# Draft
# Framework Adjustment 44
# to the
# Northeast Multispecies
# Fishery Management Plan

Including an

Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis


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



Initial framework meeting: September 23, 2009
Final framework meeting: XXX
Date submitted: XXX

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# 1.0 EXECUTIVE SUMMARY

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### 2.4 List of Acronyms

| | |
|---|---|
| ALWTRP | Atlantic Large Whale Take Reduction Plan |
| APA | Administrative Procedures Act |
| ASMFC | Atlantic States Marine Fisheries Commission |
| CAI | Closed Area I |
| CAII | Closed Area II |
| CC | Cape Cod |
| CPUE | catch per unit of effort |
| DAM | Dynamic Area Management |
| DAS | days-at-sea |
| DFO | Department of Fisheries and Oceans (Canada) |
| DMF | Division of Marine Fisheries (Massachusetts) |
| DMR | Department of Marine Resources (Maine) |
| DSEIS | Draft Supplemental Environmental Impact Statement |
| EA | Environmental Assessment |
| EEZ | exclusive economic zone |
| EFH | essential fish habitat |
| EIS | Environmental Impact Statement |
| ESA | Endangered Species Act |
| F | Fishing mortality rate |
| FAAS | Flexible Area Action System |
| FEIS | Final Environmental Impact Statement |
| FMP | fishery management plan |
| FSCS | Fisheries Scientific Computer System |
| FW | framework |
| FY | fishing year |
| GAMS | General Algebraic Modeling System |
| GB | Georges Bank |
| GIS | Geographic Information System |
| GOM | Gulf of Maine |
| GRT | gross registered tons/tonnage |
| HAPC | habitat area of particular concern |
| HPTRP | Harbor Porpoise Take Reduction Plan |
| I/O | input/output |
| IFQ | individual fishing quota |
| ITQ | individual transferable quota |
| IVR | interactive voice response reporting system |
| IWC | International Whaling Commission |
| LOA | letter of authorization |
| LPUE | landings per unit of effort |

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

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

# 3.0 INTRODUCTION AND BACKGROUND

## 3.1 Background

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

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

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

The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. Some of these species are sub-divided into individual stocks that are attributed to different geographic areas. Commercial and recreational fishermen harvest these species. The FMP has been updated through a series of amendments and framework adjustments. The most recent amendment, published as Amendment 16, was submitted to the National Marine Fisheries Service in October, 2009 and will become effective on May 1, 2010. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the M-S Act.

Amendment 16 adopted a process for setting Annual Catch Limits that requires catch levels to be set in biennial specifications packages. This framework is intended to adopt such specifications for regulated Northeast multispecies stocks, as well as stocks managed by the U.S./Canada Resource Sharing Agreement. It is also being used to incorporate the best available information in order to evaluate effort control measures adopted in Amendment 16.

## 3.2 Purpose and Need for the Action

The Northeast Multispecies FMP requires that the NMFS Regional Administrator, after consultation with the Council, determine the specifications for the groundfish fishery. The FMP requires the Council and the Regional Administrator to review the best available information regarding the status of the resource and fishery and develop appropriate fishery specifications. The FMP also provides the Regional Administrator the authority to adjust the specifications in mid-season as necessary. Amendment 16 allows for three-year specifications, as proposed in this document.

Previous amendments to the FMP established processes to evaluate fishing mortality and rebuilding progress. If necessary as a result of these evaluations, periodic framework adjustments were planned to facilitate any changes to the management program that may prove necessary in order to comply with the rebuilding programs and to provide an opportunity to adjust other management measures as necessary.

The proposed adjustments address two **needs**: to set specifications for ACLs in Fishing Years 2010-2012, and to modify management measures in order to ensure that overfishing does not occur. One **purpose** of this framework adjustment is to establish specifications for the Northeast multispecies fishery during the 2010-2012 fishing years. The other **purpose** is to adopt modifications to common pool effort control measures implemented by Amendment 16 so that the benefits from those measures are realized, and to facilitate the achievement of mortality and rebuilding targets in the fishery.

The specifications and adjustments to Amendment 16 are intended to meet the goal and many of the objectives of the Northeast Multispecies FMP, as modified in Amendment 16, specifically:

| ***Need*** | ***Purpose*** |
|---|---|
| Set specifications for ACLs in Fishing Years 2010-2012 | • Measures to adopt ACLs, including incidental catch TACs<br>• Measures to adopt TACs for U.S./Canada area |
| Modify management measures in order to ensure that overfishing does not occur consistent with the status of stocks, the National Standard guidelines, and the requirements of the MSA of 2006 | • Implement changes to trip limits for common pool vessels<br>• Implement changes to differential DAS counting for common pool vessels<br>• Enhance the RA’s authority to modify effort control measures in-season to reduce the likelihood of exceeding ACLs |
| 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 | • Identify other actions to encourage the conservation and enhancement of EFH. |

## 3.3 Brief History of the Northeast Multispecies Management Plan

Groundfish stocks were managed under the M-S Act beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was rejected in 1982 with the adoption of the Interim Groundfish Plan, which relied on minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented reductions in time fished (days-at-sea, or DAS) for some fleet sectors and adopted year-round closures to control mortality. A more detailed discussion of the history of the management plan up to 1994 can be found in Amendment 5 (NEFMC 1994). Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program and accelerated the reduction in DAS first adopted in Amendment 5. Since the implementation of Amendment 7, there were a series of amendments and smaller changes (framework adjustments) that are detailed in Amendment 13 (NEFMC 2003). Amendment 13 was developed over a four-year period to meet the M-S Act requirement to adopt rebuilding programs for stocks that are overfished and to end overfishing. Amendment 13 also brought the FMP into compliance with other provisions of the M-S Act. Subsequent to the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expanded the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock. FW 42 included measures to implement the biennial adjustment to the FMP as well as a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, an extension of the DAS leasing program, and introduced the differential DAS system. Amendment 16 was adopted in 2009 and provided major changes in the realm of groundfish management. Notably, it greatly expanded the sector program and implemented Annual Catch Limits in compliance with 2006 revisions to the M-S Act. The amendment also included a host of mortality reduction measures for “common pool” (i.e. non-sector) vessels and the recreational component of the fishery. A more detailed description of the history of the FMP is included in Amendment 16.

## 3.4 National Environmental Policy Act (NEPA)

NEPA provides a structure for identifying and evaluating the full spectrum of environmental issues associated with Federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is a combined framework adjustment to a fishery management plan and an environmental assessment (EA). An EA provides an analysis of a Proposed Action, the alternatives to that action that were considered, and the impacts of the action and the alternatives. An EA is prepared rather than an Environmental Impact Statement (EIS) when the environmental impacts are not expected to be significant. The required NEPA elements for an EA are discussed in section 8.2.1. The evaluation that this action will not have significant impacts is in section 8.2.2, and the required Finding of No Significant Impact (FONSI) statement is included at the end of that section.

# 4.0 PROPOSED ACTION

## *4.1 Northeast Multispecies Fishery ACL Specifications for Fishing Years 2010-2012*

### 4.1.1 Option One – No Action

Under this alternative, no action would be taken by the Council to implement specifications for FY 2010. It is important to note that failure to take action would violate several provisions of the Magnuson Stevens Act, and hence this alternative is not allowable by law.

The M-S Act requires that an ACL be imposed on stocks that are subject to overfishing by FY 2010, and that an ACL be adopted for remaining stocks in 2011. Because of that requirement, it is reasonable to assume that NMFS would act to impose ACLs as quickly as possible in the absence of Council action although it is difficult to predict what those ACLs would be. At a minimum NMFS would be expected to adopt ACLs for all multispecies stocks for FY 2010 except halibut, pout, plaice, redfish, GOM haddock, and GB haddock since those stocks are not subject to overfishing. The MSA requires that ACLs be set at a level equal to or lesser than the ABC recommended by the SSC. For the purposes of the No Action alternative, the best assumption is that the ABCs (Table 1) will be used as ACLs for overfished stocks.

Table 1 – ABCs and OFLs for multispecies stocks that are subject to overfishing

| Stock | Year | OFL | U.S. ABC |
|---|---|---|---|
| GB Cod | 2010 | 6,272 | 3,800 |
| | 2011 | 7,311 | 5,616 |
| | 2012 | 8,090 | 6,214 |
| GOM Cod | 2010 | 11,089 | 8,530 |
| | 2011 | 11,715 | 9,012 |
| | 2012 | 11,742 | 9,018 |
| GB Yellowtail Flounder | 2010 | 5,148 | 1,200 |
| | 2011 | 6,083 | 1,081 |
| | 2012 | 7,094 | 1,226 |
| SNE/MA Yellowtail Flounder | 2010 | 1,553 | 493 |
| | 2011 | 2,174 | 687 |
| | 2012 | 3,166 | 1,003 |
| CC/GOM Yellowtail Flounder | 2010 | 1,124 | 863 |
| | 2011 | 4,483 | 1,041 |
| | 2012 | 4,727 | 1,159 |
| Witch Flounder | 2010 | 1,239 | 944 |
| | 2011 | 1,792 | 1,369 |
| | 2012 | 2,141 | 1,639 |
| GB Winter Flounder | 2010 | 2,660 | 2,052 |
| | 2011 | 2,886 | 2,224 |

| Stock | Year | OFL | U.S. ABC |
|---|---|---|---|
| | 2012 | 3,297 | 2,543 |
| GOM Winter Flounder | 2010 | 441 | 238 |
| | 2011 | 570 | 238 |
| | 2012 | 685 | 238 |
| SNE/MA Winter Flounder | 2010 | 1,568 | 644 |
| | 2011 | 2,117 | 897 |
| | 2012 | 2,830 | 1,198 |
| White Hake | 2010 | 4,130 | 2,832 |
| | 2011 | 4,805 | 3,295 |
| | 2012 | 5,306 | 3,638 |
| Pollock | 2010 | 5,085 | 3,293 |
| | 2011 | 5,085 | 3,293 |
| | 2012 | 5,085 | 3,293 |
| N. Window-pane Flounder | 2010 | 225 | 169 |
| | 2011 | 225 | 169 |
| | 2012 | 225 | 169 |
| S. Window-pane Flounder | 2010 | 317 | 237 |
| | 2011 | 317 | 237 |
| | 2012 | 317 | 237 |
| Atlantic Wolffish | 2010 | 92 | 83 |
| | 2011 | 92 | 83 |
| | 2012 | 92 | 83 |

Under the No Action alternative, the ACL will be distributed between sectors, the common pool, and other subcomponents of the fishery as described in Amendment 16. However, there will be no separate allocation of yellowtail flounder to the scallop fishery. Any yellowtail caught by the scallop fishery would fall under the “other subcomponents” category of the ACL.

If no action is taken on specifications, the recommendations of the TMGC will also not be implemented and there will be no TAC for GB cod, haddock, or yellowtail flounder in the U.S./Canada area for FY 2010.  Vessels would still be constrained by the other regulations of the FMP, including days-at-sea (DAS), sector regulations, and closed areas.

### 4.1.2 Option Two – Fishery Specifications and ACLs for 2010-2012

Consistent with the requirements of Amendment 16, this action proposes Annual Catch Limits (ACLs) for FY 2010 – FY 2012. These ACLs will be the basis for determining whether Accountability Measures (AMs) are triggered as described in Amendment 16. As a result of the adoption of these ACLs, the incidental catch TACs that are applicable to the Category B (regular) DAS Program and certain Special Access Programs are also defined.

The ACLs proposed for FY 2010- 2012 are shown in Table 2. This table includes the Overfishing Limits (OFLs) and Acceptable Biological Catch (ABC) for each stock. The incidental catch TACs for the same period are shown in Table 3. The PDT guidance for calculating these values is attached as Appendix II, while the detailed calculations are in Appendix III.

The general approach for calculating these values begins with the ABCs set by the SSC (Appendix I). The ABC is distributed among the various components of the fishery as described in Amendment 16 and Appendices II and III. Each ABC is then adjusted for management uncertainty, where appropriate, using the adjustments approved by the Council, as shown in Appendix III

These ACLs and incidental catch TACs are based on the composition of sector rosters as of September 1, 2009. The share of each stock that is available to sector and common pool vessels may differ from that shown should sector membership be revised. Once NMFS knows the final sector rosters, the ACLs applicable to each commercial component will be revised. This will also result in changes to the incidental catch TACs.

The FY 2011 – FY 2012 ACLs for GB cod, GB haddock, and GB yellowtail flounder may be modified as a result of future decisions of the Transboundary Management Guidance Committee (TMGC). Allocation of these stocks under the terms of the U.S./Canada Resource Sharing Understanding will affect the amount available for U.S. fishermen.

Rationale: Amendment 16 described the process for establishing ACLs and AMs for the Multispecies FMP. This alternative proposes the ACLs for FY 2010 – FY 2012. As noted in Amendment 16, it is expected that the ACLs for FY 2012 – FY 2014 will be calculated and adopted before the FY 2012 ACL in this action is used. The FY 2012 values here are specified in case there is a future delay in updating the ACLs.

Table 2 – Northeast Multispecies OFLs, ABCs, ACLs, and other ACL sub-components for FY 2010 – FY 2012 (metric tons). Values are rounded to the nearest metric ton.

(1) YTF allocations for scallops are an other sub-component in FY 2010, but are expected to be sub-ACLs in FY 2011-2012

| Stock | Year | OFL | U.S. ABC | State Waters Sub-component | Other Sub-Components | Scallops (1) | Groundfish Sub-ACL | Comm Groundfish Sub-ACL | Rec Groundfish Sub-ACL | Preliminary Sectors Sub-ACL | Preliminary Non_Sector Groundfish Sub-ACL | MWT Sub_ACL | Total ACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GB Cod | 2010 | 6,272 | 3,800 | 38 | 152 | 0 | 3,430 | | | 3,256 | 174 | 0 | 3,620 |
| | 2011 | 7,311 | 5,616 | 56 | 225 | 0 | 5,068 | | | 4,812 | 257 | 0 | 5,349 |
| | 2012 | 8,090 | 6,214 | 62 | 249 | 0 | 5,608 | | | 5,324 | 284 | 0 | 5,919 |
| GOM Cod | 2010 | 11,089 | 8,530 | 566 | 283 | 0 | | 4,567 | 2,673 | 4,230 | 337 | 0 | 8,088 |
| | 2011 | 11,715 | 9,012 | 597 | 299 | 0 | | 4,825 | 2,824 | 4,469 | 356 | 0 | 8,545 |
| | 2012 | 11,742 | 9,018 | 598 | 299 | 0 | | 4,828 | 2,826 | 4,472 | 356 | 0 | 8,551 |
| GB Haddock | 2010 | 80,007 | 44,903 | 449 | 1,796 | 0 | 40,440 | | | 39,313 | 1,127 | 84 | 42,768 |
| | 2011 | 59,948 | 46,784 | 468 | 1,871 | 0 | 42,134 | | | 40,959 | 1,174 | 87 | 44,560 |
| | 2012 | 51,150 | 39,846 | 398 | 1,594 | 0 | 35,885 | | | 34,885 | 1,000 | 74 | 37,952 |
| GOM Haddock | 2010 | 1,617 | 1,265 | 9 | 37 | 0 | | 825 | 324 | 786 | 39 | 2 | 1,197 |
| | 2011 | 1,536 | 1,206 | 9 | 35 | 0 | | 787 | 308 | 749 | 37 | 2 | 1,141 |
| | 2012 | 1,296 | 1,013 | 7 | 29 | 0 | | 661 | 259 | 630 | 31 | 2 | 959 |
| GB Yellowtail Flounder | 2010 | 5,148 | 1,200 | 0 | 60 | 0 | 1,106 | | | 1,034 | 72 | 0 | 1,166 |
| | 2011 | 6,083 | 1,081 | 0 | 54 | 0 | 996 | | | 932 | 65 | 0 | 1,050 |
| | 2012 | 7,094 | 1,226 | 0 | 61 | 0 | 1,130 | | | 1,057 | 73 | 0 | 1,191 |
| SNE/MA Yellowtail Flounder | 2010 | 1,553 | 493 | 5 | 20 | 0 | 436 | | | 316 | 119 | 0 | 460 |
| | 2011 | 2,174 | 687 | 7 | 27 | 0 | 607 | | | 441 | 166 | 0 | 641 |
| | 2012 | 3,166 | 1,003 | 10 | 40 | 0 | 886 | | | 644 | 242 | 0 | 936 |
| CC/GOM Yellowtail Flounder | 2010 | 1,124 | 863 | 9 | 35 | 0 | 779 | | | 727 | 52 | 0 | 822 |
| | 2011 | 4,483 | 1,041 | 10 | 42 | 0 | 940 | | | 876 | 63 | 0 | 992 |
| | 2012 | 4,727 | 1,159 | 12 | 46 | 0 | 1,046 | | | 976 | 70 | 0 | 1,104 |
| Plaice | 2010 | 4,110 | 3,156 | 32 | 126 | 0 | 2,848 | | | 2,665 | 184 | 0 | 3,006 |
| | 2011 | 4,483 | 3,444 | 34 | 138 | 0 | 3,108 | | | 2,908 | 200 | 0 | 3,280 |
| | 2012 | 4,727 | 3,632 | 36 | 145 | 0 | 3,278 | | | 3,067 | 211 | 0 | 3,459 |

| Stock | Year | OFL | U.S. ABC | State Waters Sub-component | Other Sub-Components | Scallops (1) | Groundfish Sub-ACL | Comm Groundfish Sub-ACL | Rec Groundfish Sub-ACL | Preliminary Sectors Sub-ACL | Preliminary Non_Sector Groundfish Sub-ACL | MWT Sub_ ACL | Total ACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Witch Flounder | 2010 | 1,239 | 944 | 9 | 38 | 0 | 852 | | | 810 | 42 | 0 | 899 |
| | 2011 | 1,792 | 1,369 | 14 | 55 | 0 | 1,236 | | | 1,174 | 61 | 0 | 1,304 |
| | 2012 | 2,141 | 1,639 | 16 | 66 | 0 | 1,479 | | | 1,406 | 73 | 0 | 1,561 |
| GB Winter Flounder | 2010 | 2,660 | 2,052 | 0 | 103 | 0 | 1,852 | | | 1,797 | 55 | 0 | 1,955 |
| | 2011 | 2,886 | 2,224 | 0 | 111 | 0 | 2,007 | | | 1,948 | 60 | 0 | 2,118 |
| | 2012 | 3,297 | 2,543 | 0 | 127 | 0 | 2,295 | | | 2,227 | 68 | 0 | 2,422 |
| GOM Winter Flounder | 2010 | 441 | 238 | 60 | 12 | 0 | 158 | | | 132 | 26 | 0 | 230 |
| | 2011 | 570 | 238 | 60 | 12 | 0 | 158 | | | 132 | 26 | 0 | 230 |
| | 2012 | 685 | 238 | 60 | 12 | 0 | 158 | | | 132 | 26 | 0 | 230 |
| SNE/MA Winter Flounder | 2010 | 1,568 | 644 | 53 | 32 | 0 | 520 | | | 0 | 520 | 0 | 605 |
| | 2011 | 2,117 | 897 | 72 | 45 | 0 | 726 | | | 0 | 726 | 0 | 842 |
| | 2012 | 2,830 | 1,198 | 96 | 60 | 0 | 969 | | | 0 | 969 | 0 | 1,125 |
| | 2010 | 9,899 | 7,586 | 76 | 303 | 0 | 6,846 | | | 6,613 | 234 | 0 | 7,226 |
| | 2011 | 10,903 | 8,356 | 84 | 334 | 0 | 7,541 | | | 7,284 | 257 | 0 | 7,959 |
| Redfish | 2012 | 12,036 | 9,224 | 92 | 369 | 0 | 8,325 | | | 8,041 | 284 | 0 | 8,786 |
| White Hake | 2010 | 4,130 | 2,832 | 28 | 113 | 0 | 2,556 | | | 2,435 | 121 | 0 | 2,697 |
| | 2011 | 4,805 | 3,295 | 33 | 132 | 0 | 2,974 | | | 2,833 | 141 | 0 | 3,138 |
| | 2012 | 5,306 | 3,638 | 36 | 146 | 0 | 3,283 | | | 3,128 | 156 | 0 | 3,465 |
| Pollock | 2010 | 5,085 | 3,293 | 200 | 200 | 0 | 2,748 | | | 2,630 | 118 | 0 | 3,148 |
| | 2011 | 5,085 | 3,293 | 200 | 200 | 0 | 2,748 | | | 2,630 | 118 | 0 | 3,148 |
| | 2012 | 5,085 | 3,293 | 200 | 200 | 0 | 2,748 | | | 2,630 | 118 | 0 | 3,148 |
| N. Window-pane Flounder | 2010 | 225 | 169 | 2 | 49 | 0 | 110 | | | 0 | 110 | 0 | 161 |
| | 2011 | 225 | 169 | 2 | 49 | 0 | 110 | | | 0 | 110 | 0 | 161 |
| | 2012 | 225 | 169 | 2 | 49 | 0 | 110 | | | 0 | 110 | 0 | 161 |

| Stock | Year | OFL | U.S. ABC | State Waters Sub-component | Other Sub-Components | Scallops (1) | Groundfish Sub-ACL | Comm Groundfish Sub-ACL | Rec Groundfish Sub-ACL | Prelim-inary Sectors Sub-ACL | Preliminary Non_Sector Groundfish Sub-ACL | MWT Sub_ ACL | Total ACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. Window-pane Flounder | 2010 | 317 | 237 | 2 | 69 | 0 | 154 | | | 0 | 154 | 0 | 225 |
| | 2011 | 317 | 237 | 2 | 69 | 0 | 154 | | | 0 | 154 | 0 | 225 |
| | 2012 | 317 | 237 | 2 | 69 | 0 | 154 | | | 0 | 154 | 0 | 225 |
| Ocean Pout | 2010 | 361 | 271 | 3 | 11 | 0 | 239 | | | 0 | 239 | 0 | 253 |
| | 2011 | 361 | 271 | 3 | 11 | 0 | 239 | | | 0 | 239 | 0 | 253 |
| | 2012 | 361 | 271 | 3 | 11 | 0 | 239 | | | 0 | 239 | 0 | 253 |
| Atlantic Halibut | 2010 | 119 | 71 | 36 | 4 | 0 | 30 | | | 0 | 30 | 0 | 69 |
| | 2011 | 130 | 78 | 39 | 4 | 0 | 33 | | | 0 | 33 | 0 | 76 |
| | 2012 | 143 | 85 | 43 | 4 | 0 | 36 | | | 0 | 36 | 0 | 83 |
| Atlantic Wolffish | 2010 | 92 | 83 | 1 | 3 | 0 | 73 | | | 0 | 73 | 0 | 77 |
| | 2011 | 92 | 83 | 1 | 3 | 0 | 73 | | | 0 | 73 | 0 | 77 |
| | 2012 | 92 | 83 | 1 | 3 | 0 | 73 | | | 0 | 73 | 0 | 77 |

Table 3 – Preliminary incidental catch TACs for Special Management Programs (metric tons). These values may change as a result of changes in sector membership.

| | Cat B (regular) DAS Program | | | CAI Hook Gear Haddock SAP | | | EUS/CA Haddock SAP | | |
|---|---|---|---|---|---|---|---|---|---|
| **Stock** | **2010** | **2011** | **2012** | **2010** | **2011** | **2012** | **2010** | **2011** | **2012** |
| GB cod | 1.7 | 2.6 | 2.8 | 0.6 | 0.8 | 0.9 | 1.2 | 1.7 | 1.9 |
| GOM cod | 3.4 | 3.6 | 3.6 | | | | | | |
| GB Yellowtail | 0.7 | 0.6 | 0.7 | | | | 0.7 | 0.6 | 0.7 |
| CC/GOM yellowtail | 0.5 | 0.6 | 0.7 | | | | | | |
| SNE/MA Yellowtail | 1.2 | 1.7 | 2.4 | | | | | | |
| Plaice | 9.2 | 10.0 | 10.6 | | | | | | |
| Witch Flounder | 2.1 | 3.1 | 3.7 | | | | | | |
| White Hake | 5.2 | 7.3 | 9.7 | | | | | | |
| SNE/MA Winter Flounder | 1.1 | 1.2 | 1.4 | | | | | | |
| GB Winter Flounder | 1.2 | 1.4 | 1.6 | | | | 1.2 | 1.4 | 1.6 |
| Pollock | 1.2 | 1.2 | 1.2 | 0.4 | 0.4 | 0.4 | 0.8 | 0.8 | 0.8 |

#### 4.1.2.1 Sub-option One –Yellowtail Flounder Allocations for the Scallop Fishery – Groundfish Committee Recommendation

Amendment 16 adopts ACLs for groundfish stocks. Some of these ACLs are divided into either sub-ACLs that are subject to accountability measures (AMs), or other sub-components that are not subject to AMs. The amendment proposes that a portion of yellowtail flounder will be allocated to the scallop fishery. In FY 2010, the allocation is considered a sub-component, while in FY 2011 and beyond it will be considered a sub-ACL subject to AMs that will be adopted in a scallop amendment.

