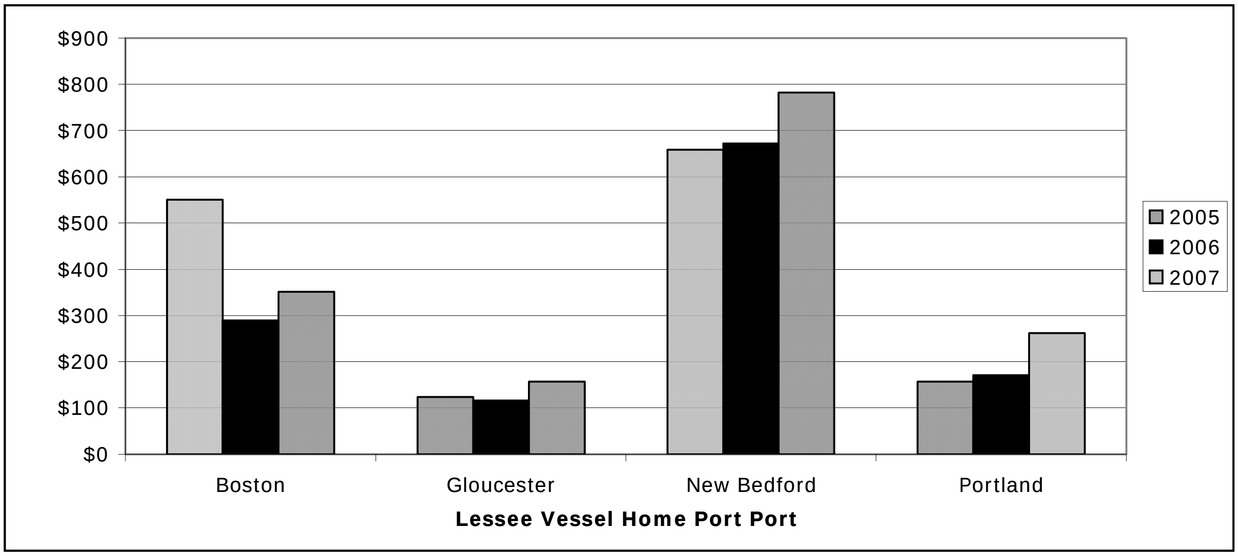
Fishing Year	Average Price per DAS Leased
2005	$287.74
2006	$283.13
2007	$313.21

Figure 40 - 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 41). 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 41 - 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 77 through Table 79). 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 77 - 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 78 - 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 79 - 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	

5.2.2.7.2 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 80 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 80 seems disproportionately low when compared to prices submitted for the DAS Leasing Program (see Table 73 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 80 - **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 81 shows the total number of DAS transferred by home port state during FYs 2006 and 2007, while Table 82 through Table 85 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 81 - **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 82 - **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 83 - **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 84 - **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 85 - **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 86 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 86 - **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 87 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 87 - **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 88 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 80 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 88 - 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

5.2.3 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.

5.2.3.1 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 89. 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 89 – 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

5.2.3.1.1 Landings and Revenues

Species-specific landings and revenues for the permits in the sector are shown in Table 91 and Table 92. 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 90 – 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
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	51,820		11,395	5,081
TUNA, YELLOWFIN	1,065			

WEAKFISH, SQUETEAGUE				8
WHELK, CHANNELED	33,415	117,163	228,123	394,116
WHELK, KNOBBED	22	47	1,627	
WHITING, KING				25
Total	2,347,573	2,675,372	1,639,518	1,448,274

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
TAUTOG	1,957	8,310	10,116	420
TUNA, BLUEFIN	336,318		86,957	94,881
TUNA, YELLOWFIN	1,338			
WEAKFISH, SQUETEAGUE				14
WHELK, CHANNELED	29,837	145,554	309,766	427,559
WHELK, KNOBBED	12	33	1,463	
WHITING, KING				56
Total	3,394,908	4,055,672	2,950,333	2,566,175

5.2.3.2 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.

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 91 below shows landings as 922,267 pounds, a difference of 3 percent. This section does not attempt to identify the reason for those differences.

5.2.3.2.1 Landings and Revenues

Species-specific landings and revenues for the sixteen permits in the sector in FY 2007 are shown in Table 91 and Table 92. 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 93, 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.

5.2.3.2.2 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 94). 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 42. 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 does 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 95). 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 91 – 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 92 – Revenues (nominal dollars) by 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 93 – 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 94 – 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 42 – Discard/kept ratios for GB cod; vessels in Fixed Gear Sector in FY 2007

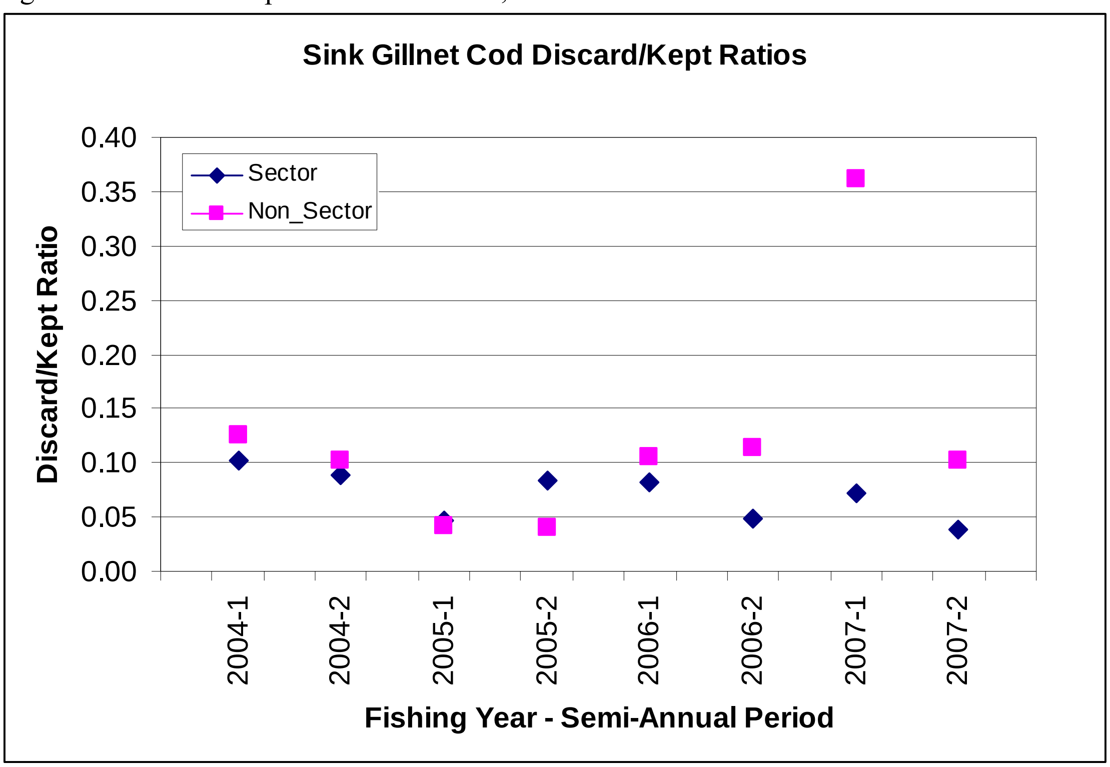


Table 95 – Cod discard reasons for vessels in the Fixed Gear Sector in FY 2007

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%

5.2.4 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.

5.2.4.1 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 96). 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 96 - 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 97). 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.

Table 97 - Winter flounder catch disposition by stock (1,000's of fish)

	Gulf of Maine Stock			SNE/MA Stock		
Calendar	Catch	Harvested	Released	Catch	Harvested	Released

Year	(A+B1+B2)	(A+B1)	Alive (B2)	(A+B1+B2)	(A+B1)	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

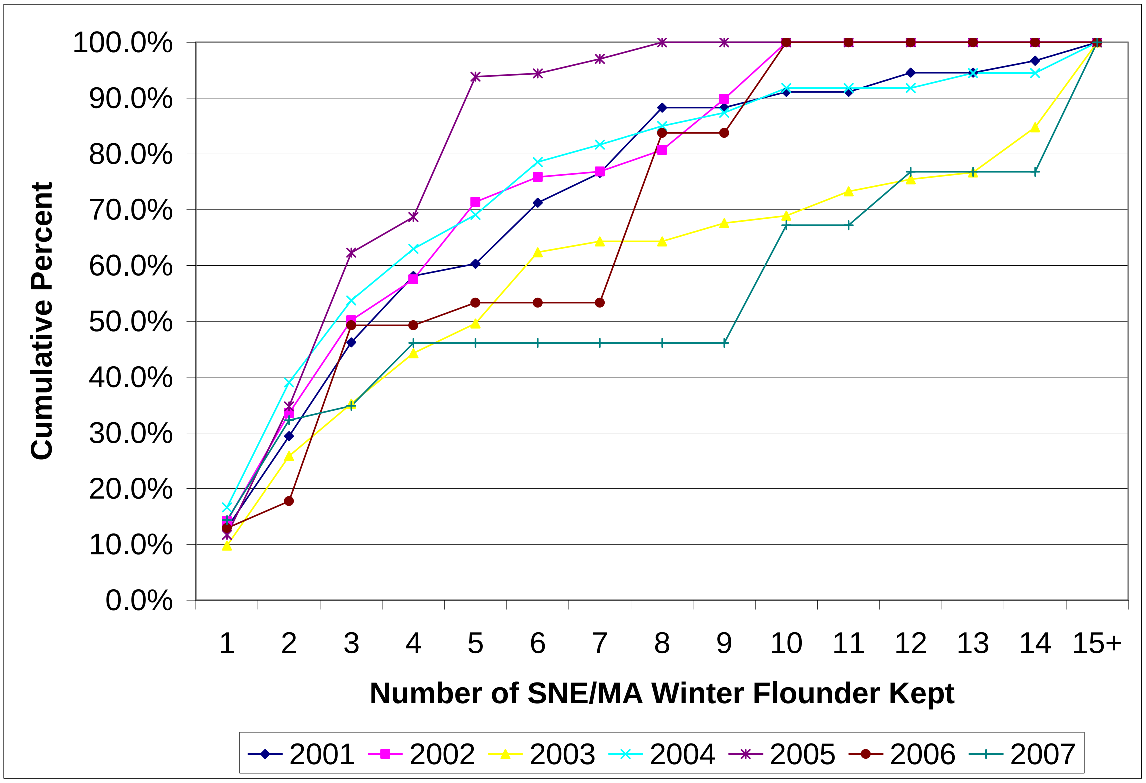
Winter flounder is harvested by party/charter, private boat and shore-based anglers. The majority of winter flounder are harvested by private boat anglers averaging 74.4% and 77.3% of GOM and SNE/MA harvested fish, respectively (Table 98). Note that the MRIP estimate of zero harvested GOM winter flounder 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 98 - 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

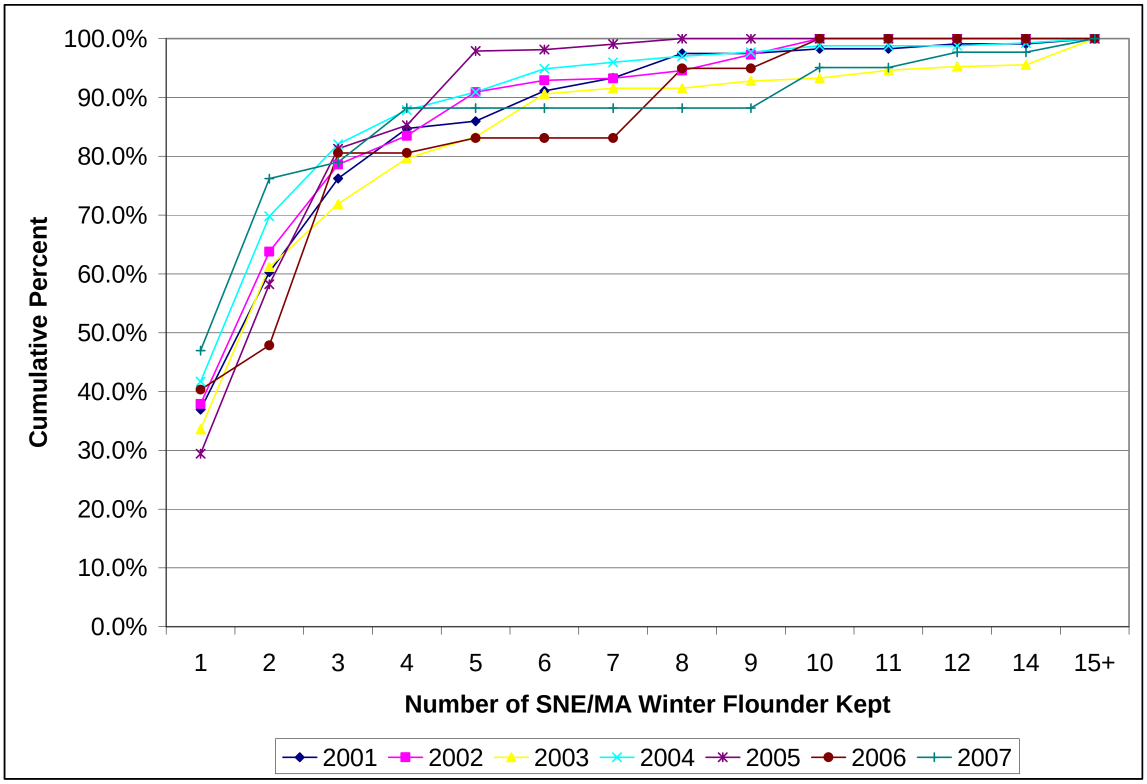
On a trip basis, recreational anglers may retain one or more fish. For example, during 2001 60% of SNE/MA winter flounder kept was caught on trips that harvested 5 or fewer fish and 90% of was kept on trips landing 10 or fewer fish (Figure 43). In both 2005 and 2006, all retained SNE/MA winter flounder were caught on trips were 10 or fewer fish were landed.

Figure 43 - 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 44). Trips landing 5 fish accounted for 89% of total trips as compared to 60% of retained winter flounder.

Figure 44 - 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 45). During these years, these trips accounted for an average of 41% of total trips where GOM winter flounder were kept (**Error! Reference source**

not found.). 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 45 - Cumulative Percent of GOM Winter flounder harvest by number of fish per angler (all modes combined)

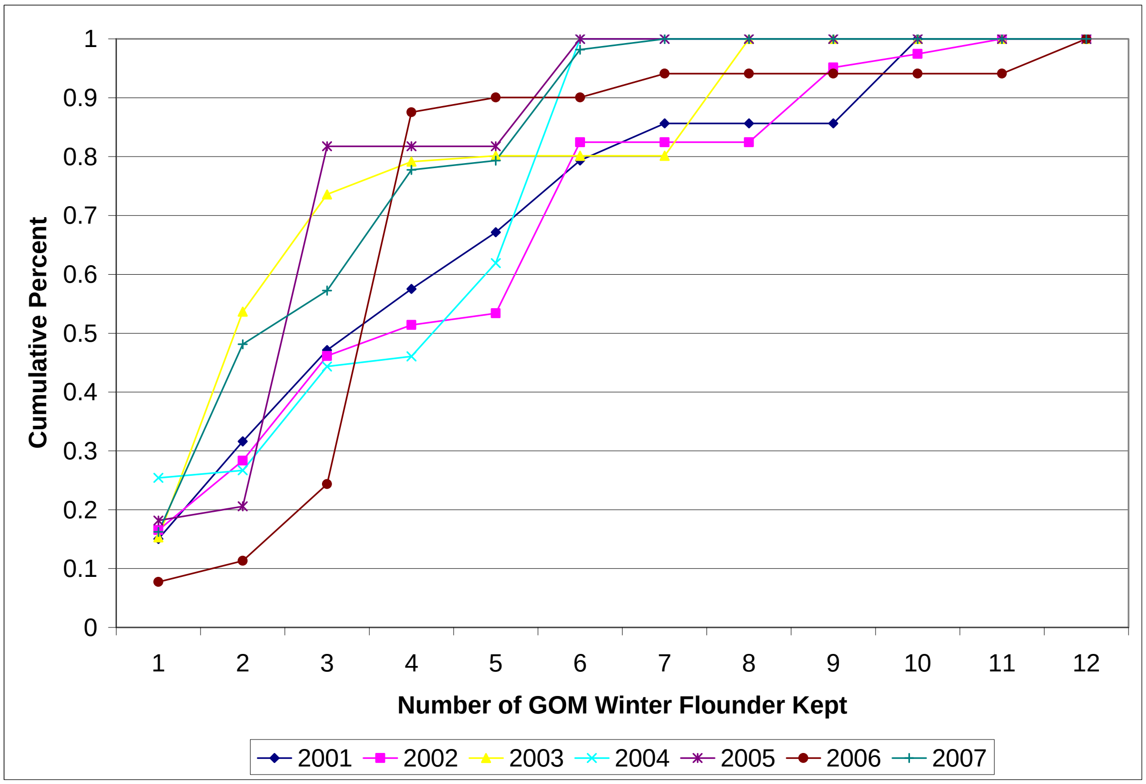
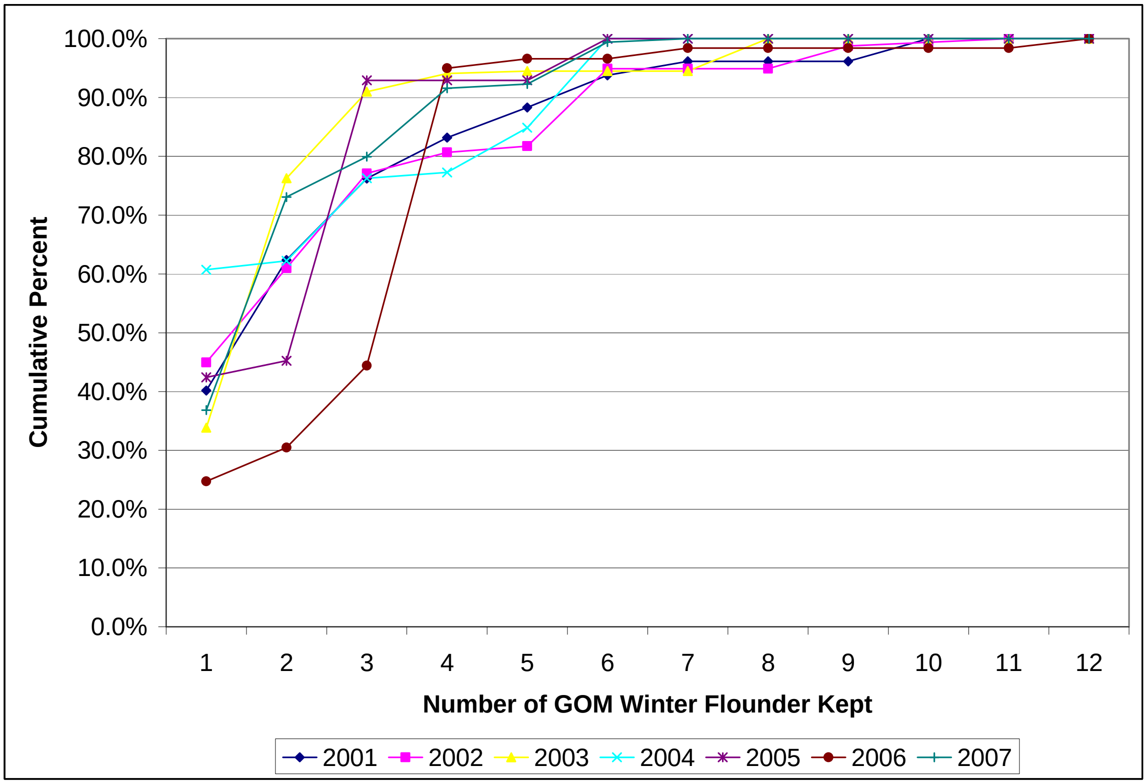


Figure 46 - Cumulative Percent of Trips Keeping GOM Winter Flounder (all modes combined)



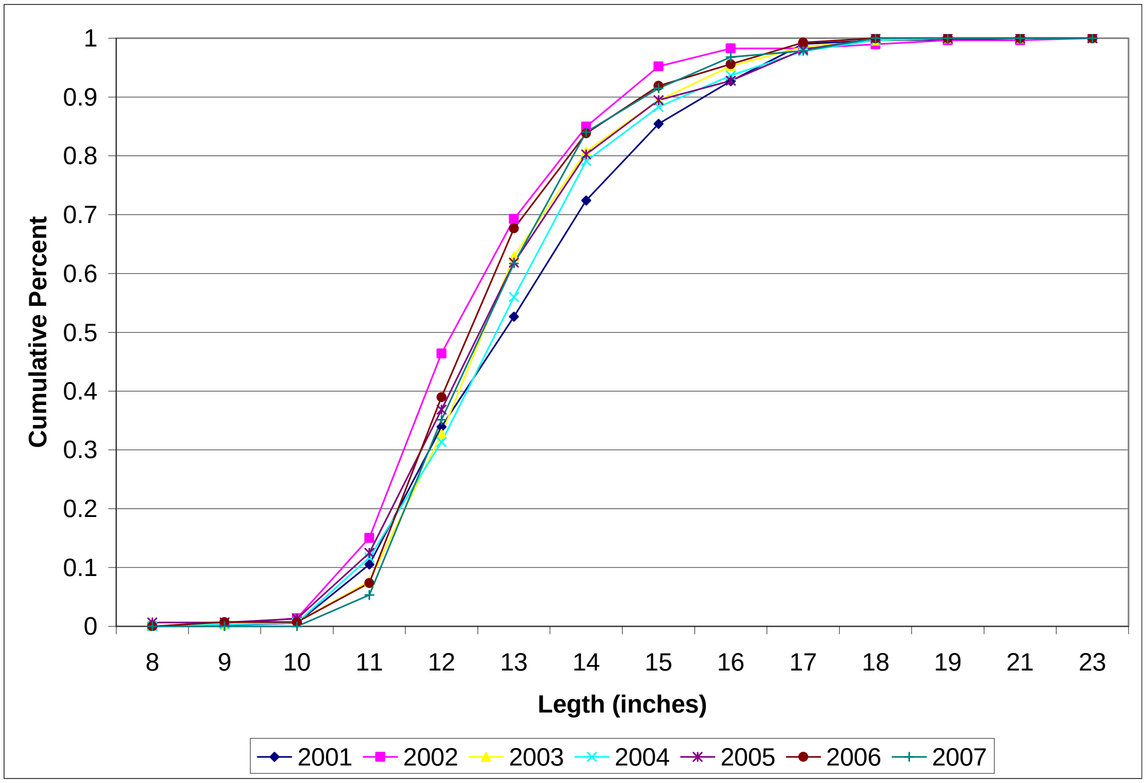
As part of the field intercept survey interviewers request to measure and weigh fish that are in the possession of each respondent. During 2001 522 winter flounder were measured as part of the intercept survey (Table 99). With a decline in harvested winter flounder the number of occasions where winter 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 99 - 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 47). 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 47. 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 100). 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 101). 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 100 - 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 101 - 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%

5.2.4.2 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 102). 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 102 - 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 103). The number of haddock caught in 2006 dropped to 442.1 thousand fish but increased to 503.6 thousand haddock during 2007.

Table 103 - 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 104). 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.

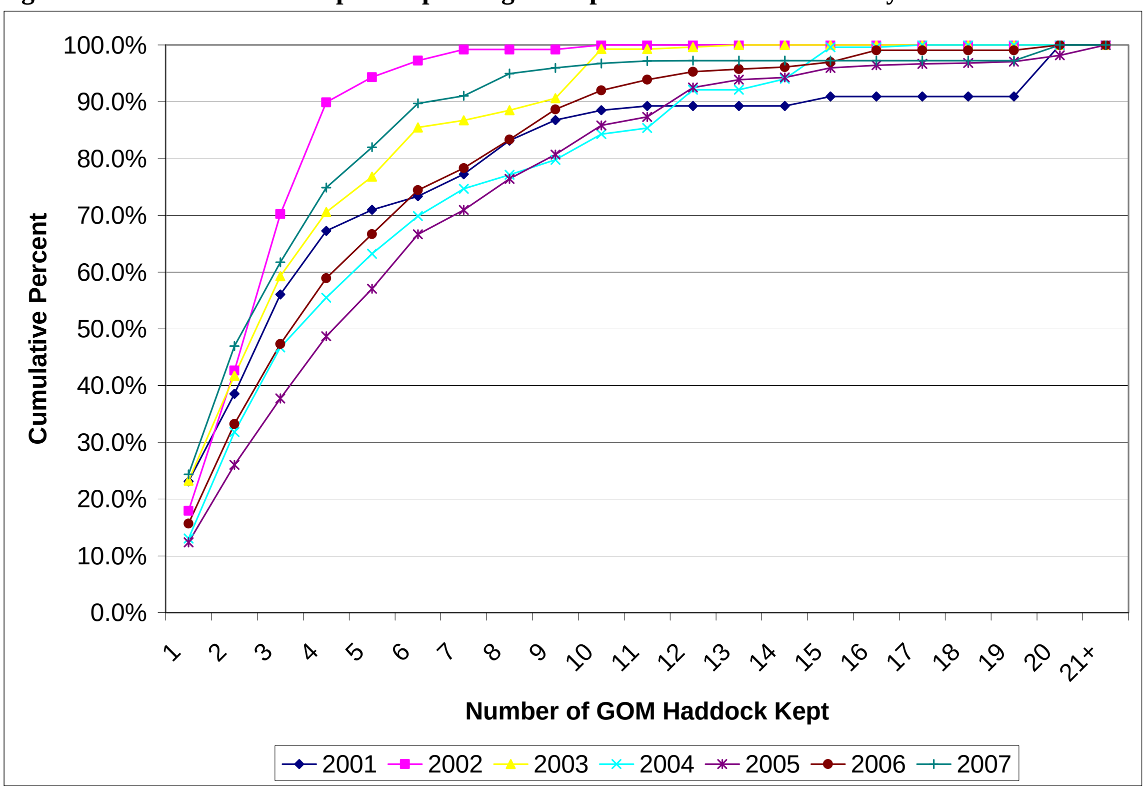
Table 104 - Gulf of Maine Haddock Harvested by Mode (numbers of fish)

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

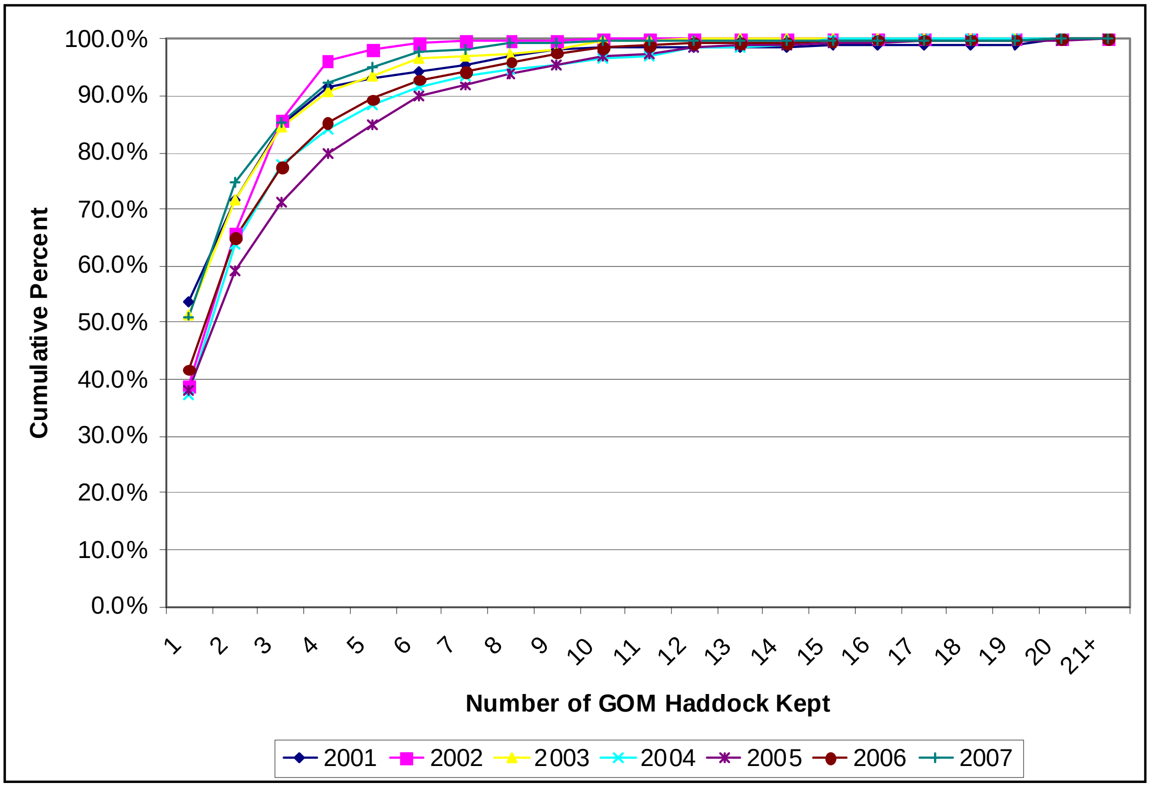
On average, 54% of GOM haddock harvested by party/charter anglers occurred on trips where 3 or fewer haddock were kept, while 92% of harvest occurred on trips that caught 10 or fewer fish were kept (**Error! Reference source not found.**). The distribution of harvest by keep class during 2004 to 2006 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 48- Distribution of Kept Fish per Angler Trip for GOM Haddock Party/Charter Mode



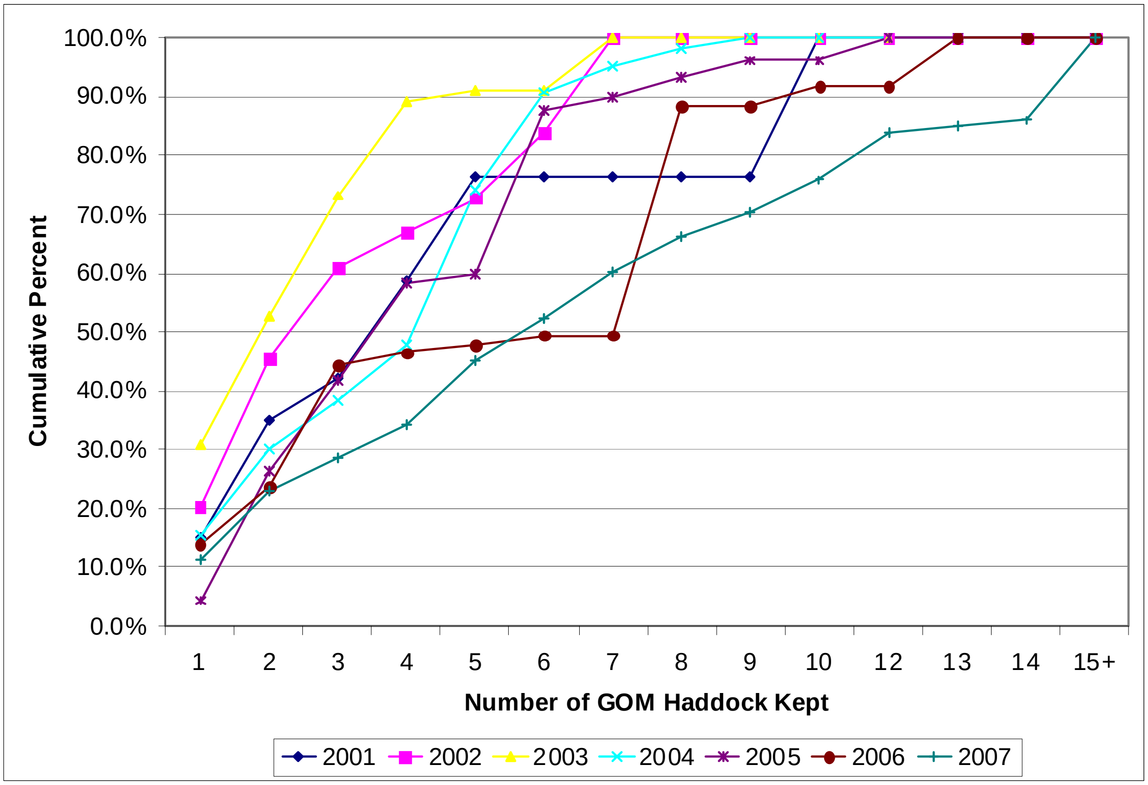
In the party/charter mode 45% of trips that landed GOM haddock kept only one fish (**Error! Reference source not found.**). Trips where 3 or fewer GOM haddock were retained accounted for an average of 81% of occasions where GOM haddock were kept during 2001 to 2007. That is, trips on which 3 or fewer 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 49 - Cumulative Percent of Party/Charter Angler Trips that Retained GOM Haddock



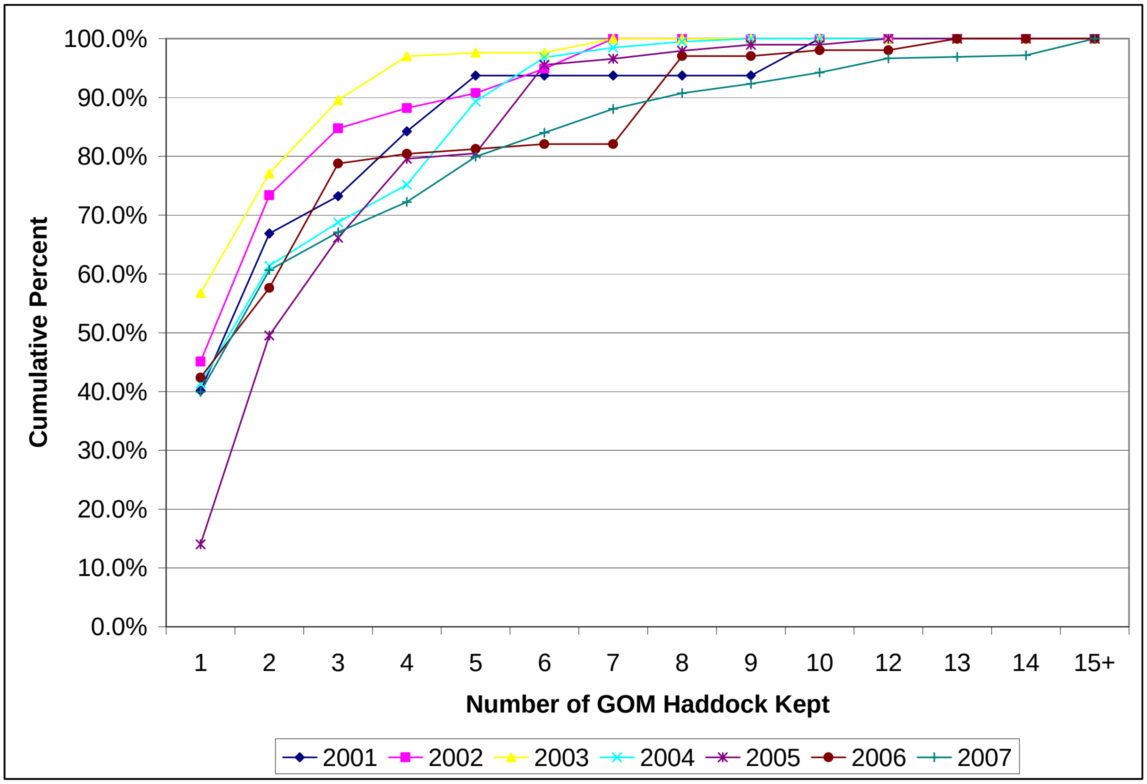
Compared to party/charter mode anglers the distribution of harvest by keep class by private boat anglers displays more inter-annual variability (Figure 49). However, the general shift toward higher numbers of fish kept on fishing trips evident in the party/charter mode is also evident in the private 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 50 - 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 51 - 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 105). 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.