An estimate of the yellowtail flounder that will be caught by the scallop fishery in FY 2010 – FY 2012 if it harvests its projected yield was developed for four scallop management scenarios. The GB and SNE/MA yellowtail founder that will be allocated to the fishery in those years is 90 percent of this amount. For CC/GOM yellowtail flounder, scallop fishery incidental catches are low enough that they will be considered part of the “other sub-component”. These catches will be monitored but a specific allocation will not be made in this action. An allocation may be made in the future.

This value will be adjusted for management uncertainty when the allocation becomes a sub-ACL (in FY 2011 and beyond). As explained in Appendix III, for GB and CC/GOM yellowtail flounder the sub-ACL will be set at 97 percent of the allocation, while for SNE/MA yellowtail flounder it will be set at 93 percent of the allocation.

The resulting values are shown in Table 4 for the four scallop management scenarios under consideration.

<u>Rationale</u>: This alternative recognizes the importance of yellowtail flounder to the prosecution of the scallop fishery and allocates most of the yellowtail flounder that the fishery is expected to catch if it harvests the available scallop yield. It also creates an incentive for scallop fishermen to reduce bycatch of yellowtail flounder in order to maximize scallop yield. With respect to Cape Cod/Gulf of Maine yellowtail flounder, no allocation is made since the incidental catch is a low percentage of the available catch and can be accommodated by the “other sub-components” category. An allocation may be made in the future.

Table 4 – Sub-Option 1A – Groundfish Committee recommended allocation of yellowtail flounder to the scallop fishery. Values are metric tons, rounded to the nearest metric ton.

| **No Closure F = 0.20** | *Total Expected to be Caught, YTF Stock Area* | | | *90 percent of Total* | | | *Sub-ACL* | | |
|---|---|---|---|---|---|---|---|---|---|
| *Year* | *CC* | *GB* | *SNEMA* | *CC* | *GB* | *SNEMA* | *CC* | *GB* | *SNEMA* |
| 2010 | 30 | 110 | 111 | | 99 | 100 | | 96 | 93 |
| 2011 | 26 | 226 | 96 | | 203 | 86 | | 197 | 80 |
| 2012 | 32 | 353 | 151 | | 318 | 136 | | 308 | 126 |
| **No Closure - F = 0.24** | | | | | | | | | |
| 2010 | 39 | 146 | 135 | | 131 | 122 | | 127 | 113 |
| 2011 | 26 | 230 | 98 | | 207 | 88 | | 201 | 82 |
| 2012 | 32 | 352 | 151 | | 317 | 136 | | 307 | 126 |
| **Closure F = 0.18** | | | | | | | | | |
| 2010 | 17 | 182 | 179 | | 164 | 161 | | 159 | 150 |
| 2011 | 13 | 256 | 130 | | 230 | 117 | | 223 | 109 |
| 2012 | 10 | 320 | 151 | | 288 | 136 | | 279 | 126 |
| **Closure F = 0.20** | | | | | | | | | |
| 2010 | 20 | 215 | 202 | | 194 | 182 | | 188 | 169 |
| 2011 | 13 | 263 | 134 | | 237 | 121 | | 230 | 112 |
| 2012 | 10 | 317 | 153 | | 285 | 138 | | 277 | 128 |

#### 4.1.2.2 Sub-option Two – U.S./Canada Resource Sharing Understanding TACs

This alternative would implement hard TACs for the U.S./Canada Management Area for FY 2010 (May 1, 2010 – April 30, 2011) as indicated in Table 5 below. These TACs would be in effect for the remainder of the fishing year, unless NMFS determines that the catch of GB cod, haddock, or yellowtail flounder from the U.S./Canada Management Area in FY 2009 exceeded the pertinent 2009 TAC. The Understanding and the regulations require that if a TAC is exceeded in a particular fishing year, then the TAC for the subsequent fishing year is reduced by the amount of the overage (TAC adjustment). In order to minimize any disruption of the fishing industry, NMFS would attempt to make any necessary TAC adjustments in the first quarter of the fishing year.

Table 5 – Proposed FY 2010 U.S./Canada TACs (mt) and Percentage Shares

| | Eastern GB Cod | Eastern GB Haddock | GB Yellowtail Flounder |
|---|---|---|---|
| Total Shared TAC | 1,350 | 29,600 | 1,500 |
| U.S. TAC | 338 (25%) | 11,988 (40.5%) | 1,200 |
| Canada TAC | 1,012 (75%) | 17,612 (59.5%) | pending |

These proposed TACs are based on the TRAC's guidance to the TMGC (TRAC Status Report 2009/01, 2009/02, and 2009/03; June 2009), and the TMGC's recommendations (TMGC Meeting of September 15, 16, 2009). The above GB yellowtail flounder TAC has not been adjusted downward to reflect management uncertainty or any allocation to the scallop fishery.

With respect to GB yellowtail flounder, the proposed U.S. TAC is based upon the recommendation of the Science and Statistical Committee recommendation for the ABC. The SSC made its recommendation at its August, 2009 meeting, based upon the 2009 TRAC Status Report, and the proposal that the U.S. delegates presented to the TMGC was consistent with the advice of the SSC (1,500 mt). In contrast, the Canadian delegation stated that they proposed 2,700 mt in order to be within the range of TRAC advice and to be consistent with the TMGC strategy, as well as to support the Understanding. It was noted that this level was close to a rebuilding fishing mortality of 0.107. The U.S. delegation explained to the Canadians that they proposed 1,500 mt because they are constrained to this level due the U.S. law and the Fishery Management Plan (FMP) rebuilding requirement. They noted that this shared catch would result in a 19% increase in amount of yellowtail for Canada in 2010.

The Canadian point of view was that since biomass is relatively high and F is low, there is not justification to be reducing the catch further. Even though recruitment has been inconsistent, there are positive indicators of stock performance. In contrast, the U.S. point of view was that the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the FMP require the stock to rebuild by 2012 and require use of the most recent scientific information, and that the laws provide no flexibility at this time (unless the MSA is modified).

The Canadian delegation suggested that an avenue to obtain flexibility may be either to refrain from revising the calculation of $F_{rebuild}$ annually, or to modify the FMP to adopt a lower probability of rebuilding than the currently adopted 75% probability. The U.S. delegates concluded that these ideas, although logical, could not be pursued at this time, given the restrictions of the MSA, the FMP, and the Council process.

Because the TMGC could not come to a consensus on an appropriate shared catch for GB yellowtail, they acknowledged this impasse and agreed to disagree. The Council voted on September 23, 2009 to adopt the recommendation of the TMGC for Eastern GB cod and Eastern GB haddock. The Council adopted a U.S. GB yellowtail flounder TAC of 1,200 mt, which was determined based on the SSC recommendation of 1,500 mt for a shared TAC, minus 300 mt for an assumed Canadian catch. 300 mt is slightly greater than the average Canadian catch of GB yellowtail flounder for 2008, 2007, and 2006, according Canadian information presented to the TMGC (151, 132, and 590 mt, respectively).

The size of the Proposed 2010 TACs relative to the 2009 TACs is shown in Table 6.

Table 6 – Comparison of Proposed FY 2010 U.S./Canada TACs with FY 2009 TACs

| Stock | FY 2009 (mt) | FY 2010 (mt) | Percent Change |
|---|---|---|---|
| Eastern GB cod | 527 | 338 | - 36 % |
| Eastern GB haddock | 11,100 | 11,988 | + 8 % |
| GB yellowtail | 1,617 | * 1,100 | - 32 % |

* does not reflect management uncertainty adjustment or allocation to scallop fishery

The changes in the TACs reflect both changes to the percentage shares for the U.S., pursuant to the U.S./Canada Understanding (increase for haddock and decreases for cod and yellowtail), as well as stock status, and the TMGC recommendations. The weighting formula used to determine the percentage shares was 90/10 (resource distribution/historic utilization). More information on the calculation of the percentage shares may be accessed through the TMGC web site at the following address:
http://www.mar.dfo-mpo.gc.ca/science/tmgc/background/share.pdf.

## *4.2 Commercial Fishery Effort Control Modification*

### 4.2.1 Option One – No Action

If adopted, the effort controls adopted by Amendment 16 would continue unchanged. The effort control alternative selected in A16 eliminated previously-existing differential DAS counting areas, reduced Category A DAS by 50 percent from the FW 42 allocations, and counted all DAS in 24-hour increments (i.e. 6 hours is counted as one DAS, 25 hours is counted as two DAS, etc.). Other measures that were in place prior to the implementation of Amendment 16 remained, including seasonal and rolling closures and gear requirements.

Trip Limits:

The trip limits in Table 7 were implemented for fishing on a Category A DAS, while all other trip limits while fishing on a Category A DAS were eliminated. For GB and GOM cod, Handgear A permits are allowed a 750-lb. per trip landing limit, while Handgear B permits are allowed 200 lbs. per trip.

Table 7 – No Action trip limits for common pool vessels

| Stock | Option 3A |
|---|---|
| GOM Cod* | 2,000 lbs./DAS; maximum 12,000 lbs/trip in GOM, 20,000 lbs/trip in GB; with the exception of the Eastern U.S./Canada area, where the Regional Administrator will specify the appropriate trip limit at the beginning of the fishing year (the default trip limit for this area remains 500 lbs./DAS, up to a maximum of 5,000 lbs./trip). |
| GB Cod* | |
| CCGOM 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 | 0 |
| Windowpane Flounder | 0 |
| Atlantic Halibut | One fish/trip |
| Ocean Pout | 0 |
| Atlantic Wolffish | 0 |

<u>Restricted Gear Areas</u>:

Two restricted gear areas were established in Amendment 16 (Figure 1). Vessels fishing under a groundfish DAS are required to comply with the gear requirements for these areas.

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

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

*Areas*: The areas are defined as:

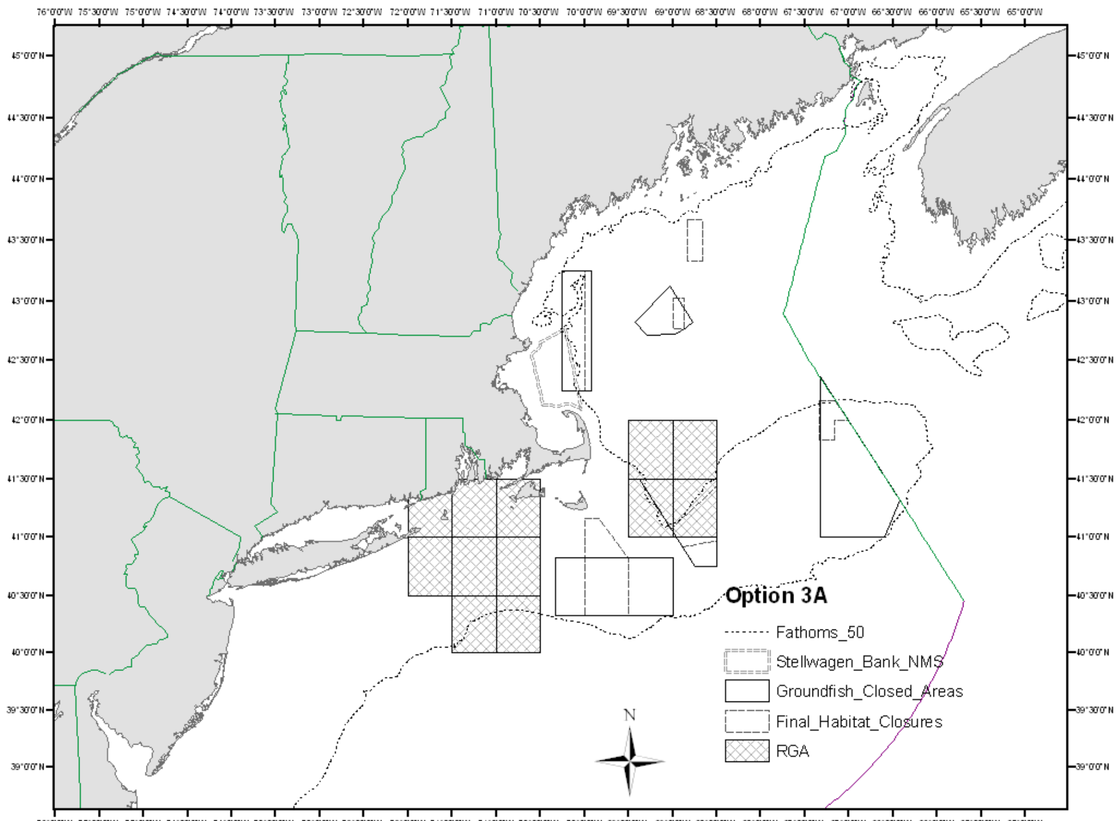
*Western GB Multispecies RGA*:

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

41-00N 69-30W

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

Figure 1 –Restricted gear areas adopted in Amendment 16




<u>Gear restrictions</u> include the following authorized gears:

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

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

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

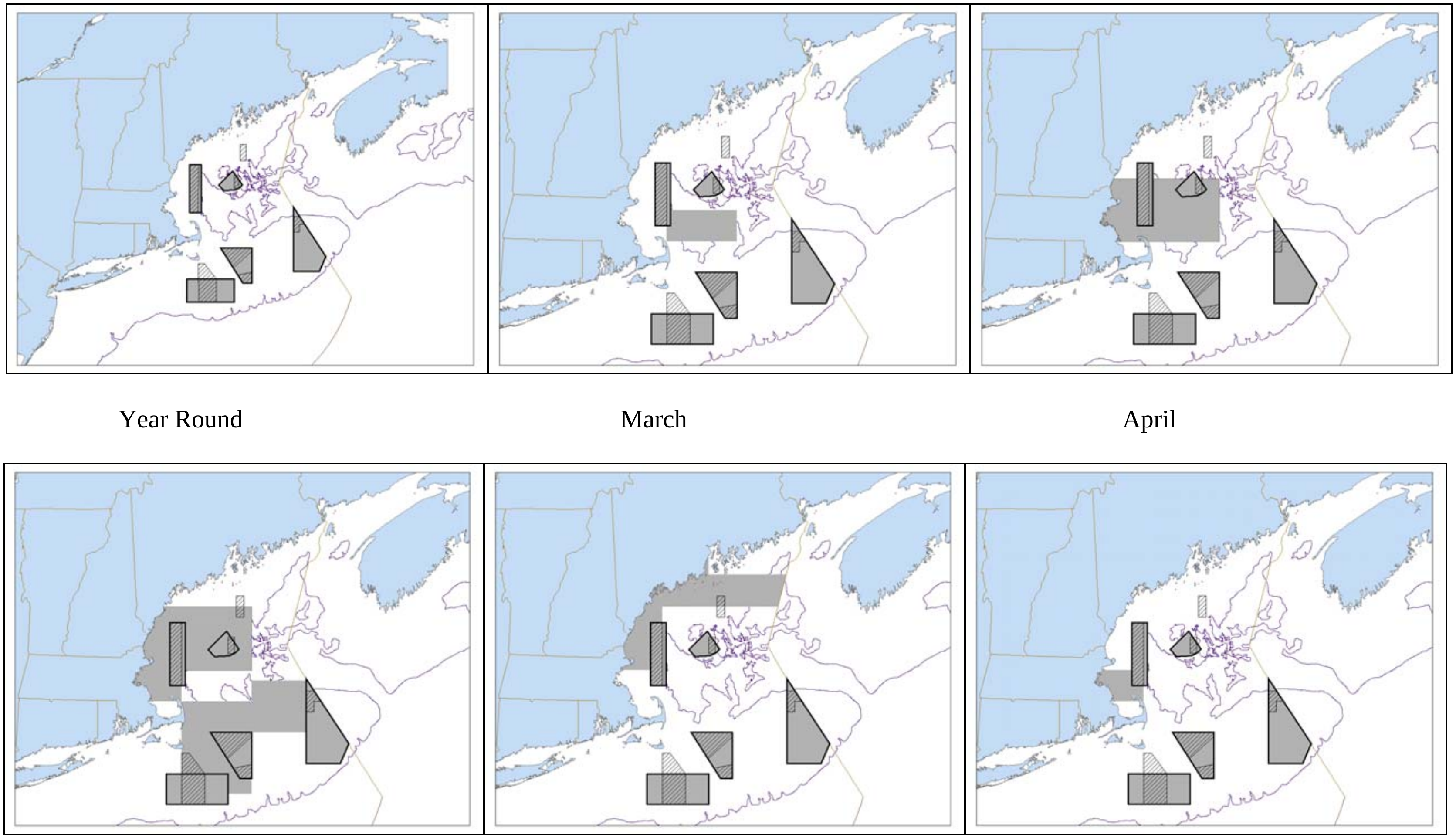
*Longline/tub trawls*

*Handgear*

Table 8 – Gear restrictions under No Action alternative

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

Figure 2 – No action alternative closed areas used as mortality controls



Year Round　March　April

May　June　October/November

Closed Areas:

Amendment 16 did not authorize additional closed areas. However, closures in place prior to its adoption remain in effect (Figure 2).

In-Season Adjustments to Mortality Control Measures:

The Regional Administrator has the authority to impose trip limits as necessary under the provisions implementing the U.S./Canada Resource Sharing Understanding. Under those regulations, the Regional Administrator specifies the trip limit for GB yellowtail flounder. In all cases, only one landing limit can be landed in any twenty-four hour period. If a vessel fishes in more than one area, the most restrictive trip limit for a species applies for the entire trip.

The RA does not have the authority to modify effort control measures in other areas absent Council action. The only exception lies in the administration of accountability measures including post-season differential DAS adjustments for FY 2010 and 2011 and the hard TAC AM in FY 2012.

### 4.2.2 Option Two – Modification of Trip Limits

The trip limit for GOM cod at the beginning of FY 2010 would be 800 lbs. per DAS and 4,000 lbs. per trip. The initial trip limit for GOM pollock would be 1,000 lbs. per DAS, up to 10,000 lbs. per trip. For cod, Handgear A permits will have a trip limit of 300 lbs., while Handgear B permits will be limited to 75 lbs. per DAS. For scallop fishery boats only, there will be no trip limit for yellowtail flounder. Groundfish vessels will still have yellowtail flounder trip limits as implemented in Amendment 16. Also, scallop boats will be required to land all legal-sized yellowtail flounder that is caught. If Option 4 of this section is also adopted, these numbers will apply at the start of the fishing year and may be changed by the RA during the year.

Rationale: The sub-ACL for the common pool is projected to be low in FY 2010 based upon current sector membership. If it is likely that the ACL may be rapidly exceeded, a derby fishery is likely to occur. Trip limits will be set somewhat conservatively at the start of the season in order to account for uncertainty over sector membership and common pool fishing practices. The trip limits for these stocks are set at the same level as in FY 2009 to ease the transition to the new management measures and so that discards are not increased from existing levels.