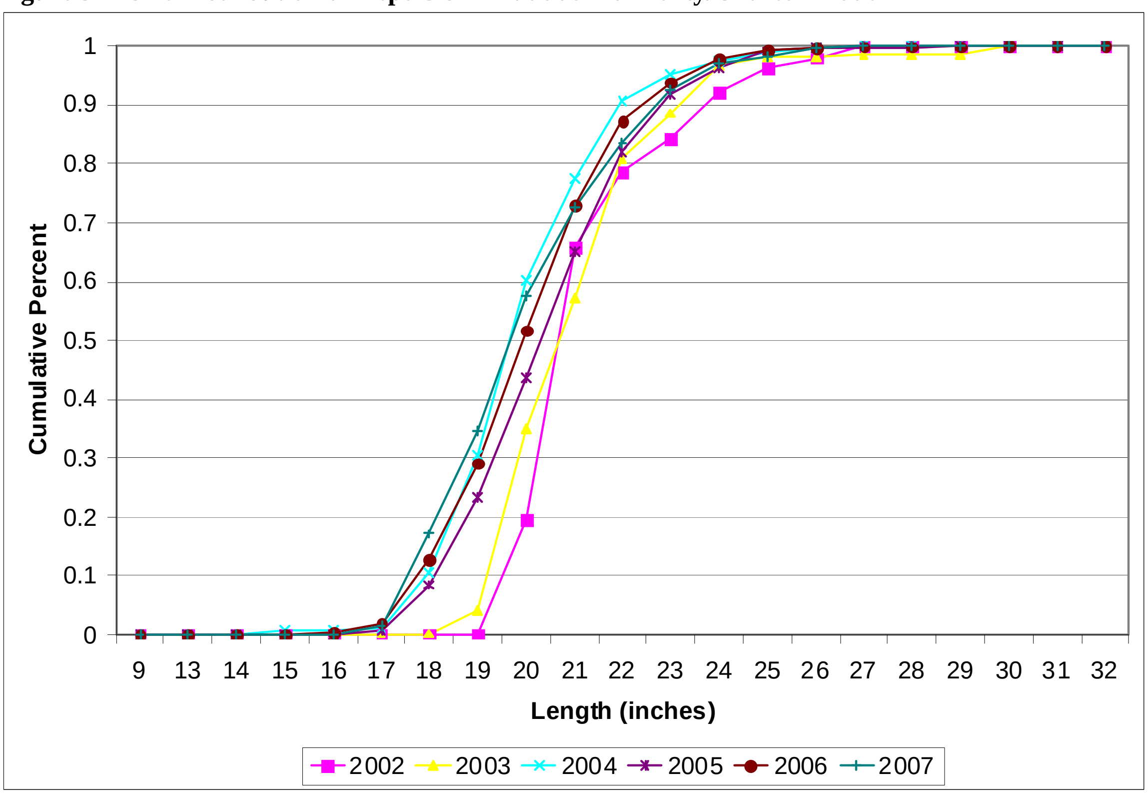
Table 105 - Number of Measured Gulf of Maine Haddock by Mode and Catch Disposition

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.

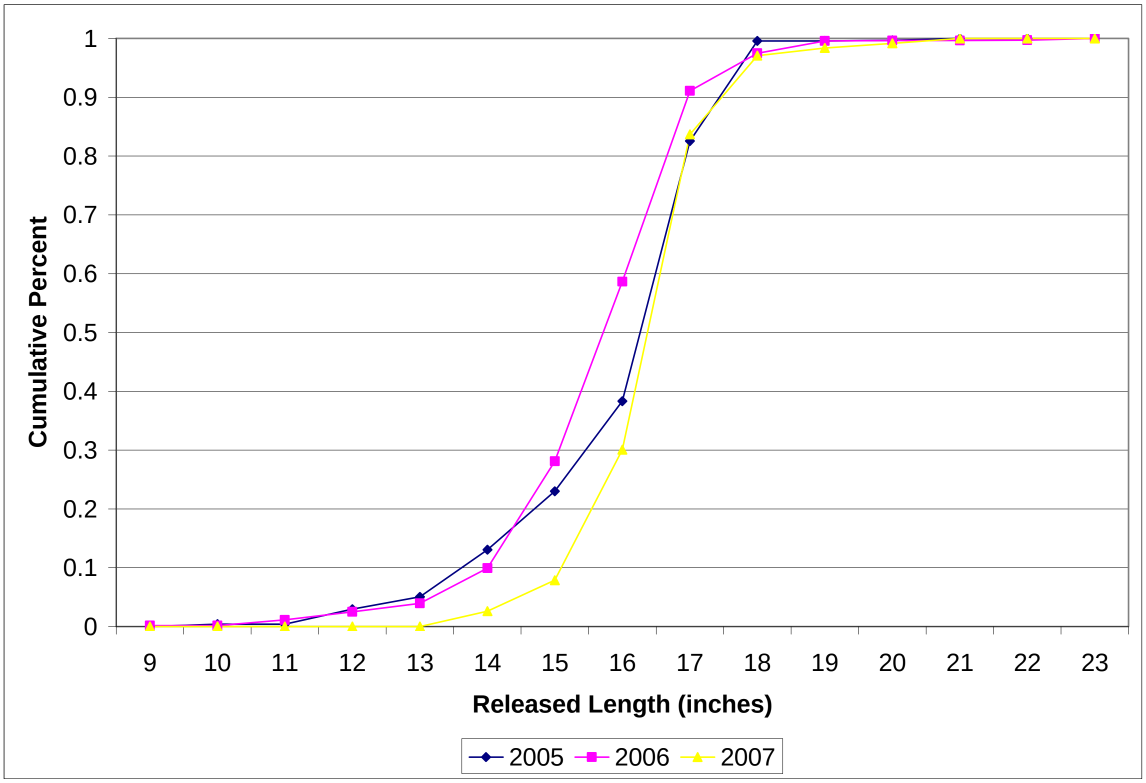
The minimum size for haddock changed several times between August 1, 2002 and May 1, 2004. From January to August the size limit was 19-inches then was raised to 23-inches until July, 2003 when the haddock size limit was lowered to 21-inches. Amendment 13, implemented May 1, 2004 returned the haddock 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 52). 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 52 - 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 53). 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 53 - 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 106). 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 106 - 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%

5.2.4.3 Pollock

Recreational catches of pollock were over one million fish in 2001 but have declined steadily to 239 thousand fish in 2007 (Table 107). 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 107 - 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 108).

Table 108 - 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 109). 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.

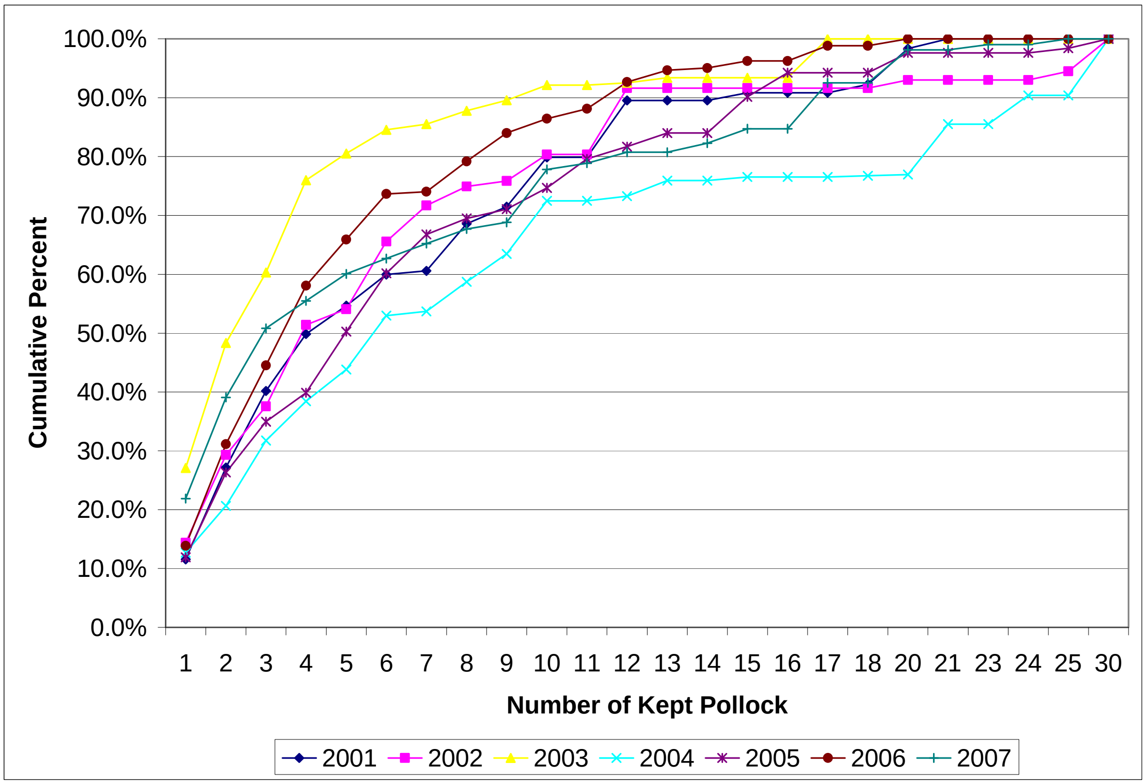
Table 109 - Number of Harvested Pollock by Mode

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

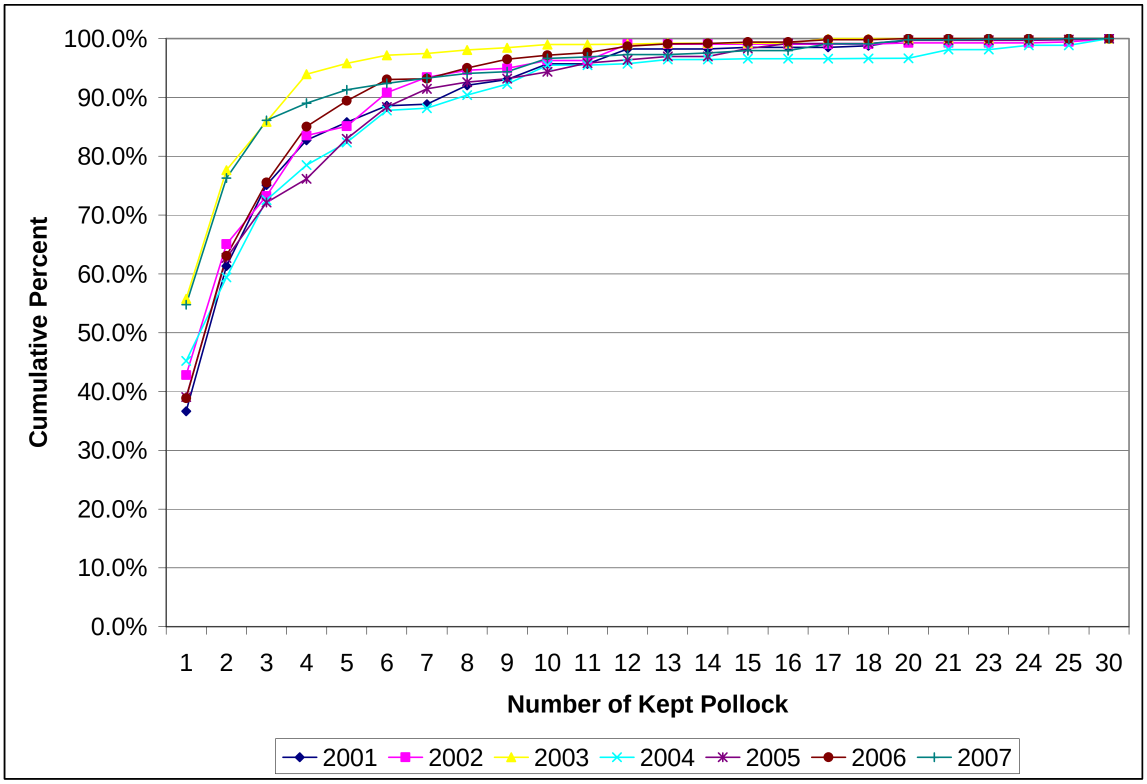
The distribution of numbers of pollock kept by party/charter anglers has been relatively stable. On average, just over half of pollock retained by party/charter anglers occurred on trips landing 4 or fewer fish (Figure 54). During 2001 to 2007 the number of fish accounting for at least half of kept pollock 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 54 - Distribution of kept pollock by number of fish per angler in the party/charter mode



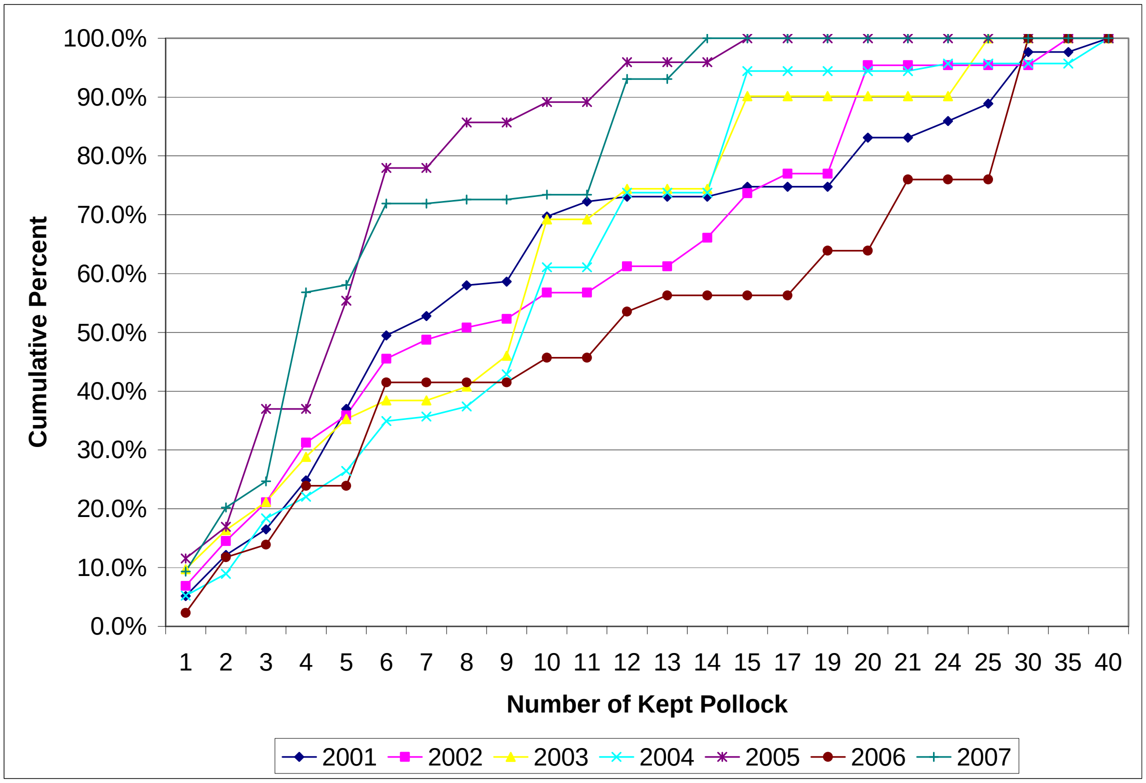
Trips that kept four or fewer pollock averaged 84% of total angler trips that retained pollock during 2001 to 2007 (Figure 55). Compared to the cumulative distribution of retained pollock, the cumulative distribution of trips is more steeply sloped asymptotically approaching 100% at lower keep levels. 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 55 - Cumulative Percent of Party/Charter Mode Trips Keeping Pollock by Number Kept per Angler Trip


100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Cumulative Percent
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 23 24 25 30
Number of Kept Pollock
2001 2002 2003 2004 2005 2006 2007

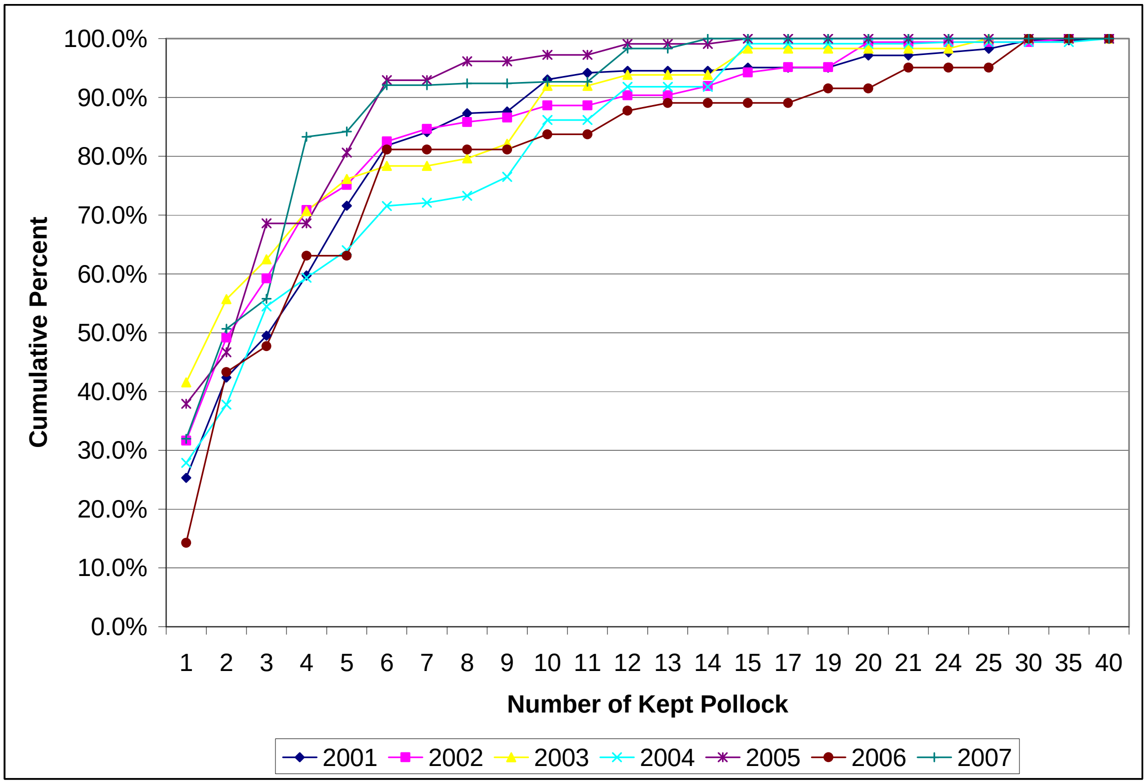
Compared to party/charter anglers the distribution of numbers of pollock kept by angler trip in the private boat/shore mode displayed considerably more variability (Figure 56). The number of pollock kept per angler that accounted for at least 50% of total kept catch ranged from 4 or fewer fish to as many as 12 or fewer pollock per trip.

Figure 56 - 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 57). 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 57 - Cumulative Percent of Private Boat Mode Trips Keeping Pollock by Number Kept per Angler Trip



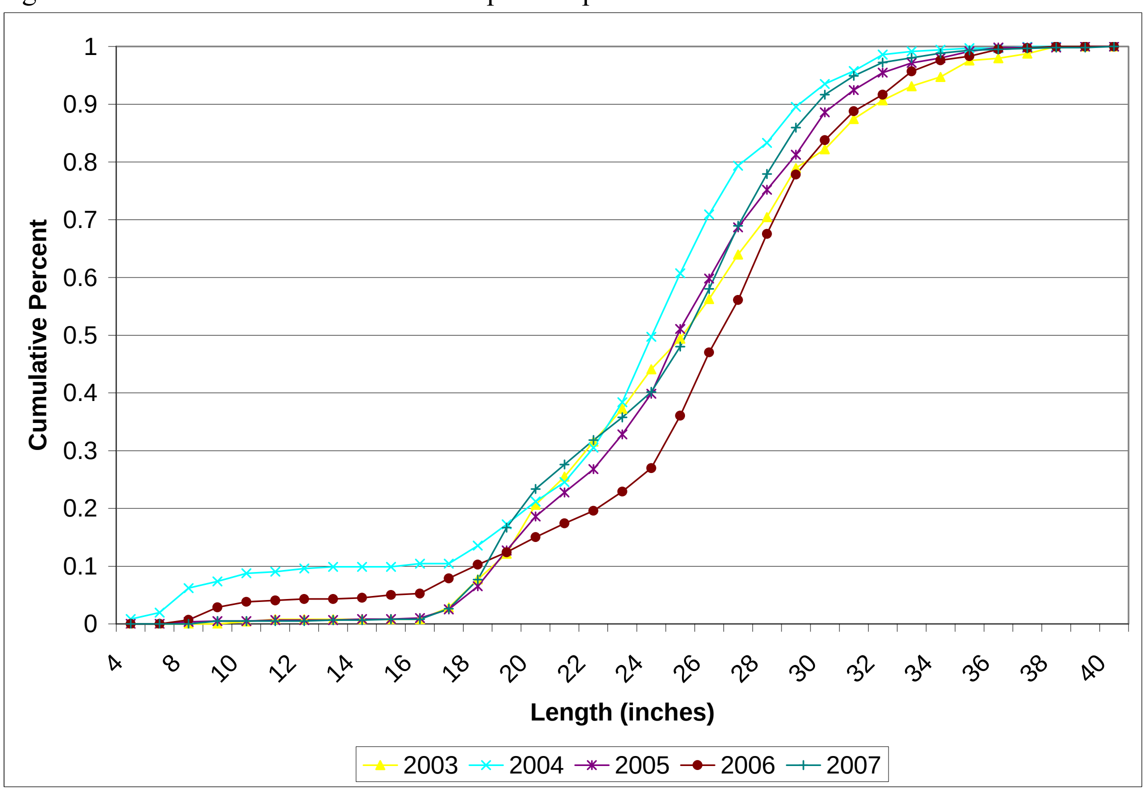
The number of pollock measured by MRIP interviewers ranged from more than 600 pollock during 2007 to less than 70 fish during both 2001 and 2002 (Table 110). Due to small sample size a size distribution for calendar years 2001 and 2002 were not estimated. Further, sample sizes by fishing mode were not 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 110 - 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 58). 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 58 - 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 111). 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 111 - 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%

5.2.4.4 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 112). 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 112 - 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 113). 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 113 - 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

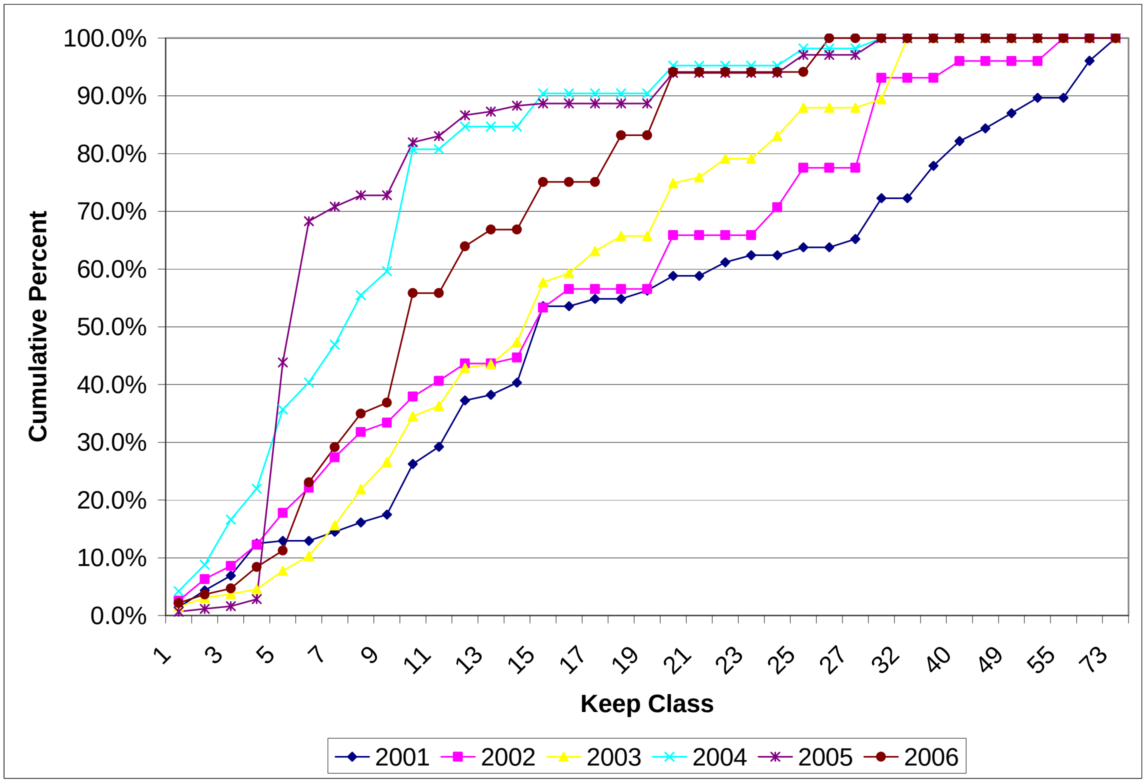
Compared to the Gulf of Maine, the overwhelming majority of Georges Bank cod were harvested by party/charter anglers (Table 114). Party/charter anglers accounted for more than 90% of harvested Georges Bank, whereas party/charter anglers averaged 25% of harvested Gulf of Maine cod in during 2001 to 2007 except for 2006 where 55% of harvested were caught by party/charter anglers.

Table 114 - 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 59). 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.

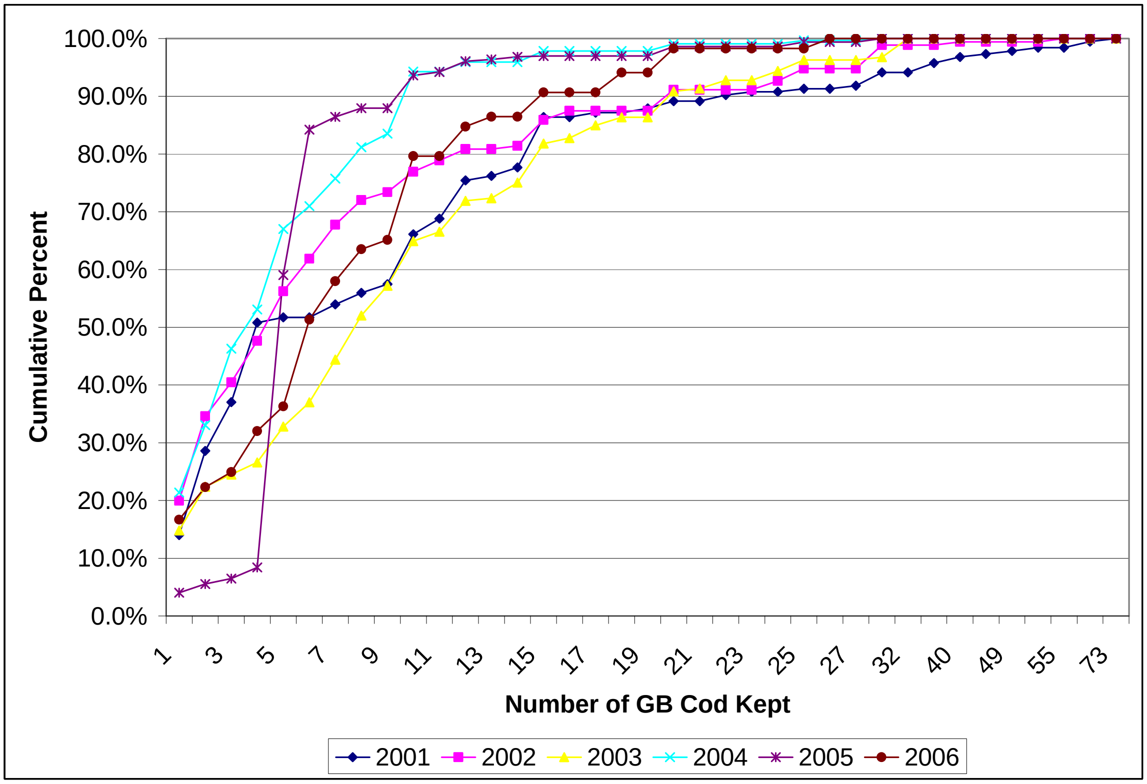
Figure 59 - Cumulative Percent of Georges Bank Cod Kept by Party/Charter Anglers by Number of Fish Kept per Angler Trip



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 60). 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 60 - 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 61). Note that these trips accounted for 87% of total angler trips that kept Gulf of Maine cod (Figure 62). 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 61 - Cumulative Percent of Gulf of Maine Cod Kept in the Party/Charter Mode

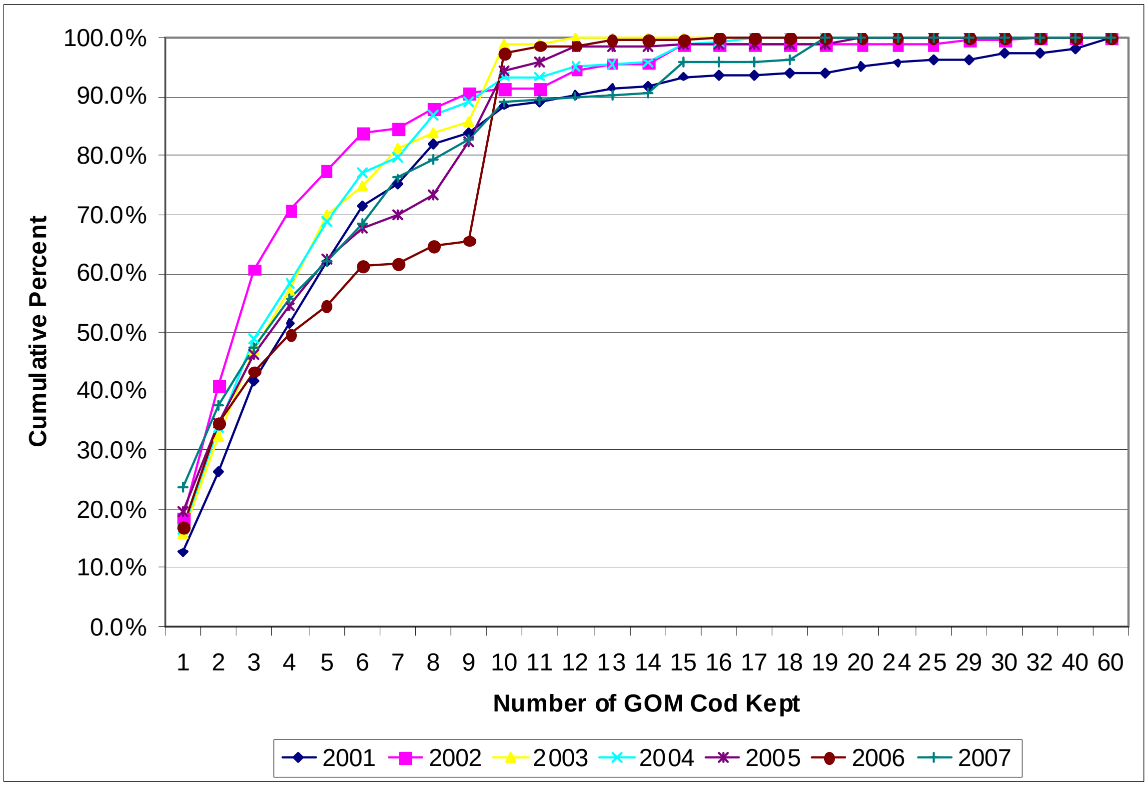
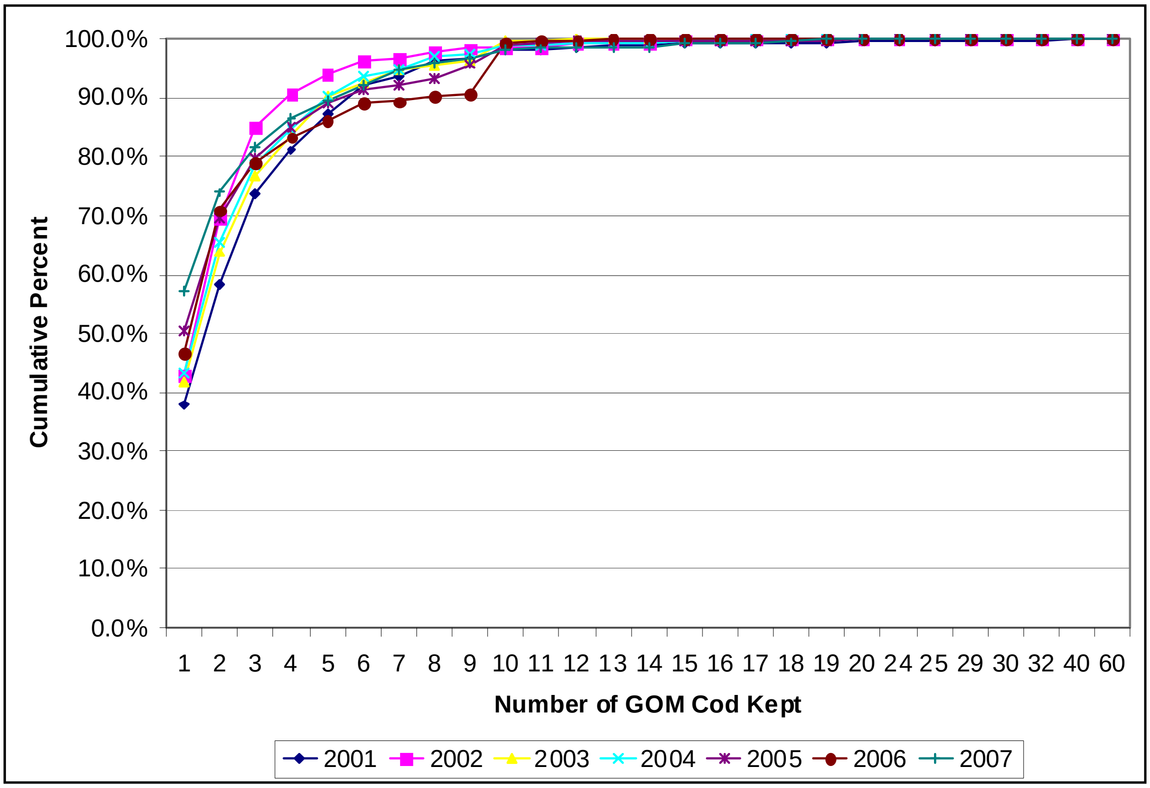
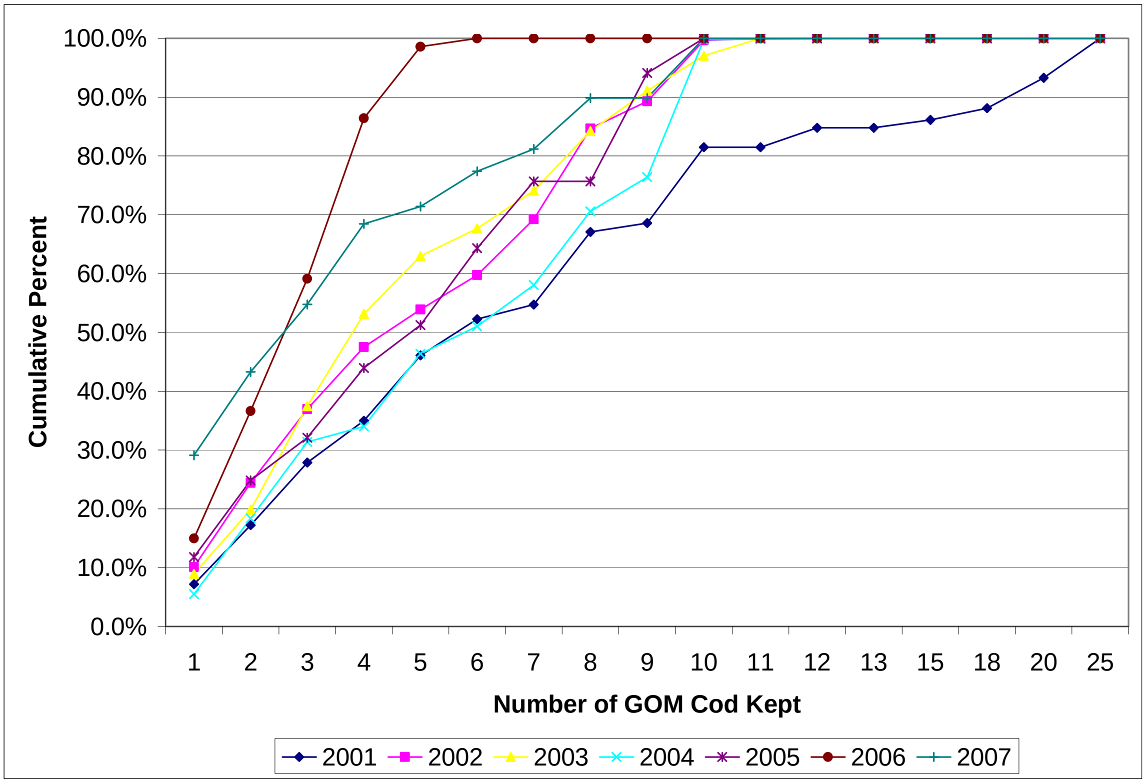


Figure 62 - Cumulative Percent of Party/Charter Angler Trips that Retained Gulf of Maine Cod



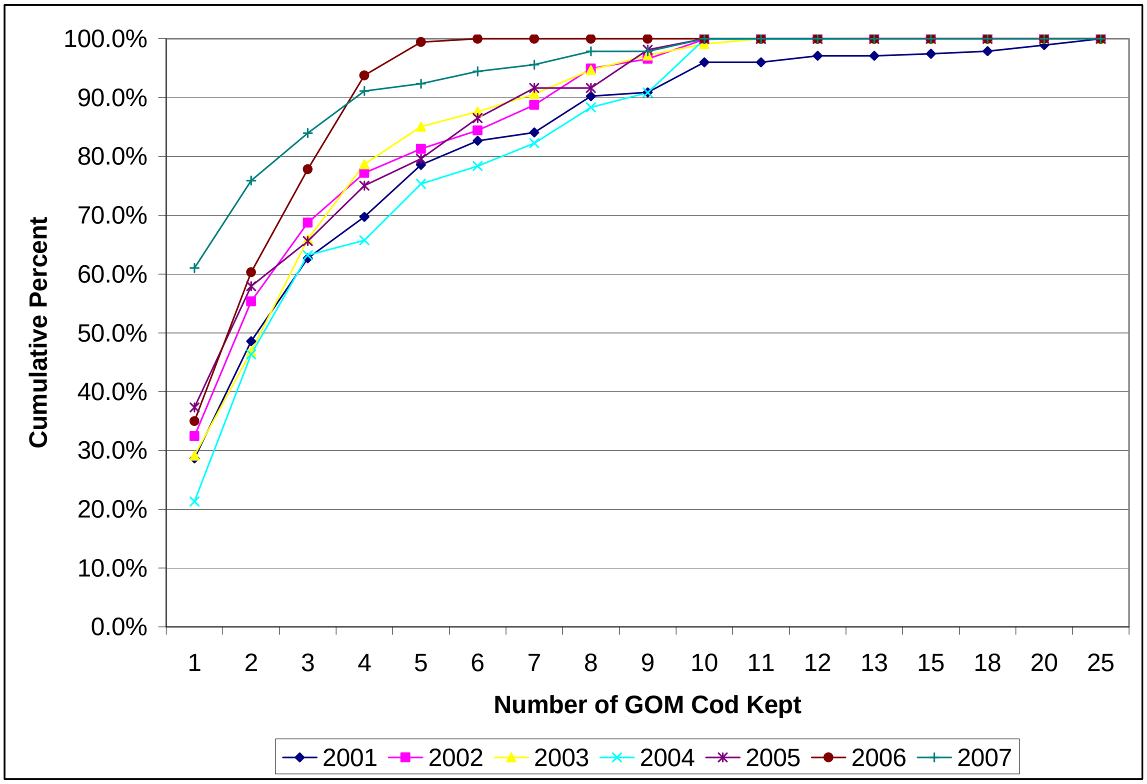
Compared to the party/charter mode, the range of retained cod by number kept per angler trip in the private boat mode was more compact, but there was substantially greater inter-annual variability in the cumulative distribution of retained Gulf of Maine cod (Figure 63). For example, during 2001 to 2007 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 63 - Cumulative Percent of Kept Gulf of Maine Cod Private Boat Mode by Number Kept per Angler Trip


100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Cumulative Percent
1 2 3 4 5 6 7 8 9 10 11 12 13 15 18 20 25
Number of GOM Cod Kept
2001 2002 2003 2004 2005 2006 2007

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 64). 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 64 - 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 115). 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 115 - 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 65). 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 68). 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 65- Cumulative Distribution of Gulf of Maine Cod Party/Charter Mode Harvest by Length

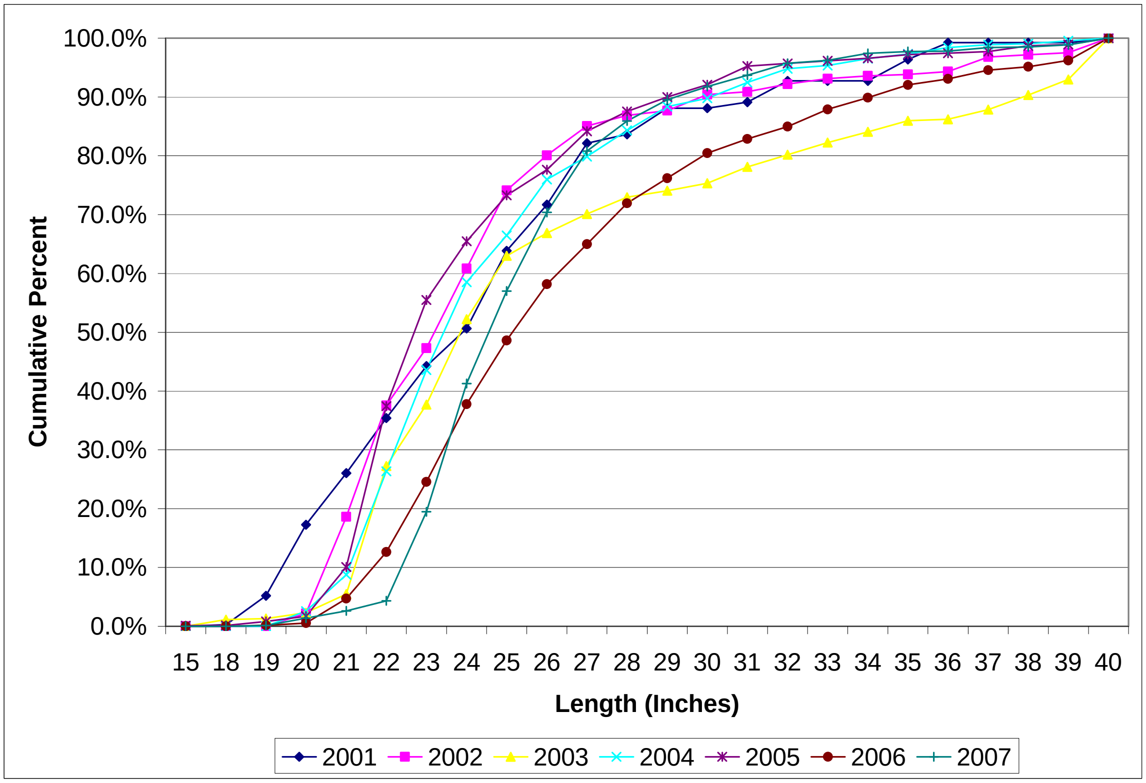
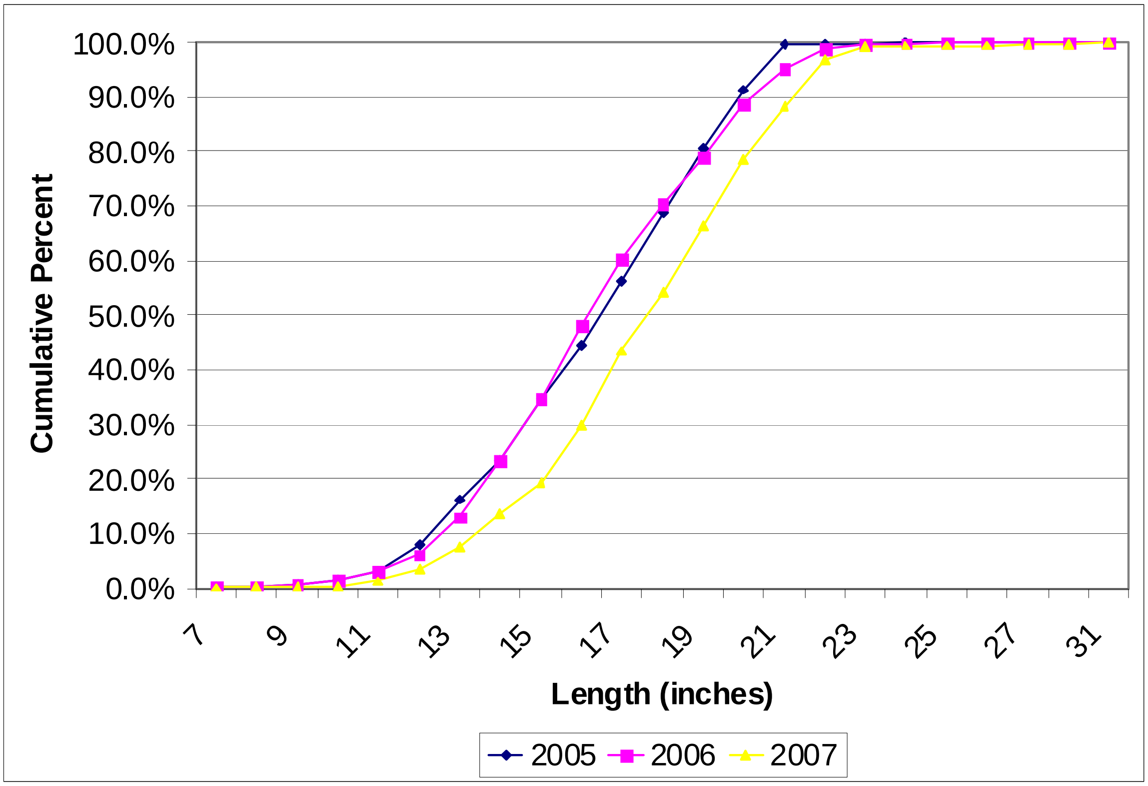


Figure 66 - Cumulative Distribution of Gulf of Maine Cod Party Mode Released Catch by Length



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 116). 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 116 - 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%

5.2.4.5 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 117). 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 FY2001-2007.

Table 117 - Summary of Northeast region party/charter permits held by Multispecies Part/Charter Permit Holders FY2001-2007.

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 FY2001 – 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 118). 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 118 - Summary of Unique party/charter permit combinations held by multispecies party/charter permit holders FY2001-2007

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 FY2001-2007 (Table 119). 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 FY2003 to 259 operators during FY2006 before increasing to 269 vessels during FY2007. The number of trips retaining groundfish and number of passengers carried on those trips were highest during FY2001. 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 119 - 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 FY2001 to FY2002, but increased by 38 permit holders from FY2002 to FY2003. During FY2004 – FY2007 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 FY2001 to FY2007. 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 FY2001 – FY2007 (Table 120). 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 FY2001. During FY2003-2007 there were 120 vessels carried passengers on one or more trips in every years 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 FY2001 – FY2003 but reported no groundfish trips in any other fishing year.

Table 120 - 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 121. 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 FY2003 that had not carried groundfish passengers in any prior year include in the analysis, while 22 operators that had carried passengers during FY2001-FY2002 left the fishery leaving a net reduction of 2 party/charter operators during FY2003. The net change in entry and exit was also negative during

FY2004 but was positive in both FY2005 and FY2006. During FY2007 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 FY2007.

Table 121 - 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 FY2001 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 122). These vessels maintained their share of both trips and passengers during FY2002 – FY2003. Since FY2003 the share of trips and passengers has declined to 59% and 63% respectively.

Table 122 - 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 FY2001-FY2007 there were between 163 and 195 party/charter operators that exclusively carried six or fewer passengers on all trips where groundfish were kept (Table 123). These operating units accounted for more than 60% of all operating units reporting groundfish trips (Table 124). These so-called “six-pack” vessels took about 2,000 trips during FY2007 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 123 - Summary of Operating Units, Trips and Passengers by type of Operation

	Only Six Passengers or Fewer			Only More than Six Passengers			Both Six and More than Six Passengers		
Fishing Year	Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Number of Operating Units	Number of Groundfish Trips	Number of Anglers	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 124 - Summary of Shares of Operating Units, Groundfish Trips, and Passengers by Type of Operation

	Only Six Passengers or Fewer			Only More than Six Passengers			Both Six and More than Six Passengers		
Fishing Year	Number of Operating Units	Number of Groundfish Trips	Number of Anglers	Number of Operating Units	Number of Groundfish Trips	Number of Anglers	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 FY2001-FY2007. 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-FY2007 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 FY2002, was just over 50% during FY2001 and FY2003-FY2005, but more recently has increased to more than 70% during FY2006-FY2007.

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 FY2001 – FY2007. 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 FY2003-FY2005, but have declined to 8% of operating units during FY2006-FY2007. Similarly, the share of groundfish trips and passengers has also declined to about 20% and 17% during FY2006-FY2007.

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 125). 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 126).

Table 125 - 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 126 - 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 127). 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 127 - 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 128). Of the vessels fishing exclusively in the Gulf of Maine more than 60% relied on groundfish for more than 90% of passengers (Table 129). 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 128 - 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 129 - 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 130). 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 FY2003-FY2005. 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 FY2003-FY2005 average and the number of passengers was down 10.2%. Both trips and number of passengers rose in FY2007 compared to FY2006 and while the number of Gulf of Maine groundfish trips was 1.1% higher compared to the FY2003-FY2005 average, the number of passengers was still down by 7.8%.

Table 130 - 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-FY2007 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 FY2001 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 FY2002 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.

5.2.5 Wholesale Trade and Processing Component

5.2.5.1 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 a 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 131).

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 131 – 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 132). The total number of reporting dealers with purchases of groundfish has been declining over time from 170 during 2001 to 133 in 2007.

Table 132 – 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 133). 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 133 – 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 134 – 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 135). 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 135 – 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%

5.2.5.2 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; Dirlam 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 136) 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 136 – 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 137). 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 137 – 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

5.2.6 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 catch 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 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 Assesssment 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, in the level of observer coverage, or in the level or quality of reporting through VTRs.

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 (shrimp and whiting are the two primary examples). 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.

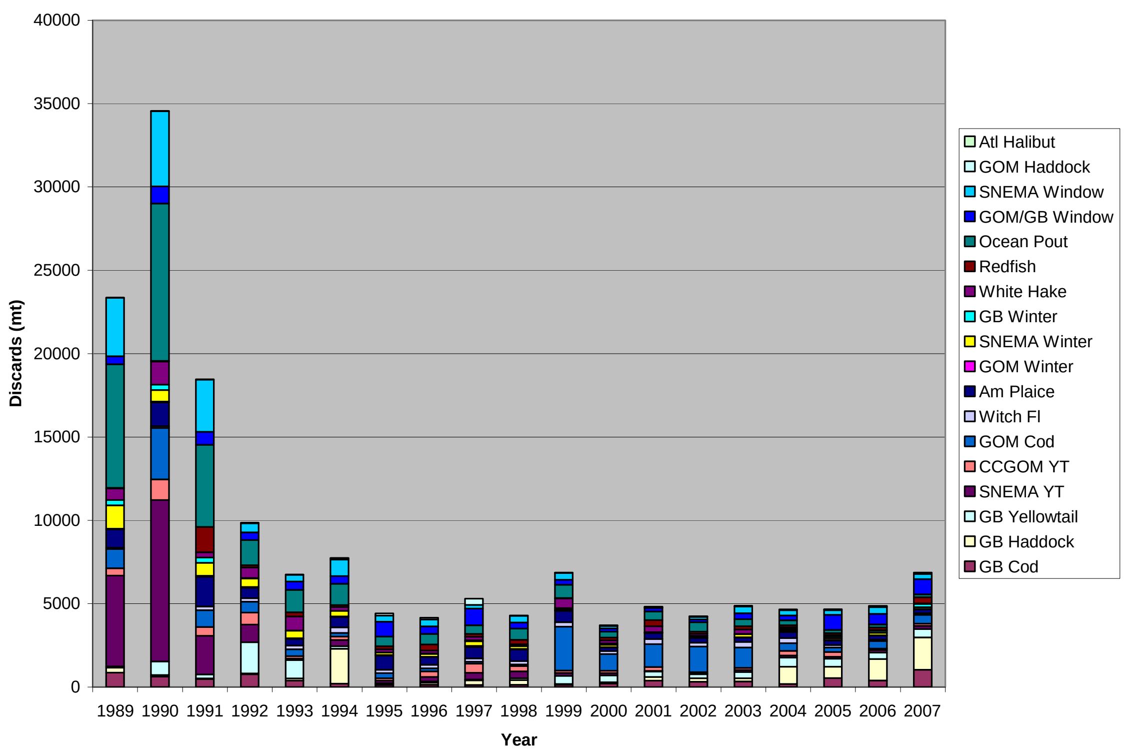
There are nineteen groundfish stocks identified as regulated groundfish managed through this action. Commercial discard estimates are available for eighteen of these stocks from their most recent assessments. Only U.S. discards are included in this summary, although Canadian discards are listed for some 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 67 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 67 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 67 – 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 138). 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 138 – 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**

5.2.6.1 Commercial Fishery Discards

5.2.6.1.1 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 68). 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 139). The majority of discards occurred among age 1 to 3 fish until 1999, and ages 2 to 3 or 4 after that year.

Figure 68 – GB Cod Landings and Discards (mt), 1989-2007

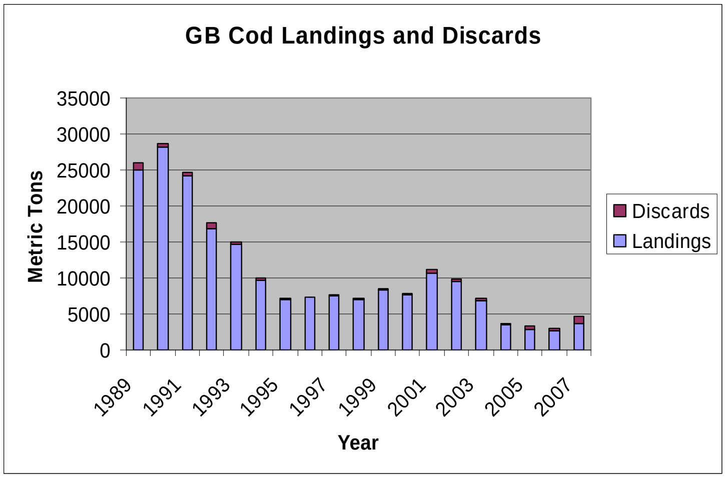


Table 139 – GB Cod Discards-at-Age (thousands of fish), 1989-2007

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 69). 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 140). 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 69 – GOM Cod Landings and Discards (mt), 1989-2007

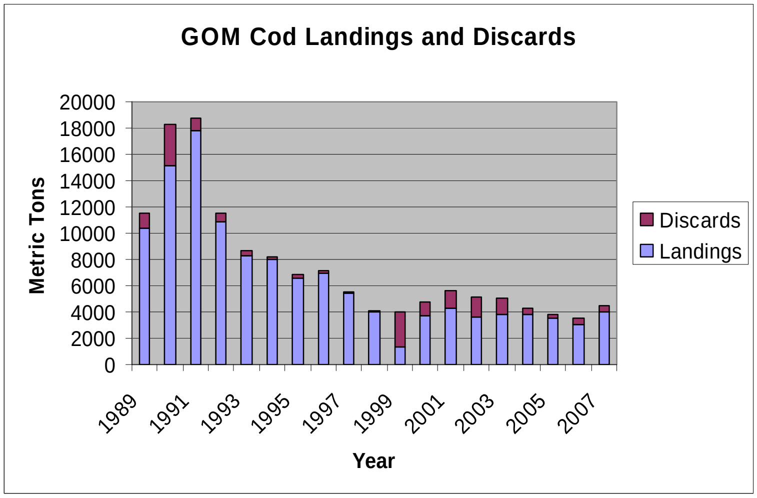


Table 140 – GOM Cod Discards-at-Age (thousands of fish), 1999-2007

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 70 – GB Haddock Landings and Discards (mt), 1989-2007

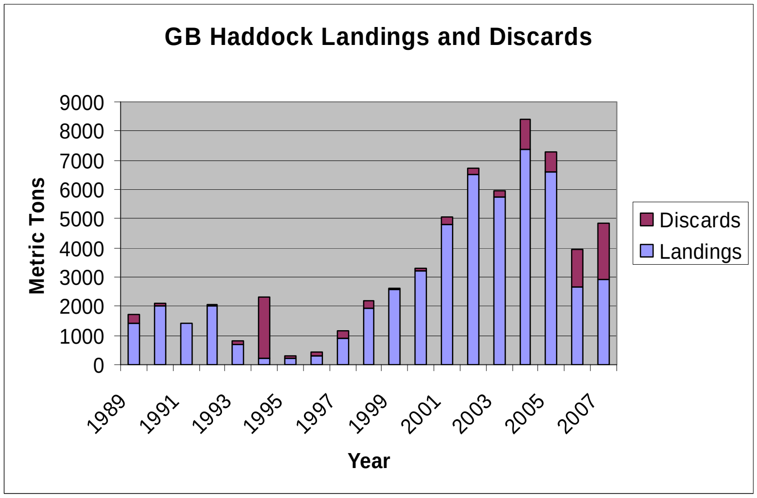


Table 141 – GB Haddock Discards-at-Age (thousands of fish), 1989-2007

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 71 – GOM Haddock Landings and Discards (mt), 1989-2007

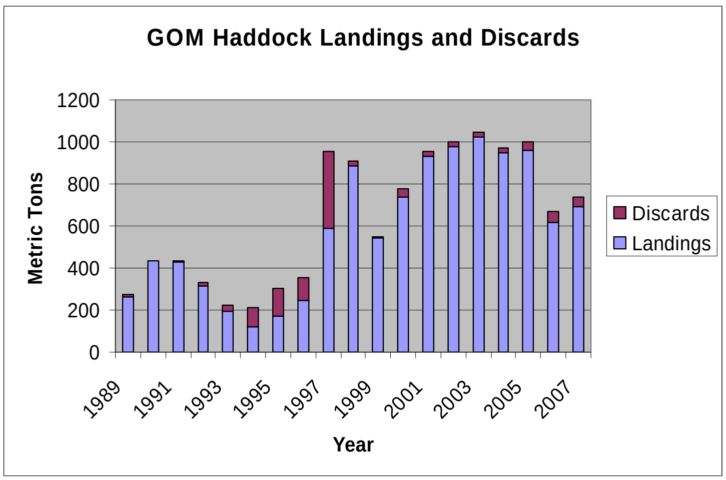


Table 142 – GOM Haddock Discards-at-Age (thousands of fish), 1989-2007

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 72).

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 72 – GB Yellowtail Flounder Landings and Discards (mt), 1989-2007

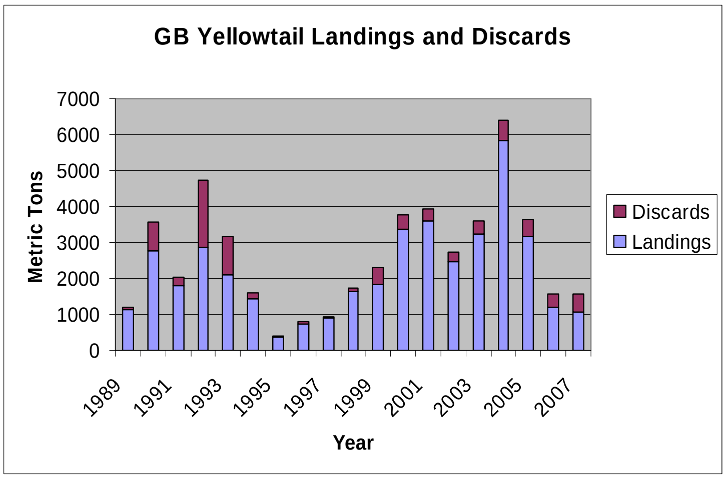


Table 143 – GB Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

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 73). 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 144).

Figure 73 – SNE/MA Yellowtail Flounder Landings and Discards (mt), 1989-2007

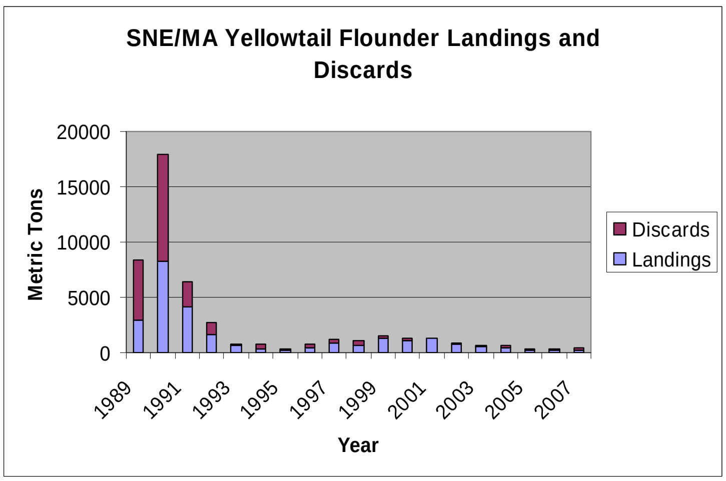


Table 144 – SNE/MA Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

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 74 – CC/GOM Yellowtail Flounder Landings and Discards (mt), 1989-2007

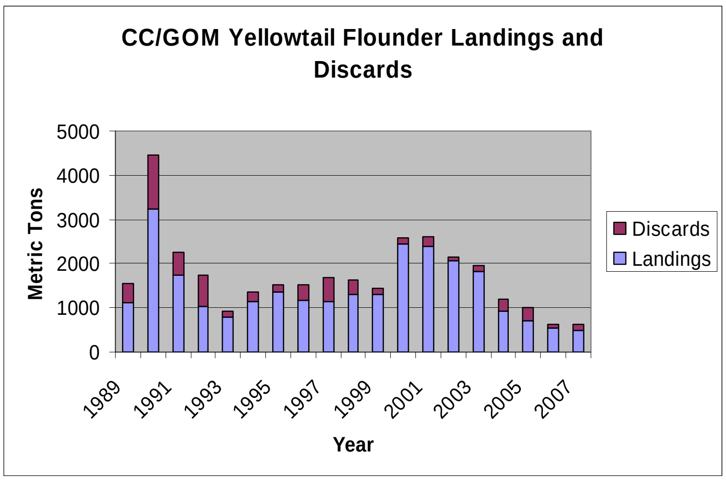


Table 145 – CC/GOM Yellowtail Flounder Discards-at-Age (thousands of fish), 1989-2007

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 75 – American Plaice Landings and Discards (mt), 1989-2007

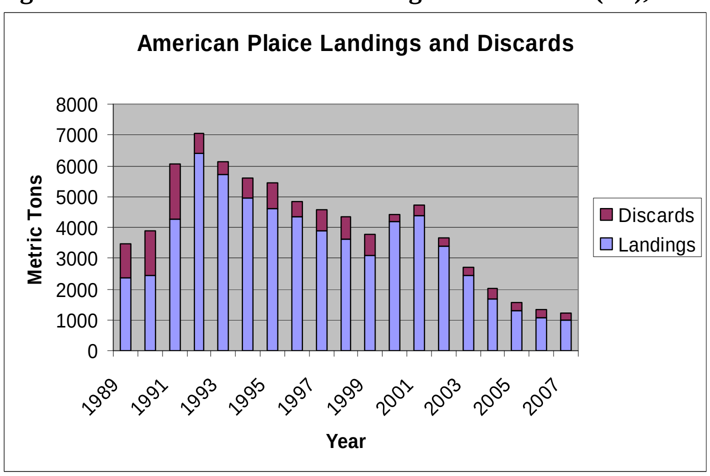


Table 146 – American Plaice Discards-at-Age (thousands of fish), 1989-2007

Year	Age 0	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 1
1989	0	15.5	2275	2530.1	2066	836.2	323.7	86.9	65	2.8	0.7	
1990	0	0	1094.4	4523.6	2761	923.1	195.8	76.9	55	0.2	0	
1991	0	0.4	255.2	1007.9	4147.2	2047.6	155.6	7.2	1.4	0.7	0	
1992	0	9.6	244.5	815.7	865.5	939.3	86.5	36.3	0	0	0	
1993	0	21.8	280.6	299	745.8	345.1	126.3	2	0	0	0	
1994	0.7	58.2	862.6	211.1	814.4	974.7	79.6	3.3	0.2	0.2	0	
1995	1.1	45.3	2433.7	1432.7	1648.5	440.5	125	14	11.4	0.5	0	
1996	0	12.5	1049.5	1083.9	1238.7	337.4	106.4	37.4	3.3	2.7	2	
1997	0	14.7	636.1	335	1058.1	1033.1	177.9	21.5	0.3	0	0	
1998	0	37.2	85.4	343	692.1	1366	714.6	74.8	0.4	0	0	

1999	0	4.2	216.3	167.4	912.4	689.2	688.9	231.7	46.7	2.4	0.4	
2000	0	2.7	303	329.2	380.6	220.2	106.2	41.9	1.6	0	0	
2001	0	0	91.7	413.8	567.7	396	206.9	65.2	18	6	0.1	
2002	0	1.1	12.8	106.1	444.1	377.8	147.1	36.3	15.7	9.8	4.2	
2003	0	11.9	689.1	45.5	167.7	456.1	177	30	34.2	11.5	0.6	1
2004	0	6.2	140	219.6	317.2	466.5	358.5	70.6	14.7	4.8	1.6	
2005	0	34.3	283.5	103.8	246.5	407.7	192.7	57	10.6	0.7	0.4	
2006	0	28.4	83.3	112.2	309.6	276.1	134	60	14.3	2.5	4.6	
2007	0	160	237.7	203.4	341.4	220.4	89.5	14.7	3.7	0.8	2.8	

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 76 – Witch Flounder Landings and Discards (mt), 1989-2007

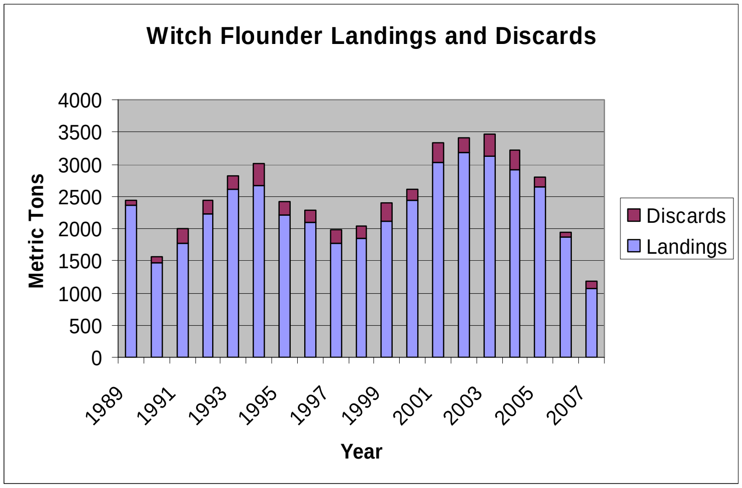


Table 147 – Witch Flounder Discards-at-Age (thousands of fish), 1989-2007

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+
1989	0.7	11.1	52.6	89.7	303.5	104.1	0	0	0.4	0	0	0
1990	1.2	5.2	117.0	303.2	200.7	200.6	0	0	0	0	0	0
1991	3.0	17.8	79.0	496.3	451.0	348.9	129.8	0	0	0	0	0
1992	2.7	43.4	137.0	161.9	460.1	273.9	130.0	12.0	0	0	0	0
1993	112.1	78.8	108.2	86.5	584.2	395.4	5.9	2.2	0	0	0	0
1994	8.1	1368.5	498.5	67.2	439.2	629.9	59.4	119.2	2.3	2.8	0	7.9
1995	2.7	49.9	658.6	640.9	354.4	278.3	108.1	2.4	1.0	0.3	0	0
1996	5.2	32.7	51.5	141.8	327.2	418.0	61.4	0	0	0	0	0
1997	8.7	74.9	106.8	124.3	485.9	366.8	155.8	5.4	1.4	0.8	0	0.2
1998	49.8	392.3	278.5	221.0	283.5	241.0	71.0	10.2	0.3	0.2	0	0
1999	32.1	253.0	188.9	146.5	275.9	340.6	51.8	15.5	1.9	0.8	0	0
2000	21.6	170.0	121.2	122.2	291.2	297.9	74.7	17.5	2.9	0	0	0
2001	12.3	97.0	66.3	65.1	310.5	645.8	176.7	43.1	0.1	0.1	0	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
2003	0	1.4	6.7	32.0	226.2	585.7	379.4	120.4	23.7	6.4	1.3	1.4
2004	0	0.1	9.6	33.0	169.1	476.8	383.7	116.8	31.7	15.1	13.5	8.0
2005	0	5.9	14.6	15.3	109.1	196.1	159.0	53.8	9.4	4.6	1.3	0.9
2006	0	2.6	20.4	47.2	36.2	61.1	136.8	36.6	9.8	3.7	2.1	1.8
2007	0	2.1	19.1	69.7	69.8	52.9	37.4	18.1	2.0	1.9	0	0.5

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 77 – GB Winter

Flounder Landings and Discards (mt), 1989-2007Figure 77). 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 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 148), 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 77 – GB Winter Flounder Landings and Discards (mt), 1989-2007

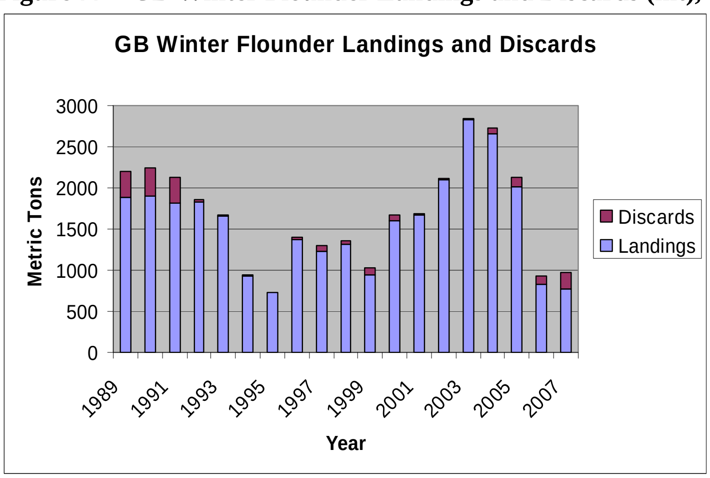


Table 148 – GB Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

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 78 – GOM Winter Flounder Landings and Discards (mt), 1989-2007

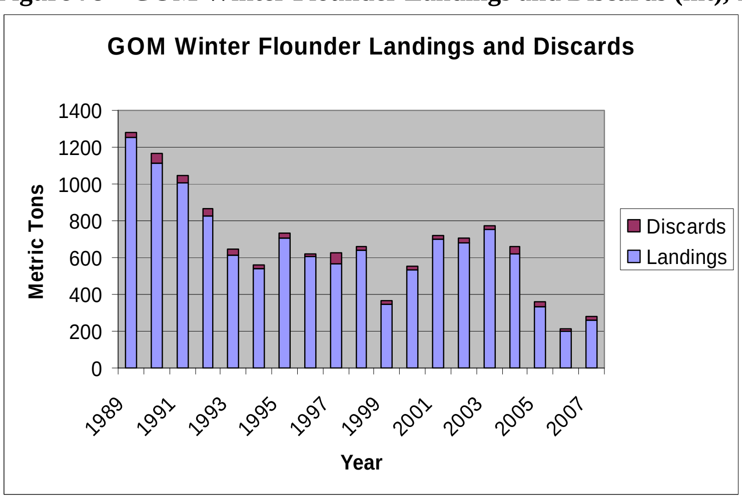


Table 149 – GOM Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

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 79 – SNE/MA Winter Flounder Landings and Discards (mt), 1989-2007

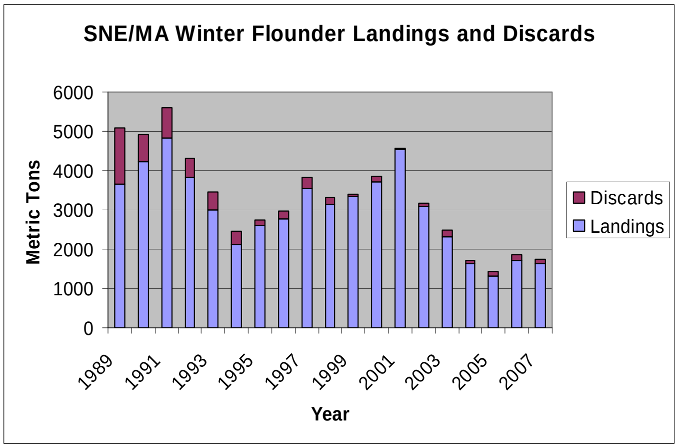


Table 150 – SNE/MA Winter Flounder Discards-at-Age (thousands of fish), 1989-2007