### 4.2.3 Option Three – Modification to Days At Sea Counting

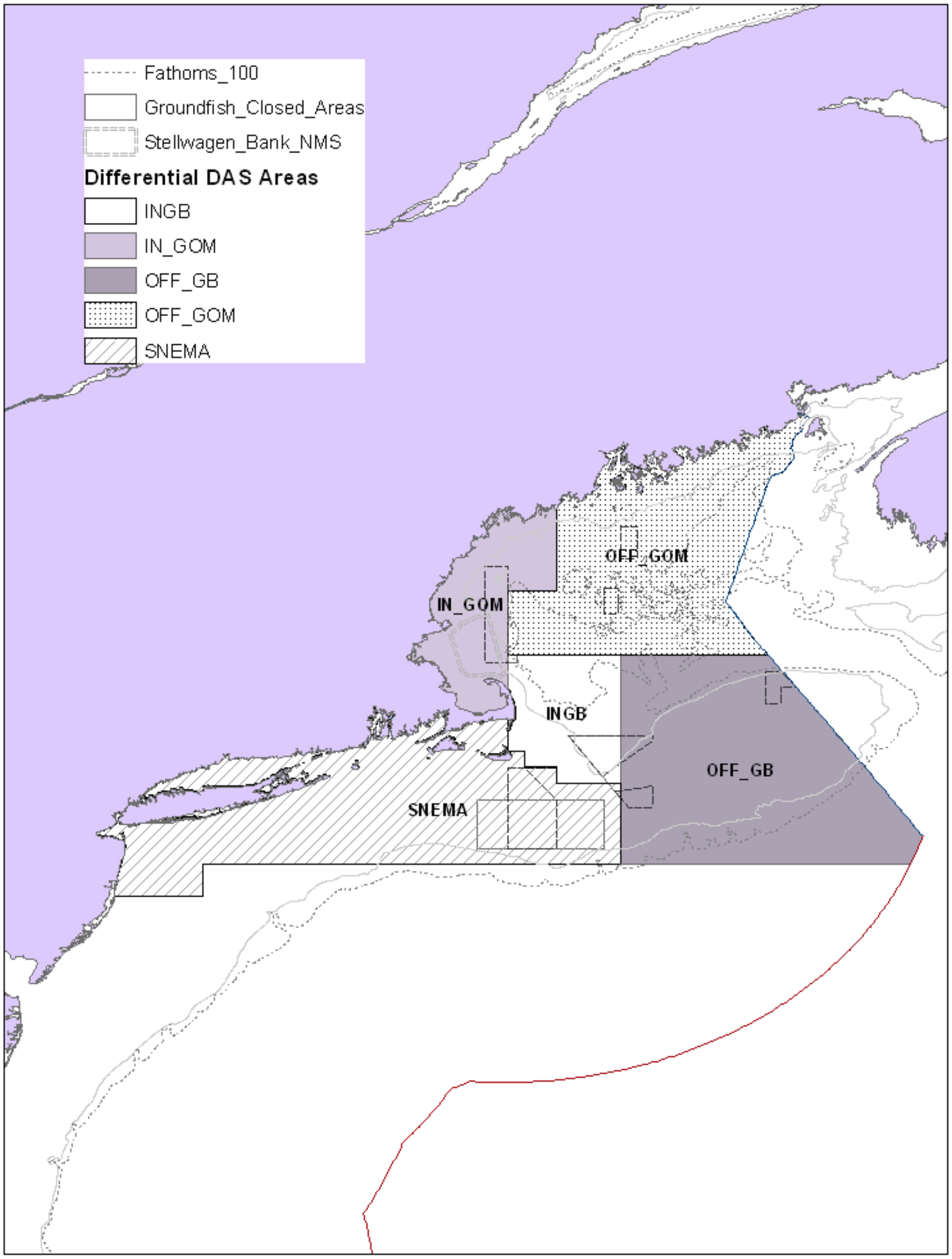
The inshore Gulf of Maine area depicted in Figure 3 will be subject to differential DAS counting at a rate of 2:1 at the outset of FY 2010. The area to be included consists of Blocks 114-116, 123-125, 132, 133, and 138-140. The area described for the inshore GOM is the same as is adopted for the Amendment 16 differential DAS accountability measure, as shown in Figure 3. If Option 4 of this section is also adopted, these counting rates will apply at the start of the fishing year and may be changed by the RA during the year.

Inshore GOM Differential DAS Area

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

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

Figure 3 – Proposed areas for differential DAS AM




Rationale: The use of a differential DAS adjustment as a mortality reduction measure is based on the concept that if stock size is known a change in catch results in a proportional change in exploitation. The area proposed coincides with a broad reporting area, simplifying administration and matching the differential DAS area with stock boundaries. Concern over rapidly exceeding the common pool sub-ACL for GOM cod and pollock stocks would lead to the differential DAS area being set somewhat conservatively at the start of the season in order to account for uncertainty over sector membership and common pool fishing practices.

### 4.2.4 Option Four – Effort Control Measure Adjustments

The Regional Administrator has the authority and responsibility to monitor the catch of multispecies stocks in relationship to the ACLs and is authorized to modify the effort control measures for common pool vessels as appropriate consistent with procedures established by the Administrative Procedures Act (APA). Effort control measures that may be modified in this manner include possession limits and DAS counting rates. Measures can be adjusted at any time during the fishing year to facilitate harvesting ACLs or to reduce the likelihood that ACLs of allocated multispecies stocks in all areas will be exceeded.

If time permits, the Council may provide advice to the Regional Administrator on the administration of this provision.

Rationale: Under existing regulations, adjustments cannot be made to the measures for the common pool except in the event that an ACL is projected to be reached under the hard TAC accountability measure (beginning in FY 2012). The RA is provided authority and guidance to adjust effort control measures to distribute fishing activity throughout the year and so that yield is not sacrificed. This action allows the Regional Administrator to adjust measures as necessary, and provides more flexibility to change measures at any time if necessary to harvest the ACL or to avoid exceeding the ACL.

# 5.0 ALTERNATIVES TO THE PROPOSED ACTION

(To be completed in final document)

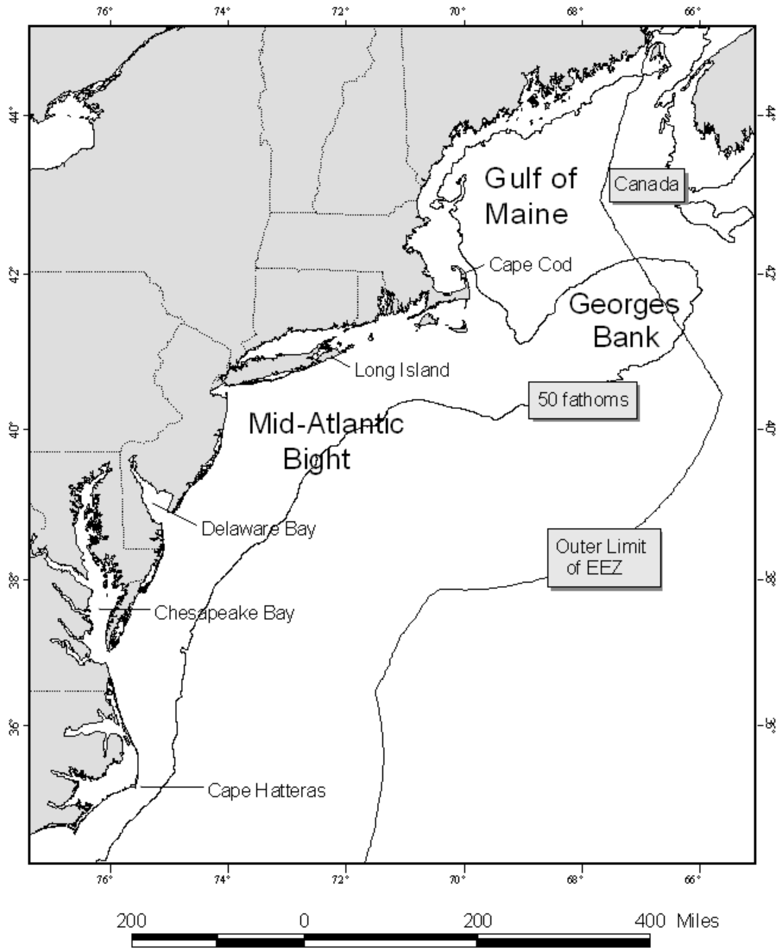
# 6.0 AFFECTED HUMAN ENVIRONMENT

The Valued Ecosystem Components (VECs) affected by the Proposed Action include the physical environment, Essential Fish Habitat (EFH), target species, non-target species/bycatch, protected resources, and human communities, which are described below.

## *6.1 Physical Environment/Habitat/EFH*

The Northeast U.S. Shelf Ecosystem (Figure 4) has been described as including the area from the Gulf of Maine south to Cape Hatteras, North Carolina, extending from the coast seaward to the edge of the continental shelf, including offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 meters (m). Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic region, and the continental slope. Since the groundfish fleet will primarily be fishing in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic areas, the description of the physical and biological environment is focused on these sub-regions. Information on the affected environment was extracted from Stevenson et al. (2004).

Figure 4 – Northeast U.S. Shelf Ecosystem

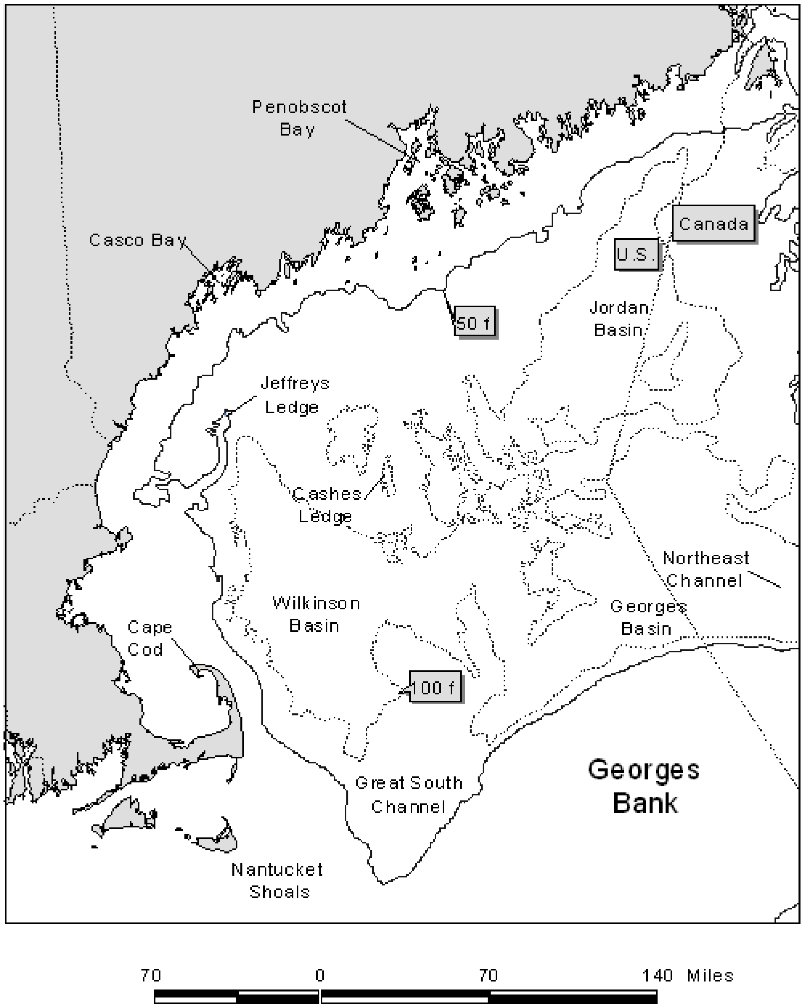



## 6.1.1 Affected Physical Environment

### 6.1.1.1 Gulf of Maine

The Gulf of Maine is an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 5). The Gulf of Maine is a boreal environment and is characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface.

Figure 5 – Gulf of Maine




The Gulf of Maine is an enclosed coastal sea that was glacially derived and is characterized by a system of deep basins, moraines, and rocky protrusions (Stevenson et al. 2004). The Gulf of Maine is topographically diverse from the rest of the continental border of the U.S. Atlantic coast (Stevenson et al. 2004). Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[1] sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a depth of about 60 m. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 20 to 40 m, except off eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Sandy

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

areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

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

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

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

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

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

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

Cold deep water, muddy bottom: fauna include species with wide temperature tolerances which are sparsely distributed, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present;

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

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

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

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

Intermediate/Combination of Deepwater Gulf of Maine-Georges Bank and Gulf of Maine-Georges Bank Transition: silver hake, red hake, goosefish (monkfish);

Shallow/Gulf of Maine-Georges Bank Transition Zone: Atlantic Cod, haddock, pollock;

Shallow water Georges Bank-southern New England: yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin;

---

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

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

Deepwater Gulf of Maine-Georges Bank: white hake, American plaice, witch flounder, thorny skate; and

Northeast Peak/Gulf of Maine-Georges Bank Transition: Atlantic cod, haddock, pollock.

#### 6.1.1.2 Georges Bank

Georges Bank is a shallow (3 to 150 m depth), elongate (161 kilometer [km] wide by 322 km long) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Figure 4.1-1). It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank and has steep submarine canyons on its eastern and southeastern edges. It is characterized by highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents reduces the amount of sand and cause an overall coarsening of the bottom sediments (Valentine and Lough 1991).

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

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

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

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

The Northeast Peak assemblage is found in variable depth and current strength and includes coarse sediments, consisting mainly of gravel and coarse sand with interspersed boulders, cobbles, and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittle stars, crustaceans, and polychaetes), with a characteristic absence of burrowing forms.

The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths less than 100 m. Medium-grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large with burrowing or motile habits. Sand dollars are most characteristic of this assemblage.

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

As stated in Section 4.1.1.1, common demersal fish species in Georges Bank are offshore hake, blackbelly rosefish, Gulf stream flounder, silver hake, red hake, goosefish (monkfish), Atlantic cod, haddock, pollock, yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin, white hake, American plaice, witch flounder, and thorny skate.

#### 6.1.1.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 4.1-1). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England and generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 to 200 m water depth) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson et al. 2004). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations during past ice ages. Since that time, currents and waves have modified this basic structure.

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

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

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

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

The "silty sand fauna" zone is dominated by amphipods and polychaetes and occurs immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material.

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

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

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

Warm temperate portions: black sea bass, summer flounder, butterfish, scup, spotted hake, and northern searobin;

Water of the inner shelf: windowpane flounder;

Water of the outer shelf: fourspot flounder; and

Water of the continental slope: shortnose greeneye, offshore hake, blackbelly rosefish, and white hake.

### 6.1.2 Habitat

Habitats provide living things with the basic life requirements of nourishment and shelter, ultimately providing for both individual and population growth. The fishery resources of a region are influenced by the quantity and quality of available habitat. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat which, in turn, determine the type and level of resource population that the habitat supports. Table 9 briefly summarizes the habitat requirements for each of the 12 groundfish species managed by the Northeast Multispecies (large-mesh) FMP, some of which consist of multiple stocks within the Northeast Multispecies FMP. Information for this table was extracted from the original FMP and profiles available from NMFS (Clark 1998). Essential fish habitat information for egg, juvenile and adult life stages for these species was

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

compiled from Stevenson et al. 2004 (Table 9). Note that EFH for the egg stage was included for species that have a demersal egg stage (winter flounder and ocean pout); all other species' eggs are found either in the surface waters, throughout the water column, or are retained inside the parent until larvae hatch. The egg habitats of these species are therefore not generally subject to interaction with gear and are not listed in Table 9.

Table 9 – Summary of geographic distribution, food sources, essential fish habitat features, and commercial gear used to catch each species in the Northeast Multispecies Fishery Management Unit

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

| Species | Geographic | Food Source | Essential Fish Habitat | Commercial |
|---|---|---|---|---|

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

Region of the Northwest Atlantic
Fishing Gear Used

| Species | Geographic Region of the Northwest Atlantic | Food Source | Essential Fish Habitat: Water Depth | Essential Fish Habitat: Substrate | Commercial Fishing Gear Used |
|---|---|---|---|---|---|
| Yellowtail flounder | Gulf of Maine, southern New England, Georges Bank | Amphipods and polychaetes | (J): 20-50 m (66-164 ft) | (J): Bottom habitats with substrate of sand or sand and mud | Otter trawl |
| | | | (A): 20-50 m (66-164 ft) | (A): Same as for (J) | |

| | | | Essential Fish Habitat | | |
|---|---|---|---|---|---|
| American plaice | Gulf of Maine, Georges Bank | Polychaetes, crustaceans, mollusks, echinoderms | (J): 45-150 m (148-492 ft) | (J): Bottom habitats with fine grained sediments or a substrate of sand or gravel | Otter trawl |
| | | | (A): 45–175 m (148-574 ft) | (A): Same as for (J) | |
| Witch flounder | Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England | Mostly polychaetes (worms), echinoderms | (J): 50-450 m (164-1,476 ft) | (J): Bottom habitats with fine grained substrate | Otter trawl |
| | | | (A): 25-300 m (82-984 ft) | (A): Same as for (J) | |
| Winter flounder | Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England | Polychaetes, crustaceans | (E): <5 m (16 ft) | (E): Bottom habitats with a substrate of sand, muddy sand, mud, and gravel | Otter trawl, gillnets |
| | | | (J): 0.1-10 m (0.3-32 ft) (1-50 m age 1+) (3.2-164 ft) | (J): Bottom habitats with a substrate of mud or fine grained sand | |
| | | | (A): 1-100 m (3.2-328 ft) | (A): Bottom habitats including estuaries with substrates of mud, sand, gravel | |

| Species | Geographic Region of the Northwest Atlantic | Food Source | Essential Fish Habitat: Water Depth | Essential Fish Habitat: Substrate | Commercial Fishing Gear Used |
|---|---|---|---|---|---|
| Atlantic wolffish<br>Proposed in Amendment 16 | Gulf of Maine & Georges Bank | Mollusks, brittle stars, crabs, and sea urchins | (J): 40-240 m (131.2-787.4 ft) | J): Rocky bottom and coarse sediments | Otter trawl, longlines, and gillnets |
| | | | (A): 40-240 m (131.2-787.4 ft) | (A): Same as for (J) | |
| Windowpane flounder | Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England | Juveniles mostly crustaceans; adults feed on crustaceans and fish | (J): 1-100 m (3.2-328 ft) | (J): Bottom habitats with substrate of mud or fine grained sand | Otter trawl |

| | Essential Fish Habitat | |
|---|---|---|
| - | (A): 1-75 m (3.2-574 ft) | (A): Same as for (J) |

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

### 6.1.3 Essential Fish Habitat (EFH)

EFH is defined by the Sustainable Fisheries Act of 1996 as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The environment that could potentially be affected by the Proposed Action has been identified as EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; Atlantic sea scallop; monkfish; deep-sea red crab; northeast skate complex; Atlantic herring; summer flounder, scup, and black sea bass; tilefish; squid, Atlantic mackerel, and butterfish; Atlantic surfclam and ocean quahog FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs are summarized in Table 9. Full descriptions and maps of EFH for each species and life stage (except Atlantic wolffish) are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.htm. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna.

### 6.1.4 Gear Types and Interaction with Habitat

The groundfish fleet fishes for target species with a number of gear types: trawl, gillnet, and hook and line gear (including jigs, handline, and non-automated demersal longlines). This section discusses the characteristics of each of the gear types as well as the typical impacts to the physical habitat associated with each of these gear types.

#### 6.1.4.1 Gear Types

The characteristics of typical gear types used by the multispecies fishery are summarized in Table 10.

Table 10 - Descriptions of the Fixed Gear Types Used by the Multispecies Fishery

| Gear Type | Trawl | Sink/ Anchor Gillnets | Bottom Longlines | Hook and Line |
|---|---|---|---|---|
| Total Length | Varies | 90 m long per net. | ~450 m. | Varies |
| Lines | N/A | Leadline and floatline with webbing (mesh) connecting | Mainline is parachute cord. Gangions (lines from mainline to hooks) are 15 inches long, 3 to 6 inches apart, and made of shrimp twine | One to several with mechanical line fishing |
| Nets | Rope or large-mesh size, depends upon target | Monofilament, mesh size depends on the target species (groundfish nets | No nets, but 12/0 circle hooks are required. | No nets, but single to multiple hooks, "umbrella rigs" |

| | | | | |
|---|---|---|---|---|
| | Species | minimum mesh size of 6.5 inches | | |
| Anchoring | N/A | 22 lb (9–11 kg) Danforth-style anchors are required at each end of the net string | 20-24lb (9-11kg) anchors, anchored at each end, using pieces of railroad track, sash weights, or Danforth anchors, depending on currents | No anchoring, but sinkers used (stones, lead) |
| Frequency/ Duration of Use | Tows last for several hours | Frequency of trending changes from daily (when targeting groundfish) to semi-weekly (when targeting monkfish and skate) | Usually set for a few hours at a time | Depends upon cast/target species |

### 6.1.4.2 Trawl Gear

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

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

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

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

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

### 6.1.4.3 Gillnet Gear

The fishery also uses individual sink/anchor gillnets which are about 90 m long and are usually fished as a series of 5 to 15 nets attached end-to-end. A vast majority of “strings” consist of 10 gillnets. Gillnets typically have three components: the leadline, webbing and floatline. In New England, leadlines are approximately 30 kilogram (kg)/net. Webs are monofilament, with the mesh size depending on the species of interest. Nets are anchored at each end using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. For New England groundfish, frequency of tending ranges from daily to semiweekly [Northeast Region Essential Fish Habitat Steering Committee (NREFHSC 2002)]. All SHS gillnet vessels would be day fishing vessels.

A bottom gillnet is a large wall of netting equipped with floats at the top and lead weights along the bottom. Bottom gillnets are anchored or staked in position. Fish are caught while trying to pass through the net mesh. Gillnets are highly selective because the species and sizes of fish caught are dependent on the mesh size of the net. Bottom gillnets are used to catch a wide range of species. Bottom gillnets are fished in two different ways, as "standup" and "tiedown" nets (Williamson 1998). Standup nets are typically used to catch Atlantic cod, haddock, pollock, and hake and are soaked (duration of time the gear is set) for 12 to 24-hours. Tiedown nets are used to catch flounders and monkfish and are left in the water for 3 to 4 days. Other species caught in bottom gillnets in are dogfish and skates.

### 6.1.4.4 Hook and Line Gear

#### 6.1.4.4.1 Hand Lines/Rod and Reel

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

#### 6.1.4.4.2 Mechanized Line Fishing

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

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

#### 6.1.4.5 Longlines

The remaining gear type that is used by the fishery are bottom longlines which are a long length of line, often several miles long, to which short lengths of line ("gangions") carrying baited hooks are attached. Longlining is undertaken for a wide range of bottom species. Bottom longlines typically have up to six individual longlines strung together for a total length of more than 450 m and are deployed with 9 to 11 kg anchors. The mainline is a parachute cord. Gangions are typically 40 centimeters (cm) long and 1 to 1.8 m apart and are made of shrimp twine. These longlines are usually set for a few hours at a time (NREFHSC 2002).

When fishing with hooks, all hooks must be 12/0 circle hooks. A “circle hook” is, defined as a hook with the point turned back towards the shank and the barbed end of the hook is displaced (offset) relative to the parallel plane of the eyed-end or shank of the hook when laid on its side. The design of circle hooks enables them to be employed to reduce the damage to habitat features that would occur with use of other hook shapes (NREFHSC 2002).