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 80), but are sometimes a substantial proportion of total removals during this period (Figure 81). 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 80 – Acadian Redfish Discards (mt), 1989-2007

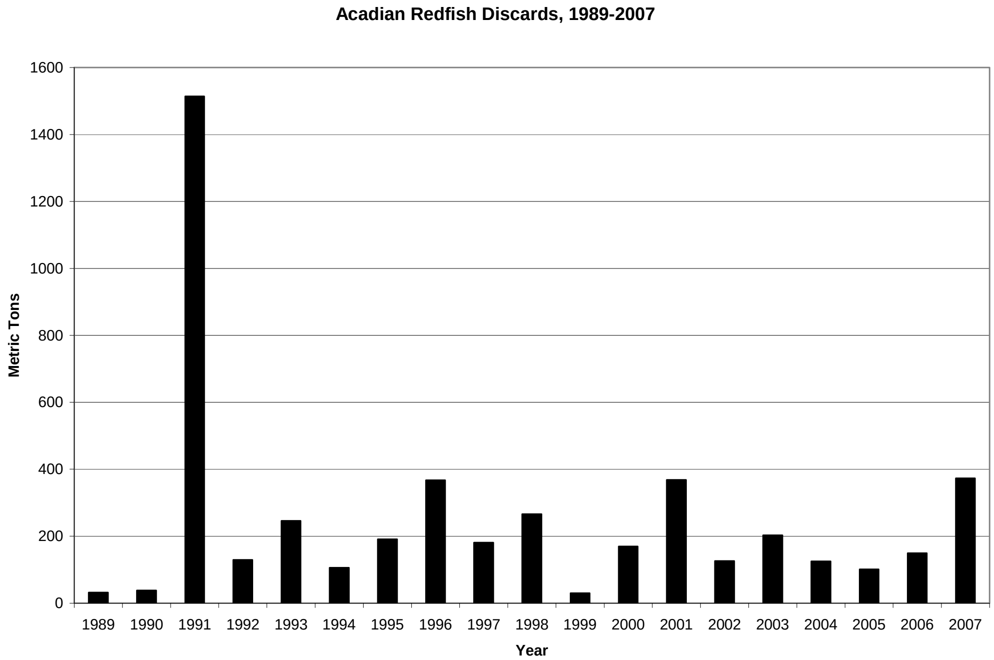
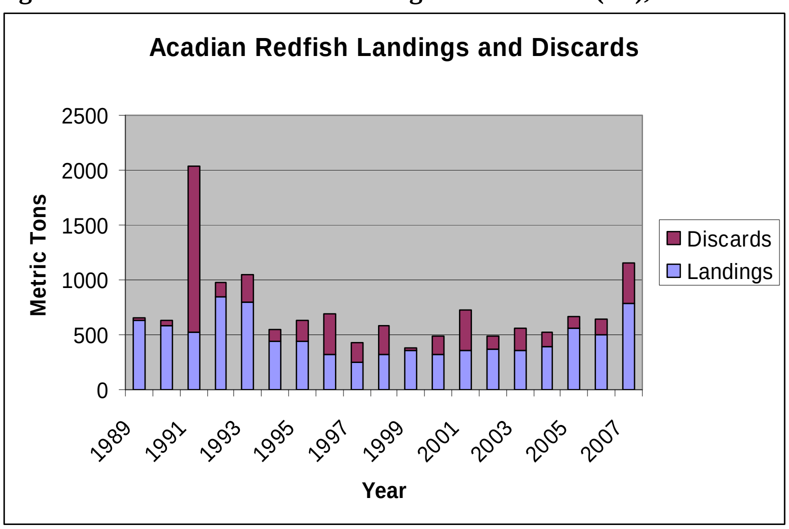


Figure 81 – Acadian Redfish Landings and Discards (mt), 1989-2007



White Hake

Commercial discards were estimated for white hake for 1989-2007 using the SBRM method of white hake discard/all kept (Figure 82). 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 83). 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 82 – White Hake Commercial Discards (mt), 1989-2007

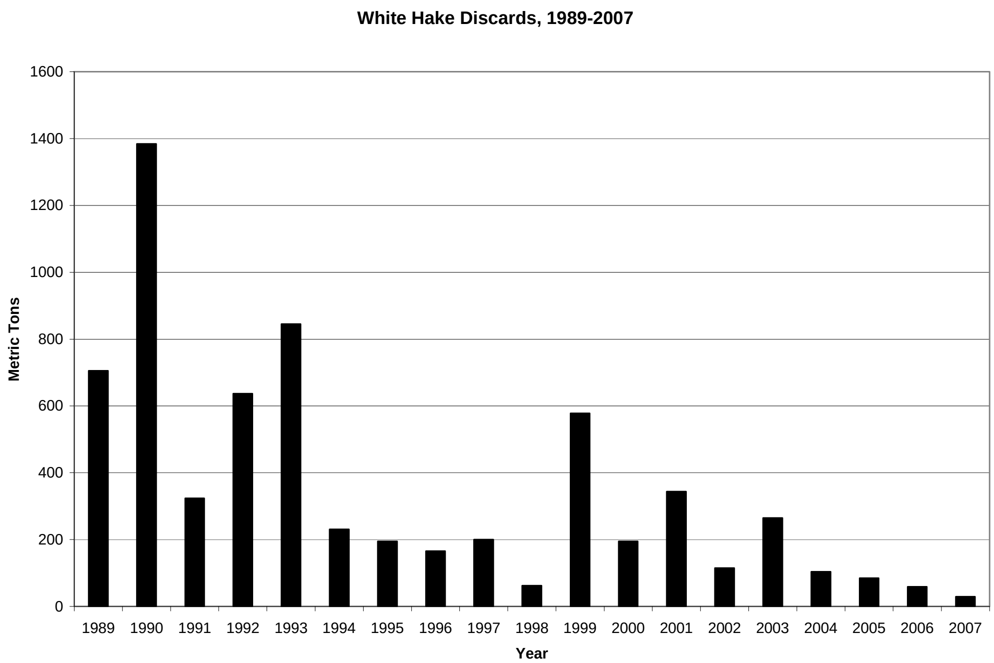
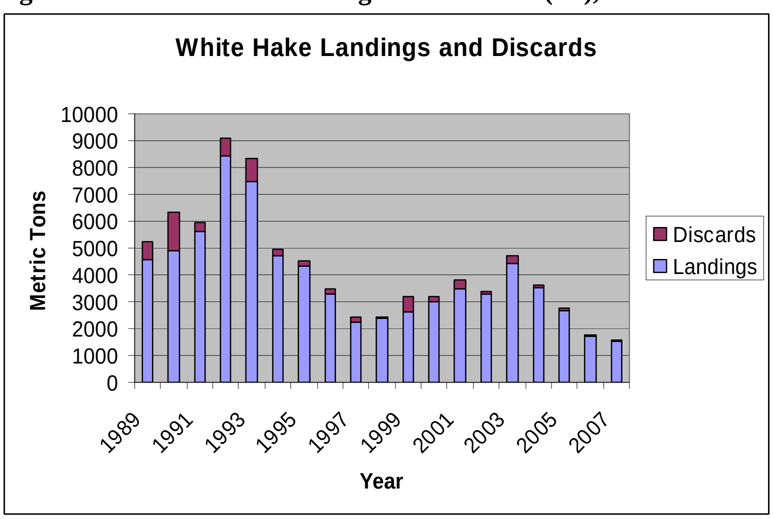


Figure 83 – White Hake Landings and Discards (mt), 1989-2007



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 84. 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 84). 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 85). 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 84 – GOM/GB Windowpane Flounder Discards (mt), 1989-2007

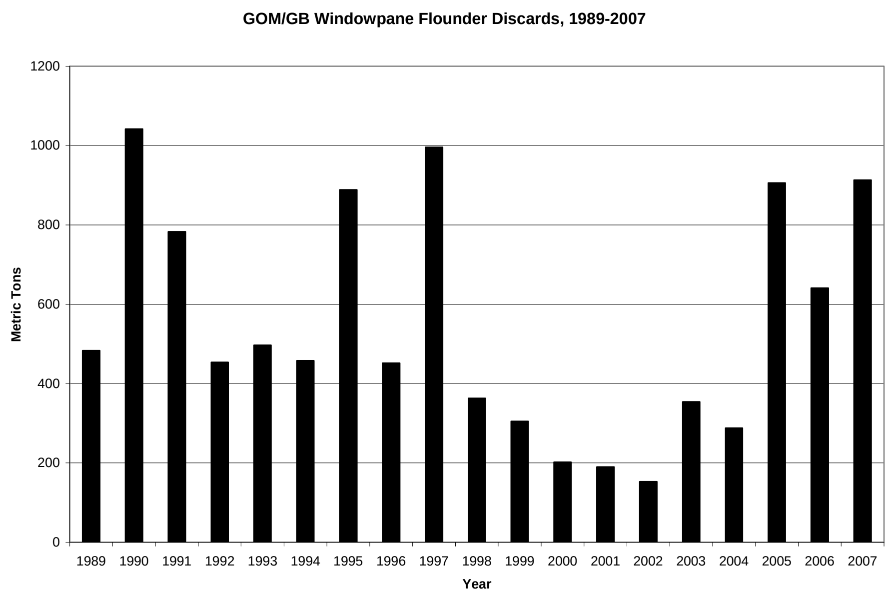
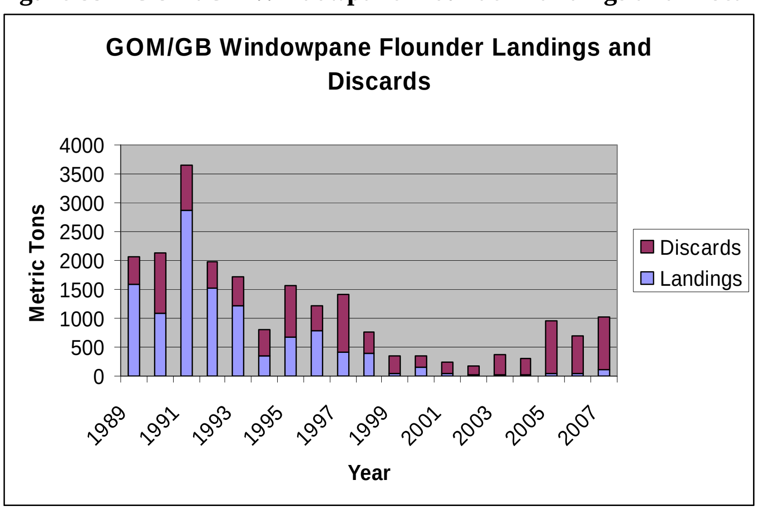


Figure 85 – GOM/GB Windowpane Flounder Landings and Discards (mt), 1989-2007



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 87). During 1989-1991, total discards ranged between 3,133 mt and 4,510 mt (Figure 86). 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 86 – SNE/MA Windowpane Flounder Discards (mt), 1989-2007

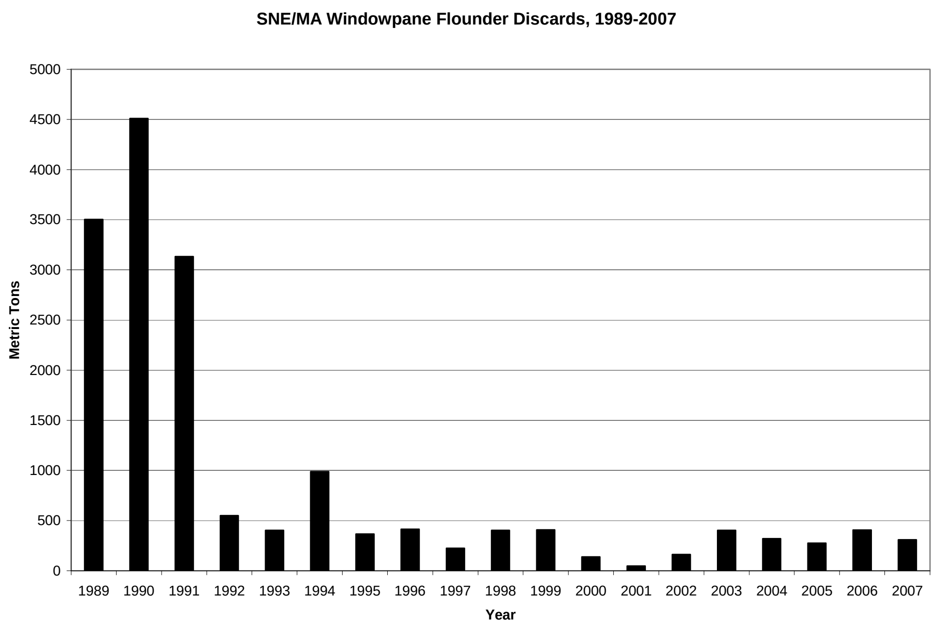
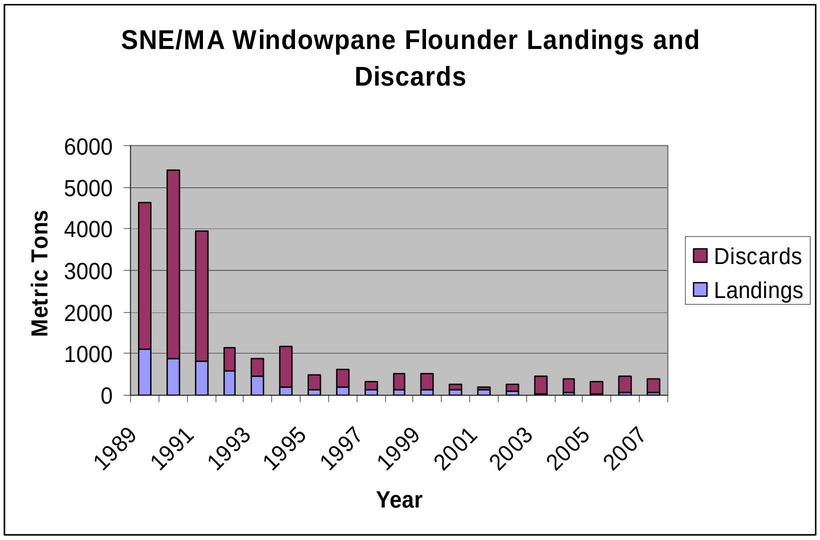


Figure 87 – SNE/MA Windowpane Flounder Landings and Discards (mt), 1989-2007



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 88). Discards far exceed landings in all years, accounting for up to 98% of total removals (Figure 89). The primary reason reported in the NEFOP for ocean pout discards is “no market”.

Figure 88 – Ocean Pout Discards (mt), 1989-2007

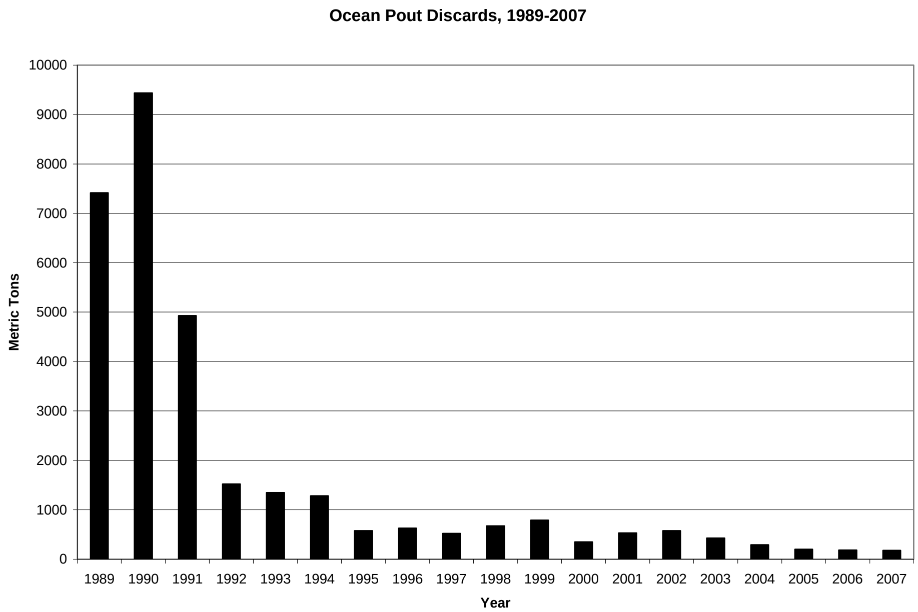
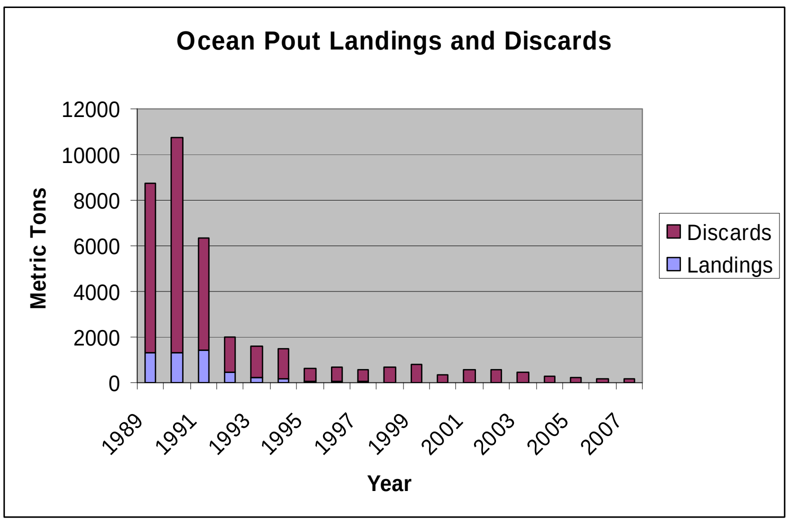


Figure 89 – Ocean Pout Landings and Discards (mt), 1989-2007



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 90), 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 91). A trip limit of one halibut per trip and a 91 cm minimum retention size were implemented in 1999.

Figure 90 – Atlantic Halibut Discards (mt), 1989-2007

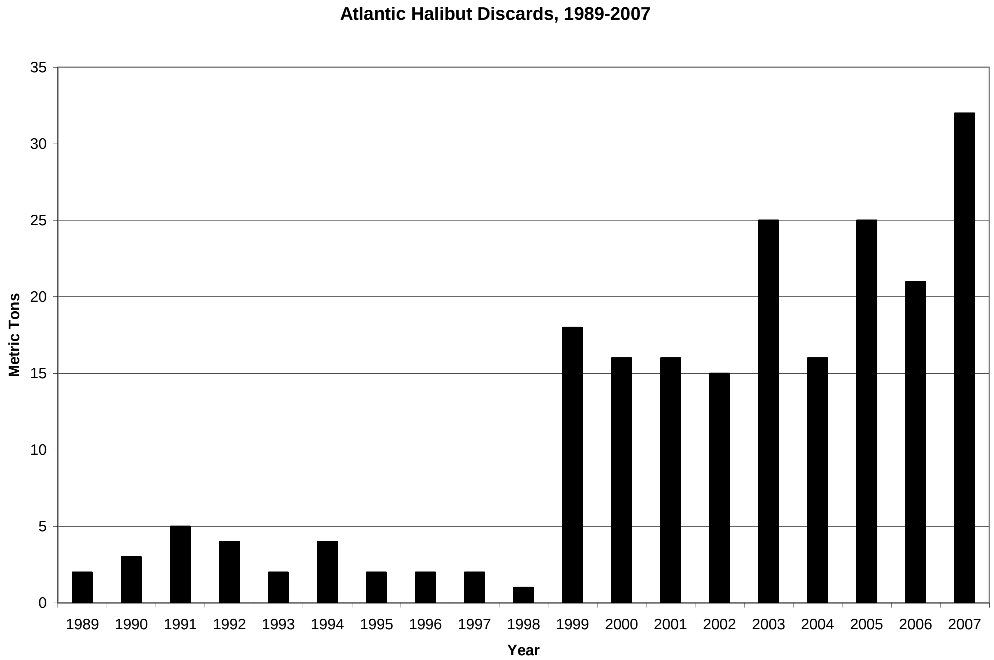
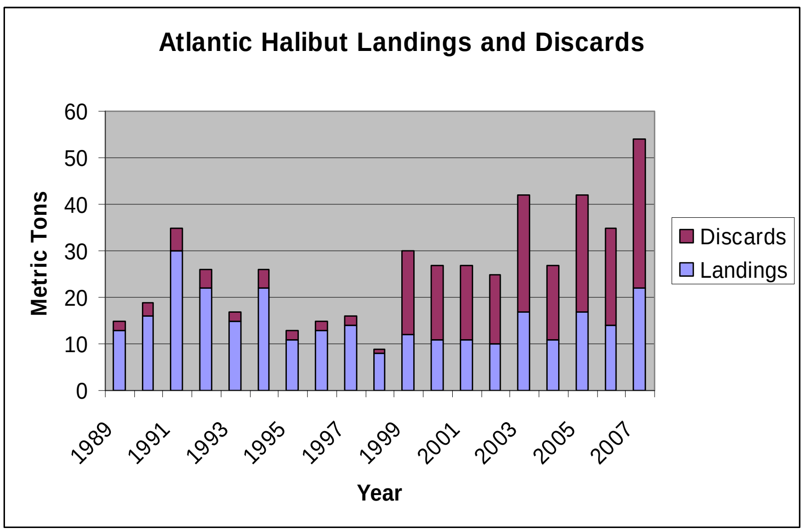


Figure 91 – Atlantic Halibut Landings and Discards (mt), 1989-2007



5.2.6.1.2 Stocks for which no estimates are possible

Recent discard estimates are not available for pollock from GARM III.

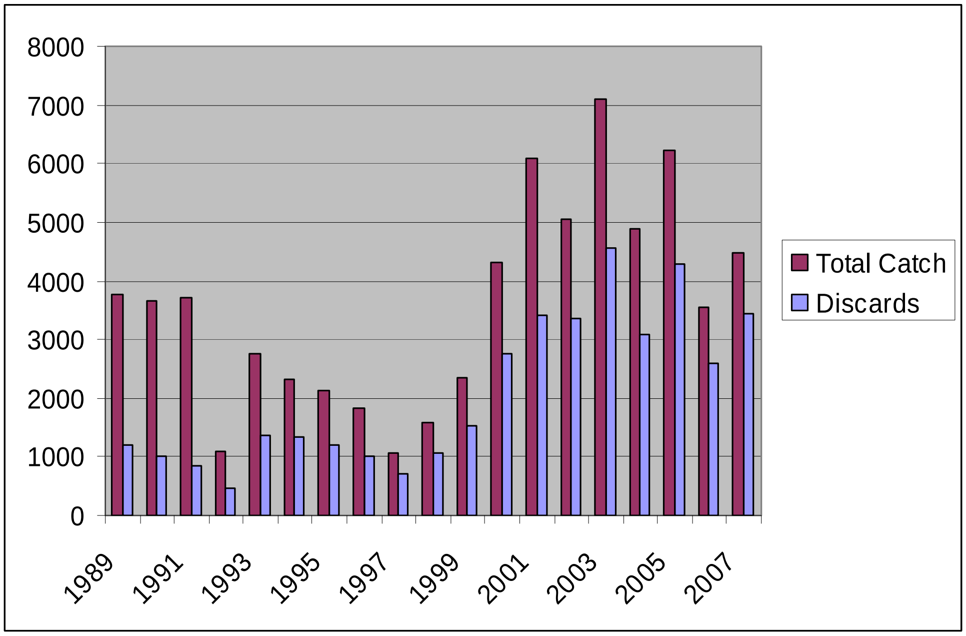
5.2.6.2 Recreational Fishery Discards

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.

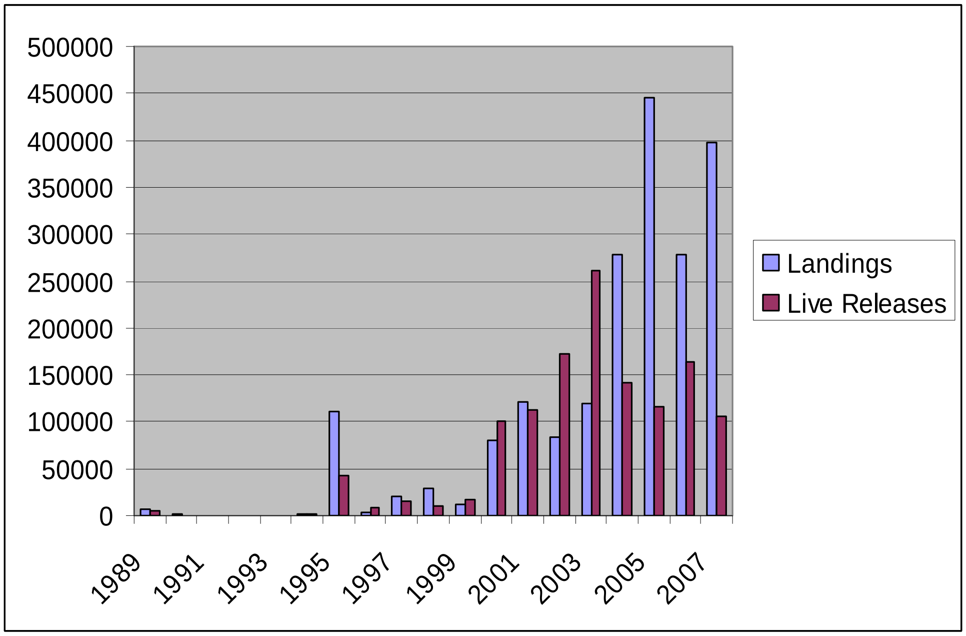
Figure 92 – GOM Cod Recreational Catch and Recreational Discards (mt), 1989-2007



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.

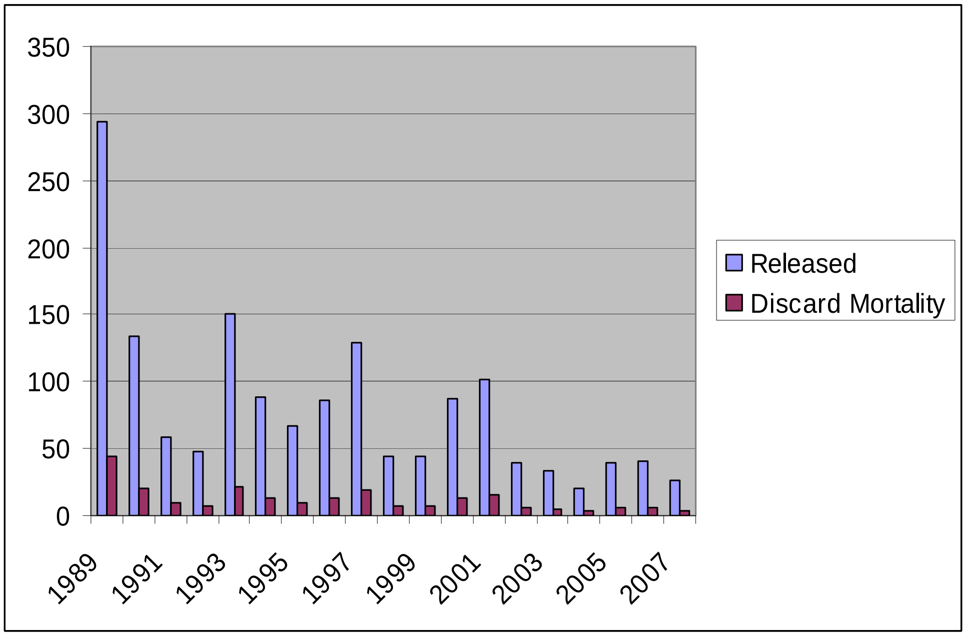
Figure 93 – GOM Haddock Recreational Landings and Live Releases (mt), 1989-2007 in numbers of fish



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).

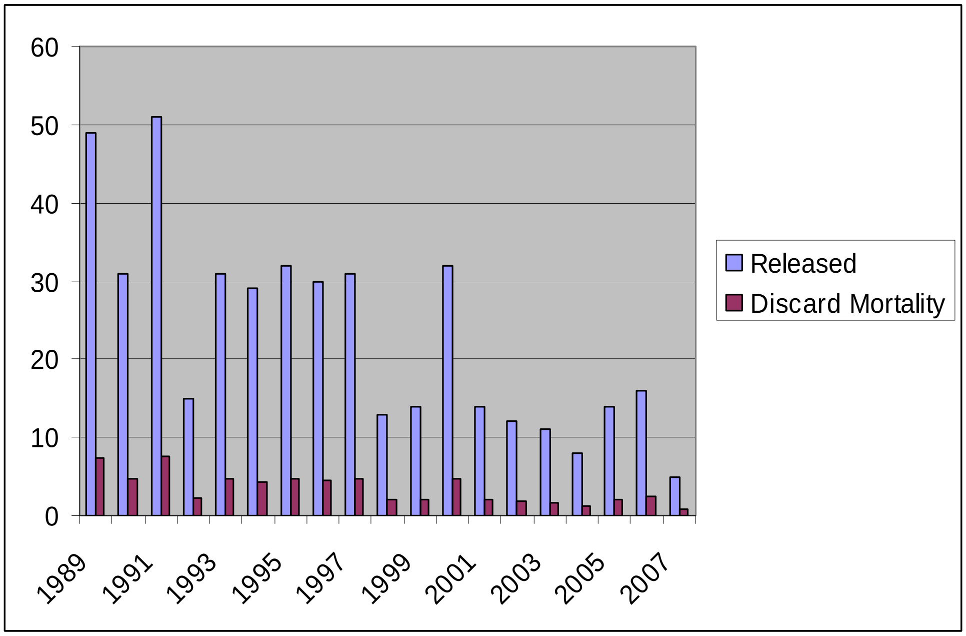
Figure 94 – GOM Winter Flounder Recreational Discards and Recreational Discard Mortality (thousands of fish), 1989-2007



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.

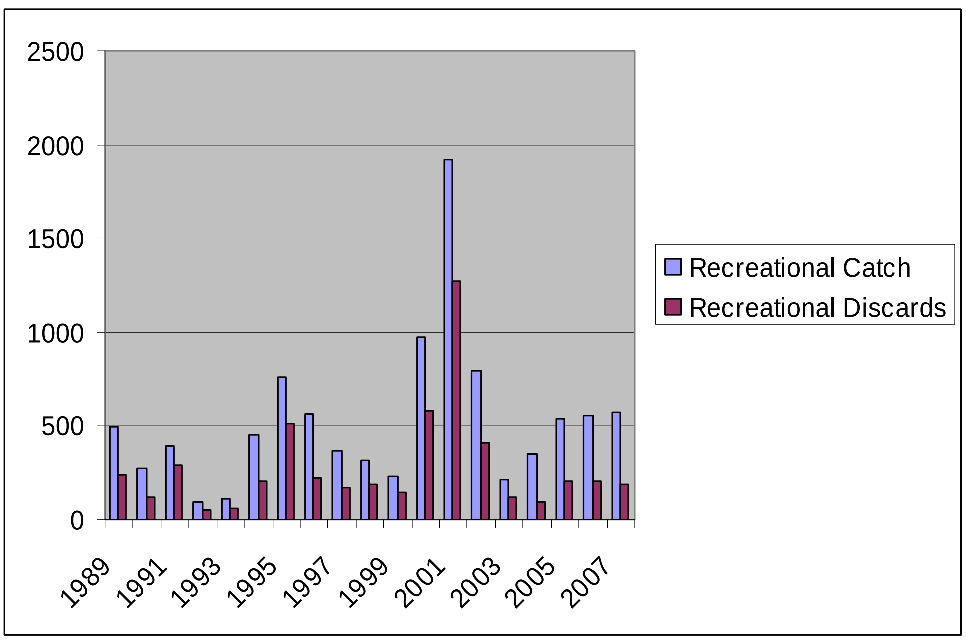
Figure 95 – SNE/MA Winter Flounder Recreational Discards and Recreational Discard Mortality (thousands of fish), 1989-2007



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 96 – Recreational Pollock Catch and Discards (mt), 1989-2007



5.2.6.3 Measures to Reduce Bycatch

(To Be Completed)

6.0 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, and 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

6.1 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.

6.1.1 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.

6.1.2 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 4.4.2) 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 XXX.

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 **Error! Reference source not found.**).

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. That lawsuit is still pending. 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.

6.1.3 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.

6.1.4 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.

6.2 Biological Impacts of the Alternatives

6.2.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

6.2.1.1 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 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 proposed in Option 1. 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 XXX. There are also differences in fishing mortality thresholds – for some stocks, the Amendment 13 values are higher, 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 Amendment 13 SDCs are a different parameter than what is recommended in Option 1. 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.

The impacts of Option 1 are in the opposite direction of those for the No Action alternative. Option 1 SDCs, however, are based on the best available science.

6.2.1.2 Revised Mortality Targets for Formal Rebuilding Programs

6.2.1.2.1 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.