#### 6.1.4.6 Gear Interaction with Habitat

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

Amendment 13 (NEFMC 2003) describes the general effects of bottom trawls on benthic marine habitats. The primary source document used for this analysis was an advisory report prepared for the International Council for the Exploration of the Seas (ICES) that identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats (ICES 2000). This report is based on scientific findings summarized in Lindeboom and de Groot (1998), which were peer-reviewed by an ICES working group. The focus of the report is the Irish Sea and North Sea, but it also includes assessments of effects in other areas. Two general conclusions were: 1) low-energy environments are more affected by bottom trawling; and 2) bottom trawling affects the potential for habitat recovery (i.e., after trawling ceases, benthic communities and habitats may not always return to their original pre-impacted state). Regarding direct habitat effects, the report also concluded that:

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

Loss of structure-forming organisms such as bryozoans, tube-dwelling polychaetes, hydroids, seapens, sponges, mussel beds, and oyster beds (changes may be permanent leading to an overall change in habitat diversity, which could in turn lead to the local loss of species and species assemblages dependent on such biogenic features);

Reduction in complexity caused by redistributing and mixing of surface sediments and the degradation of habitat and biogenic features, leading to a decrease in the physical patchiness of the seafloor (changes are not likely to be permanent); and

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

A more recent evaluation of the habitat effects of trawling and dredging was prepared by the Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002). Trawl gear evaluated included bottom otter trawls and beam trawls. This report identified four general conclusions regarding the types of habitat modifications caused by trawls:

Trawling reduces habitat complexity;

Repeated trawling results in discernable changes in benthic communities;

Bottom trawling reduces the productivity of benthic habitats; and

Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

An additional source of information for various gear types that relates specifically to the Northeast region is the report of a "Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern U.S." sponsored by the NEFMC and Mid-Atlantic Fishery Management Council (MAFMC) in October 2001 (NEFSC 2002). A panel of invited fishing industry members and experts in the fields of benthic ecology, fishery ecology, geology, and fishing gear technology convened for the purpose of assisting the NEFMC, MAFMC, and NMFS with: 1) evaluating the existing scientific research on the effects of fishing gear on benthic habitats; 2) determining the degree of impact from various gear types on benthic habitats in the Northeast; 3) specifying the type of evidence that is available to support the conclusions made about the degree of impact; 4) ranking the relative importance of gear impacts on various habitat types; and 5) providing recommendations on measures to minimize those adverse impacts. The panel was provided with a summary of available research studies that summarized information relating to the effects of bottom otter trawls, bottom gillnets, and longlines. Relying on this information plus professional judgment, the panel identified the effects and the degree of impact of these gears on mud, sand, and gravel/rock habitats.

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

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

The contents of a second expert panel report, produced by the Pew Charitable Trusts and entitled "Shifting Gears: Addressing the Collateral Impacts of Fishing Methods in U.S. Waters" (Morgan and Chuenpagdee 2003), was also summarized in Amendment 13. This group evaluated the habitat effects of 10 different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls have relatively high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. As in the International Council for Exploration of the Sea (ICES) and National Research Council (NRC) reports, individual types of trawls and dredges were not evaluated. The impacts of bottom gillnets, traps, and longlines were limited to warm or shallow water environments with rooted aquatic vegetation or "live bottom" environments (e.g., coral reefs).

## *6.2 ALLOCATED Target Species*

This section describes the species life history and stock population status for each of the 14 fish stocks that are managed under the Northeast Multispecies FMP, that would be harvested by the groundfish fishery as allocated target species under provisions of the FMP. The description of species habitat associations described in Section 6.1.2 provides context for considering the interactions between gear and species. A comparison of depth-related demersal fish assemblages of Georges Bank and the Gulf of Maine is also provided for additional context. The discussion of allocated target species is concluded with an analysis of the interaction between the gear types the fishery will use (as described in Section 6.1.4) and allocated species. Most of the following discussions have been adapted largely from the GARM III report (NEFSC 2008) and can be accessed via the NEFMC website at http://www.nefmc.org.

### 6.2.1 Species and Stock Status Descriptions

The allocated target stocks for the fishery are:

Gulf of Maine (GOM) Cod

Georges Bank (GB) Cod

GOM Haddock

GB Haddock

Redfish

Pollock

White Hake

Cape Cod/GOM Yellowtail Flounder

GB Yellowtail Flounder

SNE/MA Yellowtail Flounder

GOM Winter Flounder

GB Winter Flounder

Witch Flounder

American Plaice

The non-allocated bycatch species potentially affected by the Proposed Action are:

Spiny Dogfish

Skates

Monkfish

Spiny dogfish, skates, and monkfish may abe affected by the Proposed Action and are considered in this EA as non-allocated bycatch in Section 6.3. These species are not allocated under the Northeast Multispecies FMP and are managed under their respective FMPs.

Atlantic halibut, ocean pout, windowpane flounder, and SNE/Mid-Atlantic winter flounder do not have sector allocations but are also managed under the Northeast Multispecies FMP. Sector and Common Pool vessels are permitted to retain 1 halibut per trip. Wolffish has been provisionally added to the list of stocks not allocated under the Northeast Multispecies FMP. These species stocks are addressed in Amendment 16 to the Northeast Multispecies FMP (NEFMC 2009a), and are not considered further within this EA.

#### 6.2.1.1 Gulf of Maine Cod

**Life History:** The Atlantic cod, *Gadus morhua*, is a demersal gadoid species found on both sides of the North Atlantic. In the Northwest, Atlantic cod occur from Greenland to North Carolina. In U.S. waters, cod are assessed and managed as two stocks: Gulf of Maine and Georges Bank. GOM cod attain sexual maturity at a later age than GB cod, which is related to differences in growth rates between the two stocks. The greatest concentrations of cod off the Northeast coast of the U.S. are on rough bottoms in waters between 10 and 150 m and at temperatures between 0 and 10°C. Spawning occurs near bottom during winter and early spring, usually in water temperatures between 5 and 7°C. Eggs are pelagic, buoyant, spherical, and transparent, and drift for 2 to 3 weeks before hatching. The larvae are also pelagic until reaching 4 to 6 cm in about 3 months, at which point descending to the seafloor. Most remain on the bottom after this descent, and there is no evidence of a subsequent diel, vertical migration. Adults tend to move in schools, usually near the bottom, but also occurring in the water column. Spawning occurs year-round, with a peak in winter and spring. Peak spawning is related to environmental conditions. It is delayed until spring when winters are severe and peaks in winter when mild.

**Population Status:** The inshore GOM stock appears to be relatively distinct from the offshore cod stocks on the banks of the Scotian Shelf and Georges Bank based on tagging studies. GOM cod spawning stock biomass has increased since the late 1990s from 11,100 mt in 1997 to 34,000 mt in 2007, but the stock remains low relative to historic levels. The stock is not overfished, but overfishing is occurring.

#### 6.2.1.2 Georges Bank Cod

**Life History:** The GB cod stock is the most southerly cod stock in the world. The greatest concentrations off the northeast coast of the U.S. are on rough bottoms in waters between 10 and 150 m and at temperatures between 0 and 10°C. Spawning occurs near bottom during winter and early spring, usually in water temperatures between 5 and 7°C. Eggs are pelagic, buoyant, spherical, and transparent and drift for 2 to 3 weeks before hatching. The larvae are also pelagic until reaching 4 to 6 cm in about 3 months, at which point descending to the bottom. Most remain on the bottom after this descent, and there is no evidence of a subsequent diel, vertical migration. Adults tend to move in schools, usually near the bottom, also occurring in the water column. Spawning occurs year-round, with a peak in winter and spring. Peak spawning is related to environmental conditions. It is delayed until spring when winters are severe and peaks in winter when mild.

**Population Status:** GB Atlantic cod is a transboundary stock that is harvested by both the U.S. and Canadian fishing fleets. The GB Atlantic cod stock is overfished and overfishing is occurring.

#### 6.2.1.3 Gulf of Maine Haddock

**Life History:** The GOM haddock, *Melanogrammus aeglefinus*, is a commercially-exploited groundfish found in the northwest and northeast Atlantic Ocean. This demersal gadoid species is distributed from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland in the northwest Atlantic, where a total of six distinct haddock stocks have been identified. Two of these haddock stocks are found in U.S. waters associated with Georges Bank and Gulf of Maine.

Haddock spawn over various substrates including rocks, gravel, smooth sand, and mud. Eggs are broadcast and fertilized near the bottom. Fertilized eggs are buoyant and remain in the water column where subsequent development occurs. Larvae metamorphose into juveniles in roughly 30 to 42 days at lengths of 2 to 3 cm. Small juveniles initially live and feed in the epipelagic zone. Juveniles remain in the upper part of the water column for 3 to 5 months. Juveniles visit the ocean bottom in search of food. Once suitable bottom habitat is located, juveniles settle into a demersal existence. Haddock do not make extensive seasonal migrations. In winter, haddock prefer deeper waters and tend to move shoreward in summer. Haddock are highly fecund broadcast spawners. Eggs are released near the ocean bottom in batches and fertilized by a courting male. After fertilization, haddock eggs become buoyant and rise to the surface water layer. In the Gulf of Maine, spawning occurs from early February to May, usually peaking in February to April. In the Gulf of Maine, Jeffreys Ledge and Stellwagen Bank are the two primary spawning sites.

**Population Status:** Based on the current assessment, the GOM haddock stock is not overfished and overfishing is not occurring.

#### 6.2.1.4 Georges Bank Haddock

**Life History:** The general life history of GB haddock is comparable to the GOM haddock as described above. On Georges Bank, spawning occurs from January to June, usually peaking from February to early-April. Georges Bank is the principal haddock spawning area in the northeast U.S. continental shelf ecosystem. GB haddock spawning is concentrated on the northeast peak of Georges Bank.

Median age and size of maturity differ slightly between the GB and GOM haddock stocks. GARM III found that the Gulf of Maine fishery does not target haddock and is directed mostly at flatfish for which the fleet uses large square (6.5 in) mesh gear, which leads to reduced selectivity on haddock. The Gulf of Maine haddock have lower weights at age than the Georges Bank stock and the age at 50 percent maturity was also lower for Gulf of Maine as compared to Georges Bank haddock.

**Population Status:** The GB haddock stock is a transboundary resource, which is co-managed with Canada. Substantial declines have recently occurred in the weights at age due to slower than average growth, particularly of the 2003 year-class. This is affecting productivity in the short-term. The growth of subsequent year-classes is returning to the earlier rates. The stock is not overfished and overfishing is not occurring.

#### 6.2.1.5 Redfish

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

The redfish is a slow growing, long-lived, ovoviviparous species with an extremely low natural mortality rate. Redfish eggs are fertilized internally, develop into larvae within the oviduct, and are released near the end of the yolk sac phase. The release of larvae lasts for 3 to 4 months with a peak in late May to early June. Newly spawned larvae occur in the upper 10 m of the water column; at 10 to 25 millimeters (mm). The post-larvae descend below the thermocline when about 25 mm in length. Young-of-the-year are pelagic until reaching 40 to 50 mm at 4 to 5 months old, at which point moving to the bottom, typically by early fall of their first year. Redfish of 22 cm or greater are considered adults. As a general rule, the size of landed redfish is positively correlated with depth. The reason for this may involve differential growth rates of stocks, confused species identification (deepwater redfish are a larger species), size-specific migration, gender-specific migration (females are larger), or a combination of these factors. Redfish make diurnal vertical migrations linked to their primary euphausiid prey. Nothing is known about redfish breeding behavior, but fertilization is internal and fecundity is relatively low.

**Population Status:** The redfish stock is not overfished and overfishing is not occurring.

#### 6.2.1.6 Pollock

**Life History:** Pollock, *Pollachius virens*, occur on both sides of the North Atlantic. In the western North Atlantic, the species is most abundant on the western Scotian Shelf and in the Gulf of Maine. There is considerable movement of the species between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Pollock eggs are buoyant, rising into the water column after fertilization. The pelagic larval stage lasts for 3 to 4 months, at which time the small juveniles or “harbor pollock” migrate inshore to inhabit rocky subtidal and intertidal zones. Pollock then undergo a series of inshore-offshore movements linked to temperature until near the end of their second year. At this point, the juveniles move offshore where the pollock remain throughout the adult stage. Pollock are a schooling species and are found throughout the water column. With the exception of short migrations due to temperature changes and north-south movements for spawning, pollock are fairly stationary in the Gulf of Maine and along the Nova Scotian coast. Male pollock reach sexual maturity at a larger size and older age than females. Age and size at maturity of pollock have declined in recent years, a trend that has also been reported in other marine fish species (e.g., haddock, witch flounder). The principal pollock spawning sites in the western North Atlantic are in the western Gulf of Maine, Great South Channel, Georges Bank, and on the Scotian Shelf. Spawning takes place from September to April. Spawning time is more variable in northern sites than in southern sites. Spawning occurs over hard, stony, or rocky bottom. Spawning activity begins when the water column cools to near 8$^{o}$C, and peaks when temperatures are approximately 4.5 to 6$^{o}$C. Thus, most spawning occurs within a comparatively narrow range of temperatures.

**Population Status:** The stock is overfished and overfishing is occurring.

#### 6.2.1.7 White Hake

**Life History:** The white hake, *Urophycis tenuis*, occurs from Newfoundland to southern New England and is common on muddy bottom throughout the Gulf of Maine. The depth distribution of white hake varies by age and season; juveniles typically occupy shallower areas than adults, but individuals of all ages tend to move inshore or shoalward in summer, dispersing to deeper areas in winter. Larval distributions indicate the presence of two spawning groups in the Gulf of Maine, Georges Bank, and Scotian Shelf region, one which spawns in deep water on the continental slope in late winter and early spring, and a second that spawns on the Scotian Shelf in the summer. The eggs, larvae, and early juveniles are pelagic; older juveniles and adults are demersal. The eggs are buoyant. Pelagic juveniles become demersal at 50 to 60 mm total length. The pelagic juvenile stage lasts about two months. White hake attain a maximum length of 135 cm and weigh up to 22 kg; females are larger than males. The northern spawning group of white hake spawns in late summer (August-September) in the southern Gulf of St. Lawrence and on the Scotian Shelf. The timing and extent of spawning in the Georges Bank - Middle Atlantic spawning group has not been clearly determined.

**Population Status:** The stock is overfished and overfishing is occurring.

#### 6.2.1.8 Cape Cod/Gulf of Maine Yellowtail Flounder

**Life History:** The yellowtail flounder, *Limanda ferruginea*, is a demersal flatfish distributed from Labrador to Chesapeake Bay generally at depths between 40 and 70 m. Off the U.S. coast, three stocks are considered for management purposes including Cape Cod/GOM, GB, and SNE/MA stocks. In the northwest Atlantic, spawning occurs from March through August at temperatures of 5 to 12°C. Yellowtail flounder spawn buoyant, spherical, pelagic eggs that lack an oil globule. Pelagic larvae are brief residents in the water column; transformation to the juvenile stage occurs at 11.6 to 16 mm standard length. There are high concentrations of adults around Cape Cod in both spring and autumn. The median age at maturity for females is 2.6 years off Cape Cod. Spawning takes place along continental shelf waters northwest of Cape Cod.

**Population Status:** The Cape Cod/GOM yellowtail flounder stock continues to be overfished and overfishing is continuing. However, fishing mortality has been declining since 2004 and is currently at the lowest level observed in the time series. Spawning stock biomass has increased the past few years.

#### 6.2.1.9 Georges Bank Yellowtail Flounder

**Life History:** The general life history of the GB yellowtail flounder is comparable to the Cape Cod/GOM yellowtail described above. The median age at maturity for females is 1.8 years on Georges Bank. Spawning takes place along continental shelf waters of Georges Bank.

**Population Status:** GB yellowtail flounder continues to be overfished overfishing is continuing.

#### 6.2.1.10 Southern New England/Mid-Atlantic Yellowtail Flounder

**Life History:** The general life history of the SNE/MA yellow tail flounder is comparable to the Cape Cod/GOM yellowtail described above. The median age at maturity for females is 1.6 years off southern New England.

**Population Status:** The SNE/MA yellowtail flounder continues to be overfished and overfishing is still occurring. However, fishing mortality has been declining since 2005 and it is at lowest levels observed in the time series.

#### 6.2.1.11 Gulf of Maine Winter Flounder

**Life History:** The winter flounder, *Psuedopleuronectes americanus*, is a demersal flatfish distributed in the northwest Atlantic from Labrador to Georgia. Important U.S. commercial and recreational fisheries exist from the Gulf of Maine to the Mid-Atlantic Bight. In U.S. waters, the resource is assessed and managed as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Adult

GOM winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring. After spawning, adults typically leave inshore areas when water temperatures exceed 15$^{o}$C although some remain inshore year-round. The eggs of winter flounder are demersal, adhesive, and stick together in clusters. Larvae are initially planktonic but become increasingly bottom-oriented as metamorphosis approaches. Metamorphosis, when the left eye migrates to the right side of the body and the larvae become "flounder-like," begins around 5 to 6 weeks after hatching, and is completed by the time the larvae are 8 to 9 mm in length at about 8 weeks after hatching. Off southern New England, newly metamorphosed young-of-the-year winter flounder take up residence in shallow water where individuals may grow to about 100 mm within the first year. Winter flounder spawn from winter through spring, with peak spawning occurring during February and March in Massachusetts Bay and south of Cape Cod, and somewhat later along the coast of Maine, continuing into May.

**Population Status:** The GOM winter flounder stock is the smallest of the three winter flounder stocks. The GOM winter flounder stock is likely in an overfished condition and overfishing is probably occurring. There is high uncertainty on the status determination. This is consistent with biomass trends in the other flatfish stocks.

#### 6.2.1.12 Georges Bank Winter Flounder

**Life History:** The life history of the GB winter flounder is comparable to the GOM winter flounder as described above.

**Population Status:** The stock is likely in an overfished condition and overfishing is probably occurring.

#### 6.2.1.13 Witch Flounder

**Life History:** The witch flounder, *Glyptocephalus cynoglossus*, is a demersal flatfish distributed on both sides of the North Atlantic. In the western North Atlantic, the species ranges from Labrador southward, and is closely associated with mud or sand-mud bottom. In U.S. waters, witch flounder are common throughout the Gulf of Maine, in deeper areas on and adjacent to Georges Bank., and along the shelf edge as far south as Cape Hatteras, North Carolina. Witch flounder are assessed as a unit stock. Spawning occurs at or near the bottom; however the buoyant eggs rise into the water column where subsequent egg and larval development occurs. The pelagic stage of witch flounder is the longest among the species of the family Pleuronectidae. Descent to the bottom occurs when metamorphosis is complete, at 4 to 12 months of age. There has been a decrease in both the age and size of sexual maturity in recent years. Witch flounder spawn from March to November, with peak spawning occurring in summer. The general trend is for spawning to occur progressively later from south to north. In the Gulf of Maine-Georges Bank region, spawning occurs from April to November, and peaks from May to August. Spawning occurs in dense aggregations that are associated with areas of cold water. Witch flounder spawn at 0 to10$^{o}$C.

**Population Status:** Witch flounder is overfished and overfishing is occurring.

#### 6.2.1.14 American Plaice

**Life History:** The American plaice, *Hippoglossoides platessoides*, is an arctic-boreal to temperate-marine pleuronectid (righteye) flounder that inhabits both sides of the North Atlantic on the continental shelves of northeastern North America and northern Europe. Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine-Georges Bank region. American plaice spawn buoyant eggs, which lack oil globules. Transformation of the larvae and migration of the left eye begins when the larvae are approximately 20 mm. Dramatic physiological transformations occur during the juvenile stage.

The body shape continues to change, flattening and increasing in depth from side to side. As the migration of the left eye across the top of the head to the right side reaches completion, descent towards the seafloor begins. American plaice have been categorized as batch spawners. Eggs are released in batches every few days over the spawning period. Adults spawn and fertilize their eggs at or near the bottom. Eggs drift into the upper water column after released. Eggs float and hatch at the surface and the amount of time between fertilization and hatching varies with water temperature. A large amount of time could pass before young fish finally settle to the bottom. In U.S. and Canadian waters, American plaice is regarded as a sedentary species migrating only for spawning and feeding.

**Population Status:** In the Gulf of Maine and Georges Bank area, the American plaice stock is not overfished and overfishing is not occurring.

### 6.2.2 Assemblages of Fish Species

Georges Bank and the Gulf of Maine have been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel (1992) identified six assemblages, which are compared with the results of Overholtz and Tyler (1985) in Table 11 (adapted from Amendment 16). For the Affected Area, including southern New England, these assemblages and relationships are considered to be relatively consistent for purposes of general description. The assemblages include allocated target, non-allocated target, and bycatch species. As presented in Table 11, the terminology and definitions of habitat types varies slightly between the two studies. For further information on fish habitat relationships, see Table 9.

Table 11 – Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine

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

### 6.2.3 Stock Status Trends

Of the 19 groundfish stocks (including all management units of each species) included in the GARM III report (NEFSC 2008), benchmark assessments indicated that six stocks were fished below the fishing mortality rate that would produce maximum sustainable yield ($F_{MSY}$) (or its proxy) in 2007 and 13 were above (Table 12). The $F_{MSY}$ is the fishing mortality rate (F) that produces the maximum sustainable yield (MSY), defined as the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions (National Standards Guidelines 50 CFR 600.310). The most recent information regarding stock assessments is provided by the GARM III Report and can be accessed via the NEFMC website at http://www.nefmc.org. The information in this section is largely adapted from that report. The 19 groundfish stocks include the 14 allocated target stocks managed under the Northeast Multispecies FMP as well as non-allocated target stocks and additional bycatch stocks that may all be impacted to various degrees by groundfish fishing activities.

Table 12 – Status of the Northeast Groundfish Stocks in 2007 (GARM III)

| Stock Status | Stock Status (GARM III) |
|---|---|
| Overfished and Overfishing Biomass < ½ $B_{MSY}$ and F > $F_{MSY}$ | GB Cod<br>GB Yellowtail<br>SNE/MA Yellowtail<br>GOM/Cape Cod Yellowtail<br>SNE/MA Winter Flounder<br>White Hake<br>Pollock<br>Witch Flounder<br>GB Winter Flounder<br>GOM Winter Flounder<br>Northern Windowpane |
| Overfished but not Overfishing Biomass < ½ $B_{MSY}$ and F < $F_{MSY}$ | Ocean Pout<br>Halibut |
| Not Overfished but Overfishing Biomass > ½ $B_{MSY}$ and F > $F_{MSY}$ | GOM Cod<br>Southern Windowpane |
| Not Overfished and not Overfishing Biomass > ½ $B_{MSY}$ and F < $F_{MSY}$ | Redfish<br>Plaice<br>GB Haddock<br>GOM Haddock |

The results of GARM III show stocks of ocean pout and Atlantic halibut are being fished at a sustainable level, but the biomass indicates stocks have not yet been rebuilt and are considered to be overfished. Stocks of haddock, Acadian redfish, and American plaice have been rebuilt, which indicates Amendment 13 and FW 42 management actions have had positive effects on certain groundfish stocks. All other groundfish stocks are still experiencing overfishing, indicating the need for additional management measures.

### 6.2.4 Areas Closed to Fishing within the Groundfish Fishery Area

Select areas are closed to some level of fishing to protect the sustainability of fishery resources. The designation of long-term closures has resulted in the removal or reduction of fishing effort from important fishing grounds, with an expected result that fishery-related mortalities to stocks utilizing the closed areas may have been reduced.

Figure 6 shows the Closed Areas for:

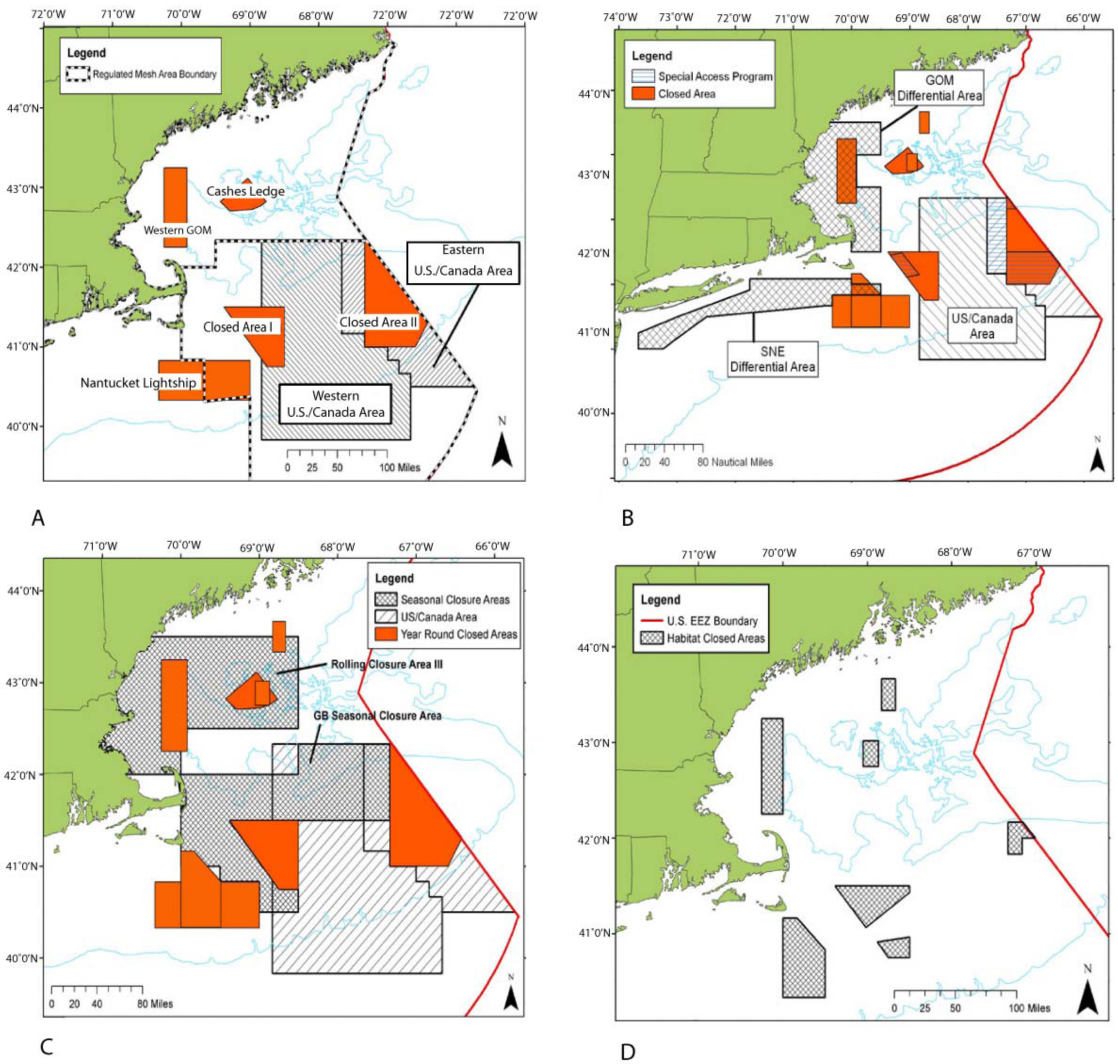
A. Northeast Multispecies Closed Areas and U.S./Canada Management Area;

B. Northeast Multispecies Differential Days-at-Sea Areas, Closed Areas, Special Access Programs, and the U.S./Canada Management Area;

C. Northeast Multispecies May Seasonal Closures Overlaid on Northeast Multispecies Closed Areas and the U.S./Canada area; and

D. Essential Fish Habitat Closure Areas.

Figure 6 - Northeast Multispecies Closed Areas and United States/Canada



## 6.2.5 U.S./Canada Fishery Information

U.S./Canada TACs

The U.S. TACs have varied over time due to primarily the change in the percentage shares allocated to the U.S. under the Sharing Understanding and the stock conditions (fishing mortality and biomass status). The stock conditions exert the dominant influence on the size of the TACs, and it should be noted that in some years, there is relatively high scientific uncertainty regarding stock size (see Transboundary Resource Assessment Committee documents). Despite the change in the weighting formula involving current distribution and historic catch from 60/40 to 85/15 (from 2004 through 2009, respectively), the percentage shares have not varied substantially. The U.S. shares of cod and haddock increased, while the share of yellowtail decreased then increased.

Table 13 – U.S./Canada TACs (mt) and Percentage Share by Year

| Year | TAC Type | Cod | Haddock | Yellowtail Flounder |
|---|---|---|---|---|
| 2009 | Total Shared TAC | 1,700 | 30,000 | 2,100 |
| | U.S. TAC | 527 (31 %) | 11,100 (37 %) | 1,617 (77 %) |
| 85/15 | Canada TAC | 1,173 (69 %) | 18,900 (63 %) | 483 (23 %) |
| 2008 | | | | |
| | Total Shared TAC | 2,300 | 23,000 | 2,500 |
| 80/20 | U.S. TAC | 667 (29 %) | 8,050 (35 %) | ** 1,950 (78 %) |
| | Canada TAC | 1,633 (71 %) | 14,950 (65 %) | 550 (22 %) |
| 2007 | | | | |
| | Total Shared TAC | 1,900 | 19,000 | 1,250 |
| 75/25 | U.S. TAC | 494 (26 %) | 6,270 (33 %) | 900 (72 %) |
| | Canada TAC | 1,406 (74 %) | 12,730 (67 %) | 350 (28 %) |
| 2006 | | | | |
| | Total Shared TAC | 1,700 | 22,000 | 3,000 |
| 70/30 | U.S. TAC | 374 (22 %) | 7,480 (34 %) | 2,070 (69 %) |
| | Canada TAC | 1,326 (78 %) | 14,520 (66 %) | 930 (31 %) |
| 2005 | | | | |
| | Total Shared TAC | 1,000 | 23,000 | 6,000 |
| 65/35 | U.S. TAC | 260 (26 %) | 7,590 (33 %) | 4,260 (71 %) |
| | Canada TAC | 740 (74 %) | 15,410 (67 %) | 1,740 (29 %) |
| 2004 | | | | |
| | Total Shared TAC | 1,300 | 15,000 | 7,900 |
| 60/40 | U.S. TAC | 300 (23 %) | 5,100 (34 %) | 6,000 (76 %) |
| | Canada TAC | 1,000 (77 %) | 9,900 (66 %) | 1,900 (24 %) |

* Weighting formula: x/y resource distribution/utilization
* * Adjusted downward to 1,868.7 mt due to overharvest of 2007 TAC

U.S. Catch from Shared Stocks

The catch of Eastern GB cod, and haddock, and GB yellowtail flounder have varied due the availability of TAC, pertinent regulations, fish availability, market conditions and other factors. For example, particularly notable is the large FY 2004 catch of GB yellowtail flounder that resulted from the large TAC and the opening of the Closed Area II Yellowtail Flounder Special Access Program. Since 2004, the haddock TAC has not been a limiting factor, whereas access to the eastern U.S./Canada Area was limited multiple times by closures as a result of the projected attainment of the yellowtail and cod TACs. In only one instance has one of the TACs been exceeded. In FY 2007, the GB yellowtail TAC was overharvested by 9 percent as a result of late reporting, and relatively slow accounting of yellowtail catch by the scallop fleet (from outside scallop access areas). Since that time, NMFS modified its monitoring to improve the timelines of such data. The methodology of estimating catch and discards is described in detail in an unpublished paper (Caless, Wilhelm and Wang, 2005), as well as in NMFS's annual summary memoranda. Note, for cod and haddock, for trips that fished both inside and outside of the Eastern U.S./Canada Area, in-season monitoring attributed all fish caught on such trips towards the TAC. Because such trips include fish caught both inside and outside of the Eastern U.S./Canada Area, for 2006, the final catch numbers were adjusted downward to reflect only fish caught inside the Eastern Area. All final catch numbers include adjustments made to reflect live weight, as well as adjustments made to account for the discrepancy between vessel monitoring system data and dealer data.

Pursuant to Regional Administrator authority to modify certain measures to optimize catch (neither under-harvest, nor over-harvest the TACs), NMFS has relied upon three management tools: modifications to the cod and yellowtail trip limits, closures to the eastern U.S./Canada Area, and prohibition on the use of flatfish nets. For the 2008 and 2009 fishing years, the Council recommended, and NMFS implemented a delay in the opening of the Eastern U.S./Canada Area for vessels fishing with trawls, in order to avoid trawl fishing during the season when the cod catch rate is usually high.

During FYs 2004-2009 there were several Special Access Programs (SAPs), which provided vessels opportunities to fish in the U.S. Canada Management Area under rules which differed from the generic regulations that apply to the U.S. Canada Management Area. The catch under each of the SAPs (kept and discarded) counted toward the pertinent U.S. TAC specified for each FY (cod, haddock, and yellowtail flounder), and were consistent with the Understanding.

Table 14 – U.S. Catch from Shared Stocks

| Cod | | | | |
|---|---|---|---|---|
| Fishing Year | TAC (mt) | Catch (% of TAC) | Catch (mt) | Discards (% of catch) |
| 2004 | 300 | 59 % | 177 | 23 % |
| 2005 | 260 | 94 % | 244 | 64 % |
| 2006 | 374 | 90 % | 335 | 50 % |
| 2007 | 494 | 64 % | 315 | 67 % |
| 2008 | 667 | 75 % | 501 | 15 % |

| Haddock | | | | |
|---|---|---|---|---|
| Fishing Year | TAC (mt) | Catch (% of TAC) | Catch (mt) | Discards (% of catch) |
| 2004 | 5,100 | 21 % | 1,060 | 18 % |
| 2005 | 7,590 | 8 % | 589 | 12 % |
| 2006 | 7,480 | 9 % | 671 | 37 % |
| 2007 | 6,270 | 5 % | 307 | 46 % |
| 2008 | 8,050 | 20 % | 1,649 | 4 % |

| Yellowtail Flounder | | | | |
|---|---|---|---|---|
| Fishing Year | TAC (mt) | Catch (% of TAC) | Catch (mt) | Discards* (% of catch) |
| 2004 | 6,000 | 98 % | 5,852 | 8 % |
| 2005 | 4,260 | 88 % | 3,760 | 9 % |
| 2006 | 2,070 | 89 % | 1,851 | 29 % |
| 2007 | 900 | 109 % | 981 | 39 % |
| 2008 | 1,869 | 82 % | 1,531 | 28 % |

* Note; yellowtail discard % includes groundfish and scallop fishery discards

Table 15 – Summary of Numbers of Trips and DAS* in U.S./Canada Management Area

| Fishing Year | Trips | | | Days-at-Sea | | |
|---|---|---|---|---|---|---|
| | Total | West | East | Total | West | East |
| 2004 | 1,910 | 1,424 | 468 | 9,805 | 7,808 | 1,997 |
| 2005 | 2,176 | 1,963 | 213 | 14,368 | 13,287 | 1,081 |
| 2006 | 1,579 | 1,295 | 284 | 9,282 | 7,907 | 1,375 |
| 2007 | 1,272 | 1,134 | 138 | 10,950 | 10,264 | 686 |
| 2008 | 1,273 | 559 | 714 | 8,990 | 4,804 | 4,186 |

* A, B regular, and B reserve groundfish DAS,

Table 16 – Number of Distinct Vessels that Fished in the U.S./Canada Management Area

| Fishing Year | Western Area | Eastern Area | East and West |
|---|---|---|---|
| 2004 | 159 | 110 | 162 |
| 2005 | 184 | 78 | 184 |
| 2006 | 155 | 92 | 161 |
| 2007 | 148 | 59 | 151 |
| 2008 | 126 | 92 | 147 |

Table 17 – Estimates of Observer Coverage in U.S./Canada Area (percent of trips)

| Fishing Year | Approximate Percentage |
|---|---|
| 2006 | 19 % |
| 2007 | 26 % |
| 2008 | 29 % |

Table 18 – Canadian Catch from Shared Georges Bank Stocks

| Cod | | | | |
|---|---|---|---|---|
| | TAC (mt) | Catch (% of TAC) | Catch (mt) | **Discards** |
| 2004 | 1,000 | 111 % | 1,112 | unknown |
| 2005 | * 640 (740) | 98 % | 627 | unknown |
| 2006 | 1,326 | 109 % | 1,448 | 24 % |
| 2007 | * 1,275 (1,406) | 94 % | 1,195 | 125 mt from scallopers |
| 2008 | 1,173 | 94 % | 1,529 | 31 mt from scallopers |

* Adjusted downward to account for previous year's overharvest

| Haddock | | | | |
|---|---|---|---|---|
| | TAC (mt) | Catch (% of TAC) | Catch (mt) | Discards |
| 2004 | 9,900 | 98 % | 9,745 | unknown |
| 2005 | 15,410 | 94 % | 14,483 | unknown |
| 2006 | 14,520 | 83 % | 12,054 | |
| 2007 | 12,728 | 94 % | 11,951 | 61 mt from scallopers |
| 2008 (prelim) | 18,900 | 99 % | 14,815 | 30 mt from scallopers |

| Yellowtail Flounder | | | | |
|---|---|---|---|---|
| | TAC (mt) | Catch (% of TAC) | Catch (mt) | Discards |
| 2004 | 1,900 | < 1 % | 95 | unknown |
| 2005 | 1,740 | < 1 % | 29 | unknown |
| 2006 | 930 | 62 % | 580 | |
| 2007 | 350 | 38 % | 132 | 105 mt from scallopers |
| 2008 (prelim) | 483 | 29 % | 158 | 45 mt from scallopers |

Table 19 – Summary of Georges Bank Yellowtail Flounder Catch by Scallop Fishery (based on NMFS/FSO end of fishing year summary reports for US/CA Area; includes both scallop access area and open areas on GB)

| Year | 2005 | 2006 | 2007 | 2008 | * 2009 |
|---|---|---|---|---|---|
| Landings | 2,000 lb | 16,000 lb | 1,100 lb | 10,000 lb | 6,766 (access area) |
| Discards | 470,000 lb | 949,000 lb | 417,000 lb | 475,000 lb (6,575,000 meat lb of scallop X 0.072 discard rate for USCA open access scallop trips) | 200,196 (open area) 321,120 (access area) |
| Total | 472,000 lb | 966,000 lb | 419,000 lb | 485,000 lb | 528,082 |
| Groundfish GB Yellowtail TAC | 9,392,000 | 4,564,000 | 1,984,000 | 4,119,779 | 3,564,875 |
| % of TAC | 5% | 21% | 21% | 12 % | 15% |

* 2009 data through August 16, 2009;

Table 20 – GB Yellowtail Catch from Scallop Access Fishery (from FSO website)

| | Kept | Discarded | Total |
|---|---|---|---|
| 2009 CA II Scallop Access Area | 6,766 lb | 321,120 lb | 327,886 lb |
| 2007 CA I Scallop Access Area | 501 lb | 53,387 lb | 53,888 lb |
| 2006 CA II Scallop Access Area | 7,470 lb | 454, 842 lb | 462,312 |

### 6.2.6 Interaction between Gear and Allocated Target Species

The analysis of interactions between gear and allocated species is based on catch information for the Northeast Multispecies FMP Common Pool fishery from FY 1996 through FY 2006 as presented in GARM III. Historic landings for select target species by gear type from FY 1996 through FY 2006 (Table 21) show that the majority of fish of all species are caught with trawls. Only cod and white hake are caught in significant numbers by gillnets. Only haddock are caught in significant numbers by hook and line.

## 6.3 Non-ALLOCATED Bycatch Species

Non-allocated bycatch species likely to be affected by the multispecies fishery include monkfish, skates, and spiny dogfish. These species have no allocation under the Northeast Multispecies FMP and are managed under separate FMPs. The discussion in this section is limited to these three groups of fish. Monkfish and skates are commonly landed when caught. Monkfish may be discarded when regulations or market conditions constrain the amount of the catch that could be landed. Spiny dogfish, which tend to be relatively abundant in catches, may be landed but are often the predominant component of the discarded bycatch.

### 6.3.1 Monkfish

**Life History:** Monkfish, *Lophius americanus*, also called goosefish, are distributed in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish may be found from inshore areas to depths of at least 900 m. Seasonal onshore-offshore migrations occur and appear to be related to spawning and possibly to food availability.
Female monkfish begin to mature at age 4, and 50 percent of females are mature by age 5 (about 43 cm). Males mature at slightly younger ages and smaller sizes (50 percent maturity at age 4.2 or 36 cm). Spawning takes place from spring through early autumn, progressing from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil which can be as large as 12 m long and 1.5 m wide, and only a few mm thick. The eggs are arranged in a single layer in the veil, and the larvae hatch after about 1 to 3 weeks, depending on water temperature. The larvae and juveniles spend several months in a pelagic phase before settling to a benthic existence at a size of about 8 cm.

**Population Management and Status:** Monkfish are currently regulated by the Monkfish FMP, which was implemented in 1999 (NEFMC and MAFMC 1998). The FMP was designed to stop overfishing and rebuild the stocks through a number of measures, including: limiting the number of vessels with access to the fishery and allocating DAS to those vessels; setting trip limits for vessels fishing for monkfish; minimum fish size limits; gear restrictions; mandatory time out of the fishery during the spawning season; and a framework adjustment process.

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

Table 21 - Historic landings for Allocated and Non-Allocated target species by gear type from Fishing Year 1996 to Fishing Year 2006 in metric tons (mt) as presented in GARM III.

| Stock/species | Trawl | Large-mesh trawl discards | Small-mesh trawl discards | Gillnet | Gillnet discards | Hook/ line | Hook/ line discards | Scallop dredge | Scallop dredge discards | Other | Other discards | Total discards | Total landings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Georges Bank Cod | | 2,742 | 551 | | | | | | 170 | | | 2,862 | 73,806 |
| Georges Bank Haddock | 38,989 | 3,950 | | 883 | 61 | 2,461 | 380 | | 31 | 297 | | 4,423 | 42,626 |
| Georges Bank Yellowtail Flounder | | 1,280 | 134 | | | | | | 2,562 | | | 3,976 | 27,960 |
| So. New England/Mid-Atlantic Yellowtail Flounder | | 725 | 129 | | | | | | 1,119 | | | 1,972 | 7,968 |
| Gulf of Maine/Cape Cod Yellowtail Flounder | | 1,123 | 33 | | 510 | | | | 944 | | | 2,611 | 15,796 |
| Gulf of Maine Cod | 22,435 | 5,301 | | 17,532 | 4,036 | | | | | 3,639 | | 9,337 | 43,606 |
| Witch Flounder | | 1,911 | 469 | | | | | | | | 71 | 2,481 | 27,031 |
| American Plaice | | 3,059 | 1,237 | | | | | | | | 350 | 4,533 | 31,031 |
| Gulf of Maine Winter Flounder | 4,479 | 259 | 54 | 1,346 | 163 | | | | | 168 | | 476 | 5,993 |
| So. New England/Mid-Atlantic Winter Flounder[a] | | | | | | | | | | | | 1,481 | 31,146 |
| Georges Bank Winter Flounder | 18,202 | 169 | 47 | | | | | 210 | 418 | 135 | | 634 | 18,546 |

| Stock/species | Trawl | Large-mesh trawl discards | Small-mesh trawl discards | Gillnet | Gillnet discards | Hook/ line | Hook/ line discards | Scallop dredge | Scallop dredge discards | Other | Other discards | Total discards | Total landings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| White Hake | 22,532 | | | 9,355 | 239 | | | | | 2,191 | | 2,173 | 32,547 |
| Pollock | | | | | | | | | | | | N/A | 51,568 |
| Acadian Redfish | | | | | | | | | | | | 6,200 | 4,115 |
| Ocean Pout [a] | | | | | | | | | | | | 5,165 | 207 |
| Gulf of Maine Haddock | 6,396 | 5 | 0.49 | 1,091 | 1 | | | | | 969 | 2 | | 8,456 |
| Atlantic Halibut [a] | | | | | | | | | | | | 157 | 138 |
| Gulf of Maine/Georges Bank Windowpane [a] | 1,966 | 3,584 | 403 | 4 | | | | 3 | 615 | 7 | | 4,850 | 1,978 |
| Southern New England/Mid-Atlantic Windowpane [a] | 1,071 | 1,762 | 433 | 3 | | | | 1 | 1,004 | 18 | | 3,197 | 1,093 |
| Atlantic Wolffish [b] | | | | | | | | | | | | | |

Notes:

[a] as adopted by the NEFMC June, 2009

[b] provisionally added to list of stocks not allocated

### 6.3.2 Skates

**Life History:** The seven species in the Northeast Region (Maine to Virginia) skate complex are: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis)*, thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). The barndoor skate is most common skate in the Gulf of Maine, on Georges Bank, and in southern New England. In the Northeast Region, the center of distribution for the little and winter skates is Georges Bank and southern New England. The thorny and smooth skates are commonly found in the Gulf of Maine. The clearnose and rosette skates have a more southern distribution, and are found primarily in southern New England and the Chesapeake Bight.

Skates are not known to undertake large-scale migrations. Skates tend to move seasonally in response to changes in water temperature, moving offshore in summer and early autumn and returning inshore during winter and spring. Members of the skate family lay eggs that are enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 to 12 months, with the young having the adult form at the time of hatching.

**Population Management and Status:** The Skate FMP was implemented in September 2003 with a primary requirement for mandatory reporting of skate landings by species by both dealers and vessels. Possession prohibitions of barndoor, thorny, and smooth skates in the Gulf of Maine were also provisions of the FMP. A trip limit of 10,000 pounds (lbs) was implemented for winter skate with a Letter of Authorization for the bait fishery (little skate) to exceed the trip limit. Draft Amendment 3 and the Draft Environmental Impact Statement (DEIS) to the Skate FMP updates and supplements the original EIS for the skate fishery and serves as a Stock Assessment and Fishery Evaluation (SAFE) Report (http://www.nefmc.org/skates/fmp/fmp.htm).

Skate landings have been reported to be generally increasing since 2000. Due to insufficient information about the population dynamics of skates, there remains considerable uncertainty about the status of skate stocks. The landings and catch limits proposed by Amendment 3 have been reported to have an acceptable probability of promoting biomass growth and achieving the rebuilding (biomass) targets for thorny skates. Modest reductions in landings and a stabilization of total catch below the median relative exploitation ratio is expected to cause skate biomass and future yield to increase.