Figure 97 – GB cod predicted SSB, Option1

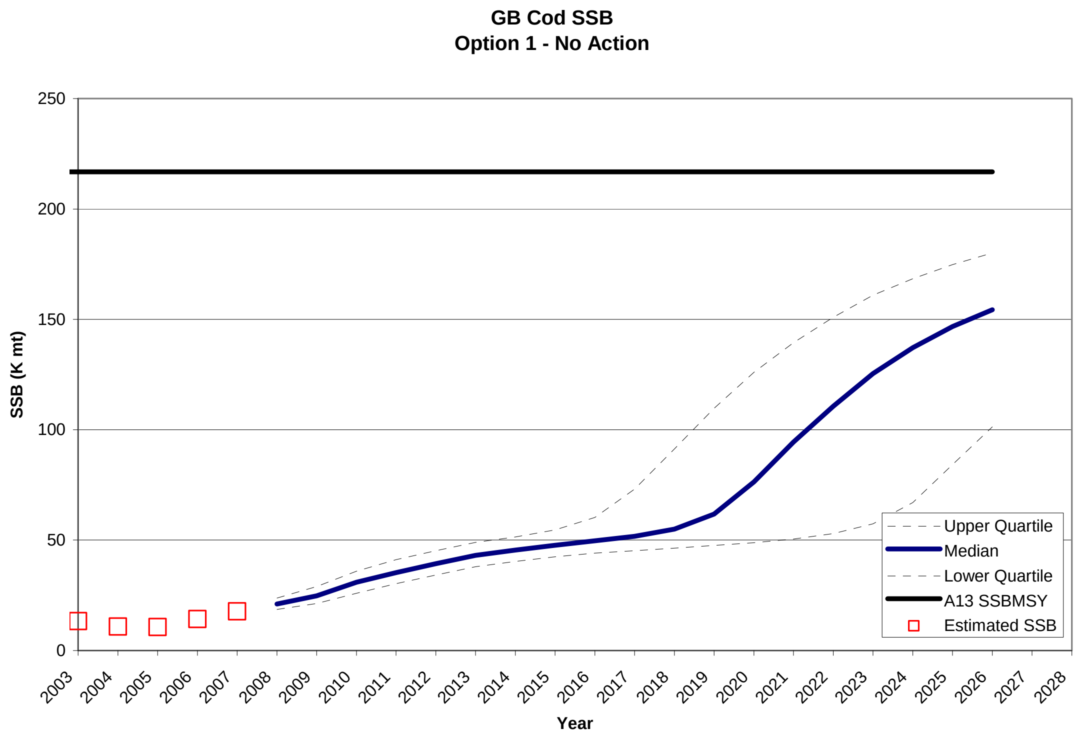


Figure 98 - GOM cod predicted SSB, Option 1

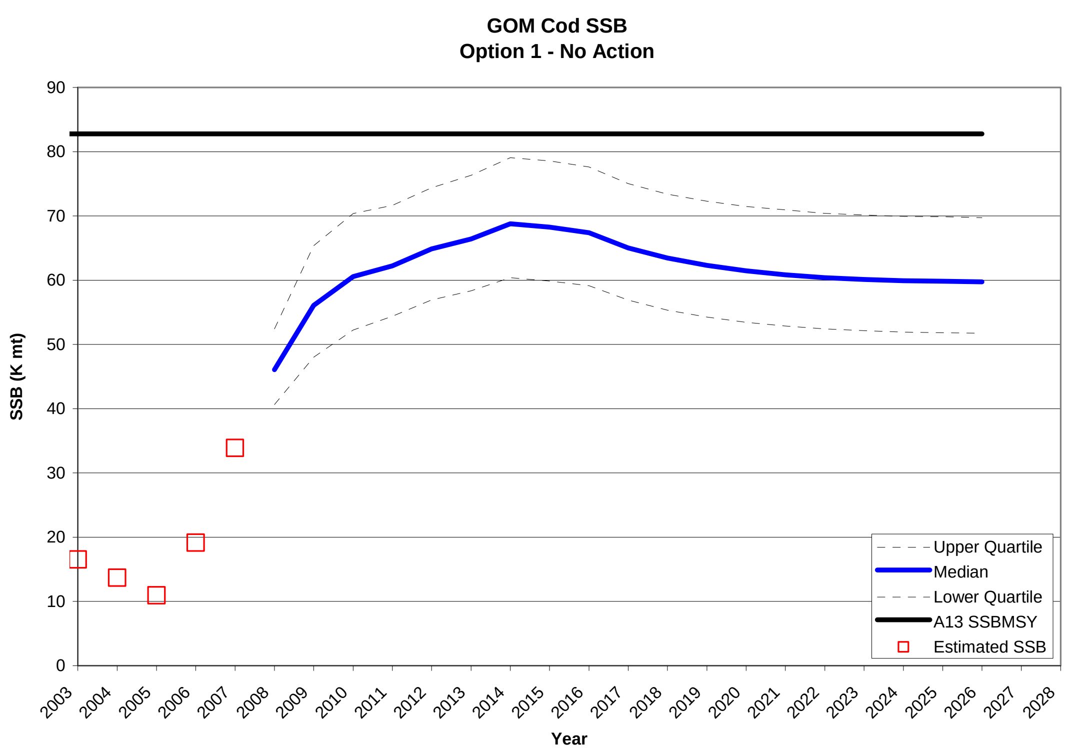


Figure 99 - GB haddock predicted SSB, Option 1

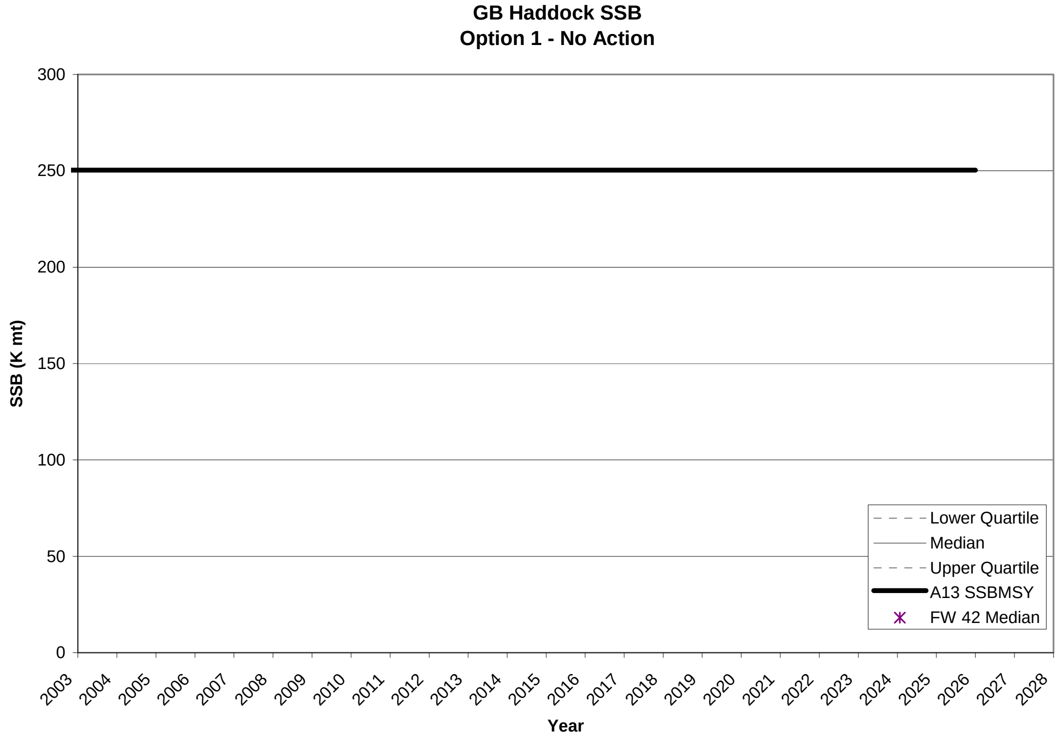


Figure 100 - GB yellowtail flounder predicted SSB, Option 1

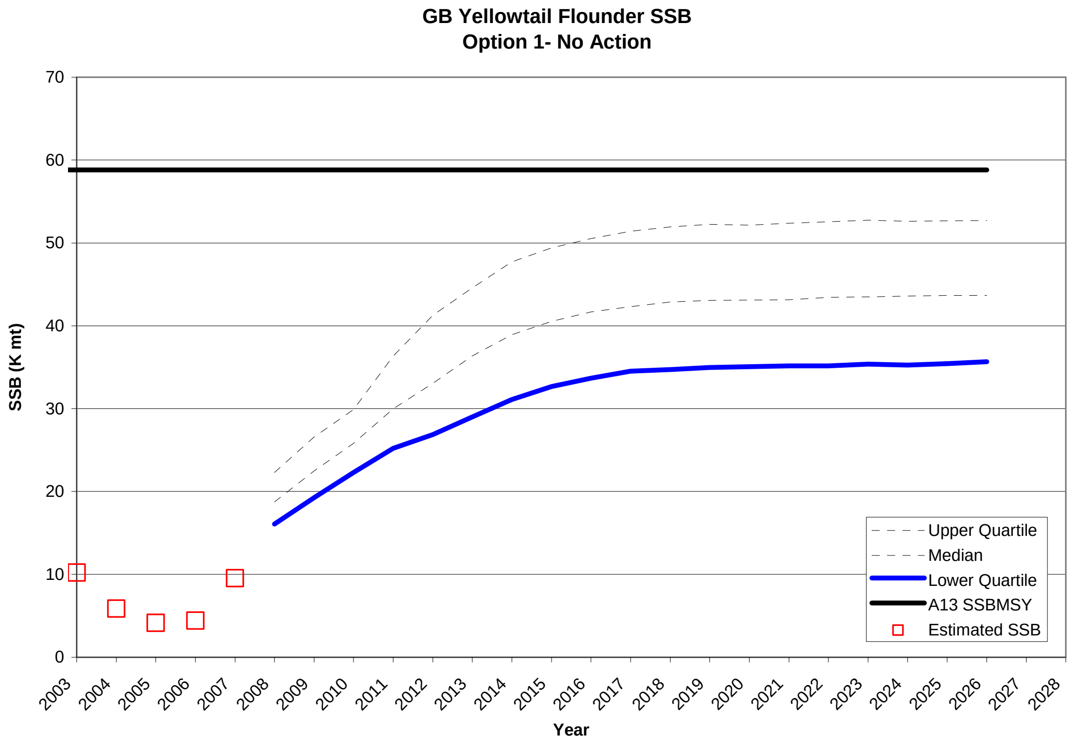


Figure 101 – SNE/MA yellowtail flounder predicted SSB, Option 1

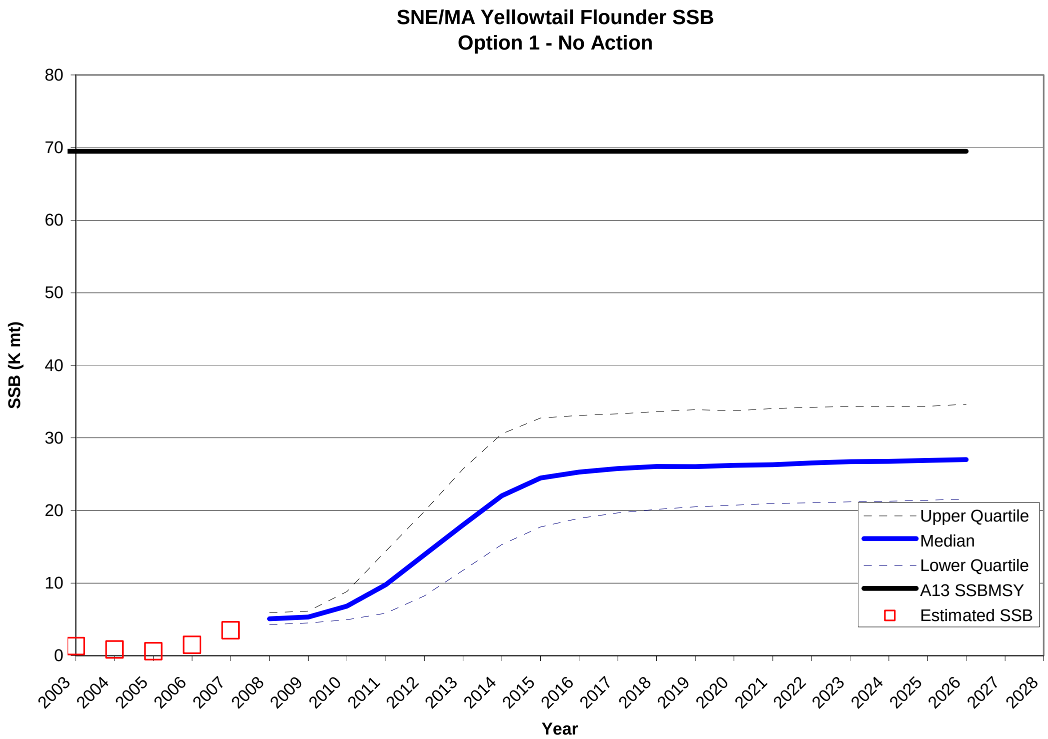


Figure 102 – CC/GOM yellowtail flounder predicted SSB, Option 1

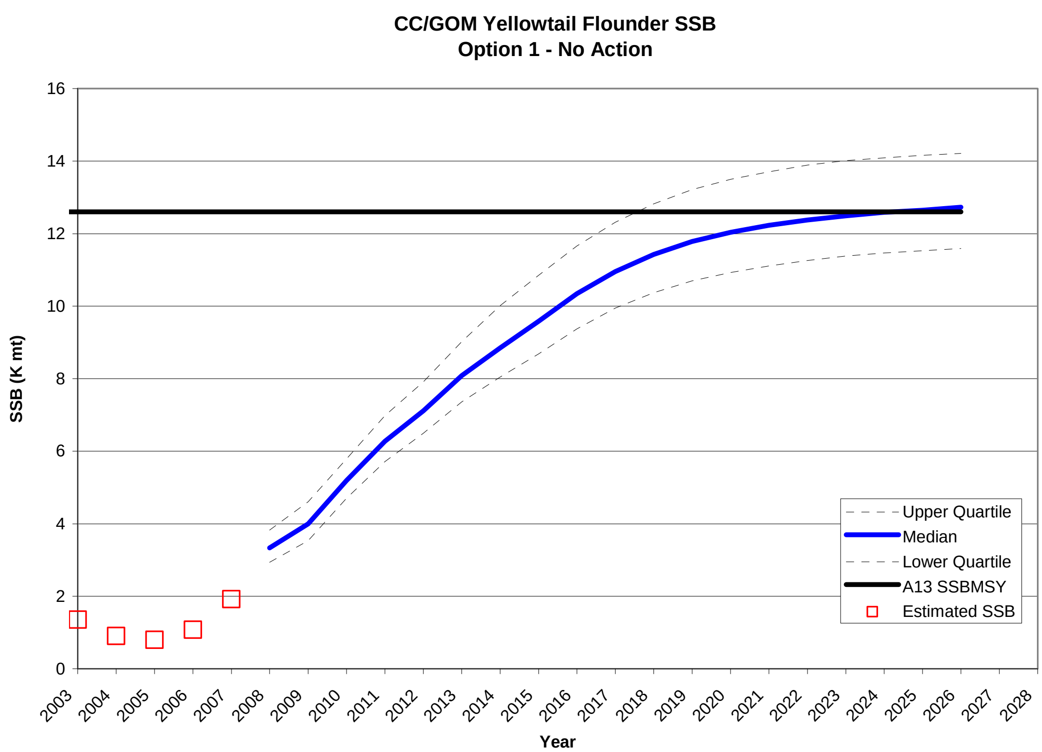


Figure 103 – American plaice predicted SSB, Option 1

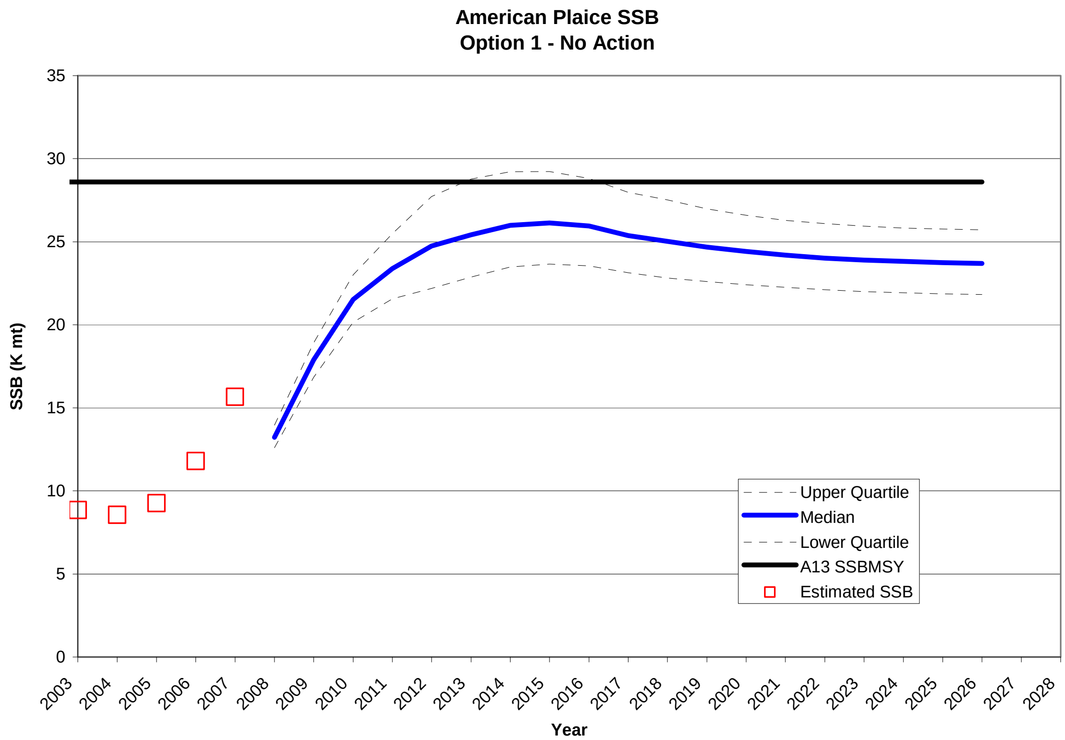


Figure 104 – Witch flounder predicted SSB, Option 1

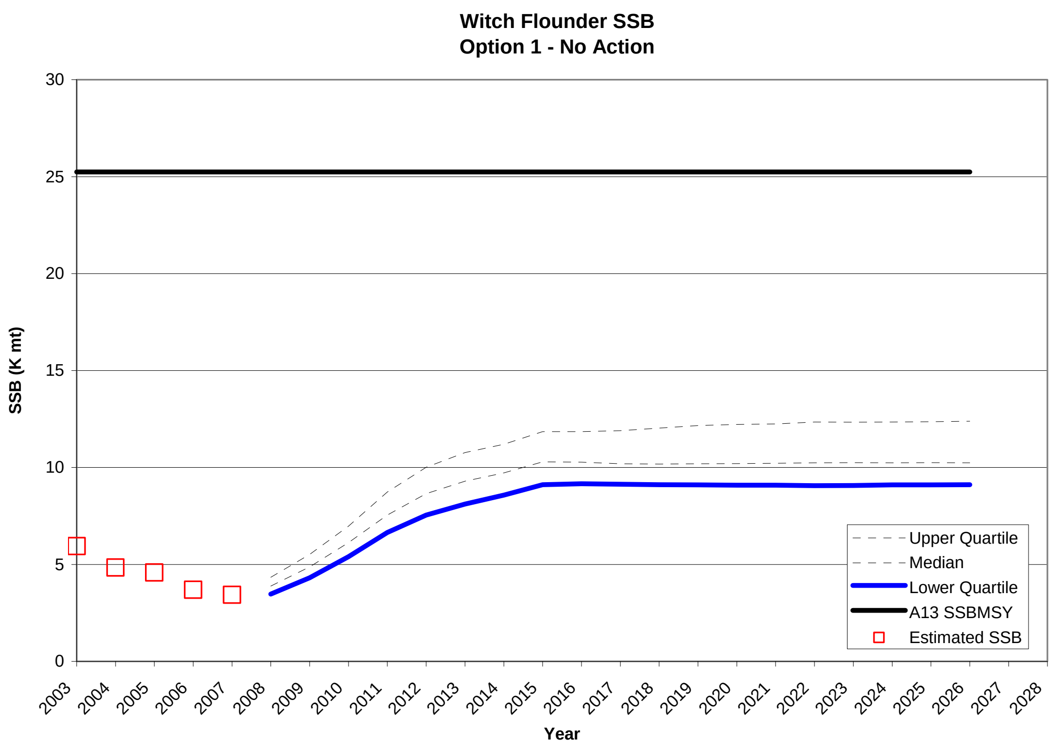


Figure 105 – GB winter flounder predicted SSB, Option 1

Figure 106 – SNE/MA winter flounder predicted SSB, Option 1

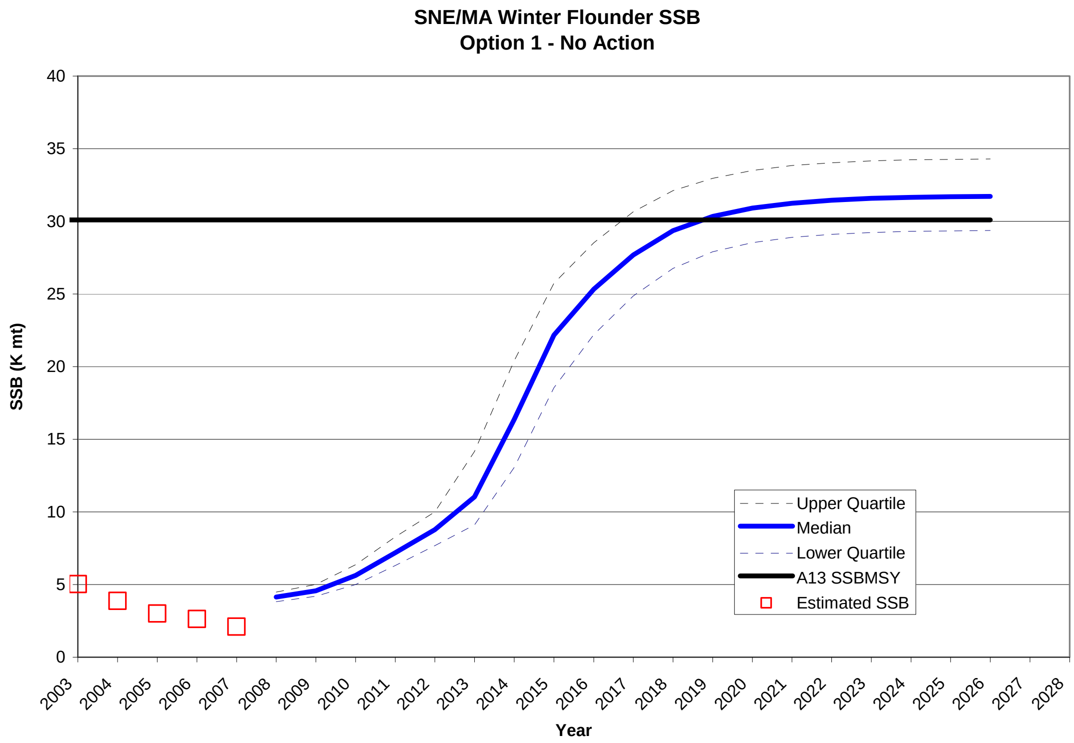
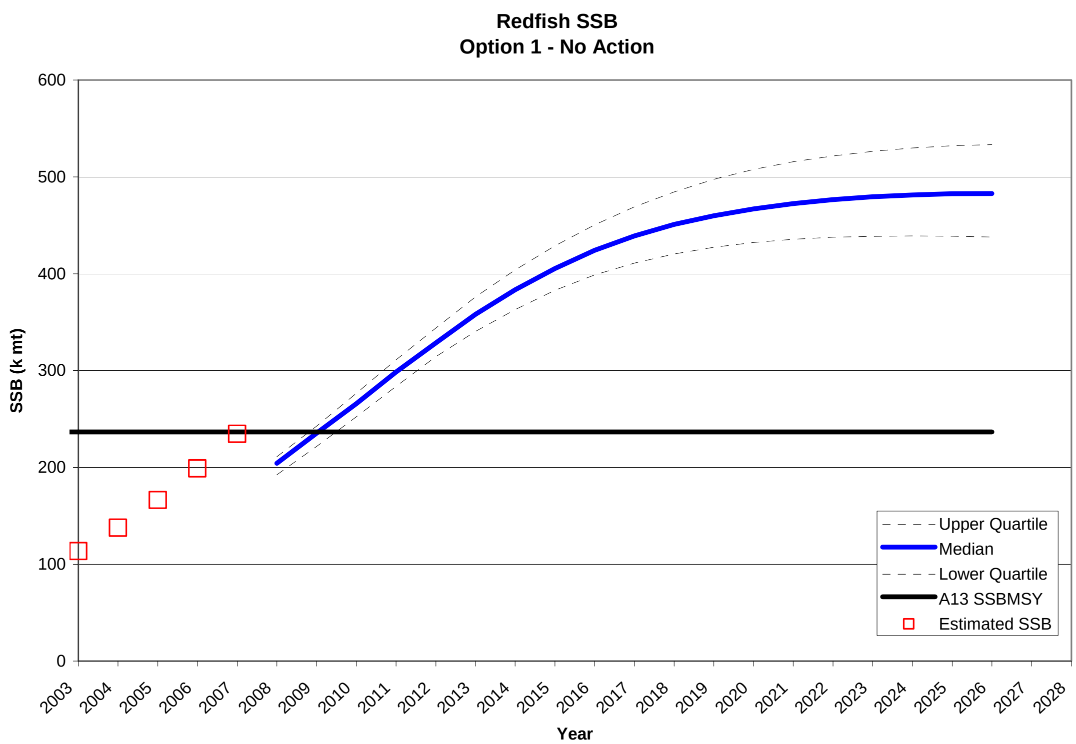


Figure 107 - Redfish predicted SSB, Option 1



6.2.1.2.2 Option 2 – Revised Rebuilding Mortality Targets

This option 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. 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 proposed SSB_{MSY} level. In each chart the solid SSB line reflects the rebuilding strategy.

Charts are not shown for GOM winter flounder, Northern and Southern windowpane flounder or ocean pout. The GARM III review panel 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.