### 6.3.3 Spiny Dogfish

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

##### 6.3.3.1.1 Population Management and Status:

The fishery is managed under a FMP developed jointly by the NEFMC and Mid Atlantic Fishery Management Council (MAFMC) for federal waters and a plan developed concurrently by the Atlantic States Marine Fisheries Commission for state waters. Spawning stock biomass of spiny dogfish declined rapidly in response to a directed fishery during the 1990s. Management measures, initially implemented in 2001, have been effective in reducing landings and reducing fishing mortality. Overfishing is not presently considered to be occurring. Conclusions regarding the overfished and overfishing status of spiny dogfish are strongly dependent on the Northeast Fisheries Science Center spring survey estimates in 2006. Concerns have been raised about the influence of these data (NEFSC 2006a); future surveys would be closely monitored to determine if the 2006 results signal a true increase in abundance (http://www.nefsc.noaa.gov/sos/spsyn/op/dogfish/).

### 6.3.4 Interaction between Gear and Non-allocated Bycatch Species

The analysis of interactions between gear and non-allocated species and by catch is based on catch information for the Northeast Multispecies FMP Common Pool fishery from FY 1996 to FY 2006.

The Final Supplemental Environmental Impact Statement (FSEIS) to Amendment 2 (NEFMC and MAFMC 2003) evaluated the potential adverse effects of gears used in the directed monkfish fishery for monkfish and other federally-managed species and the effects of fishing activities regulated under other federal FMPs on monkfish. The two gears used in the directed monkfish fishery are bottom trawls and bottom gill nets which are described in detail in Section 1.2.1 of Appendix 2 to Amendment 2 to the Monkfish FMP (NEFMC and MAFMC 2003).

Regionally, skates are harvested in two very different fisheries, one for lobster bait and one for wings for food. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops and land them if the price is high enough. Therefore, gear interactions with skate can be expected in the conduct of fishing for groundfish. Detailed information about skate fisheries, gear and conduct can be found in Section 7.6 of the recent NEFMC Amendment to the Skate FMP and accompanying FSEIS (NEFMC 2009b).

Of the non-allocated target species considered in the EA, dogfish have the potential for an interaction with all gear types expected to be used by the groundfish fleet. Historic landings for non-allocated target species from FY 1996 to FY 2007 (Table 22) show that the majority of fish of all species are caught with otter trawls. Only cod and white hake are caught in significant numbers by gillnets. Only haddock are caught in significant numbers by hook and line.

Table 22 - Historic Landings (mt) for non-allocated target species by gear type from Fishing Year 1996 to Fishing Year 2006[a]

| | Gear Type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Trawl | | Gillnet | | Dredge | | Other Gear[b] | Total | |
| Species | land | discard | land | discard | land | discard | land | land | discard |
| Monkfish | 122,700 | 16,520 | 7,440 | 6,526 | 31,555 | 16,136 | 8,811 | 228,000 | 35,100 |
| Skates | 117,381 | 189,741 | 29,711 | 19,448 | 38,638 | -- | 4,413 | 151,505 | 247,827 |
| Dogfish | 24,368 | 61,914 | 72,712 | 39,852 | -- | -- | 946 | 98,026 | 101,766 |

Notes:

[a] monkfish 1997-2006, skates 1996-2006, dogfish 1996-2005

[b] discards not available for other gear

Source: Northeast Data Poor Stocks Working Group 2007; Sosebee et al. 2008; NEFSC 2006b.

## *6.4 Atlantic Sea Scallop Resource*

The Atlantic sea scallop, *Placopecten magellanicus* (Gmelin), is a bivalve mollusk ranging from North Carolina to the Gulf of St. Lawrence (Hart and Chute, 2004). Although all sea scallops in the US EEZ are managed as a single stock per Amendment 10, 4 regional components and 6 resource areas are recognized. Major aggregations occur in the Mid-Atlantic from Virginia to Long Island (Mid-Atlantic component), Georges Bank, the Great South Channel (South Channel component), and the Gulf of Maine (Hart and Rago, 2006; NEFSC, 2007). These 4 regional components are further divided into 6 resource areas: Delmarva (Mid-Atlantic), New York Bight (Mid-Atlantic), South Channel, southeast part of Georges Bank, northeast peak and northern part of Georges Bank, and the Gulf of Maine (NEFMC, 2007). Assessments focus on two main parts of the stock and fishery that contain the largest concentrations of sea scallops: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock (NEFMC, 2007).

Sea scallops are generally found in waters less than 20$^{o}$C and depths that range from 30-110m on Georges Bank, 20-80m in the Mid-Atlantic, and less than 40m in the near-shore waters of the Gulf of Maine. They feed by filtering zoo- and phytoplankton and detritus particles. Sea scallops have separate sexes, reach sexual maturity at age 2, and use external fertilization. Scallops greater than 40mm are considered mature individuals. Spawning generally occurs in late summer and early autumn, although there is evidence of spring spawning as well in the Mid-Atlantic Bight (DuPaul et al., 1989) and limited winter-early spring spawning on Georges Bank (Almeida et al., 1994; Dibacco et al., 1995). Annual fecundity increases rapidly with shell height; individuals younger than 4 years may contribute little to total egg production (MacDonald and Thompson, 1985; NEFMC, 1993; NEFSC, 2007). The pelagic larval stage lasts 4-7 weeks with settlement usually on firm sand, gravel, shells, etc. (Hart and Chute, 2004; NEFMC, 2007; NEFSC, 2007). Recruitment to the NEFSC survey occurs at 40mm shell height (SH) and to the commercial fishery at 90-105mm SH, which corresponds to an age of 4-5 years old (NEFSC, 2007; NEFMC, 2007).

Meat weight can quadruple between the ages of 3 to 5 (NEFSC, 2004; NEFMC, 2007). Meat weight is dependent on shell size, which increases with age, and depth. Meat weight decreases with depth, possibly due to a reduced food supply (NEFSC, 2007). Both the Mid-Atlantic and Georges Bank showed a drop in meat weights between August and October, coinciding with the September-October spawning period (Haynes, 1966; Serchuk and Smolowitz, 1989; NEFSC, 2007). Meat weight of landed scallops may differ from those predicted based on research survey data because: 1) the shell height/meat weight relationship varies seasonally in part because of the reproductive cycle, causing meats collected during the NEFSC survey in July to differ from the rest of the year; 2) commercial fishers concentrate on speed while shucking, leaving some meat on the shell (Naidu, 1987; Kirkley and DuPaul, 1989); and 3) fishers may target areas with relatively large meat weight at shell height, thus increasing commercial weights compared to those on the research vessel (NEFSC, 2007).

### 6.4.1 Assessment

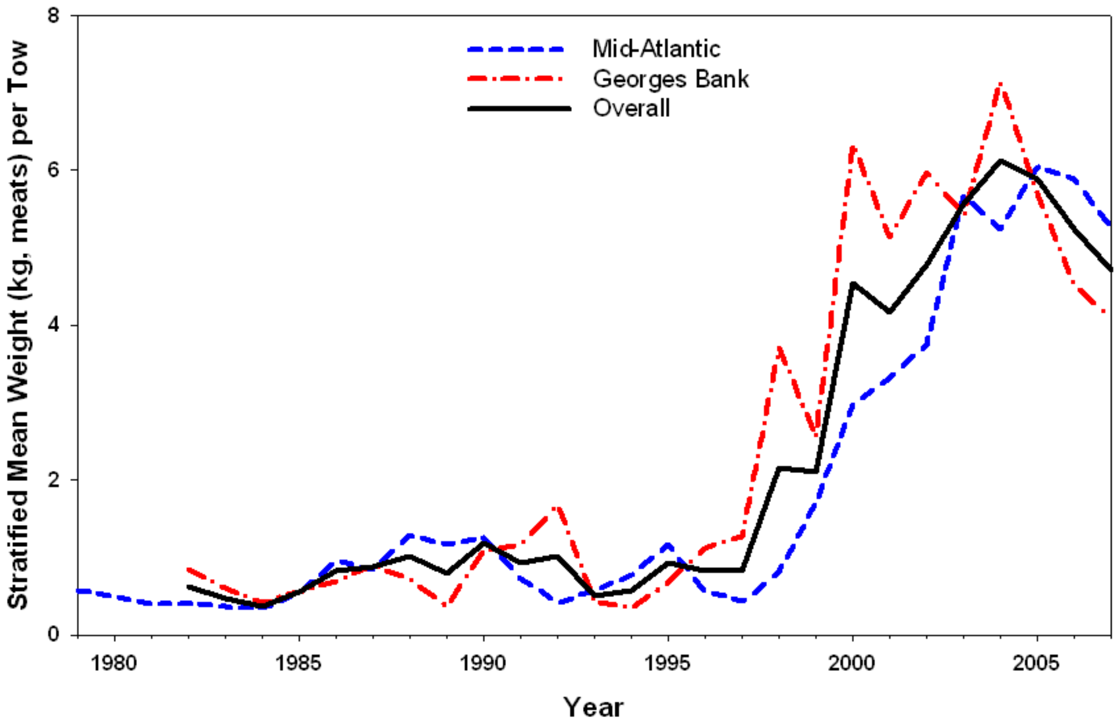
The primary source of data used in the biological component of the scallop assessment currently comes from the federal scallop survey. The scallop dredge survey has been conducted in a consistent manner since 1979. An 8-foot modified scallop dredge is used with 2" rings and a 1.5" liner. Tows are 15 minutes in length at a speed of 3.8 knots, and stations are identified using a random-stratified design. About 500 stations are completed each year on Georges Bank and the Mid-Atlantic. A Scallop Survey Advisory Panel (SSAP) is reviewing the scallop survey and making recommendations about how future surveys should be conducted. The vessel platform used in the past (R/V Albatross IV) went out of service in 2008. The 2008 and 2009 resource surveys were conducted on the R/V Hugh Sharp owned by the University of Delaware. The 2009 surveys were conducted six weeks earlier than previous surveys in hopes that the data would be available in time for 2010 management actions. Calibration tows have been conducted with the WHOI HabCam, in order to use this video survey in future projections.

Other primary components of the assessment include defining parameters for scallop growth, maturity and fecundity, shell height/meat weight relationships, recruitment, and estimates of natural mortality, which are all combined with fishery data (landing and discards) to estimate fishing mortality rates and biological reference points. The per-recruit reference points $F_{max}$ and $B_{max}$ are used by managers as proxies for $F_{msy}$ and $B_{msy}$ because the stock-recruitment relationship is not well defined. The Catch-At-Size-Analysis (CASA) model utilizes additional information including commercial catch, LPUE, commercial shell height compositions, data from the NMFS sea scallop and winter trawl surveys, data from the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) small camera video surveys, data from dredge surveys conducted by VIMS, growth increment data from scallop shells, and shell height/meat weight data adjusted to take commercial practices and seasonality into account (NEFSC, 2007).

Based on the results of the last stock assessment workshop, biological reference points have been set for the entire US sea scallop stock. The threshold fishing mortality rate for fully-recruited scallops that generates the maximum yield-per-recruit, $F_{max}$, was estimated at 0.37. The biomass target is 108.6 thousand mt meats and the recommended biomass threshold is half the biomass target, or 54.3 thousand mt meats.

In general, scallop biomass has increased dramatically in recent years. Figure 7 shows this increase in terms of estimated Mid-Atlantic, Georges Bank and total scallop biomass based on the scallop survey through 2007. These values are unadjusted; therefore cannot be directly compared to biomass thresholds, but the general increasing trend in biomass in both areas is evident.

**Figure 7 - Trend in R/V Albatross stratified mean weight per tow from mid 1980s through 2006 by region.**




## 6.4.2 Stock Status

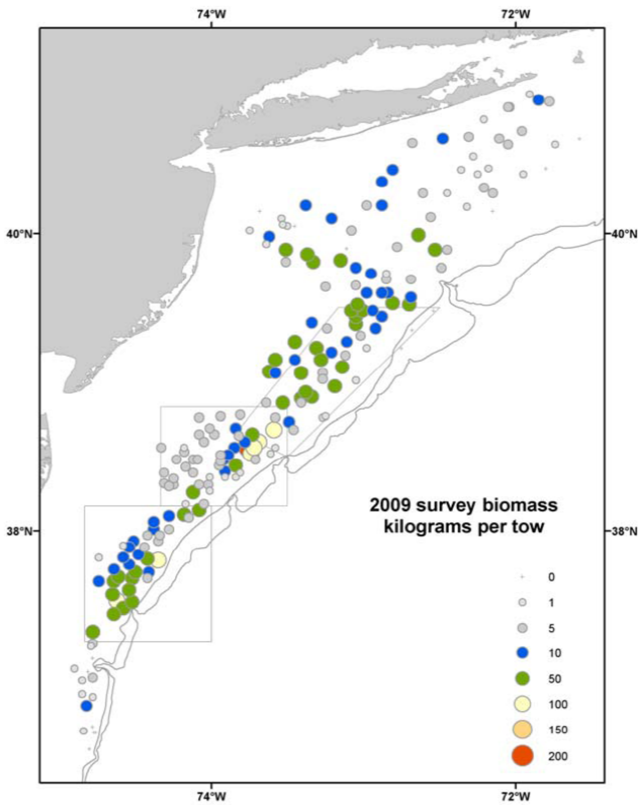
Preliminary results from the CASA model in 2009 estimate an overall fishing mortality of 0.30. Stock status has been fluctuating in recent years. Overall biomass increased almost without interruption since 1997, peaking at 8.2 kg/tow in 2004. Fishing mortality was above the original threshold of 0.24 and target of 0.20 for both 2003 and 2004 with both years at or above 0.30. For 2005, 2006, and 2007, fishing mortality was reduced to 0.22, 0.20, and 0.20 respectively, staying below the threshold value. In 2008 fishing mortality went back up to 0.28, and remained high again in 2009 at 0.30. Thus, it may be found that overfishing is occurring once the updated assessment is completed in 2010. It is therefore likely that a reduction in F of approximately 20% will be needed in 2010.

### 6.4.2.1 Biomass

Despite a decline in biomass in the past few years, the overall trend shows a considerable increase since 1994, especially in the Georges Bank closed areas and the ETA (part of the Mid-Atlantic component) (NEFSC, 2007). Scallop biomass on Georges Bank has increased by a factor of 18 and in the Mid-Atlantic Bight by a factor of 8 (Hart and Rago, 2006), which is likely due to very strong recruitment in the Mid-Atlantic and improved management in both the Mid-Atlantic and Georges Bank (NEFMC, 2007). The resource remains in relatively good condition even though mortality was above target for 2003-2004, with a greater share of the landings coming from older and larger scallops. Whole-stock estimates indicate that annual abundance, annual egg production, and biomass were relatively high during 2009, with recruitment relatively low (NEFSC, 2007).

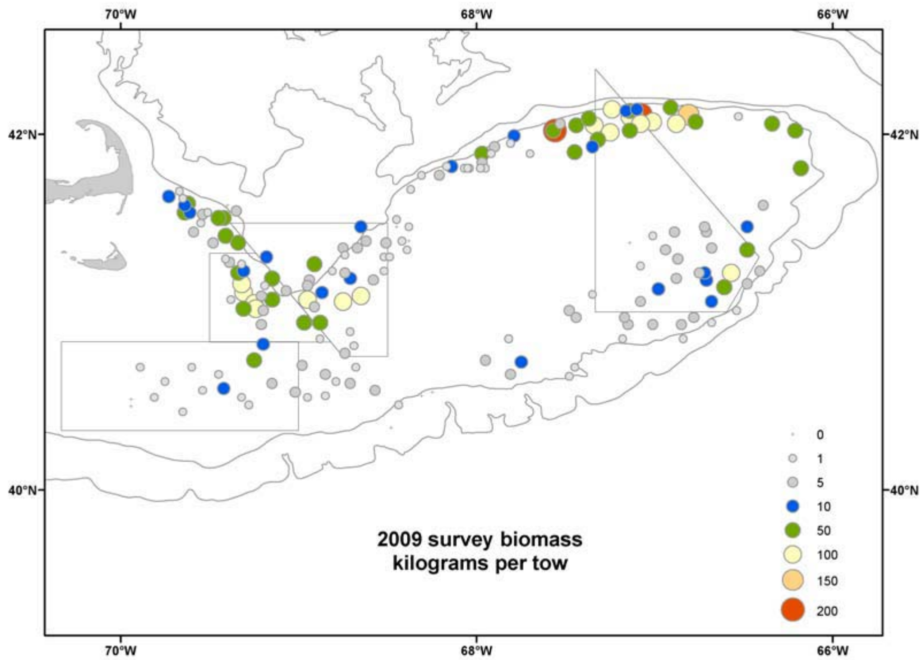
Biomass increased rapidly in the Mid-Atlantic Bight from 1998-2003 due to area closures, reduced fishing mortality, changes in fishery selectivity, and strong recruitment. Biomass in the Hudson Canyon area increased while it was closed from 1998-2001; likewise, biomass increased steadily in the ETA after its closure in 2004. Two very strong year classes were protected by the ETA closure, which contained over one-quarter of the total scallop biomass in 2007. Figure 2 shows the biomass in the Mid Atlantic based on the 2009 NMFS scallop survey. Biomass is distributed fairly evenly throughout the three area closures (Hudson Canyon, Elephant Trunk, Delmarva), with the largest tows confined to ETA and Delmarva.

Figure 8. Biomass chart for the Mid-Atlantic from the 2009 NMFS sea scallop survey




The scallop abundance and biomass on Georges Bank increased from 1995-2000 after implementation of closures and effort reduction measures. Biomass and abundance then declined from 2006-2008 because of poor recruitment and the reopening of portions of groundfish closed areas. The 2009 survey estimates an increase in biomass. The highest concentrations of biomass on Georges Bank are currently on the northern edge of Georges Bank, within Closed Area I, and within Nantucket Lightship closed areas (Figure 3) (NEFMC, 2007). A large portion of the biomass is in the South Channel area proposed for closure in Framework 21.

Figure 9. Biomass chart for Georges Bank from the 2009 NMFS sea scallop survey




The sea scallop resource has experienced a change in distribution in recent years. Figure 10 displays scallop biomass in a pie chart by area based on 2007 (left) and 2009 (right) survey data. The ETA (shown in royal blue) contained 32% of the overall biomass in 2007, and now contains 15%. Overall biomass is less concentrated than in past years, with increases elsewhere in the Mid Atlantic and in open areas in both regions. Figure 5 illustrates the reduction in ET biomass from 2006-2009. The largest tows of scallops all but disappeared in 2009, and there has been a big reduction in the medium-sized tows as well. This is not surprising since effort levels have been high in this area for several years. However, biomass is lower in ET than previous projections estimated, even with high fishing pressure.

Figure 10. Distribution of scallop biomass by area in 2007 (left) and 2009 (right).

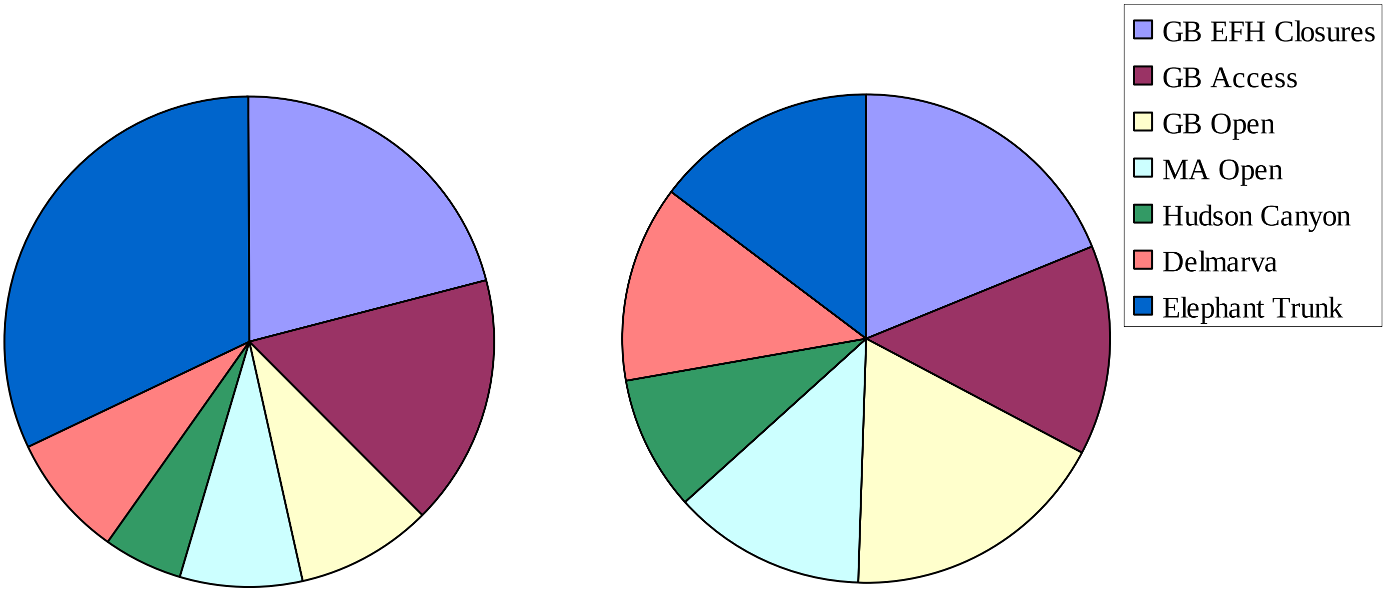
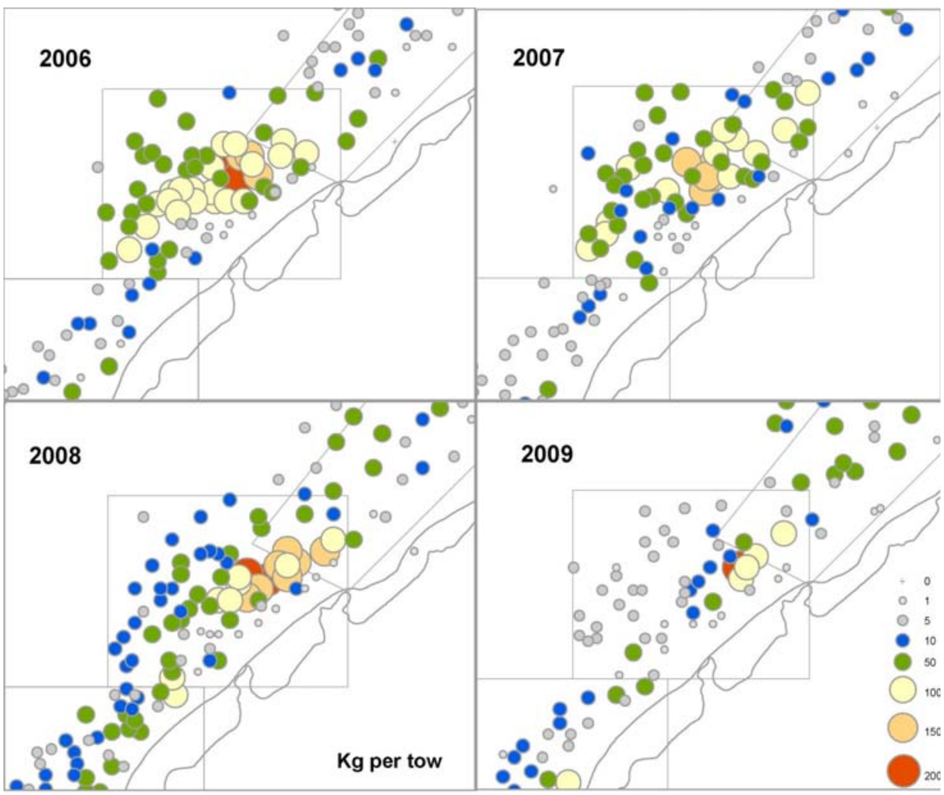



Figure 11 - Reduction of ET Biomass from 2006-2009 surveys



### 6.4.2.2 Recruitment

Strong recruitment was observed on Georges Bank in 2009, especially in the South Channel, on the Northern Edge, and in the Southeast part of CA II (Figure 6). Several very large tows of recruits were observed in the South Channel area proposed for closure in Framework 21.

Poor recruitment was observed in the Mid-Atlantic, except for some promising tows in the southern portion of the Delmarva area (Figure 7). Looking at trends for both portions of the scallop stock (Figure 8), there is a strong recruitment pattern in place currently for Georges Bank, with three high years in a row. The drop-off in the Mid-Atlantic is somewhat drastic, but not inconsistent with the variable pattern shown by the stock of several strong years followed by a drop-off and recovery.

Figure 12 - Recruitment on Georges Bank from 2007 NMFS sea scallop survey

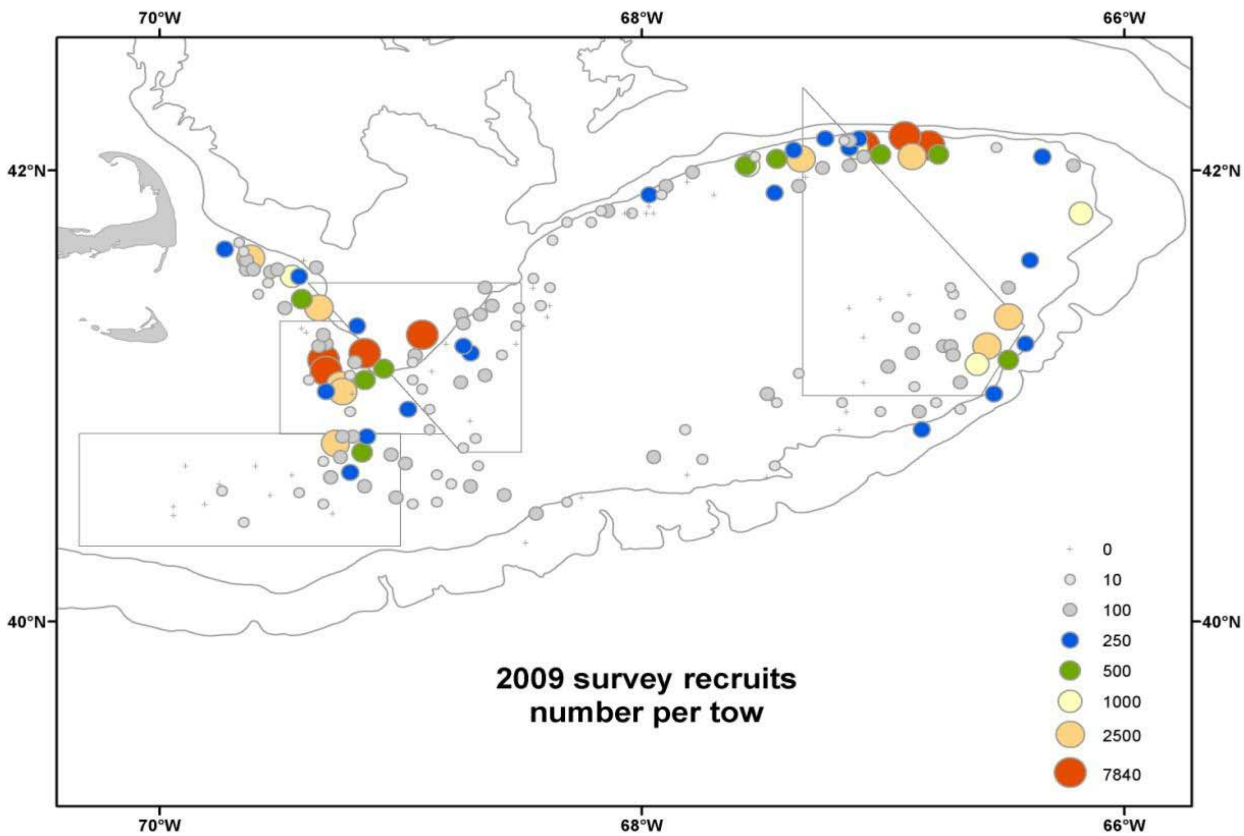


Figure 13 - Recruitment in the Mid-Atlantic from the 2007 NMFS sea scallop survey

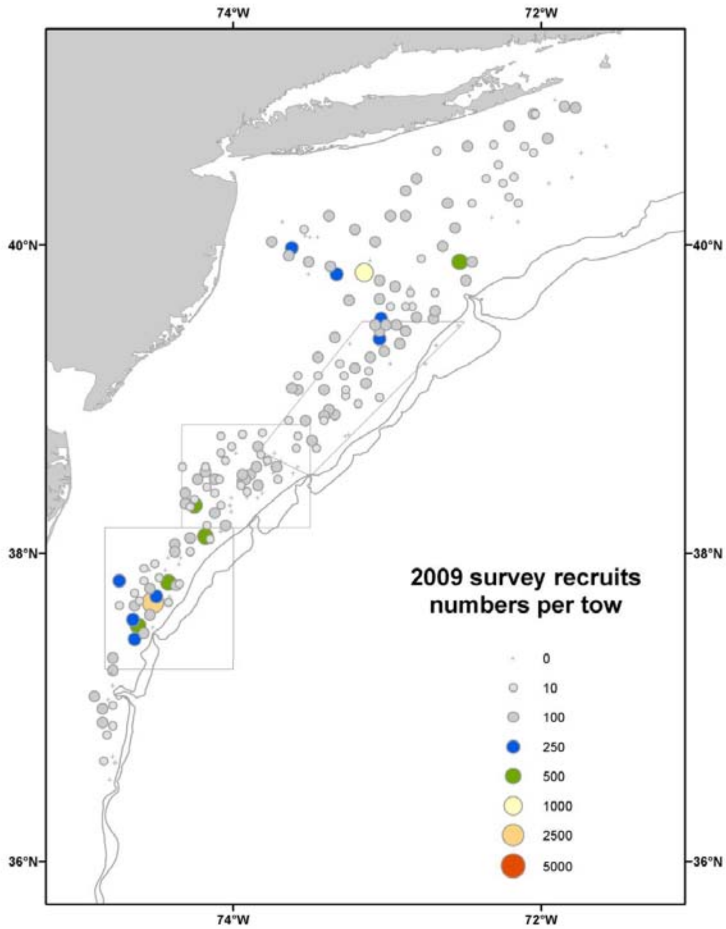
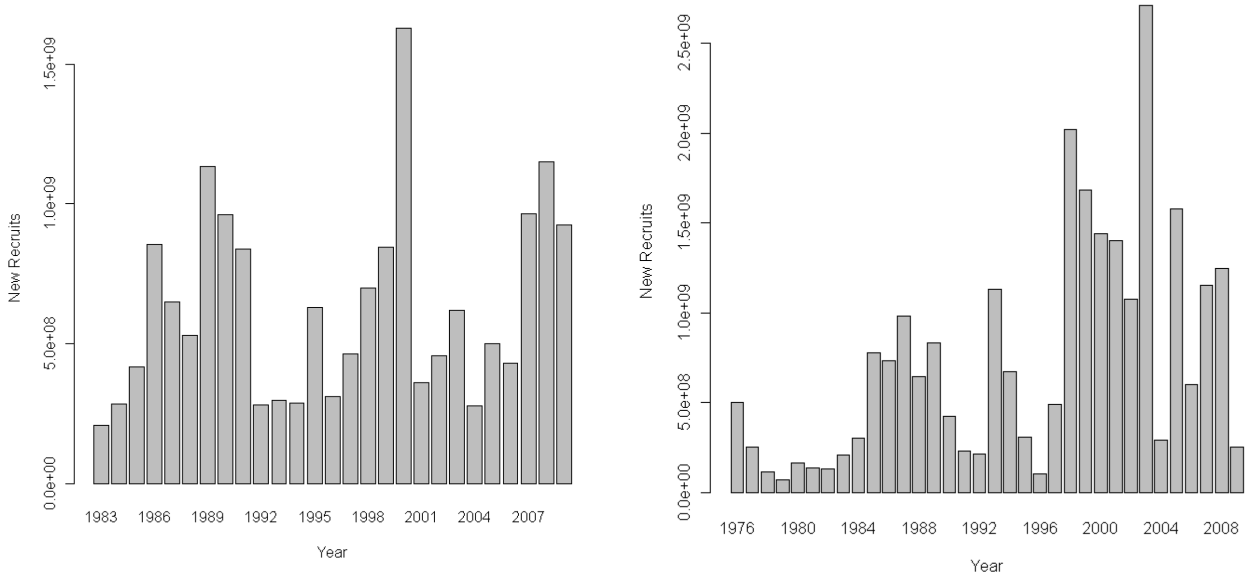


Figure 14 - Recruitment patterns on Georges Bank (left ) and the Mid-Atlantic (right)




## 6.4.2.3 Fishing mortality

Four types of mortality are accounted for in the assessment: natural, discard, incidental, and fishing. The natural mortality rate was assumed to be $M$=0.1$y^{-1}$ for scallops with shell heights greater than 40mm based on estimates of $M$ based on ratios of clappers (still-intact shells from dead scallops) versus live scallops (Merrill and Posgay, 1964). Natural mortality may increase at larger shell heights (MacDonald and Thompson, 1986; NEFSC, 2007).

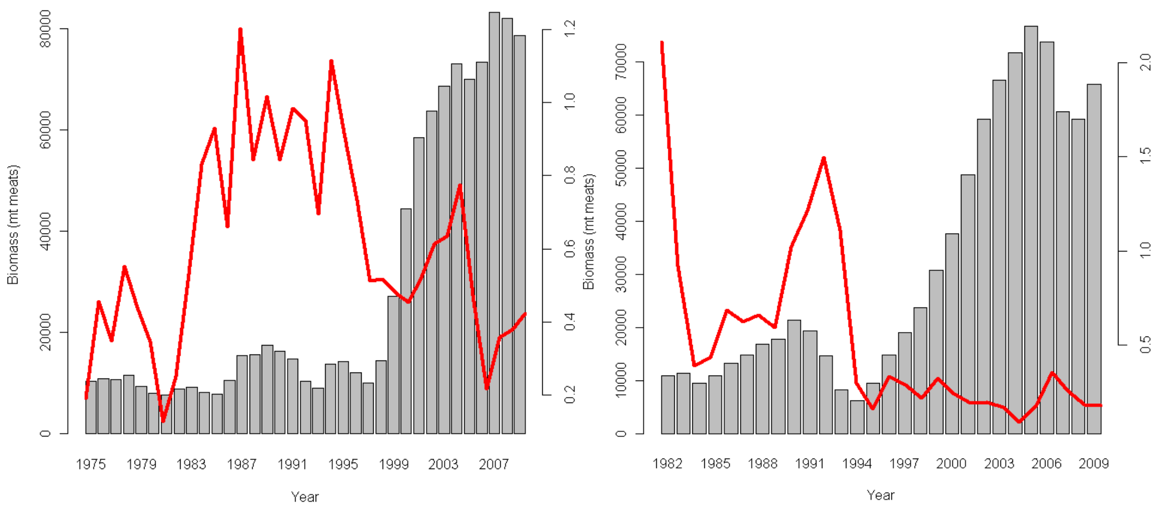
Discard mortality occurs when scallops are discarded on directed scallop trips because they are too small to be economically profitable to shuck or due to high-grading during access area trips to previously-closed areas. Discard ratios were low during the 2005-2006 season, probably because of new gear regulations (4" rings). Scallops can also be caught as bycatch and either landed or discarded in other fisheries. Trawl fisheries with the largest scallop bycatch for 1994-2006 were longfin squid, summer flounder, yellowtail, haddock, cod, and monkfish. From 1994-2006, an estimated mean of 94 mt meats of scallops were landed and 68 mt meats were discarded per year as bycatch in other fisheries. Total discard mortality is estimated at 20% (NEFSC, 2007).

Incidental mortality is non-landed mortality associated with scallop dredges that likely kill and injure some scallops that are contacted but not caught by crushing their shells. Caddy (1973) estimated 15-20% of the scallops remaining in the dredge track were killed, while Murawski and Serchuk (1989) estimated that <5% were killed. The difference is possibly due to differences in substrate; the first study was done in a hard bottom area, while the subsequent study was in an area with a sandy bottom. Incidental mortality for this assessment was assumed to be 0.15 $F_L$ in Georges Bank and 0.04 $F_L$ in the Mid-Atlantic (NEFSC, 2007).

Fishing mortality, the mortality associated with scallop landings on directed scallop trips, was calculated separately for Georges Bank and the Mid-Atlantic because of differences in growth rates. For comparison to biological reference points used to identify overfishing and overfished stock conditions, a whole-stock estimate of fishing mortality is also necessary. Survey-based and rescaled $F$ estimates show increasing mortality until the early 1990s and reductions from 1994-2006 (NEFSC, 2007). The current CASA $F_{max}$ estimate for 2009 is 0.30, which is above the threshold (0.29) approved in the last stock assessment.

Fishing mortality peaked for both stocks in the early 1990s, but has decreased substantially since then, as tighter regulations were put into place including area closures and biomass levels recovered (Figure 9). In general, *F* has remained stable on Georges Bank since 1995, and the Mid-Atlantic has shown larger fluctuations and an overall higher *F*.

Figure 15 – Fishing mortality (red line) and biomass estimates ($y^{-1}$, gray bars) from the CASA model for sea scallops on Georges Bank (right), and in the Mid-Atlantic Bight (left).




## 6.5 Protected Resources

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

### 6.5.1 Species Present in the Area

Table 23 lists the species, protected either by the ESA, the MMPA, or both, may be found in the environment that would be utilized by the groundfish fishery.

Table 23 - Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery.

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

**Table 23 (continued)**
**Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery.**

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

Note:

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

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

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

### 6.5.2 Species Potentially Affected

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

### 6.5.2.1 Sea Turtles

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

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

### 6.5.2.2 Large Cetaceans

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

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

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

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

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

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

#### 6.5.2.3 Small Cetaceans

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

#### 6.5.2.4 Pinnipeds

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

#### 6.5.2.5 Species Not Likely to be Affected

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

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

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

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009a). Since operation of the multispecies fishery would not occur in waters that are typically used by hawksbill sea turtles, it is highly unlikely that its operations would affect this turtle species.

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

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

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

### 6.5.3 Interactions Between Gear and Protected Resources

Commercial fisheries are categorized by NMFS based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each stock. The system is based on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level (the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population). Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries while Tier 2 considers marine mammal mortality caused by the individual fisheries; Tier 2 classifications are used in this EA to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). Table 24 identifies the classifications used in the List of Fisheries (LOF) proposed for FY 2010 (50 CFR 229), which are broken down into Tier 2 Categories I, II, and III).

Table 24 – Descriptions of the Tier 2 Fishery Classification Categories

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

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

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

Table 25 lists the marine mammals known to have had interactions with sink gillnets, bottom trawls, and bottom longlines within the Gulf of Maine and Georges Bank, as excerpted from the proposed LOF for FY 2010 (also see Waring et al. 2009). Northeast sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. Impacts to protected resources through interaction with bottom longline gear are not known within the operations area; however, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

Table 25 – Marine Mammals Impacts Based on Groundfishing Gear and Northeast Multispecies Fishing Areas (Based on 2010 List of Fisheries)

| Fishery | | Estimated Number of Vessels/Persons | Marine Mammal Species and Stocks Incidentally Killed or Injured |
|---|---|---|---|
| Category | Type | | |
| Tier 2, Category I | Mid-Atlantic gillnet | 7,596 | Bottlenose dolphin, western north Atlantic (WNA), coastal[a] |
| | | | Bottlenose dolphin, WNA, offshore |
| | | | Common dolphin, WNA |
| | | | Gray seal, WNA |
| | | | Harbor porpoise, Gulf of Maine(GOM)/Bay of Fundy(BOF) |
| | | | Harbor seal, WNA |
| | | | Harp seal, WNA |
| | | | Humpback whale, GOM |
| | | | Long-finned pilot whale, WNA |
| | | | Minke whale, Canadian east coast |
| | | | Short-finned pilot whale, WNA |
| | | | White-sided dolphin, WNA |
| Tier 2, Category I | Northeast sink gillnet | >6,455 | Bottlenose dolphin, WNA, offshore |
| | | | Common dolphin, WNA |
| | | | Fin whale, WNA |
| | | | Gray seal, WNA |
| | | | Harbor porpoise, GOM/BOF [a] |
| | | | Harbor seal, WNA |
| | | | Harp seal, WNA |
| | | | Hooded seal, WNA |
| | | | Humpback whale, GOM |
| | | | Minke whale, Canadian east coast |
| | | | North Atlantic right whale, WNA |
| | | | Risso's dolphin, WNA |
| | | | White-sided dolphin, WNA |

| Fishery | | Estimated Number of Vessels/Persons | Marine Mammal Species and Stocks Incidentally Killed or Injured |
|---|---|---|---|
| **Category** | **Type** | | |
| Tier 2, Category II | Mid-Atlantic bottom trawl | >1,000 | Common dolphin, WNA [a]<br>Long-finned pilot whale, WNA [a]<br>Short-finned pilot whale, WNA [a]<br>White-sided dolphin, WNA [a] |
| | Northeast bottom trawl | 1,600 | Common dolphin, WNA<br>Gray seal, WNA[b]<br>Harbor porpoise, GOM/BF<br>Harbor seal, WNA<br>Harp seal, WNA<br>Long-finned pilot whale, WNA<br>Short-finned pilot whale, WNA<br>White-sided dolphin, WNA [a] |
| | Atlantic mixed species trap/pot [c] | >429 | Fin whale, WNA [d]<br>Humpback whale, GOM |
| Tier 2, Category III | Northeast/Mid-Atlantic bottom longline/hook-and-line | 46 | None documented in recent years |

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

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

## *6.6 Human Communities/Social-Economic Environment*

This EA considers changes to the multispecies FMP and evaluates the effect such changes may have on people's way of life, traditions, and community. These "social impacts" may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. Although it is possible that social impacts would be solely experienced by individual fishery participants, it is more likely that impacts would be experienced across communities, gear cohorts, and/or vessel size classes.

The remainder of this section reviews the Northeast multispecies fishery and describes the human communities potentially impacted by the Proposed Action. This includes a description of the fishery participants as well as their homeports.

### 6.6.1 Overview of New England Groundfish Fishery

New England's fishery has been identified with groundfishing both economically and culturally for over 400 years. Broadly described, the Northeast multispecies fishery includes the landing, processing, and distribution of commercially important fish that live on the sea bottom. In the early years, the Northeast multispecies fishery related primarily to cod and haddock. The Northeast Multispecies FMP (large-mesh and small-mesh) includes a total of 12 large-mesh species of groundfish (Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout, and white hake) harvested from 3 geographic areas (Gulf of Maine, Georges Bank, and Mid-Atlantic Bight/southern New England) representing 19 distinct stocks.

Prior to the industrial revolution, the groundfish fishery focused primarily on cod. The salt cod industry, which preserved fish by salting while still at sea, supported a hook and line fishery that included hundreds of sailing vessels and shore-side industries including salt mining, ice harvesting, and boat building. Late in the 19th century, the fleet also began to focus on Atlantic halibut with landings peaking in 1896 at around 4,900 tons.

From 1900 to 1930, the fleet transitioned to steam powered trawlers and increasingly targeted haddock for delivery to the fresh and frozen fillet markets. With the transition to steam powered trawling, it became possible to exploit the groundfish stocks with increasing efficiency. This increased exploitation resulted in a series of boom and bust fisheries from 1930 to 1960 as the North American fleet targeted previously unexploited stocks, depleted the resource, and then transitioned to new stocks.

In the early 1960's, fishing pressure increased with the discovery of haddock, hake, and herring off of Georges Bank and the introduction of foreign factory trawlers. Foreign effort levels remained elevated until the passage of the Magnuson Fishery Conservation and Management Act in 1976. Early in this time period, landings of the principal groundfish (cod, haddock, pollock, hake, and redfish) peaked at about 650,000 tons. However, by the 1970's, landing decreased sharply to between 200,000 and 300,000 tons as the previously virgin GB stocks were exploited (NOAA 2007).

The exclusion of the foreign fishermen in 1976, coupled with technological advances and some strong classes of cod and haddock, caused a rapid increase in the number and efficiency of U.S. vessels participating in the Northeast groundfish fishery in the late 1970's. This shift resulted in a temporary increase in domestic groundfish landings; however overall landings continued to trend downward from about 200,000 tons to about 100,000 tons through the mid 1980s (NOAA 2007). In 1986, NEFMC implemented the Northeast Multispecies FMP with the goal of rebuilding stocks. From that time, the multispecies fishery has been administered as a limited access fishery managed through a variety of effort control measures including DAS, area closures, trip limits, minimum size limits, and gear restrictions.

Partially in response to those regulations, landing decreased throughout the latter part of the 1980s until reaching a more or less constant level of around 40,000 tons annually since the mid 1990's.

In 2004, the final rule implementing Amendment 13 to the FMP allowed for self-selected groups of limited access groundfish permit holders to form sectors. These sectors develop a legally binding operations plan and operate under an ACE. While approved sectors are subject to general requirements specified in Amendment 16 in exchange for operating under an ACE, sector members are exempt from DAS and some of the other effort control measures that tended to limit the flexibility of fishermen. The 2004 rule also authorized implementation of the first sector, the Georges Bank Cod Hook Sector and in 2006 a second sector, the Georges Bank Cod Fixed Gear Sector, was authorized.