Figure 108 – GB cod predicted SSB, Option 2

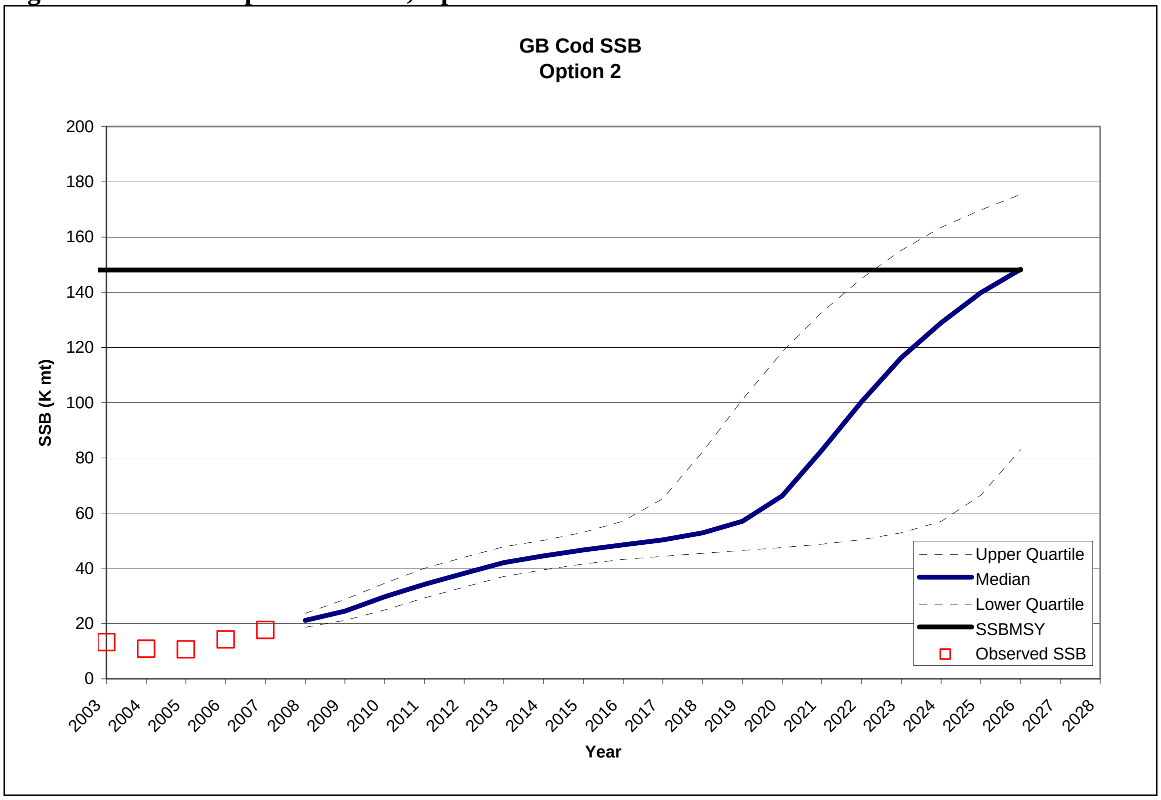


Figure 109 - GOM cod predicted SSB, Option 2

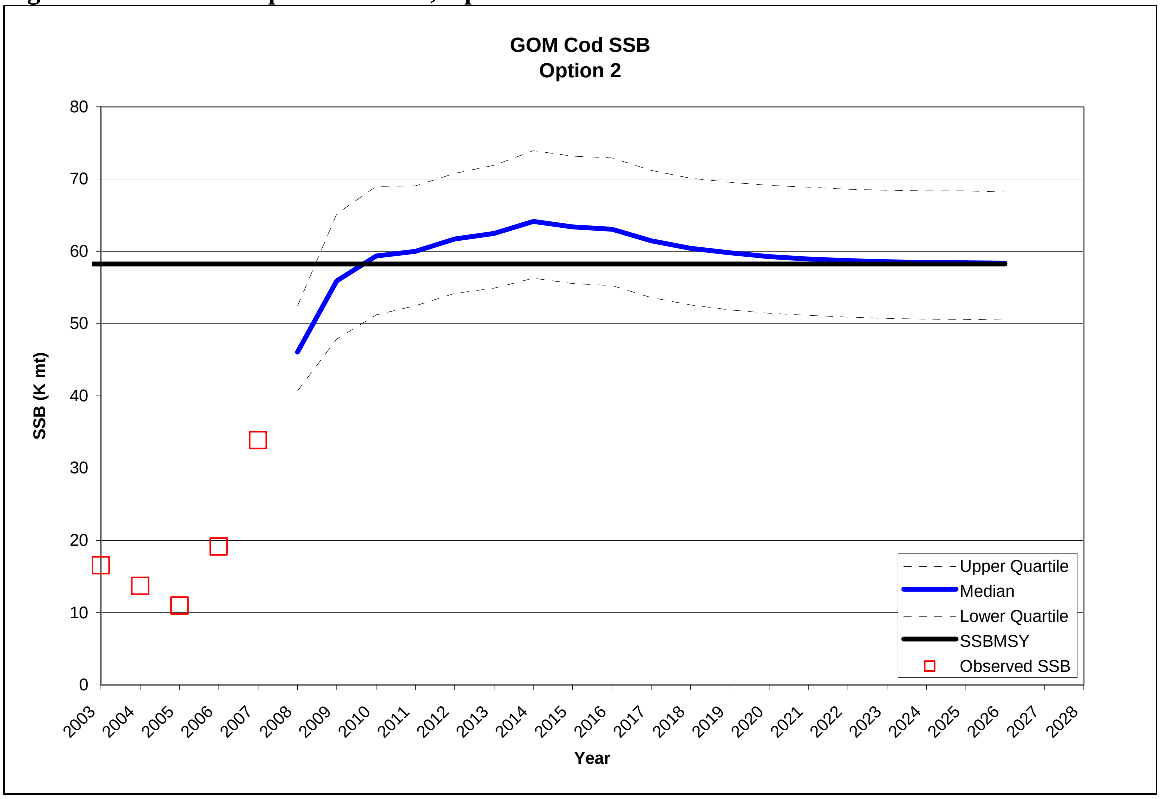


Figure 110 - GB haddock predicted SSB, Option 2

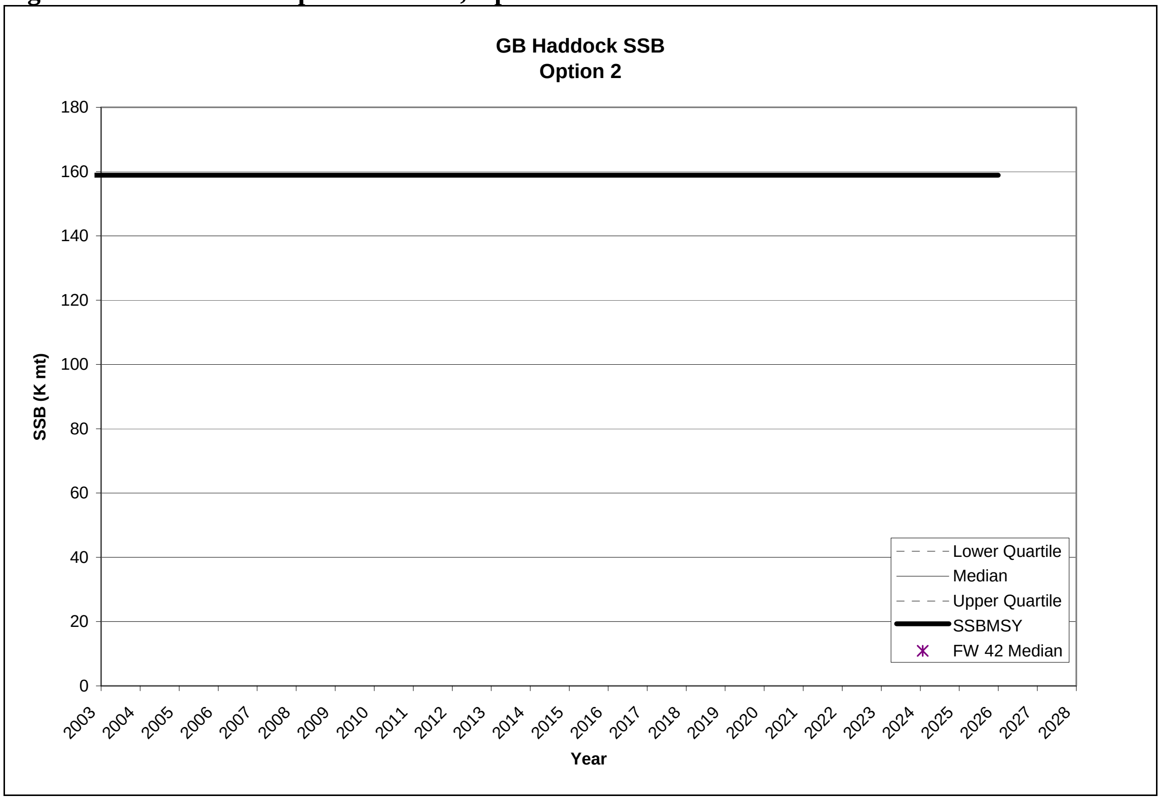


Figure 111 – GOM haddock predicted SSB, Option 2

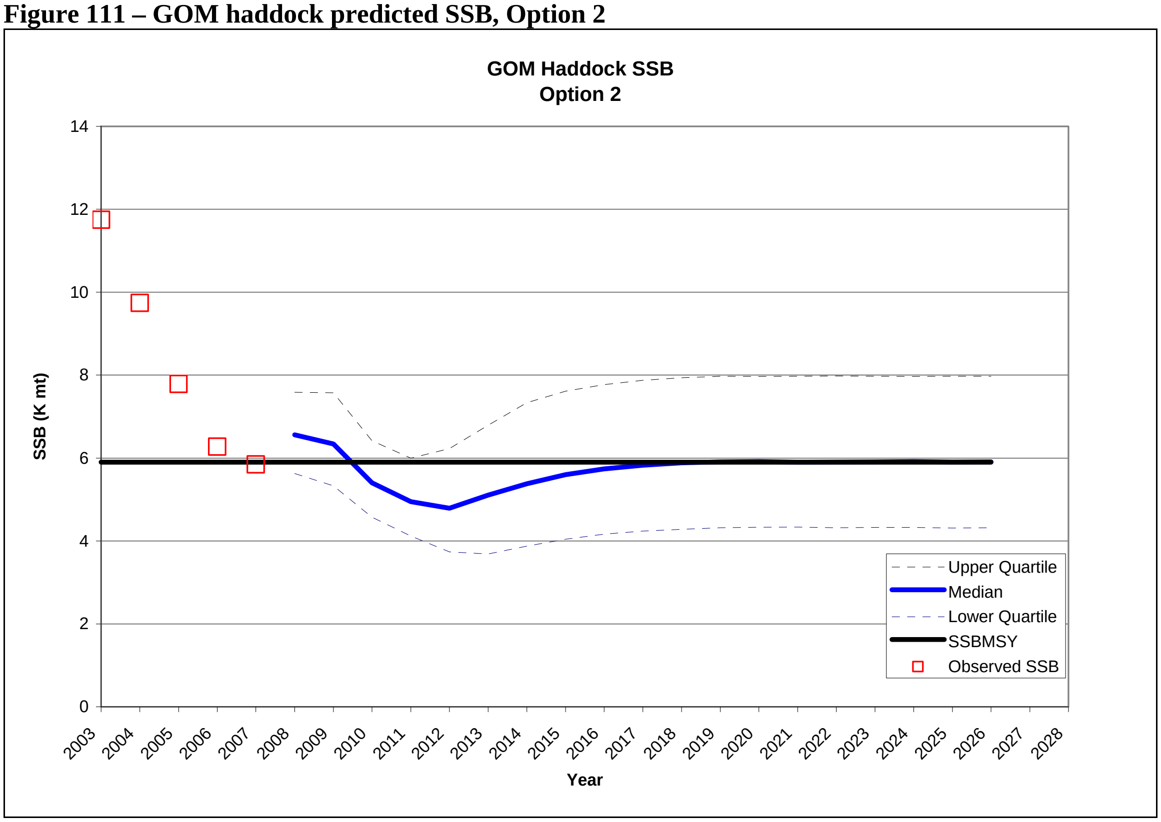


Figure 112 - GB yellowtail flounder predicted SSB, Option 2

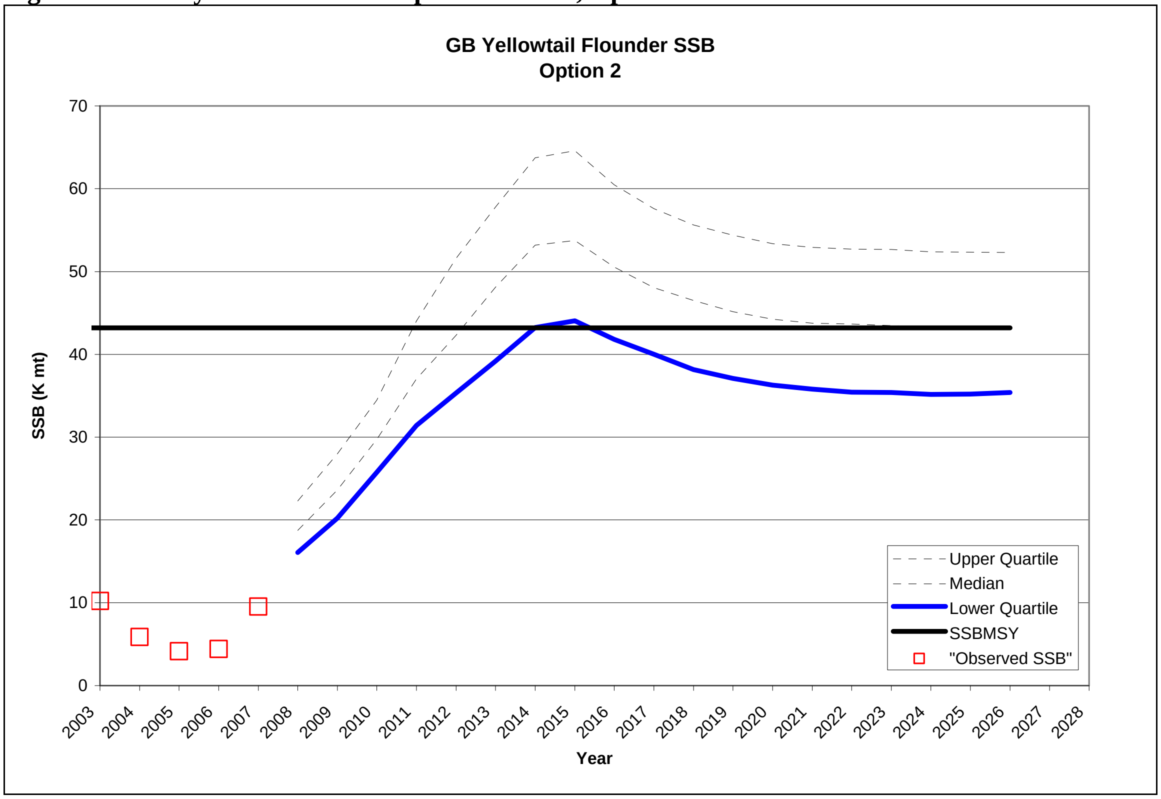


Figure 113 – SNE/MA yellowtail flounder predicted SSB, Option 2

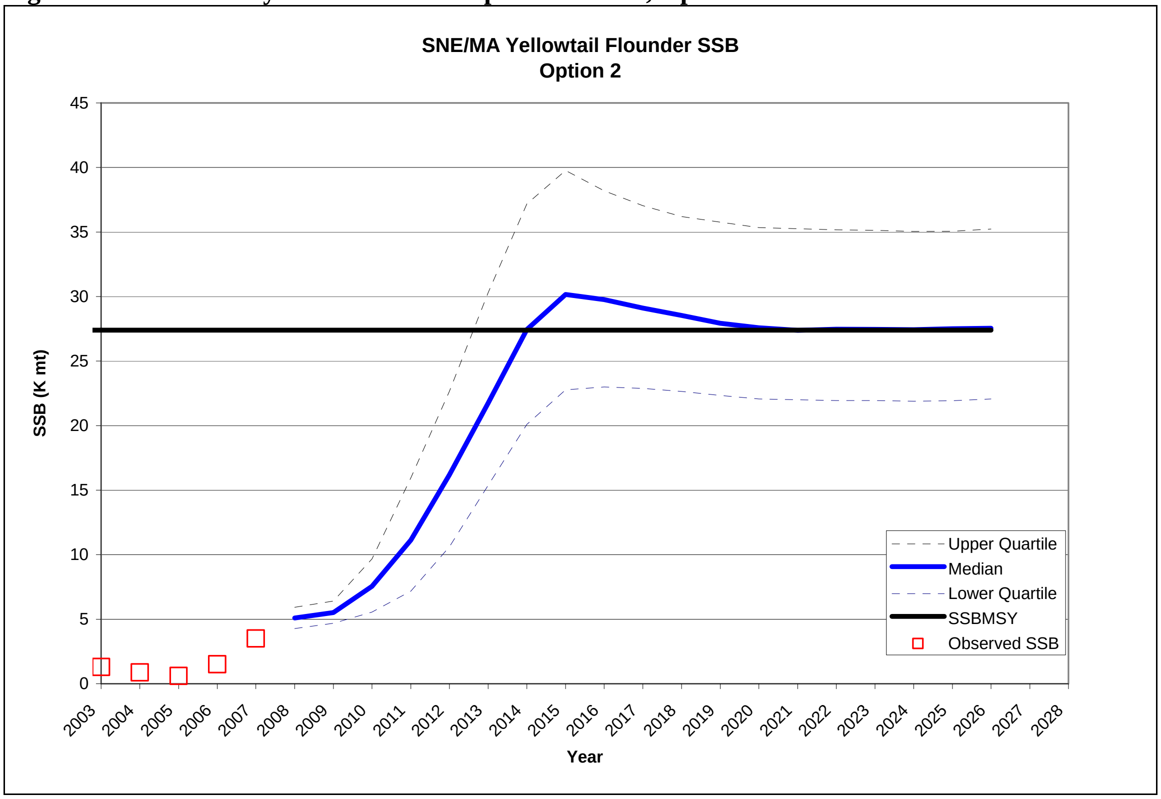


Figure 114 – CC/GOM yellowtail flounder predicted SSB, Option 2

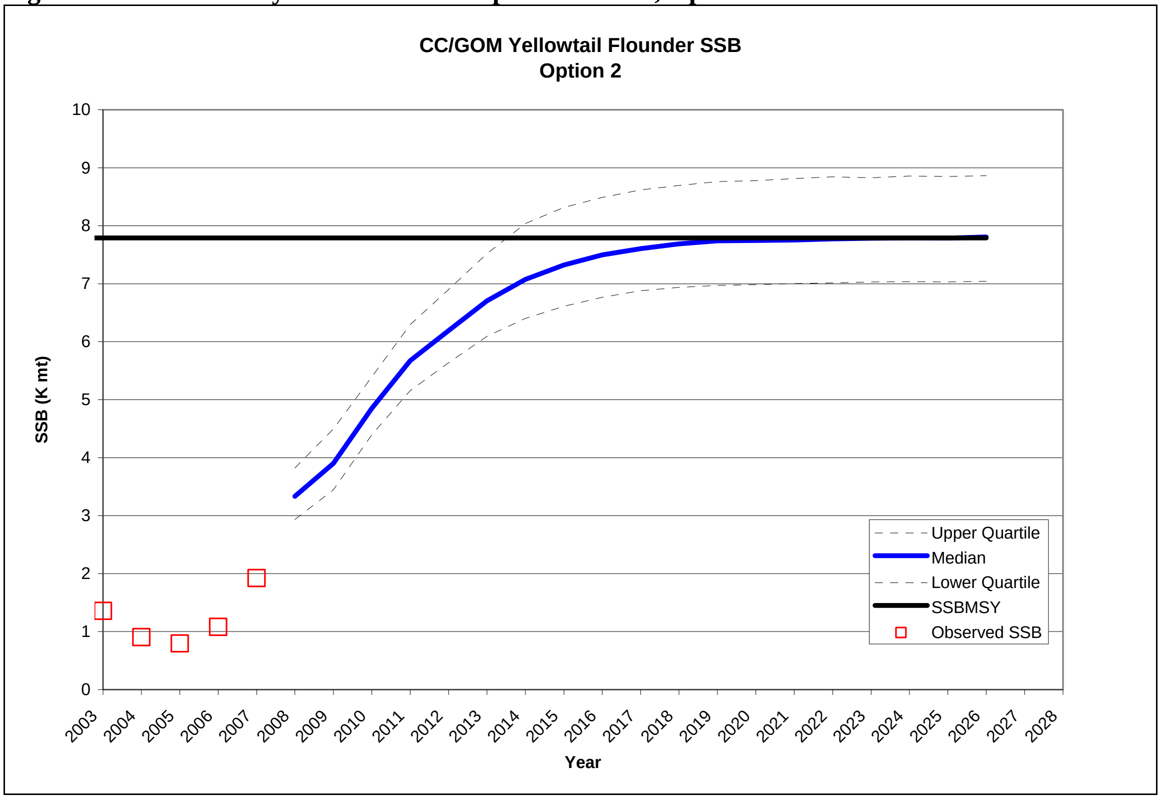


Figure 115 – American plaice predicted SSB, Option 2

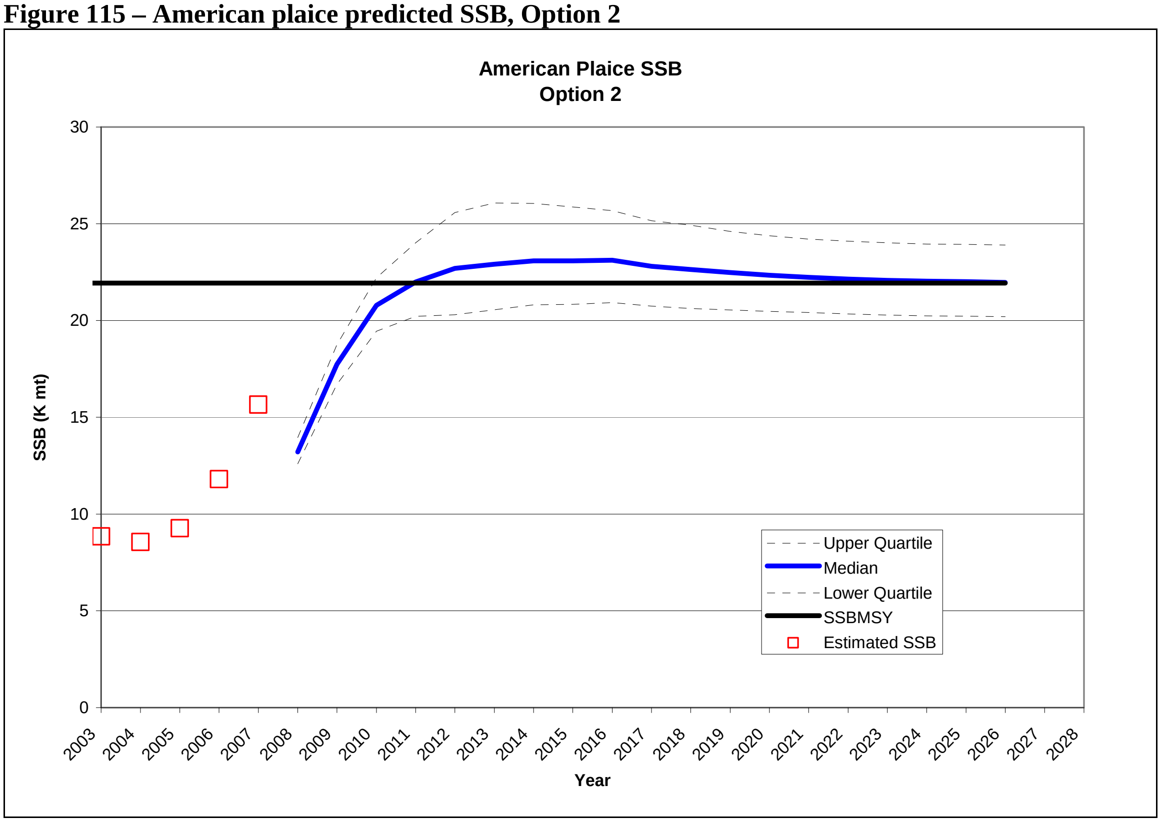


Figure 116 – Witch flounder predicted SSB, Option 2

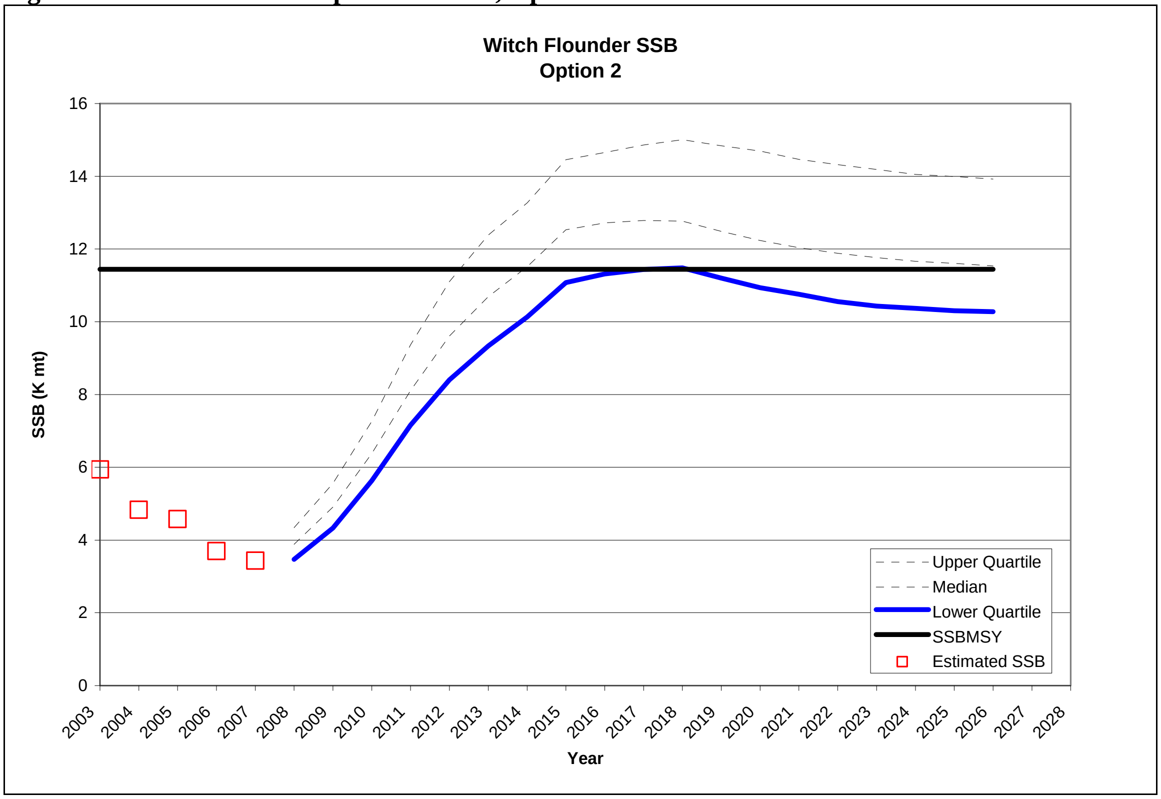


Figure 117 – GB winter flounder predicted SSB, Option 2

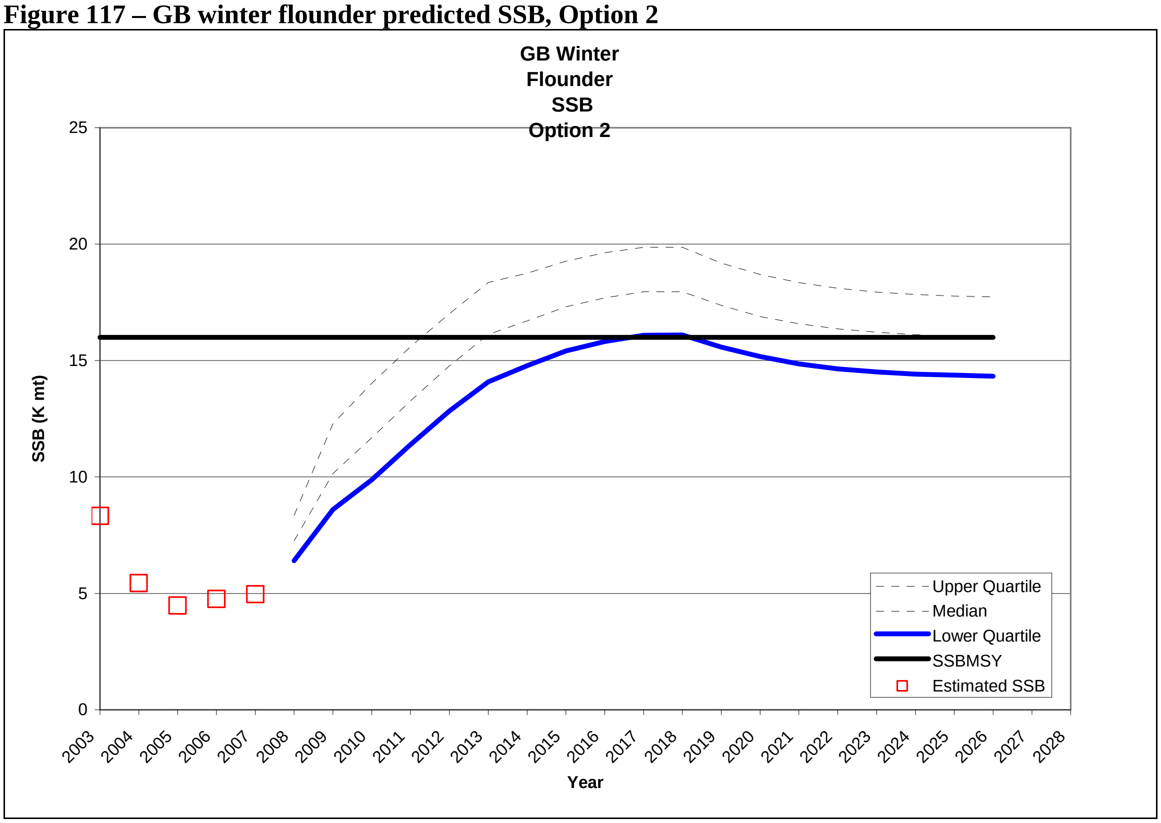


Figure 118 – SNE/MA winter flounder predicted SSB, Option 2

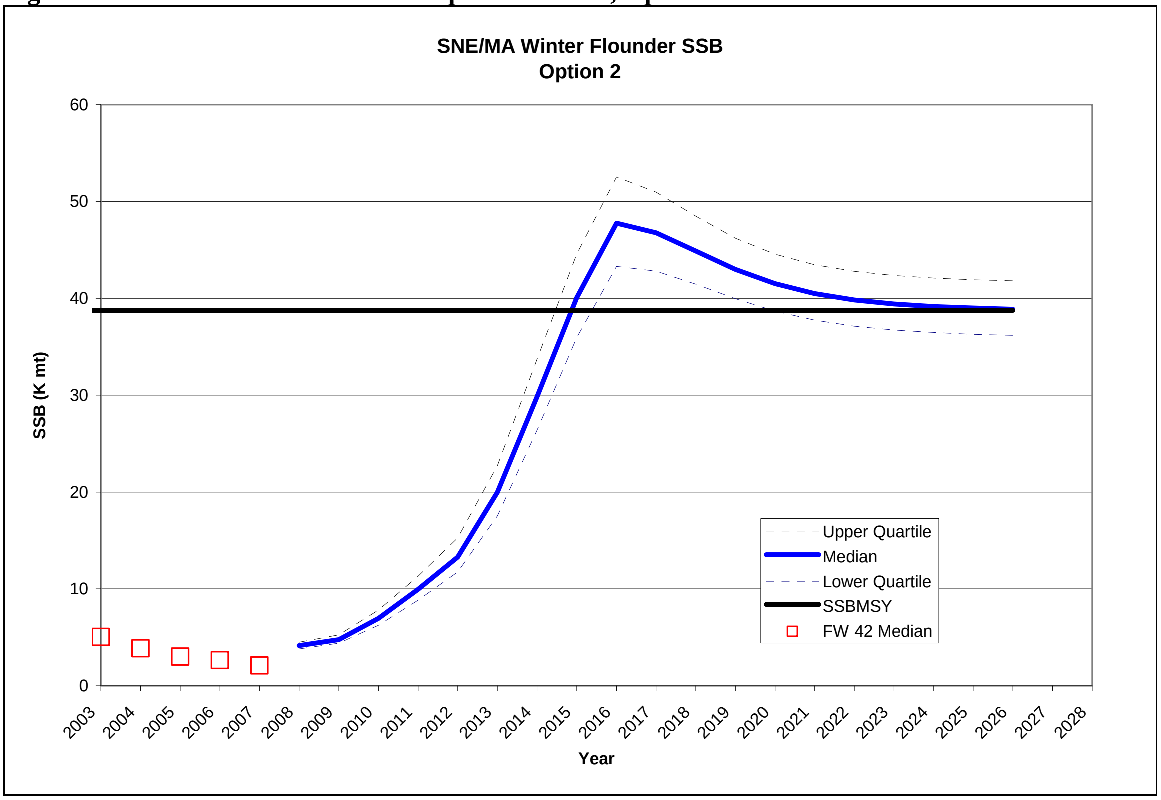
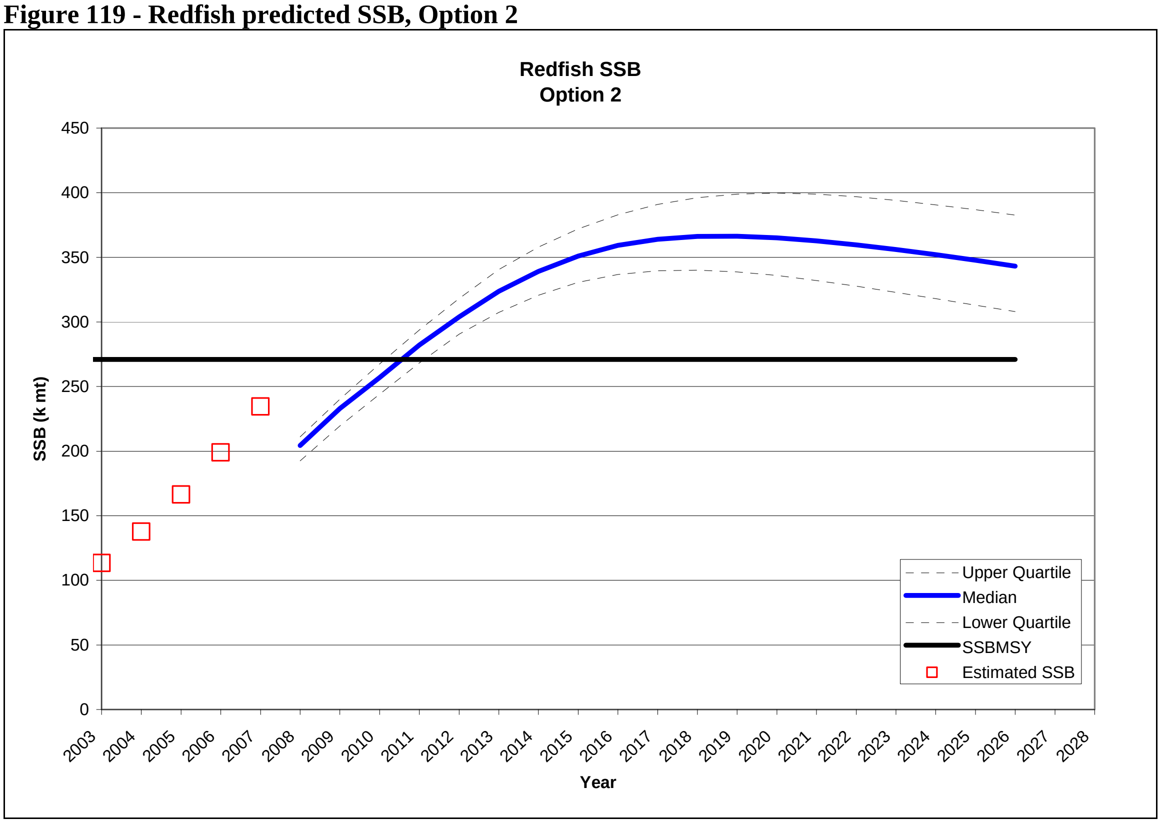


Figure 119 - Redfish predicted SSB, Option 2



6.2.2 Fishery Program Administration

6.2.2.1 Annual Catch Limits

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 B_{MSY} 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 and ocean pout 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.

6.2.2.2 Addition of Atlantic Wolffish to the Management Unit

Atlantic wolffish was recently assessed through a Data Poor Working Group. Several measures of abundance show that this stock has declined in abundance since roughly the mid-1980s. This species is caught by vessels fishing for groundfish in the Gulf of Maine and Georges Bank areas. While this particular measure is merely an administrative first step, adding Atlantic wolffish to the management unit allows the implementation of management measures to protect this stock under the provisions of the M-S Act. Absent this step, measures that are specifically designed for this species would be difficult to implement. A specific measure is also included that is expected to reduce wolffish fishing mortality (see section XXXX).

6.2.2.3 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. 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 considers five alternatives to the existing method used to determine the potential sector contribution (permit history) for limited access permit holders eligible to join sectors. While these options determine the annual catch entitlement (ACE) for each sector, which limits the sector's catch, the options themselves do not have direct biological impacts. They are different ways of allocating the same amount of the resource. It is possible that these options may have different indirect biological impacts. For example, if one option 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, 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.

Allocation of Resources
This action proposes to change how resources are allocated to sectors. As currently implemented, 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.

The option being considered will require that sector fishing be limited by a hard TAC for all regulated groundfish stocks, except for ocean pout, the two windowpane flounder stocks, and halibut. Limiting sectors to TACs for more stocks should provide more certainty that fishing mortality targets will be met. For the four 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).

This option 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.

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.

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 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 are included in this amendment. The first approach is an interim approach and applies an estimated discard rate to sector landings on a trip-by-trip basis. This discard rate will be determined one of two ways, but in both instances is based on observer information collected by the NMFS observer program as detailed in the SBRM amendment. 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. 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.

Transfer of Catch Entitlements
An option (Option 2) is proposed that would allow 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 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 PDT examined two illustrations of this problem that assumed the entire carry-over and base allocation are caught in the subsequent year. While this assumption may be unrealistic (it is more likely that part of the available catch will not be caught each year, as noted in Sanchirico et al (2006)) 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. While there are economic and social benefits to allowing a carry-forward, it is not clear that a measure that explicitly allows the possibility of overfishing can be implemented given current legal requirements.

It may be possible to develop an approvable carry-over system (that is, one with minimal 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 4.3.1.2.3). One of those components will be the portion of the ACE that is allocated to sectors. If ACE carry-over is allowed, this fact can be considered when setting the ACL. 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, or 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.

Participation in Special Management Programs

These measures describe sector participation in special management programs. 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 effect on fishing mortality.

Interaction with Common Pool Vessels/Universal Exemptions

This section specifies the measures that sectors cannot be excused from, as well as those that all sectors receive an exemption. There are no changes to the measures that all sectors must follow, 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.

Movement Between Sectors
This measure is primarily administrative and is not expected to have measureable impacts on fishing mortality.

6.2.2.4 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.

6.2.2.4.1 Option 1 – No Action

No additional biological impacts are expected if the current reporting system is not modified.

6.2.2.4.2 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 XXXX; Nies and Applegate 2006). 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.

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.

6.2.2.4.3 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 are considered for determining the discard rate that is applied to each trip. 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. 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.

Sub-option B would use a discard rate based on the previous year's fishing activity. The two advantage 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.

6.2.2.5 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

This measure considers two options for allocating specific groundfish stocks between the recreational and commercial components of the fishery.

6.2.2.5.1 Option 1 – No Action

No additional biological impacts are expected if this option is adopted.

6.2.2.5.2 Option 2 – Commercial and recreational allocation for certain stocks options

This option proposes a specific allocation to the commercial and recreational components of the fishery. 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.

6.2.2.6 Changes to the DAS Transfer and Leasing Programs

6.2.2.6.1 Option 1 - No Action

No additional biological impacts would be expected if the DAS transfer and leasing programs are not modified.

6.2.2.6.2 Option 2 – DAS Transfer Program Conservation Tax Change

This option would modify the DAS transfer program by reducing or removing the conservation tax on DAS transfers. 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 FY2006 and FY2007. There were only 23 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 reducing 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. If the tax is reduced rather than eliminated, it is likely that the biological impacts may be less than for a complete removal of the tax, but it impossible to quantify the differences.

This measure includes two sub-options. Sub-option A would not return any DAS to permits that participated in the DAS transfer program before adoption of this measure. Sub-Option B, on the other hand, would return the DAS that were lost to the conversation tax. Sub-Option B would increase DAS from current levels by the number of DAS that have been lost. 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.

6.2.2.6.3 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 considers setting a tax that is equivalent to that used for he DAS transfer program, the implication being that the DAS transfer program tax is not completely eliminated. 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 5.2.2.7, 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.

6.2.2.6.4 Option 4 – DAS Transfer Program Conservation Tax Exemption Window

In essence this option would temporarily remove the DAS Transfer Program Conservation Tax. The concept is 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.

6.2.2.7 Special Management Programs

6.2.2.7.1 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.

The proposed expansion of the season and area for the SAP in 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 catches of both of these species by non-sector vessels in the SAP are limited by incidental catch TACs, while any catches by sector vessels will count against sector ACE. For these reasons expansion of the SAP is not expected to result in overfishing f\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 that tested selectively targeting haddock through using specific baits from 2003 - 2005. Correia (2008, Appendix XXX) 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 SAP's expansion in time and space. Observed sets were not randomly distributed (see Figure 120). There are temporal limitations for the availability of the data and sets were not observed throughout the proposed time period: no sets were observed on 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 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 151).

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.

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.

Figure 120 - 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. Form Correia (2008).

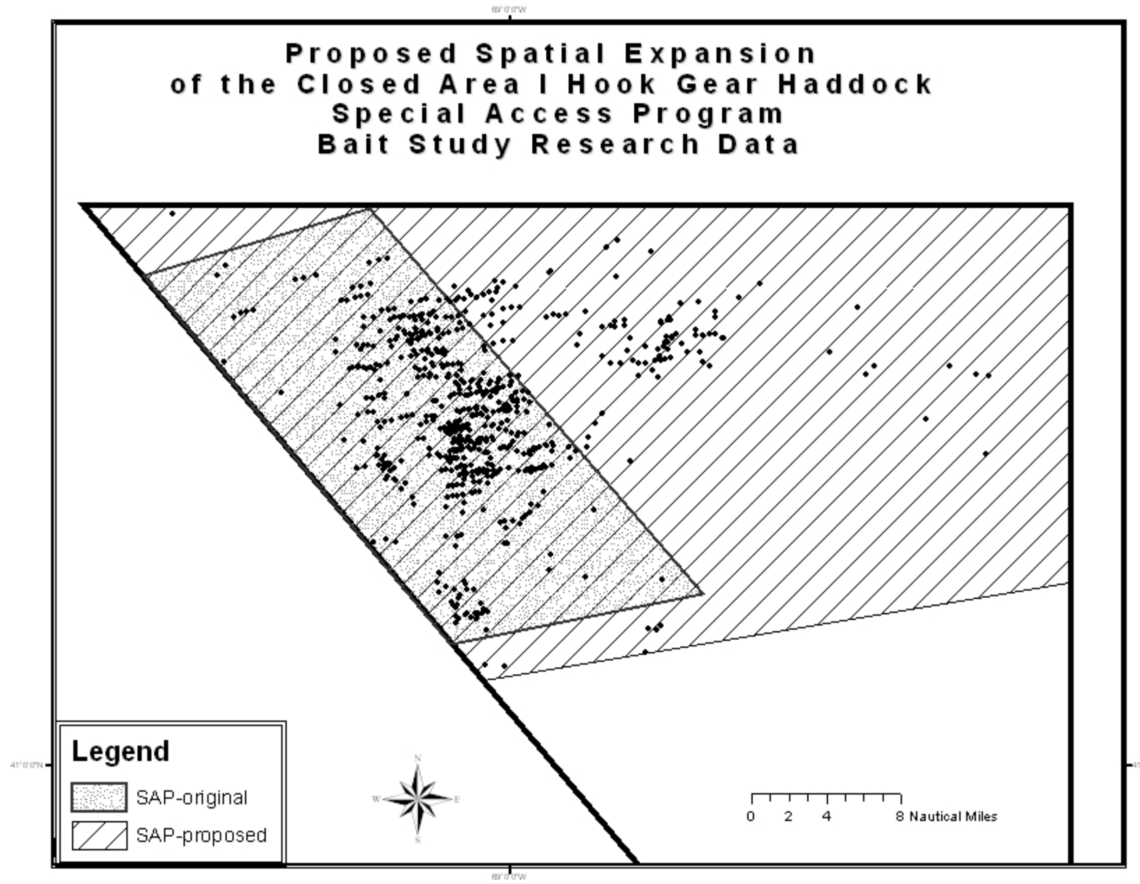


Table 151 - Ratio estimators of total white hake: haddock kept and total cod: haddock kept., Jackknife standard error (SE) and bias (in standard error units), and 95% confidence limits using the Percentile method (1000 bootstrap replications) and the Bias Corrected and Accelerated method (BCa) using 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 (NEFMCXXXX). 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.

6.2.2.7.2 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.

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.

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. Catches in the SAPA 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 5.2.2.6). 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.

6.2.2.7.3 CA II Yellowtail Flounder SAP

Option 1 of this measure is the No Action option and would not change the CAII yellowtail flounder SAP.

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 biological impacts would be the same as previously described, and would be the same as the No Action alternative. In years when the SAP is not open to target GB yellowtail flounder the regulations would 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.

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 152** 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, the five-point trawl, and longline gear. These gears are expected to dramatically reduce the catches of these species. Table 156 summarizes the performance of the proposed trawl gear configurations in experimental fisheries, while section 5.2.2.6 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 71 summarizes observed ratios of haddock to cod, skates, yellowtail flounder, and winter flounder on observed tows using a separator trawl. There were dramatic improvement 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.

Table 152 - 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

6.2.2.7.4 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 6.5.8.4) 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.

Prohibiting this SAP, however, is not likely to reduce removals of winter flounder by this percentage. As shown in section 6.5.8.4, 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 this measure 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.

6.2.2.7.5 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.

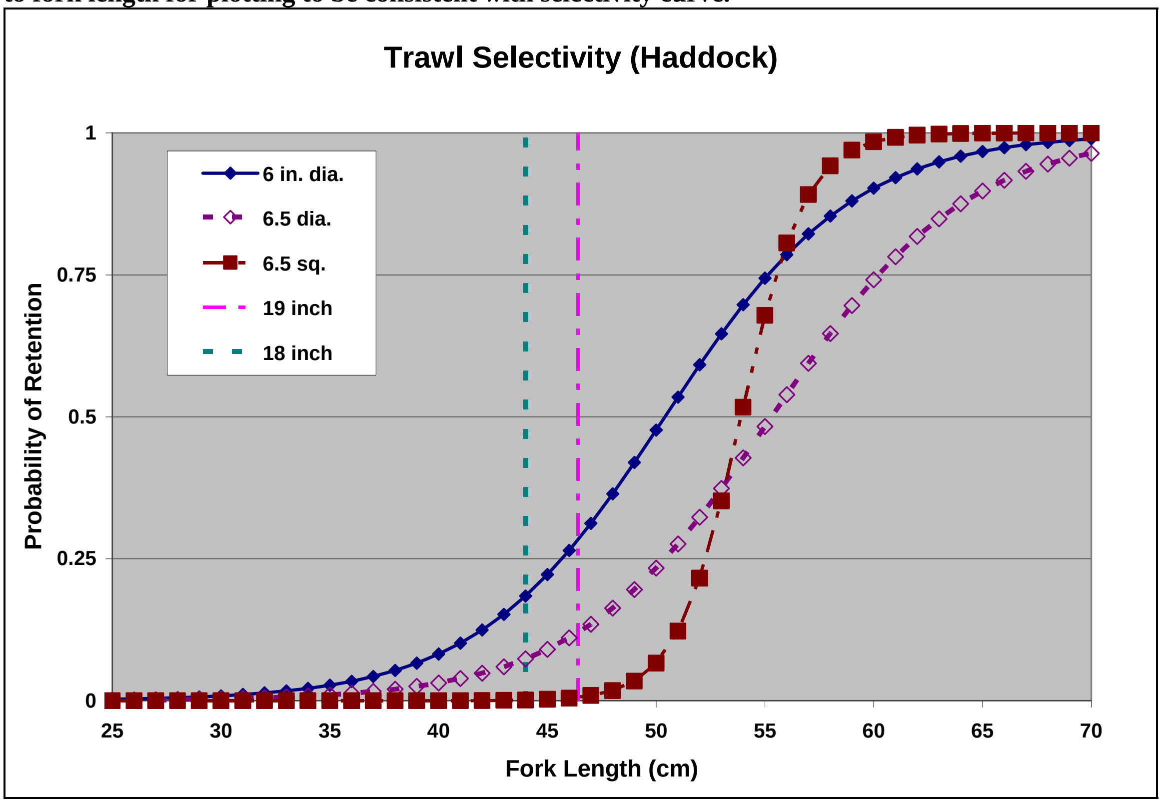
Option 2 modifies the Category B (regular) DAS program to eliminate the opportunity to use the program to target pollock. This should reduce pollock commercial landings by approximately 500 mt based on recent catches, reducing fishing mortality for that stock. Another modification to the program allows 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 121). 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 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. Second, the catches of groundfish species in this program are limited by an incidental catch TAC.

Figure 121 – 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.



6.2.2.8 Periodic Adjustment Process

The proposed changes to the periodic adjustment process are administrative measures and are not expected to have direct biological impacts.

6.2.2.9 Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel

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, suing 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 dkate 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 DAS are fished, fishing mortality rates could be affected.

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.

6.2.3 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.

6.2.3.1 Commercial Fishery Measures

6.2.3.1.1 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 6.2.2.2 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 153 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 cod stocks, 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 153 – No Action changes in exploitation

Spec	AREA	Needed Difference	No Action % Difference
COD	GBANK	-50.20%	-17.10%
COD	GM	-18.70%	-16.30%
HADDOCK	GBANK	290.00%	-18.70%
HADDOCK	GM	58.50%	-17.50%
WINTER	GBANK	51.00%	-18.60%
WINTER	GM	-9.30%	-15.00%
WINTER	SNEMA	-100.00%	-20.30%
PLAICE	ALL	83.30%	-16.30%
WITCH	ALL	-42.00%	-16.30%
WHK	ALL	28.10%	-17.20%
WIND	NORTH	-74.50%	-18.60%
WIND	SOUTH	-20.50%	-20.80%
YTF	CCGOM	-15.70%	-18.40%
YTF	GBANK	-15.30%	-20.00%
YTF	SNEMA	-39.00%	-18.30%
POLLOCK	ALL	-35.10%	-17.30%
REDFISH	ALL	368.00%	-17.70%

6.2.3.1.2 Option 2A – Differential DAS and Trip Limits

Option 2A extends differential DAS counting throughout much of the fishery, maintains the default DAS reduction, and adjusts trip limits for most stocks. Analysis in the CAM suggests this alternative will 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 alls within the range of error assume for the CAM) . The CAM results may not fully capture the mortality reductions for these stocks. 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 2:1 rate even 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 Freb, the CAM indicates that exploitation will be reduced about 40 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.

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 6.2.2.7.4) 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.

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 154 – Option 2A changes in exploitation

Spec	AREA	Needed Difference	Option 2A Action % Difference
COD	GBANK	-50.20%	-51.00%
COD	GM	-18.70%	-22.40%
HADDOCK	GBANK	290.00%	-45.10%
HADDOCK	GM	58.50%	-21.90%
WINTER	GBANK	51.00%	-33.90%
WINTER	GM	-9.30%	-14.10%
WINTER	SNEMA	-100.00%	-73.10%
PLAICE	ALL	83.30%	-37.60%
WITCH	ALL	-42.00%	-36.30%
WHK	ALL	28.10%	-40.30%
WIND	NORTH	-74.50%	-29.70%
WIND	SOUTH	-20.50%	-44.10%
YTF	CCGOM	-15.70%	-39.40%
YTF	GBANK	-15.30%	-32.00%
YTF	SNEMA	-39.00%	-55.00%
POLLOCK	ALL	-35.10%	-40.10%
REDFISH	ALL	368.00%	-40.90%

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 174 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 5.2.2.3.1, 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. 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.

6.2.3.1.3 Option 3A – 24 –Hour Clock and Restricted Gear Areas

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 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.

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 6.2.2.7.4) 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.

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 156. 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 155 – Option 3A changes in exploitation

Spec	AREA	Needed Difference	Option 3A Action % Difference
COD	GBANK	-50.20%	-53.60%
COD	GM	-18.70%	-51.60%
HADDOCK	GBANK	290.00%	-53.10%
HADDOCK	GM	58.50%	-54.20%
WINTER	GBANK	51.00%	-52.40%
WINTER	GM	-9.30%	-45.30%
WINTER	SNEMA	-100.00%	-66.90%
PLAICE	ALL	83.30%	-56.20%
WITCH	ALL	-42.00%	-56.20%
WHK	ALL	28.10%	-62.60%
WIND	NORTH	-74.50%	-58.50%
WIND	SOUTH	-20.50%	-61.00%
YTF	CCGOM	-15.70%	-57.20%
YTF	GBANK	-15.30%	-58.60%
YTF	SNEMA	-39.00%	-38.90%
POLLOCK	ALL	-35.10%	-60.90%
REDFISH	ALL	368.00%	-61.50%

Table 156 – 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 174 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 5.2.2.3.1, 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. 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.

6.2.3.1.4 Option 4 – DAS reduction and Restricted Gear Areas

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 Freb, the CAM indicates that exploitation will be reduced about 58 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.

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 6.2.2.7.4) 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.

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 156. 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 157 – Option 4 changes in exploitation

Spec	AREA	Needed Difference	Option 3A Action % Difference
COD	GBANK	-50.20%	-40.70%
COD	GM	-18.70%	-33.80%
HADDOCK	GBANK	290.00%	-42.00%
HADDOCK	GM	58.50%	-38.80%
WINTER	GBANK	51.00%	-36.00%
WINTER	GM	-9.30%	-34.70%
WINTER	SNEMA	-100.00%	-59.90%
PLAICE	ALL	83.30%	-36.40%
WITCH	ALL	-42.00%	-37.20%
WHK	ALL	28.10%	-38.70%
WIND	NORTH	-74.50%	-42.90%
WIND	SOUTH	-20.50%	-55.80%
YTF	CCGOM	-15.70%	-47.30%
YTF	GBANK	-15.30%	-41.40%
YTF	SNEMA	-39.00%	-45.00%
POLLOCK	ALL	-35.10%	-38.30%
REDFISH	ALL	368.00%	-39.10%

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 174 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 5.2.2.3.1, 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. 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.

6.2.3.1.5 GOM Haddock Sink Gillnet Pilot Program

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 122). 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 gillnet are effective at targeting cod, and this measure may also affect cod mortality. As can be seen in the cod selectivity curve (Figure 122), 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.
There is little evidence in observer data that cod discards per set are sensitive to either mesh size or the number of nets fished in each set (Figure 123 and Figure 124), at least within the range of recently observed measurements of these factors. This suggests it is unlikely that there will be a significant increase in cod discards caused by the change in mesh size. Note that the number of nets that can be sued in this program is40 percent less than the number of nets that are allowed in the area. If there is an undetected relationship between nets fished and discards or catch of cod and pollock, this measure may further reduce catches of these two species.

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.

Figure 122 – 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.

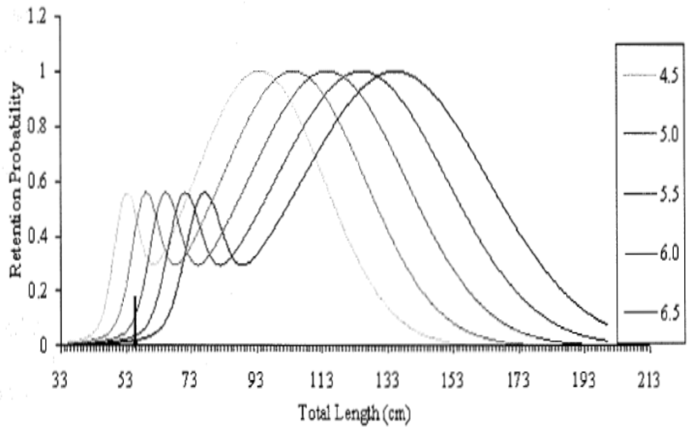


Figure 3: Bimodal retention curves for Atlantic cod for five mesh sizes. All lengths were pooled. Arrow indicates minimum landing size.

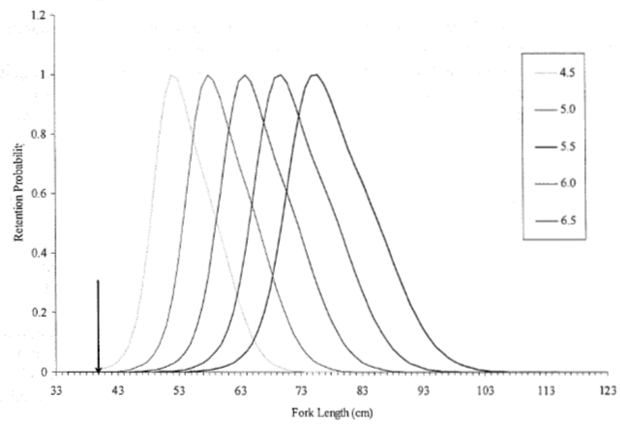


Figure 4: Pollock bimodal retention curves for five mesh sizes. Curves were derived from REML analysis of five individual sets. Arrow indicates minimum landing size, converted to fork length.

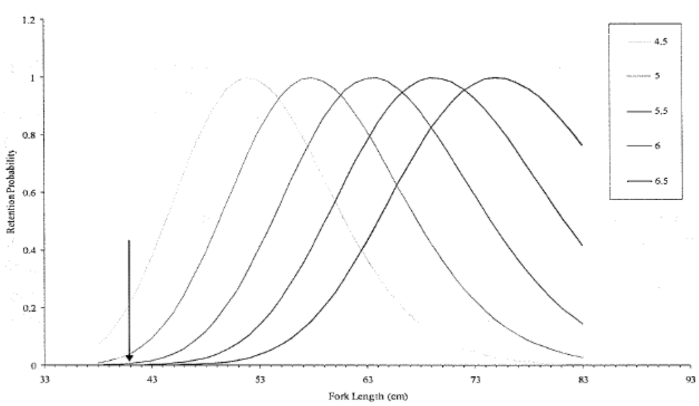


Figure 2: Haddock lognormal retention curves for five mesh sizes. All lengths were pooled. Arrow indicates minimum landing size, converted to fork length.

Figure 123 – Observed discards/set, SAs 511-515, vs. number of nets per set. Boxes represent interquartile range (25 percentile – 75 percentile); horizontal line is median. (NMFS OBDBS, unpublished data)

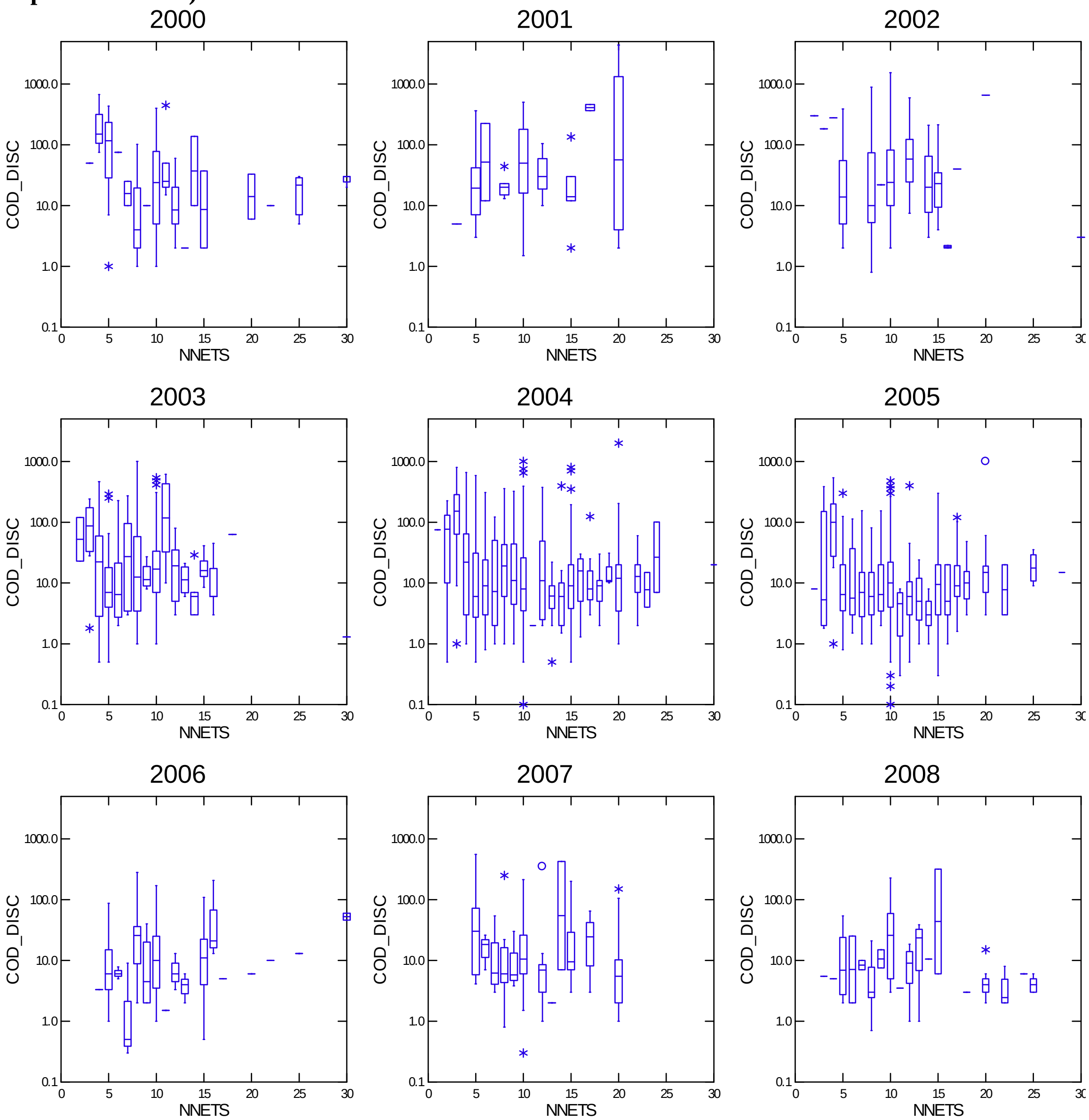
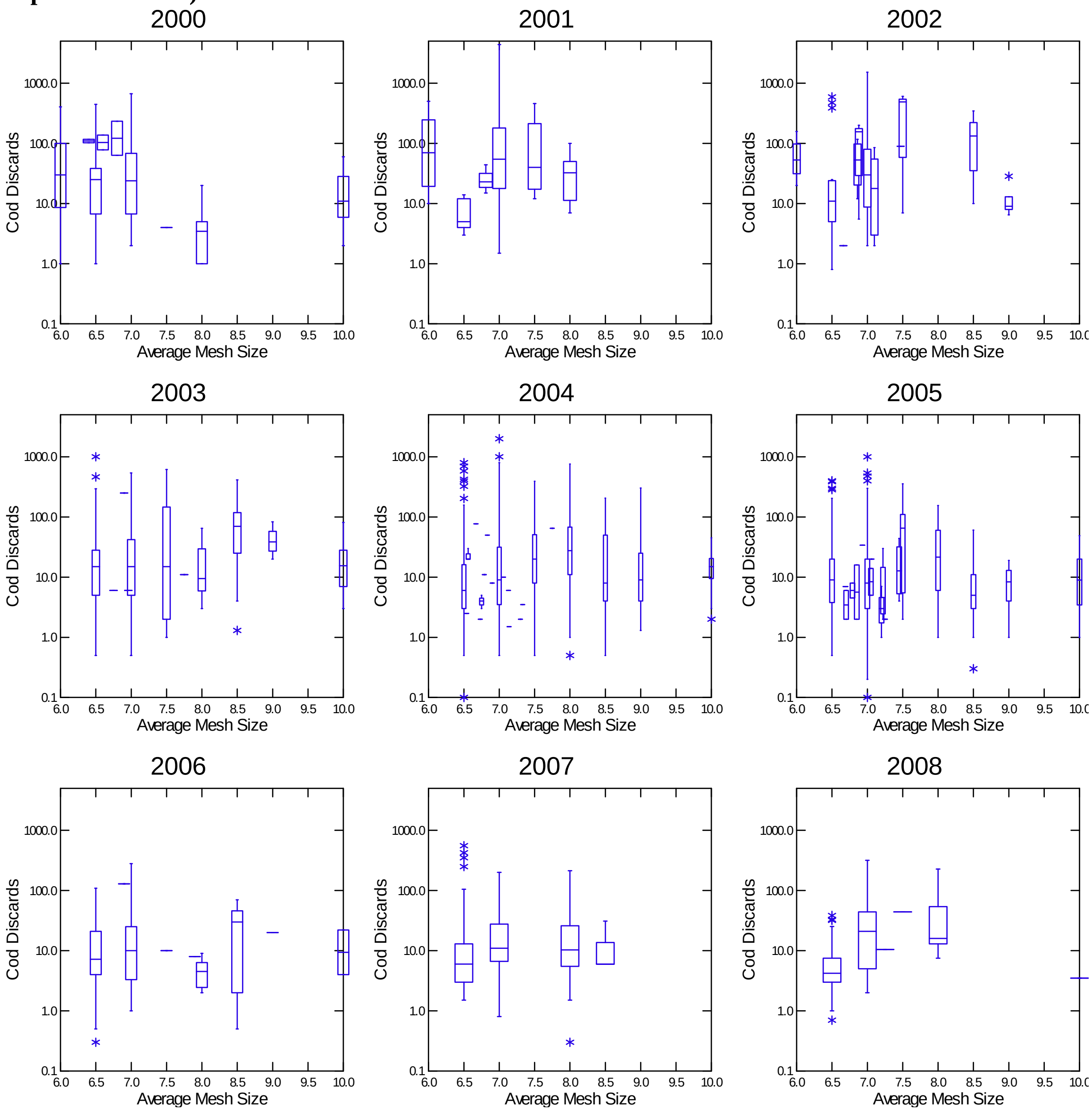


Figure 124 – Observed cod discards/set vs. average mesh size, SAs 511-515 (NMFS OBDBS, unpublished data)



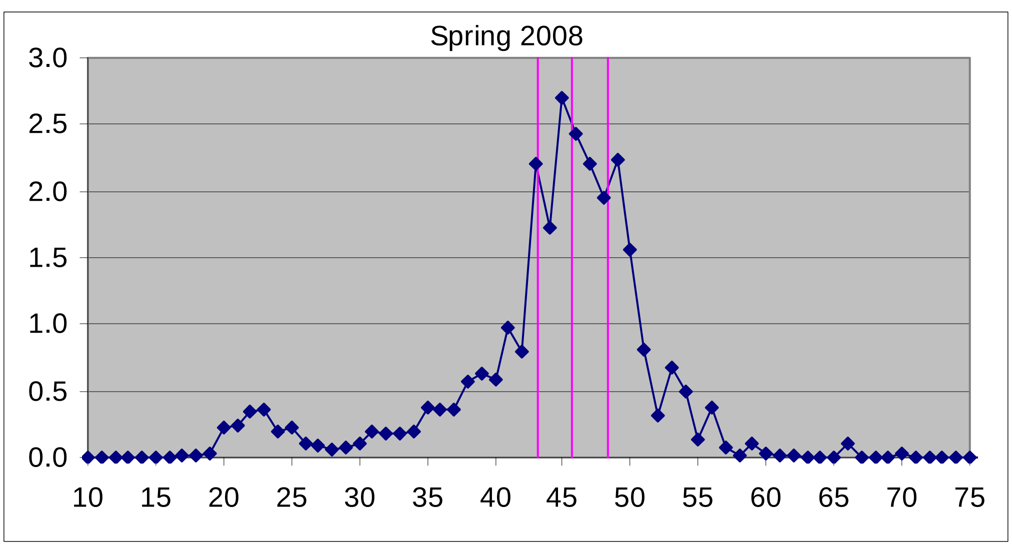
6.2.3.1.6 Haddock Minimum Size

This action 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 125 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.

Figure 125 - Haddock Length Frequency Distribution from the Spring 2008 NEFSC Trawl Survey.



6.2.3.2 Recreational Fishery Management Measures

6.2.3.2.1 Provisions for Landing Fillets

This measure allows landing skinned fillets, a common practice in the party/charter fishery that is a violation of current regulations. This measure is not expected to have direct biological impacts. If this results in the landing of cod during closures it could result in an increase in fishing mortality and a degradation in data quality, affecting future assessments, but this is a compliance issue and not a direct result of the change in the measure.

6.2.3.2.2 Removal of the limit on hooks

This regulation 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 case 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.

6.2.3.2.3 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), but there are no discard mortality studies specific to the GOM cod recreational fishery.

Table 158 – Needed recreational mortality reductions under two allocation options

Stock	Overall Needed Reduction	Allocation Years 1996-2006		Allocation Years 2001-2006	
		Rec.	Comm.	Rec.	Comm.
GOM cod	-21%	.-27%	-19%	-2%	-28%
GOM haddock	NA	-18%	Increase	Increase	Increase

There are three options under consideration to reduce recreational fishing mortality for GOM cod.

Option 1 increases 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 159 – 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 reduces 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 160 – 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 3 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 161 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 161 – 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%

There are four options considered for GOM haddock. Option 1 increases 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 162 - GOM haddock recreational Option 1 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	-38.2%	-38.2%	-38.2%
0.1	-34.4%	-34.4%	-34.4%
0.2	-30.6%	-30.6%	-30.6%
0.3	-26.8%	-26.7%	-26.8%
0.4	-22.9%	-22.9%	-22.9%
0.5	-19.1%	-19.1%	-19.1%

Option 2 implements 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 163 - GOM haddock recreational Option 2 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0	**-24.6%**	**-21.6%**	**-23.0%**
0.1	**-22.1%**	**-19.4%**	**-20.7%**
0.2	**-19.7%**	**-17.3%**	**-18.4%**
0.3	**-17.2%**	**-15.1%**	**-16.1%**
0.4	**-14.8%**	**-13.0%**	**-13.8%**
0.5	**-12.3%**	**-10.8%**	**-11.5%**

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. (fill in when complete)

Table 164 - GOM haddock recreational Option 3 biological impacts

Discard Mortality	Private Boat	Party/Charter	Total
0			
0.1			
0.2			
0.3			
0.4			
0.5			

Option 4 reduces 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.

6.2.3.3 Atlantic Halibut Minimum Size

This option 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.

6.2.3.4 Prohibition on Retention of Atlantic Wolffish

This measure 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 100 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, but survival rates with hook gear or gillnet gear are expected to be high as well.

The measure considers requiring the return of wolffish either year-round or during the fall and winter. 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 non wolffish stock status. Instituting this requirement for part of the year reduces its effectiveness but provides some data for determining wolffish status. The period that the fishery would be open under Option 2 accounted for an average of 77 percent of wolffish landings during CY 200-4 through CY 2007 so this option would be expected to reduce landings by only about 25 percent.

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.

6.2.3.5 Implementation of Additional Sectors/Modifications to Existing Sectors

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 165 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 165 – Examples of continued overfishing in spire 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 6.2.2.3.

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 5.2.3.2.2). While this source of discards may decline, 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 the seasonal closure on Georges Bank or the rolling closures in the Gulf of Maine. 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 166 through **Error! Reference source not found.**. 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 harvest, 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 5.2.3.2.1). 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.

Table 166 – 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 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 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									
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 167 – 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	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									
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

Table 168 – 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 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 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									
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 169 – 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 2004	GB 2005	GB 2006	GB 2007	GOM 2004	GOM 2005	GOM 2006	GOM 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									
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 170 – 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	N/A				69	40	64	106
Roundfish	Mean catch/hour					62	765	104	380
Tow Length						4.401	4.401	4.401	4.401
Tows/Day						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									
Flatfish						10,076	17,251	10,844	6,532
Roundfish						11,158	903	6,637	1,821

Table 171 – 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									
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

6.2.3.6 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.

Commercial Groundfish Common Pool Accountability Measures
Two options are being considered for this measure.

Option 1 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.

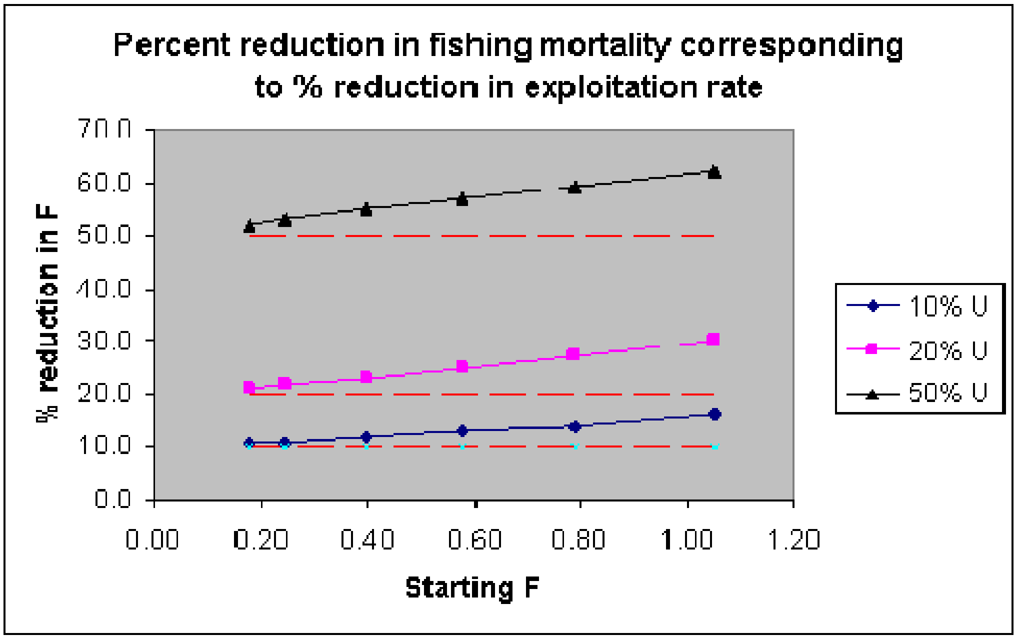
This system provides a proactive, in-season AM. Action is taken to control catches prior to an overage. Assuming efficient catch monitoring and setting of trimester ACLs/quotas the use of a fishery closure allows for a prompt response to excessive harvesting rates. While the closures do not end all fishing 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.

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

Option 2 uses 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 126 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 126 – 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.

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.

6.3 Impacts on Protected Species

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 amendment 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 at this time.

6.3.1 Protected Species Impacts of Updates to Status Determination Criteria and Formal Rebuilding Programs

Revised status determination criteria (Section x) and revised mortality targets for formal rebuilding programs (Section x) 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 as a consequence.

6.3.2 Protected Species Impacts of Fishery Program Administration Measures

6.3.2.1 Annual Catch Limits

This is a proposal to adopt a process for setting annual catch limits (ACLs) as mandated by the MSA. 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.

6.3.2.2 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). 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. 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 4.4.5). If NMFS finds that listing is not warranted, then discussion of the impact of the proposed action in this section is not necessary.

6.3.2.3 Sector Administration Provisions

This section contains a number of measures pertaining to the administration of sectors: sector definition/formation of 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. 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 sectors on protected species is discussed below under the [section 4.4], Measures to Meet Mortality Objectives.

6.3.2.3.1 Reporting Requirements

The Council is considering a measure that would require all limited access groundfish vessels that are required to use VMS to declare at the start of the trip whether they intend to fish on one broad reporting area or multiple reporting areas. This proposal would not currently replace the VTR reporting requirement, but could do so in the future to avoid unnecessary duplication. 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.

6.3.2.3.2 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

This is a proposal to adopt 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 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.

6.3.2.3.3 Changes to the DAS Transfer and DAS Leasing Programs

The Council is considering several changes to the DAS transfer and leasing programs with regards to a conservation tax.

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.

Option 2 – DAS Transfer Program Conservation Tax

The Council is considering changing or eliminating the 20% conservation tax on DAS transfers. If the Council decides to make such a change, it will also consider whether to leave in place any conservation tax applied to prior transfers (Option A) or refund DAS, consistent with the new tax level, to prior transfers where the conservation tax had applied. 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.

Option 3 – DAS Leasing Program Conservation Tax

The Council is considering setting a conservation tax on leased DAS equivalent to any conservation tax applied to the DAS transfer program (see Option 2 above). 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 is considering 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 where done without a conservation tax, but all other associated fishing permits were retired in the transaction.

6.3.2.3.4 Special Management Programs

Incidental Catch TACs

The Council is considering modifications to the incidental catch TACs for some of the SAPs. These changes, if adopted, would not have an impact on fishing effort, and, consequently, on the interaction of the fishery with protected species.

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, there is no evidence that such interactions have taken place in open areas around CAI during this period, suggesting that the probability of any increased impact on protected species is minimal. A review of observer reports during May – September for the years 2004 – 2008 showed no incidental catch of sea turtles in the bottom longline fishery in the area. Therefore, the impact of the proposed action on protected species, particularly sea turtles, is neutral or potentially only slightly negative compared to the no action alternative.

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, 2008. Under 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. Since there is no evidence of protected species interactions in this fishery, the impact of Option 2 is likely to be neutral compared to no action, or moderately and indirectly positive, if vessels that otherwise would have fished in the SAP, were it not extended, shift their effort to areas and times with a higher chance of interactions.

Closed Area II Yellowtail Flounder SAP

The Council is considering modifying the CAII yellowtail flounder SAP to provide an opportunity to target GB haddock in the SAP area, even when the SAP is not opened to targeting of yellowtail flounder. Under the no action alternative, no such opportunity would exist. 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.

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 and elimination of the state waters winter flounder exemption could be somewhat positive for protected species if it reduces effort that would otherwise occur as a result of vessels targeting winter flounder.

Category B DAS Revisions

The Council proposes allowing 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.

6.3.2.3.5 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. 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.

6.3.2.3.6 Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel

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 during that time, 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.

6.3.3 Protected Species Impacts of 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.

6.3.3.1 Options 2A, 3A, 4 and No-Action

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. Option 2A uses a combination of differential DAS and a trip limits on a few stocks to achieve mortality objectives. 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%. 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, all three of the options 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 groundfishing 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.

6.3.3.2 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.

6.3.3.3 GOM Haddock Sink Gillnet Pilot Program

This proposal would establish 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 4.4.2.6. 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 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.

6.3.3.4 Haddock Minimum Size

This action would reduce the haddock minimum size on commercial vessels to 18 inches from 19 inches. Recreational vessels already have an 18-inch minimum size. 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.

6.3.4 Protected Species Impacts of Recreational Management Measures

The Council is considering 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. 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.

6.3.4.1 Protected Species Impacts of Atlantic Halibut Minimum Size

The Council proposes to 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.

6.3.5 Protected Species Impacts of a Prohibition on the Retention of Atlantic Wolffish

As noted above in Section 6.3.2, NMFS is reviewing a petition to list wolffish as either “endangered” or “threatened” under the ESA. If wolffish is included in the Multispecies management unit, the Council will designate wolffish EFH and is considering one of two options for prohibiting the retention of wolffish by commercial and recreational vessels: either year-round (Option 1) or September 1 – March 31 (Option 2). Option 2 would provide a mechanism for monitoring the status of wolffish, while requiring those caught during the colder months when discard mortality appears to be much lower, be returned as quickly as possible. Depending on the outcome of the status review, the impact of either 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.

6.3.6 Implementation of Additional Sectors/Modifications to Existing Sectors

The Council is considering adoption of as many as 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, wherein protected species impacts need to be analyzed and discussed. 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.

6.3.7 Accountability Measures

The Council is considering three components for accountability measures to comply with MSA requirements: common pool, recreational, and sectors. Accountability measures are intended to ensure that ACLs are not exceeded, and, if they are, to implement a management response to prevent further excesses.

6.3.7.1 Common Pool Vessel Accountability Measures – Alternative 1

This proposal would implement a quota (hard TAC) for commercial vessels that are not participating in a sector program. Also excluded from this provision are recreational groundfish vessels, and 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.

6.3.7.2 Common Pool Vessel Accountability Measures – Alternative 2

Under this proposal, 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.

6.3.7.3 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

6.3.7.4 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.

6.4 Impacts to Essential Fish Habitat

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 5.1.5 and 5.1.6 of this document detail the species with EFH that are vulnerable to mobile bottom tending gears and discuss the effects of fishing on habitat.

6.4.1 No Action Alternative

This alterantive 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.

6.4.2 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.

6.4.2.1 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 if determined appropriate to do so. This information is not yet available but preliminary information is included in this draft amendment (Section 4.2)

Two options are presented in the document; a No Action option and a revised criteria option.

Habitat Impacts:
Status Determination Criteria are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

6.4.2.2 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. This information will be developed after the status determination criteria are evaluated and current stock status is determined. Mortality targets will be 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)

Two options are presented in the document; a No Action option and a revised rebuilding mortality targets option.

Habitat Impacts:
Mortality targets are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

6.4.3 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.

6.4.3.1 Annual Catch Limits

Two options for implementing Annual Catch Limits (ACLs) as required by the M-S Act are proposed – a No Action option and an option for establishing and setting ACLs.

Habitat Impacts:
Annual Catch Limits are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

6.4.3.2 Addition of Atlantic Wolffish to the Management Unit

This measure would add Atlantic wolffish (*Anarhichas lupus*) to the management unit for the Northeast Multispecies Fishery Management Plan.

Habitat Impacts:
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.

6.4.3.3 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).

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. 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.

6.4.3.4 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. Three options are proposed; a No Action option, an Area-specific reporting requirements option and an option for accounting for discards for no-sector vessels.

Habitat Impacts:
Reporting requirements are administrative in nature and are not expected to have any direct impact on habitats designated EFH.

Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries
At present, there is no allocation of groundfish made between the recreational groundfish fishery (private boat/party/charter) and the commercial groundfish fishery. Options are presented to allocate portions of certain regulated groundfish stocks.

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, pollock, GOM winter flounder and SNE/MA winter flounder) are actively fished. Options for allocating groundfish to the commercial and recreational groundfish fisheries are expected to have minimal, if any, notable effects on habitats designated EFH.

6.4.3.5 Changes to the DAS Transfer and DAS Leasing Programs

The Council will consider changing or eliminating the conservation tax on DAS transfers, currently set at 20 percent. Five options are presented; a No Action option which does not change the conservation tax charged by the DAS leasing or transfer programs, together with options that reduce or eliminate this tax on transfers, and/or sets a tax on leases that is equivalent to any DAS transfer tax.

Habitat Impacts:
In the event that the transfer DAS tax is decreased and the leasing DAS tax is increased, and these programs continue to be utilized by the active fishing fleet, total DAS allocations may be reduced. If this were to occur, it may enable fisherman to achieve mortality targets with less total fishing effort, possibly through relaxing trip limits, but the likelihood and degree of such an effect is impossible to quantify. Ultimately, changes to the DAS transfer and leasing program taxes not expected to have more than a minimal effect on habitats designated EFH.

6.4.3.6 Special Management Programs

6.4.3.6.1 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.
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.

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.

6.4.3.6.2 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. Two options are presented; a No Action option which specifies that the SAP will not be re-opened, and an option for reauthorizing 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 reauthorizing option would 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).

6.4.3.6.3 Closed Area II Yellowtail Flounder SAP

Two options are proposed; first, an option that allows for no modifications to the existing yellowtail flounder SAP, and second an option that 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.

6.4.3.6.4 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 fishing on this stock using category B 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. However, this measure will likely have some positive effect on habitats designated EFH in the SNE/MA winter flounder SAP area.

6.4.3.6.5 Category B DAS Program

This option presents measure for either no change to the B DAS program (a no action option) or changing 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. Final assessment on the degree of potential impacts to habitats designated EFH will be made once the scope of this program is better understood.

6.4.3.7 Periodic Adjustment Process

The periodic adjustment process is administrative in nature and is not expected to have any direct impact on habitats designated EFH.

Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel
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. A second option is presented that 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 6.4.2 of this document highlights the fact that this option 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.

6.4.4 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.

6.4.4.1 Commercial Fishery Measures

6.4.4.1.1 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.

Habitat Impacts:
The provisions within this option that utilize increased differential DAS counting ratios 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.

6.4.4.1.2 24 hour clock, Restricted Gear Areas

This option 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.

6.4.4.1.3 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.

6.4.4.1.4 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, is required to use 12-inch drop chains on the footrope.

Habitat Impacts:
The purpose of this requirement is to raise the footrope off the bottom and reduce catches of winter flounder. As such, there will be 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 is likely to result in some benefit to habitats designated EFH that overlap with the portion of the SNE/MA winter flounder stock area subject to this requirement.

6.4.4.1.5 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.

Habitat Impacts:
This measure is not expected to have any change in impact on habitats designated EFH relative to the baseline period.

6.4.4.2 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.

6.4.4.3 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, this measure is not expected to have any impact on habitats designated EFH.

6.4.4.4 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.

Habitat Impacts:
Limits on habitat can't be predicted but are not likely to be negative.

6.4.4.5 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.

6.5 Economic Impacts

6.5.1 Updates to Status Determination Criteria and Formal Rebuilding Programs

6.5.1.1 Revised Status Determination Criteria

6.5.1.2 Revised Mortality Targets for Formal Rebuilding Programs

6.5.2 Annual Catch Limits

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 parts 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 transactions 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 biological 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 19 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.

6.5.3 Addition of Atlantic Wolffish to the Management Unit

The proposed addition of Atlantic wolffish 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. 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.

6.5.4 Sector Administration Provisions

6.5.4.1 Sector Formation, Operations Plans, and Annual Reports

The 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 sectors 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 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 XXX. 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.

6.5.4.2 Analysis of PSC Options

Three of the options for determining potential sector contributions (PSCs) include 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.

Table 172 - **Stepwise Order for Cobb-Douglas Model**

Trawl	FY2001	FY2002	FY2003	FY2004	FY2005	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 173 - **Stepwise Order for Linear Model**

Trawl	FY2001	FY2002	FY2003	FY2004	FY2005	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 174 - Stepwise Marginal Contribution to R-Square for Cobb-Douglas Model

Trawl	FY2001	FY2002	FY2003	FY2004	FY2005	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 175 - Stepwise Marginal Contribution to R-Square for Linear Model

Trawl	FY2001	FY2002	FY2003	FY2004	FY2005	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	

6.5.4.3 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.

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.

- 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.

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 toan esimtated 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 date 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 176. For GOM winter flounder, pollock, and white hake, the starting values for the catch area based on FY 2009 TTACs.

Table 176 – 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

6.5.4.4 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 177, 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 178 through Table 182.

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.

6.5.4.5 PSC Shares, ACE Allocations and Potential Value by Homeport State

PSC shares aggregated by homeport state are shown in Table 183 through Table 187, with the resulting ACE allocations shown in Table 188 through Table 192 and values in Table 193 through Table 197.

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 193 through Table 197.

6.5.4.6 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 198 through Table 207.

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.

6.5.4.7 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 177 – Estimated potential sector contribution shares by vessel length group

	No 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 178 – 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 179 – 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 180 – 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 181 – 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 182 – 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 183 - 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 184 - 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 185 - 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 186 - 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 187 - 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 188 - 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 189 – 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 190 – 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 191 – 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 192 – 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 193 – 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

1
Table 194 – 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 195 – 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 196 – 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 197 – 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 198 – 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 199 – 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 200 – 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 201 – Option 3 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	1,339.5	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 202 – 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 203 – 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 204 – 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 205 – Option 2 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	$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 206 – Option 3 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	$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 207 – Option 4 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	$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 208 – 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 209 – 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 210 – Option 2 estimated ACE allocation 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 211 – Option 3 estimated ACE allocation 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 212 – Option 4 estimated ACE allocation 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 213 – 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 214 – 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 215 – Option 2 estimated ACE value 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 216 – Option 3 estimated ACE value 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 217 – Option 4 estimated ACE value 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

6.5.4.8 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 176. 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 Option 1 (landings history FY1996 – 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 127). 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 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 Option 1 and vice versa. In part this is because both options use only one critiera – landings history – and differ only by the time period used.

Compared to Option 1 the capacity adjusted options all result in a systematic pattern in which vessels with lower allocations under Option 1 tend to receive higher allocations while vessels with higher allocations under 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 128), Option 3 (Figure 129), and Option 4 (Figure 130).

Figure 127 Combined Contribution Shares for No Action and Option 1

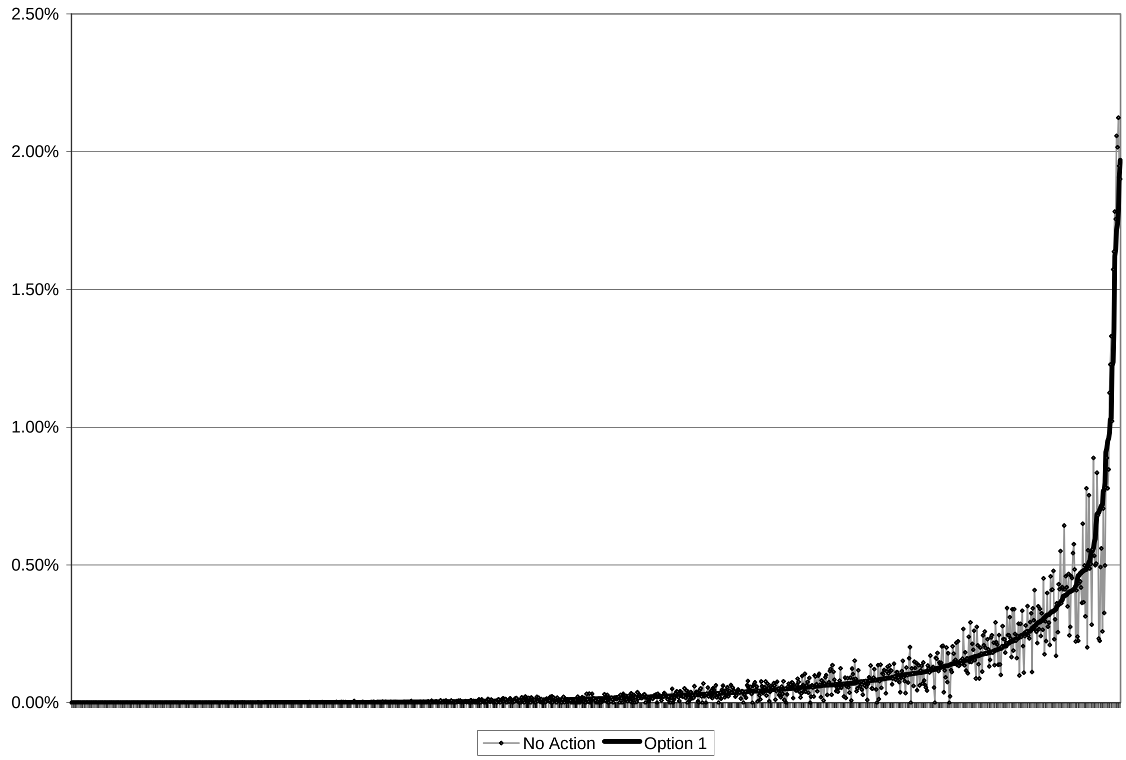


Figure 128 Combined Contribution Shares for Option 1 and Option 2

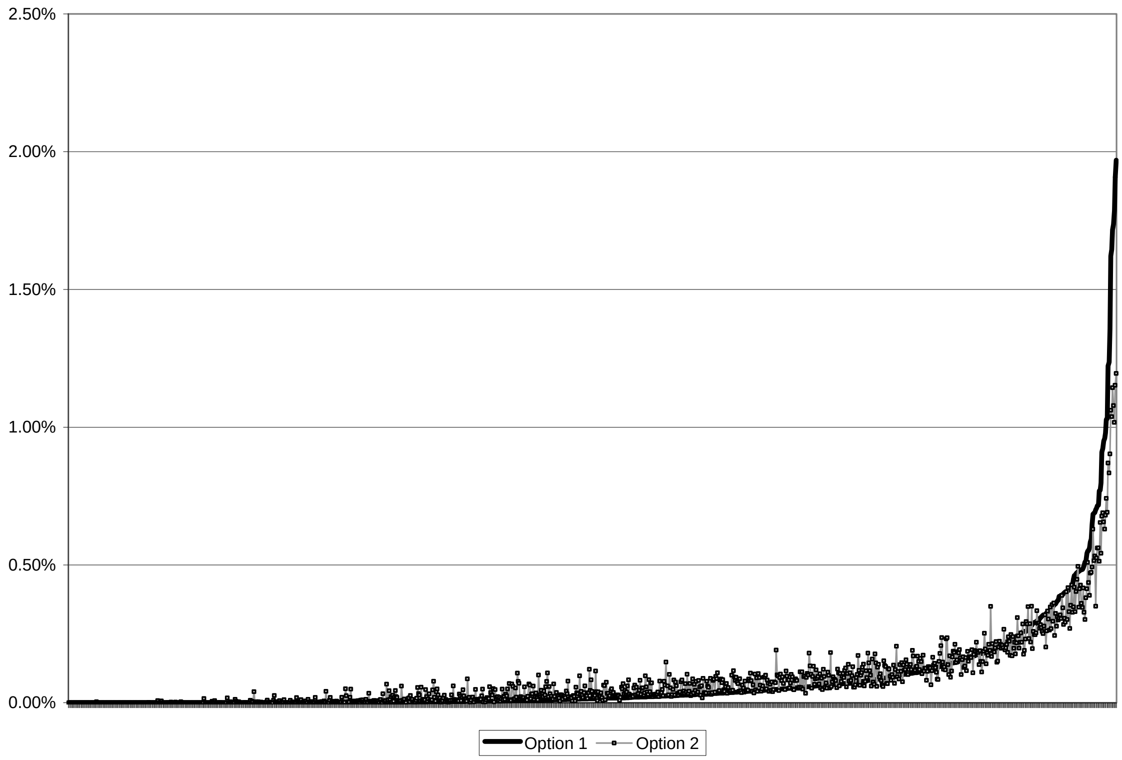


Figure 129 Combined Contribution Shares for Option 1 and Option 3

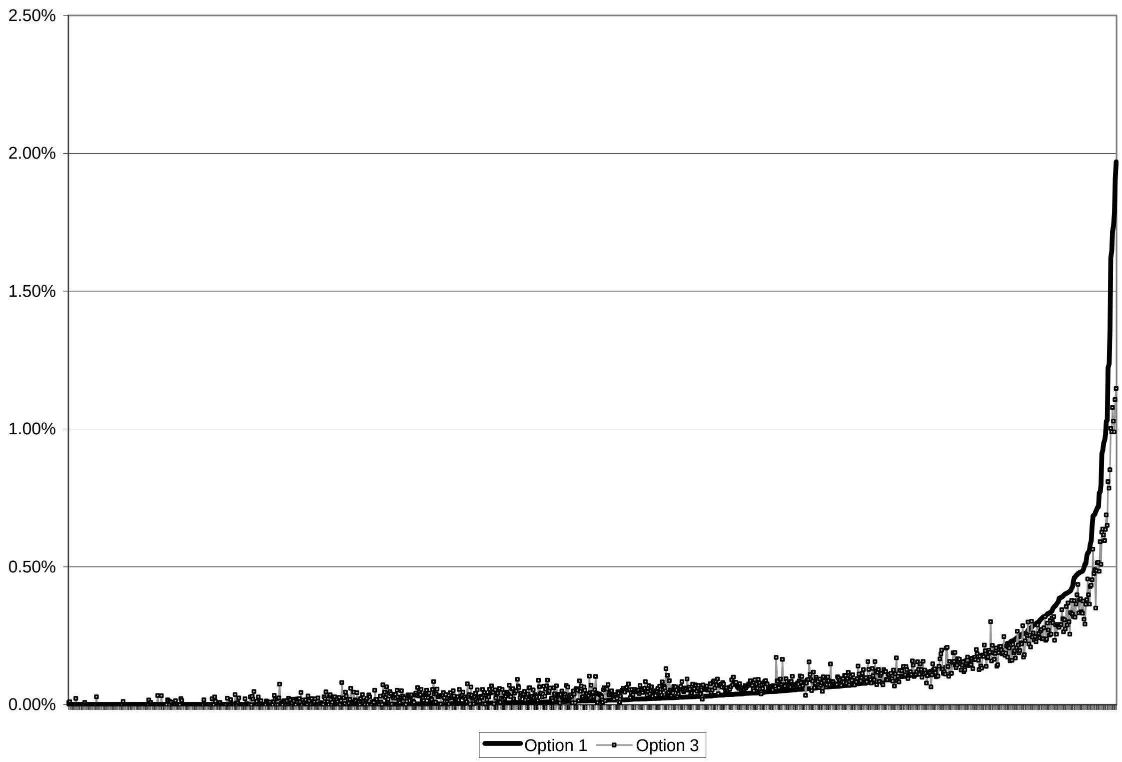
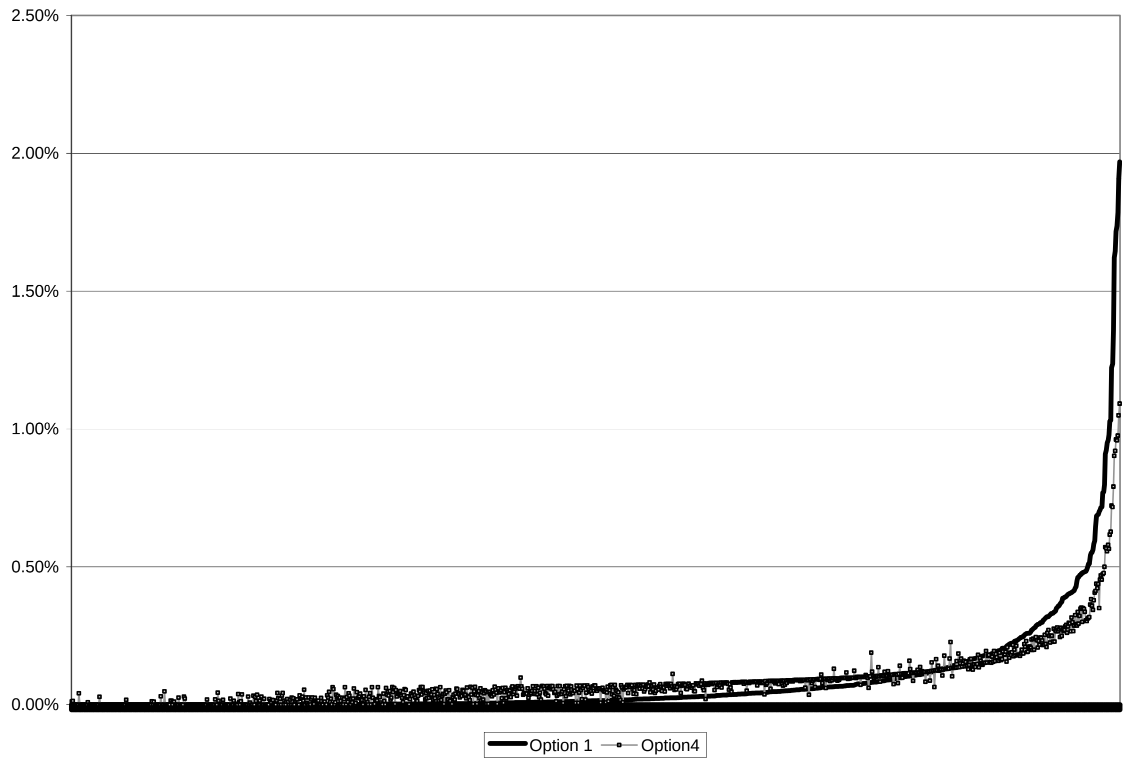


Figure 130 Combined Contribution Shares for Option 1 and Option 4



6.5.4.9 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 form 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 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 5.2.2.7.1, 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.

6.5.4.10 Monitoring and Enforcement

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. Coverage levels will be determined but are proposed to be either 100 percent of all trips and days at sea or some lower level. 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 (insert references). With respect to costs, McElderry and Turris (2008b) provided the estimates shown in Table 218. 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 6.2.2.3, 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 218 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 decline, since fewer trips will occur. The authors assume that the number of trips is roughly half the number of sea days, so cutting sea days by 60 percent should result in a similar reduction in dockside costs.

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.

Table 218 –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

6.5.4.11 Transfer of ACE

Two options are being considered which allow ACE to either be transferred between sectors or between time periods.

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.

Option 2 addresses both of these concerns by allowing sectors to carry forward a portion of unused ACE and by allowing 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. (expand on experience in other fisheries) 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.

6.5.4.12 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.

6.5.5 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.

6.5.6 Allocation of Groundfish to the Commercial and Recreational Groundfish Fisheries

6.5.7 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. The proposed action would also implement a conservation tax on leased DAS at a rate equivalent to the conservation tax in the DAS transfer 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 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 him/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.

6.5.8 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 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.

6.5.8.1 Closed Area I Hook Gear Haddock SAP Revisions

6.5.8.2 Eastern U.S./Canada Haddock SAP

6.5.8.3 Closed Area II Yellowtail Flounder SAP Revisions

6.5.8.4 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 participations 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 219. 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 SPA 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.

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 219 – 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%

6.5.8.5 Category B DAS Program

6.5.9 Periodic Adjustment Process

6.5.10 Possession of a limited access multispecies permit and a limited access scallop permit by the same vessel

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. 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 220. 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 221. 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 does not appear to match with any groundfish permits.

Table 220 – 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 221 - 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 222 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 222 – 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 223).

Table 223 – 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

6.5.11 Measures to Meet Mortality Objectives

6.5.11.1 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 FY2005 – FY2007 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 FY2005 – FY2007 baseline. Third, total fishing revenue for the alternative was calculated by summing the result from the second step and FY2005 – FY2007 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 modeled within the CAM as if the allowed gears were perfectly able to avoid catches of certain stocks. 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 FY2005 – FY2007 and average total revenue was $158 million. Average FY2005 – FY2007 groundfish trip revenues for the vessels included in the analysis was $101 million during FY2005 to FY2007 and average total revenue was $158 million. These revenues represent 88% and 94% respectively of total FY2005-FY2007 average revenue on groundfish trips and revenue from all trips by all limited access permit holders. Because such a high proportion of revenues is accounted for by the vessels in the analysis, the results are believed representative of the impacts on the fleet as a whole.

6.5.11.1.1 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 FY2005 to FY2007 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 224). 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 FY2005 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 224 - Change in Groundfish Trip and Total Trip Revenue by Home Port State

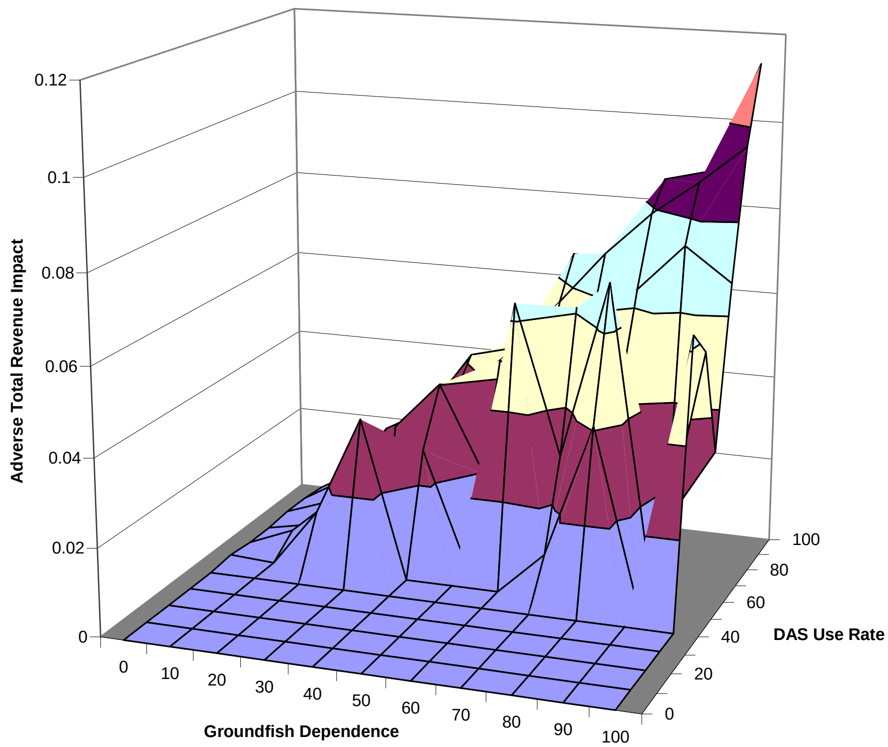
State	2005-2007 Average Total Revenue	Estimated Total Revenue	Change in Total Revenue	2005-2007 Average Groundfish Trip Revenue	Estimated Groundfish Trip Revenue	Change in Groundfish Trip Revenue
CT	$471,853	$442,888	-6.1%	$234,954	$205,989	-12.3%
MA	$76,335,101	$68,953,330	-9.7%	$61,075,061	$53,693,291	-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 131). Figure 131 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.

Figure 131 - Relationship between groundfish dependence, DAS use rate and average revenue impact.



Across all vessels gross revenues for 34 of the 509 included in the analysis would not change relative to status quo conditions (Table 224). 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 225). 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.

Table 225 - 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 226). 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 226 - 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 20th 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 80th percentile) was larger (16%) compared to either gillnet or trawl gear (13%) (Table 227).

Table 227 - 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 228). 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 20th 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 80th 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 228 - 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 229). 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.

Table 229 - 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%

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 230). In each category of gross sales the estimated average adverse change in gross sales ranged from 1-2% for all vessels up to the 20^{th} percentile to 13-14% for vessels above the 80^{th} percentile.

Table 230 - 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 80^{th} 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 then $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 then $500 k	2.0%	6.0%	12.0%	13.0%

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 231). 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 231 consist of combined port groups due to confidentiality concerns.

Table 231 - 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%

6.5.11.1.2 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.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY2005 to FY2007 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 232). 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 232 - 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 233 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 20th percentile (Table 233). Of the remaining vessels the estimated adverse impact of total revenue ranged from an average of 8% between the 20th percentile and the median to 30% for vessels above the 80th percentile.

Table 233 - 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 20th (Table 234). For example, large vessels between the 20th 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 80th percentile large vessels were estimated to lose an average of 33% compared to 29% for medium and 24% for small vessels.

Table 234 - 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 20th percentile and averaged 4% at the 80th percentile (Table 235). 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 235 - Alternative 2a Estimated Adverse Impact and Affected Vessels by Primary Gear

	Gillnet		Hook		Trawl	
Impact Category	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 236).

Table 236 - 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 237). 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 237 - 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 238). 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 238 - 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 239). 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 239 - 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%

6.5.11.1.3 Economic Impacts of 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 FY2005 to FY2007 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 240). 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 240 - 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 241). 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 241 - 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 242). 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 242 - Alternative 3a 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	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 243). 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 243 - Alternative 3a Estimated Adverse Impact and Affected Vessels by Primary Gear

	Gillnet		Hook		Trawl	
Impact Category	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 80th percentile (Table 244). 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

20th percentile (8%) and was at least 60% higher than any other state between the 20th percentile and the median (15%) and between the median and the 80th percentile (27%). Above the 80th 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 244 - 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 245). 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 245 - 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 246). 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 246 - 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 247). 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 247 - 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%

6.5.11.1.4 Economic Impacts of Alternative 4: Differential DAS

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.

Aggregate Impacts

Average groundfish trip revenue for the vessels included in the analysis was $101 million during FY2005 to FY2007 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 248). 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 248 - 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 249). 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 249 - Alternative 4 Estimated Impact 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 250). 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 250 - Alternative 4 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	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 251). 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 251 - Alternative 4 Estimated Adverse Impact and Affected Vessels by Primary Gear

Impact Category	Gillnet Number of Vessels	Gillnet Average Adverse Impact	Hook Number of Vessels	Hook Average Adverse Impact	Trawl Number of Vessels	Trawl 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 252). 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 252 - 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 253). 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 253 - 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 254). 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 254 - 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 255). 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 255 - 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%

6.5.11.2 GOM Haddock Sink Gillnet Pilot Program

This program 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 122). 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 measure 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.

6.5.11.3 Haddock Minimum Size

Lowering the haddock minimum size would increase the number of haddock that would be allowed to be retained. 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. 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, either 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.

6.5.11.4 Recreational Management Measures

6.5.11.4.1 Provisions for Landing Fillets

6.5.11.4.2 Removal of the Limit on Hooks

6.5.11.4.3 Measures to Reduce Mortality

6.5.11.5 Atlantic Halibut Minimum Size

This measure proposes to increase the minimum size for landing Atlantic halibut for both commercial and recreational vessels. 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.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.

For recreational vessels, the increase in minimum size may affect the value of a recreational fishing trip. There is little evidence that trips are designed specifically to target halibut and it is unlikely this measure will reduce the number of private or party/charter trips.

6.5.11.6 Prohibition on Retention of Atlantic Wolffish

This measure proposes to prohibit retention of Atlantic wolffish in the commercial and recreational fisheries. Option prohibits retention throughout the year, while Option 2 prohibits retention from September 1 through March 31.

This measure will reduce revenues for the commercial fishery. Atlantic wolffish landings were on the order of several hundred metric tons in the 1980s, peaking at 499 mt in CY 1983. Landings declined through the 1990s and were 110 mt in 199. Landings continued to decline through CY 2007, reaching a time series low of 29 mt. Landed revenues were less than $150,000 since CY 2004, with a recent low of only $101,000 in CY 2007. Given recent landings trends, Option 1 of 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. If Option 2 is selected the revenue loss will be les since some wolffish will be landed from April through August. This period accounted for an average of 62 percent of wolffish revenues from 2004 – 2007. Option 2 would this result in revenue losses on the order of $40,000 to $60,000.

For recreational vessels, the prohibition on retention may affect the value of a recreational fishing trip. There is little evidence that trips are designed specifically to target wolffish and it is unlikely this measure will reduce the number of private or party/charter trips.

6.5.11.7 Implementation of Additional Sectors/Modifications to Existing Sectors

6.5.11.8 Accountability Measures

6.6 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.

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.
The following paragraphs summarize recent fishing activity in the *communities of interest*.

COMMUNITY DESCRIPTIONS IN DEVELOPMENT

6.7 Cumulative Effects Analysis

6.7.1 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 5.0 (Description of the Affected Human 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, 2009) 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 Human Environment section of the document (section 5.0). 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 5.0).

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 5.0) 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.

Although a full description of past, present and reasonably foreseeable future actions is presented immediately below in Table 256 and in Appendix XX, it is not possible at the DEIS stage of this document to provide equally thorough summaries of the baseline conditions of the groundfish fishery (Section XX Affected Human Environment) or impacts from the proposed action and alternatives (Section 6.0 Environmental Consequences). This is primarily the result of data limitations that exist because GARM III results will not be available until September 2008. However, despite this limitation, the following sections provide general conclusions regarding the baseline conditions for resources and the human environment and the impacts of the alternatives.

6.7.2 Past, Present and Reasonably Foreseeable Future Actions

Table 256 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 XX).

Note that most of the actions effecting this amendment and considered in Table 256 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 256 - Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Amendment 16 (based on actions listed in Appendix XX).

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	**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 discards/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

Impact Definitions:
-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

6.7.3 Baseline Conditions for Resources and the Human Environment

While groundfish stock status information will not be available until the results of GARM III are released, it is assumed that the status of some groundfish species will have improved as a result of more stringent regulations implemented in recent years. However, despite improvements, the fishery must be managed to rebuild stocks that remain overfished or where overfishing is occurring. Therefore, this action anticipates that further effort reductions will be necessary to rebuild the fishery and maintain sustainable stocks. This results in mixed baseline conditions for groundfish species where the short-term status for some species is negative while rebuilding is ongoing and positive in the long-term once rebuilding is attained. For other stocks that are not overfished or where overfishing is not occurring, the short and long-term baseline condition is positive.

Regarding baseline conditions for non-groundfish species, endangered and other protected species and habitat, conditions are generally positive. Management of the groundfish fishery has led to reductions in bycatch, interactions with protected species and interactions with habitat. In the long-term, the regulatory atmosphere of fisheries will likely continue to restrict access to resources however, as stock status improves, greater effort is likely and may lead to higher resource and habitat interactions.

The condition of human communities is more variable and has grown increasingly negative as effort controls have been strengthened. While the current status is likely negative due to fewer opportunities to fish and other non-fishing impacts such as rising fuel and food costs, the long-term outlook is good as groundfish and other fisheries under rebuilding improve and become sustainable.

6.7.4 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 stock status determination criteria and formal rebuilding programs; (2) fishery program administration such as sector provisions, permitting requirements, commercial and recreational allocations, reporting requirements, procedures for implementing ACLs and SAP modifications; and (3) measures to meet mortality objectives including effort control alternatives (for sector and non-sector vessels), implementation of additional sectors and accountability measures.

Actions taken under number one above would potentially 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. As a whole, effort control measures have the greatest impact on the fishery. Additional reductions would continue stocks on their rebuilding strategy and have a positive impact on biological resources. 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 sectors would likely be allocated a hard TAC for almost all regulated groundfish stocks, impacts to the directed fishery would be controlled. However, impacts to the other four VECs are not as clear. 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 are permitted to 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, depending 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 annual 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, procedures for implementing ACLs and SAP modifications) would have impacts less substantial than effort reductions. Alternatives for implementing ACL procedures and new reporting requirements to facilitate better catch monitoring are primarily administrative, particularly the ACL procedures which would not be implemented until FY 2010 or 2011. 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 haddock SAPs would extend the time and area of the CA I SAP, providing greater opportunities to harvest healthy stocks and allow the U.S./Canada SAP to continue unless closed for the season. Both of these alternatives would encourage only slight effort increases and in doing so would focus on GB haddock, a healthy stock. By shifting effort away from stocks in need of greater protection, these changes could have a positive biological impact on groundfish species and to human communities. Impacts to protected species, habitat and non-groundfish species would likely be minor.

6.7.5 Cumulative Effects Summary

As previously noted, given the data limitations due to the lack of the GARM III results, it is not possible to conduct a measure-by-measure cumulative effects assessment for the DEIS, though a more detailed assessment will be included as part of the FEIS after GARM III information becomes available. However, despite data limitations, based on past experience involving similar groundfish actions (e.g., Amendment 13 and Framework 42 to the FMP) and the types of alternatives contained in this document, particularly effort controls, some general conclusions can be made.

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 five VECs 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.

When considering this long-term positive trend 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 benefits.

7.0 APPLICABLE LAW

7.1 Magnuson-Stevens Fishery Conservation and Management Act

7.1.1 Consistency with National Standards

Section 301 of the Magnuson-Stevens Act requires that regulations implementing any fishery management plan or amendment be consistent with the ten national standards listed below.

Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

Amendment 13 to the Northeast Multispecies FMP adopted formal rebuilding plans and measures to end overfishing on this complex. Amendment 13 included a schedule for periodic adjustments to management measures in order to ensure that mortality objectives are met.

Conservation and management measures shall be based on the best scientific information available.

To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

Conservation and management measures shall, where practicable consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into *account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse impacts on such communities.*

Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Conservation and management measures shall, to the extent practicable, promote safety of human life at sea.

7.1.2 Other M-SFCMA requirements

Section 303 (a) of FCMA contains 14 required provisions for FMPs. These are discussed below. It should be emphasized that the requirement is impost on the FMP. In some cases noted below, the M-S Act requirements are met by information in the Northeast Multispecies FMP, as amended. Any fishery management plan that is prepared by any Council, or by the Secretary, with respect to any fishery, shall—

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the national standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

Foreign fishing is not allowed under this management plan or this action and so specific measures are not included that specify and control allowable foreign catch. The measures in this management plan, as adopted by Amendment 13 and subsequently modified by FW 40A, 40B, 41, 42 and this action, are designed to prevent overfishing and rebuild overfished stocks. There are not international agreements or recommendations by international organizations that are germane to multispecies management.

(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. FW 42 updates this information for the period 2001 trough 2004. Information on the commercial harvesting sector can be found in section XXX Information on the recreational harvesting sector can be found in section XXX. Short overviews of the gear used in the fishery, and the impacts of those gear on habitat, are in section XXX.

(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 XXX. Likely future conditions of the resource are described in section XXX. The maximum sustainable yield and optimum yield for the fishery are described in Amendment 13, section 3.1, and are not changed by this action.

(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 13, section 3.1 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. The requirements include Vessel Trip Reports (VTRs) that are submitted by each fishing vessel. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

(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. The Council may review those designations in an omnibus EFH amendment that is currently in development.

(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 needs were identified in Amendment 13 (NEFMC 2004), section 6.0, and are not revised by this action.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--(A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

Impacts of this framework action fishing communities directly affected by this action can be found in sections xx and xx. Possible impacts on fisheries conduced in adjacent areas are described in sectionxx.

(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, are included in section 0.

(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;

(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; and

As noted above, the description of the commercial, recreational, and charter fishing sectors was updated in Amendment 13 (NEFMC 2004), sections 9.2 and 9.3. This information is updated in this document, sections XXX and XXX.

(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.

(15) 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) The EFH Provisions of the SFA (50 CFR Part 600.815) require the inclusion of the following components of FMPs. The Council has fully met these obligations as detailed below each mandatory component.

(A) Identify and description of EFH
(B) Fishing activities that adversely affect EFH
(i) Evaluation of potential adverse effects
(ii) Minimizing adverse effects
(C) Identification of non-Magnuson-Stevens Act fishing activities that may adversely affect EFH
(D) Identification of non-fishing related activities that may adversely effect EFH.
(E) Cumulative impacts analysis
(F) Identification of conservation and enhancement actions.
(G) List the major prey species and discussion the location of the prey species' habitat
(H) Identification of habitat areas of particular concern
(I) Recommendations for research and information needs
(J) Review and revision of EFH components of FMPs.

7.1.3 EFH Assessment

7.1.4 Skate Baseline Review

7.2 National Environmental Policy Act (NEPA)

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the M-S Act and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508). 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). 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 6.0;
- The agencies and persons consulted on this action are listed in section XXX.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An Executive Summary can be found in section **Error! Reference source not found.**.
- A table of contents can be found in section **Error! Reference source not found.**.
- Background and purpose are described in section 0.
- A summary of the document can be found in section XX.
- A brief description of the affected environment is in section 5.0.
- Cumulative impacts of the Proposed Action are described in section XX.
- A list of preparers is in section XX.
- The index is in section XX.

7.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 13 Final Supplemental Environmental Impact Statement. 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 compared to the prosecution of the fishery prior to implementation of Amendment 13. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 42.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see section 6.3 of this document.

7.4 Marine Mammal Protection Act

The NEFMC has reviewed the impacts of the Proposed Action on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the multispecies management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see section 6.3 of this document.

7.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to 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. Accordingly, the Council has determined that this action would have no effect on any coastal use or resources of any state. Letters documenting the Council's negative determination, along with this document, will be sent to the coastal zone management program offices of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. A list of the specific state contacts and a copy of the letters are available upon request.

7.6 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.

7.7 Data Quality Act

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

7.7.1 Utility of Information Product

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the Proposed Action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the Proposed Action is included so that intended users may have a full understanding of the Proposed Action and its implications.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.

This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page in PDF format. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

7.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

7.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. These update assessments were reviewed by the Groundfish Assessment Review Meeting II (GARM II; NEFSC 2005) 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 proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Proposed Action were conducted using information from the most recent complete calendar years, through 2004, and in some cases includes information that was collected during the first nine months of calendar year 2005. Complete data were not available for calendar year 2005. 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 XX and XX _ 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 XX of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

7.8 Executive Order 13132 (Federalism)

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in 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.

7.9 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

7.10 Paperwork Reduction Act

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

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
- 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, has been submitted under separate cover.

7.11 Preliminary Regulatory Economic Evaluation

7.11.1 Executive Order 12866

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section **Error! Reference source not found.** of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action, in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is a not "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.

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

> •Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs,

the environment, public health or safety, or State, local, or tribal governments or communities;

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

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

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

{To be completed}

8.0 References

8.1 Literature Cited

Abernathy, A., ed. 1989. Description of the Mid-Atlantic environment. U.S. Dep. Interior, Minerals Manage. Ser., Herndon, VA. 167 p. + appendices.
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.
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.

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.
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.
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.
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.
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.
Gabriel, W. 1992. Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, northwest Atlantic. J. Northwest Atl. Fish. Sci. 14: 29-46.
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.

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.

Idoine, J.S. 1998. Atlantic wolffish. In: S. H. Clarck, 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.

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.

Johannesses, T., J. Gjosaeter and E. Moksness. 1993. Reproduction, spawning behaviour and captive breeding of the common wolffish, *Anarhincas lupus* L. Aquaculture 115:41-51.

Jonsson, G. 1982. Contribution to the biology of catfish (*Anarhichas lupus*) at Iceland. Rit Fiskideild 6:3-26.

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.

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.

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.

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.

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.

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.

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.

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.

Northeast Fisheries Science Center [NEFSC]. 2002. 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]. 2008. Assessment of 19 Northeast Groundfish Stocks Through 2007: Report of the 3rd Groundfish Assessment Review Meeting (GARM III), Northeast Fisheries Science Center, Woods Hole, Massachusetts, August 4 – 8, 2008. 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.
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.
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.
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.
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.
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.

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.

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.

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.

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.

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.
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.

8.2 Glossary

8.3 Index

Appendices

Appendix I

Summary of Past, Present, or Reasonably Foreseeable Future Actions

APPENDIX XX

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 XX. 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, windowpaine 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
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	**Direct High Positive** Implemented effort reductions that anticipated achieving mortality reductions needed to	**Mixed** Effort reductions lead to reduced discards/bycatch but the B Regular DAS program increased monkfish and skate	**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

	trip limits on cod, yellowtail, etc.	keep stocks on track to rebuild	bycatch			stocks
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 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
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 (~2008/2009)	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 (~2009/2010)	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 (2009)	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