Through Amendment 16, NEFMC sought to rewrite groundfish sector policies with a scheduled implementation date of May 1, 2009. When that implementation date was delayed until FY 2010, the NMFS Regional Administrator announced that, in addition to a previously announced 18 percent reduction in DAS, interim rules would be implemented to reduce fishing mortality during FY 2009. These interim measures generally reduced opportunity among groundfish vessels through differential DAS counting, elimination of the SNE/MA winter flounder SAP, elimination of the state waters winter flounder exemption, revisions to incidental catch allocations and a reduction in some groundfish allocations (NOAA 2009a).

In 2007, the Northeast multispecies fishery included 2,515 permits, about 1,500 of which are limited access, and about 690 active fishing vessels. Those vessels include a range of gear types including hook, bottom longline, gillnet, and trawlers (NEFMC 2009a). In FY 2009, between 40 and 50 of these vessels were members of the Georges Bank Cod Sectors. The remaining vessels were Common Pool groundfishing vessels.

There are over 100 communities that are homeport to one or more Northeast groundfishing vessels. These ports are distributed throughout the coastal northeast and in New Jersey. Vessels from these ports pursue stocks in three geographic regions: Gulf of Maine, Georges Bank, and southern New England. In 2007, the estimated dockside value of these groundfish landings was less than $60 million and represented approximately ½ of the total revenue received on trips where groundfish were landed.

Many groundfish captains and crew are second- or third-generation fishermen who hope to pass the tradition on to their children. This occupational transfer is an important component of community continuity as an important alternative occupation in these port areas, tourism, is largely seasonal.

There is little hard socio-economic data upon which to evaluate the regional or community specific importance of the multispecies fishery. In addition to the direct employment of captains and crew, the industry is known to support ancillary businesses such as gear, tackle, and bait suppliers; fish processing and transportation; marine construction and repair; and restaurants. The perceived importance of these economic interrelationships is reflected by the creation of the Cape Cod regional competitiveness council, government recommendations that NEFMC begin compiling the data necessary to evaluate the importance of the fishery to the regional economy, and the inclusion of social and economic impact analysis in the NEFMC research priorities and data needs 2009-2013.

### 6.6.2 Multispecies Fleet Home Ports

Each of these ports is described below (in alphabetic order). The primary source of information for these descriptions is the Community Profiles for Northeast US Fisheries, by NEFSC (2009). Please refer to the source documents for a list of references as all of the in-text citations in this section are implied to be 'as cited in' NEFSC (2009).

#### 6.6.2.1 Boston, Massachusetts

The City of Boston (42.35º N, 71.06º W) is the capital of Massachusetts, and is located in Suffolk County. Boston Harbor opens out onto Massachusetts Bay (USGS 2008). The city covers a total of 89.6 square miles, of which only 48.4 square miles (54 percent) is land.

##### 6.6.2.1.1 History

The City of Boston has been an important port since its founding in 1630. Early on, it was the leading commercial center in the colonies (Banner 2005) and its economy was based on fishing, shipbuilding, and trade in and out of Boston Harbor. After the Revolutionary War, Boston became one of the wealthiest international ports in the world, exporting products such as rum, tobacco, fish, and salt (Lovestead 1997). Once an important manufacturing center, with many factories and mills based along Boston's numerous rivers and in the surrounding communities, many of the manufacturing jobs began to disappear around the early 1900s, as factories moved to the South. These industries were quickly replaced, however, by banking, financing, retail, and healthcare, and Boston later became a leader in high-tech industries (Banner 2005). The city remains the largest in New England and an important hub for shipping and commerce, as well as being an intellectual and educational hub. The Boston Fish Pier, located on the South Boston waterfront, has been housing fishermen for almost a century, and is the oldest continuously operating fish pier in the United States (BHA No Date) and home to the nation's oldest daily fish auction.

##### 6.6.2.1.2 Commercial Fishing

More than 11,500 tons of fish are processed at the Fish Pier each year, of which 4,000 tons come from the 12 to 15 fishing vessels that dock there (BHA 2004). The landings show that large-mesh groundfish were the most valuable fishery in Boston, followed by monkfish and lobster (Table 26). While the value of landings in the multispecies fishery was less in 2006 than the 1997-2006 average, the value of both lobster and monkfish to Boston fishermen increased.

There are far more vessels with their homeport in Boston than there are vessel owners in Boston, indicating that most fishermen docked in Boston Harbor live elsewhere (Table 27). The landings values for both homeport and landed port varied over the period from 1997 to 2006, with no significant pattern. The landed port value exceeded the homeport value in every year, meaning some fishermen come from elsewhere to land their catch here.

Table 26 – Dollar value of Federally managed groups landed in Boston

| Federal Group | Rank Value of Average Landings from 1997-2006[d] |
|---|---|
| Large-mesh Groundfish[a] | 1 |
| Monkfish | 2 |
| Lobster | 3 |
| Other[b] | 4 |
| Squid, Mackerel, Butterfish | 5 |
| Skate | 6 |
| Scallop | 7 |
| Herring | 8 |
| Summer Flounder, Scup, Black Sea Bass | 9 |
| Small-mesh Groundfish[c] | 10 |
| Bluefish | 11 |
| Dogfish | 12 |
| Tilefish | 13 |

Notes:

[a]. Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] Only rank value is provided because value information is confidential in ports with fewer than three vessels or fewer than three dealers, or where one dealer predominates in a particular species and would therefore be identifiable.

Table 27 – Commercial Fishing Trends in Boston

| Year | Number of vessels with Boston homeport | Number of vessels whose owner receives mail in Boston |
|---|---|---|
| 1997 | 66 | 16 |
| 1998 | 49 | 10 |
| 1999 | 45 | 8 |
| 2000 | 37 | 10 |
| 2001 | 42 | 9 |
| 2002 | 45 | 9 |
| 2003 | 42 | 9 |
| 2004 | 43 | 9 |
| 2005 | 46 | 8 |
| 2006 | 46 | 7 |

### 6.6.2.2 Cundy's Harbor, Maine

The Village of Cundy's Harbor (44.40º N, 69.89º W) is located on Casco Bay within the town of Harpswell, in Cumberland County, Maine. The town of Harpswell is made up of a 10-mile peninsula extending into Casco Bay. It also includes three large islands, Bailey Island, Orr Island, and Great (Sebascodegan) Island, and over 200 small islands, creating over 216 miles of coastline for the town (TPL 2007). Cundy's Harbor is located on the tip of Great Island (USGS 2008).

#### 6.6.2.2.1 History

The town of Harpswell is geographically spread out, and is divided into five main villages: Cundy's Harbor, Harpswell, South Harpswell, Bailey Island, and Orr's Island. Cundy's Harbor is the oldest lobstering community in Maine (TPL 2007). Harpswell was incorporated as a town in 1758, under what was then the Massachusetts Bay Colony. Many tall ships, sloops, and schooners were built here during the 1800s, and fishing has been an important economic activity for the town for centuries. Today the town is often considered to have three populations: commuters, who reside here but work in Portland, Bath, or Brunswick; retirees who have moved to Harpswell; and "working townsfolk," many of whom earn their income from fishing (Hall-Arber et al. 2001).

#### 6.6.2.2.2 Commercial Fishing

There are multiple commercial wharves here including Cundy's Harbor, Holbrook's, Hawkes, Mill's Ledge Seafood, Watson's, and Oakhurst Island. Overall, lobster dominates the landings in Cundy's Harbor, worth more than $2.5 million in 2006 (Table 28). Landings in the "Other" species grouping were also significant, with the 10-year average greater than the 2006 value. The level of landings in Cundy's Harbor overall varied during this time period between about $1.5 million and over $3.4 million, with no discernible pattern (Table 29). The level of homeport fishing for Cundy's Harbor was consistently lower than the level of landings here overall, indicating that fishermen from other harbors land their catch there. The level of fishing for homeported values was also variable. The number of homeported vessels in Cundy's Harbor showed somewhat of a declining trend from 1997 to 2006, while the number of vessels with owners living in Cundy's Harbor declined sharply, from 11 in 1997 to three in 2006.

Table 28 – Commercial Fishing Trends in Cundy's Harbor

| Year | Number of vessels with Cundy's Harbor homeport | Number of vessels whose owner receives mail in Cundy's Harbor | Value of landings among vessels homeported in Cundy's Harbor[a] | Value of fisheries landed in Cundy's Harbor[a] |
|---|---|---|---|---|
| 1997 | 28 | 11 | $2,053,625 | $2,595,709 |
| 1998 | 21 | 7 | $1,611,016 | $1,577,290 |
| 1999 | 21 | 6 | $1,343,196 | $3,248,354 |
| 2000 | 17 | 3 | $1,361,446 | $3,329,120 |
| 2001 | 20 | 2 | $1,371,412 | $2,636,583 |
| 2002 | 25 | 2 | $2,029,047 | $1,797,178 |
| 2003 | 21 | 1 | $1,849,415 | $2,191,411 |
| 2004 | 19 | 2 | $1,676,130 | $3,230,312 |
| 2005 | 19 | 2 | $2,573,070 | $3,479,115 |
| 2006 | 20 | 3 | $2,708,258 | $3,206,997 |

Note:
[a] All values are reported in nominal U.S. dollars.

Table 29 – Dollar Value of Federally Managed Groups Landed in Cundy's Harbor

| Federal Group | Average from 1997-2006[d] | 2006 only[d] |
|---|---|---|
| Lobster | $2,088,171 | $2,512,267 |
| Other[a] | $500,190 | $385,155 |
| Large-mesh Groundfish[b] | $109,930 | $285,239 |
| Monkfish | $26,098 | $17,655 |
| Herring | $3,671 | $0 |
| Dogfish | $667 | $6,667 |
| Scallop | $380 | $0 |
| Skate | $106 | $0 |
| Small-mesh Groundfish[c] | $12 | $0 |
| Squid, Mackerel, Butterfish | $1 | CONFIDENTIAL |

Notes:
[a]. "Other" species includes any species not accounted for in a federally managed group.
[b] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.
[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).
[d] All values are reported in nominal U.S. dollars.

### 6.6.2.3 Gloucester, Massachusetts

The City of Gloucester (42.62°N, 70.66°W) is located on Cape Ann, along the northern coast of Massachusetts in Essex County. It is 30 miles northeast of Boston and 16 miles northeast of Salem. The area encompasses 41.5 square miles of territory, of which 26 square miles is land (USGS 2008).

#### 6.6.2.3.1 History

The history of Gloucester has revolved around the fishing and seafood industries since its settlement in 1623. By the mid 1800s, Gloucester was regarded by many to be the largest fishing port in the world. The construction of memorial statues and an annual memorial to fishermen demonstrates that the historic death tolls in commercial fisheries are still in the memory of the town's residents. The town is well-known as the home of Gorton's frozen fish packaging company, the nation's largest frozen seafood company. As in many communities, after the U.S. passed the Magnuson Fishery Conservation and Management Act of 1976 and foreign vessels were prevented from fishing within the EEZ, Gloucester's fishing fleet soon increased -- only to decline with the onset of major declines in fish stocks and subsequent strict catch regulations. For more detailed information regarding Gloucester's history, see Hall-Arber et al. (2001).

#### 6.6.2.3.2 Commercial Fishing

Although there are threats to the future of Gloucester's fishery, the fishing industry remains strong in terms of recently reported landings. Gloucester's commercial fishing industry had the 13th highest landings in the U.S. (over 39,000 tons) and the nation's ninth highest landing value in 2002 ($41.2 million). Gloucester's federally managed group with the highest landed value was large-mesh groundfish worth nearly $20 million in 2006 (Table 30). Lobster landings were second in value, bringing in more than $10 million in 2006, a significant increase from the 1997-2006 average value of just over $7 million. Monkfish and herring were also valuable species; both had more valuable landings in 2006 than the 10-year average value. The number of vessels homeported (federal) decreased slightly from 1997 to 2006 (Table 31).

Table 30 – Dollar value of Federally managed groups landed in Gloucester

| Federal Group | Average from 1997-2006[d] | 2006 only[d] |
|---|---|---|
| Large-mesh Groundfish[a] | $17,068,934 | $19,577,975 |
| Lobster | $7,036,231 | $10,179,221 |
| Monkfish | $3,556,840 | $4,343,644 |
| Other[b] | $3,246,920 | $1,906,551 |
| Herring | $3,127,523 | $5,623,383 |
| Squid, Mackerel, Butterfish | $1,065,567 | $3,692,506 |
| Scallop | $735,708 | $1,113,749 |
| Small-mesh Groundfish[c] | $732,353 | $254,287 |
| Dogfish | $375,972 | $316,913 |
| Skate | $63,488 | $27,334 |
| Tilefish | $52,502 | $245,398 |
| Surf Clams, Ocean Quahog | $29,033 | $77,805 |
| Bluefish | $21,672 | $18,116 |
| Summer Flounder, Scup, Black Sea Bass | $1,286 | $603 |

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

Table 31 – Commercial Fishing Trends in Gloucester

| Year | Number of vessels with Gloucester homeport | Number of vessels whose owner receives mail in Gloucester | Value of landings among vessels homeported in Gloucester[a] | Value of fisheries landed in Gloucester[a] |
|---|---|---|---|---|
| 1997 | 123 | 49 | $14,260,267 | $43,219,804 |
| 1998 | 104 | 43 | $11,898,155 | $35,203,041 |
| 1999 | 116 | 47 | $14,781,969 | $42,393,247 |
| 2000 | 115 | 43 | $16,486,230 | $45,434,740 |
| 2001 | 109 | 39 | $15,488,517 | $34,356,660 |
| 2002 | 107 | 40 | $15,208,020 | $40,396,946 |
| 2003 | 114 | 40 | $15,478,904 | $28,892,963 |
| 2004 | 111 | 38 | $17,763,527 | $34,690,050 |
| 2005 | 111 | 43 | $18,051,059 | $34,613,266 |
| 2006 | 104 | 44 | $13,255,702 | $27,825,058 |

Note:

[a] All values are reported in nominal U.S. dollars.

### 6.6.2.4 New Bedford, Massachusetts

New Bedford is the fourth largest city in Massachusetts. It is situated on Buzzards Bay, located in the southeastern section of the state in Bristol County. The city is 54 miles south of Boston (State of Massachusetts 2006), and has a total area of 24 square miles, of which about 4 square miles (16.2 percent) is water (USGS 2008).

#### 6.6.2.4.1 History

Settled in 1652, a New Bedford fishing community was established in 1760. The port focused largely on whaling until the discovery of petroleum decreased the demand for sperm oil in the mid- to late 1800's. At that time, New Bedford began to diversify its economy, by expanding the focus of the fishing fleet, and focusing on the manufacture of textiles until the southeast cotton boom in the 1920s.
Since then, New Bedford has continued to diversify, but the city is still a major commercial fishing port (USGenNet 2006) consistently ranked among the top two ports in the U.S. for landed value. One factor complicating further development of the New Bedford harbor area is its listing by U.S. EPA as a superfund site due to the presence of metals, organic compounds, and PCBs.

#### 6.6.2.4.2 Commercial Fishing

The number of commercial fishing vessels homeported in New Bedford increased from 244 in 1997 to 273 in 2006 as fishermen moved to New Bedford to take advantage of commercial fishing infrastructure. Concurrent with this increase in homeported vessels, the value of fishing for homeport vessels more than doubled from $80 million to $184 million from 1997 to 2006 and the value of New Bedford landings increased to $281 million (Table 32). However, over that same time the value of groundfish landings decreased approximately 20 percent (Table 33).

Table 32 – Commercial Fishing Trends in New Bedford

| Year | Number of vessels with New Bedford homeport | Number of vessels whose owner receives mail in New Bedford | Value of landings among vessels homeported in New Bedford[a] | Value of fisheries landed in New Bedford[a] |
|---|---|---|---|---|
| 1997 | 244 | 162 | $80,472,279 | $103,723,261 |
| 1998 | 213 | 137 | $74,686,581 | $94,880,103 |
| 1999 | 204 | 140 | $89,092,544 | $129,880,525 |
| 2000 | 211 | 148 | $101,633,975 | $148,806,074 |
| 2001 | 226 | 153 | $111,508,249 | $151,382,187 |
| 2002 | 237 | 164 | $120,426,514 | $168,612,006 |
| 2003 | 245 | 181 | $129,670,762 | $176,200,566 |
| 2004 | 257 | 185 | $159,815,443 | $206,273,974 |
| 2005 | 271 | 195 | $200,399,633 | $282,510,202 |
| 2006 | 273 | 199 | $184,415,796 | $281,326,486 |

Note:
[a] All values are reported in nominal U.S. dollars.

Table 33 – Dollar value of Federally managed groups landed in New Bedford

| Federal Group | Average from 1997-2006[d] | 2006 only[d] |
|---|---|---|
| Scallop | $108,387,505 | $216,937,686 |
| Large-mesh Groundfish[a] | $30,921,996 | $23,978,055 |
| Monkfish | $10,202,039 | $8,180,015 |
| Surf Clams, Ocean Quahog | $7,990,366 | $9,855,093 |
| Lobster | $4,682,873 | $5,872,100 |
| Other[b] | $4,200,323 | $2,270,579 |
| Skate | $2,054,062 | $3,554,808 |
| Squid, Mackerel, Butterfish | $1,916,647 | $5,084,463 |
| Summer Flounder, Scup, Black Sea Bass | $1,481,161 | $2,227,973 |
| Small-mesh Groundfish[c] | $897,392 | $1,302,488 |
| Herring | $767,283 | $2,037,784 |
| Dogfish | $89,071 | $13,607 |
| Bluefish | $25,828 | $10,751 |
| Tilefish | $2,675 | $1,084 |

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] “Other” species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

In addition to the commercial fleet, New Bedford has approximately 44 fish wholesale companies, 75 seafood processors, and about 200 shore-side industries (Hall-Arber 2001). This core seafood industry supports 2,600 local jobs, which represents 45 percent of employment in the seafood harvesting sector in Massachusetts (State of Massachusetts 2002).

#### 6.6.2.5 Newport, Rhode Island

Newport, Rhode Island (41.50°N, 71.30°W) is located at the southern end of Aquidneck Island in Newport County (USGS 2008). The city is located 60 miles from Boston, Massachusetts, and about 187 miles from New York City.

##### 6.6.2.5.1 History

English settlers founded Newport in 1639 (City of Newport No Date). Although Newport’s port is now mostly dedicated to tourism and recreational boating, it has had a long commercial fishing presence. In the mid 1700s, Newport was one of the five largest ports in colonial North America. Until Point Judith’s docking facilities were developed, Newport was the center for fishing and shipping in Rhode Island (Hall-Arber et al. 2001; RIEDC 2008).

Between 1800 and 1930, the bay and inshore fleet dominated the fishing industry of Newport. Menhaden was the most important fishery in Newport and all of Rhode Island until the 1930s when the fishery collapsed. At this time, the fishing industry shifted to groundfish trawling. The use of the diesel engine, beginning in the 1920s, facilitated fishing farther from shore than was done in prior years (Hall-Arber et al. 2001).

#### 6.6.2.5.2 Commercial Fishing

Of the federal landed species, scallop had the highest value in 2006, at over $13 million. The average value of scallop landings for 1997-2006 was just over $2.5 million; 2006 landings represent a more than five-fold increase over this average value. Lobster was the most valuable species, worth more than $2.7 million on average, and close to $3 million in 2006. The squid, mackerel, and butterfish grouping, large-mesh groundfish, and monkfish were all valuable fisheries in Newport (Table 34). The value of landings for homeported vessels in Newport was relatively consistent from 1997-2006, with a high of just under $8 million in 2003 (Table 35). The level of landings in Newport was steady from 1997-2004, and then saw enormous increases in 2005 and 2006, to almost $21 million in 2006. Homeported vessels in Newport declined from a high of 59 in 2000 to 48 in 2006. The number of vessels with owners living in Newport increased from 13 in 1997 to 18 in 2006 indicating that most vessels homeported in Newport have owners residing in other communities.

Table 34 - Dollar value of Federally managed groups landed in Newport

| Federal Group | Average from 1997-2006[d] | 2006 only[d] |
|---|---|---|
| Lobster | $2,578,908 | $2,971,680 |
| Scallop | $2,528,448 | $13,267,494 |
| Squid, Mackerel, Butterfish | $1,425,947 | $1,315,229 |
| Large-mesh Groundfish[a] | $1,039,962 | $445,273 |
| Monkfish | $878,265 | $1,068,547 |
| Summer Flounder, Scup, Black Sea Bass | $739,880 | $815,918 |
| Other[b] | $334,103 | $401,779 |
| Small-mesh Groundfish[c] | $179,296 | $43,165 |
| Skate | $58,481 | $224,184 |
| Herring | $42,538 | $267,164 |
| Dogfish | $26,441 | $6,037 |
| Red Crab | $15,560 | $0 |
| Bluefish | $11,759 | $9,878 |
| Tilefish | $9,230 | $1,213 |

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

Table 35 - Commercial Fishing Trends in Newport

| Year | Number of vessels with Newport homeport | Number of vessels whose owner receives mail in Newport | Value of landings among vessels homeported in Newport [a] | Value of fisheries landed in Newport [a] |
|---|---|---|---|---|
| 1997 | 52 | 13 | $5,130,647 | $7,598,103 |
| 1998 | 52 | 16 | $6,123,619 | $8,196,648 |
| 1999 | 52 | 14 | $6,313,350 | $8,740,253 |
| 2000 | 59 | 14 | $6,351,986 | $8,296,017 |
| 2001 | 52 | 15 | $5,813,509 | $7,485,584 |
| 2002 | 55 | 17 | $6,683,412 | $7,567,366 |
| 2003 | 52 | 16 | $7,859,848 | $9,082,560 |
| 2004 | 52 | 15 | $5,951,228 | $8,402,556 |
| 2005 | 54 | 17 | $6,012,472 | $14,281,505 |
| 2006 | 48 | 18 | $6,811,060 | $20,837,561 |

Note:
[a] All values are reported in nominal U.S. dollars.

### 6.6.2.6 Portland Harbor, Maine

The city of Portland, Maine (43.66 N, 70.2 W) has 56.9 miles of coastline (Sheehan and Copperthwaite 2002), a terrestrial area of 54.9 square miles, and 31.4 square miles of water. It is located in Cumberland County on Casco Bay, and is adjacent to South Portland, Westbrook, and Falmouth. Portsmouth and Manchester, New Hampshire are the closest large cities (MapQuest 2006). Portland is the largest city in Maine and has the highest population in New England north of Boston.

#### 6.6.2.6.1 History

The city's port industries have driven its economy since its settlement. From the mid-1800s until World War I, Portland provided the only port for Montreal, Canada. Railroads from the south to the north fed through the city, facilitating trade and travel. Although Canada developed its own ports, and other cities in southern New England states built larger ports, the city remained tied to its maritime roots by depending on the fishing industry. More recently, it has become a popular cruise ship destination. Although tourism plays a major role in the city's economy, Portland functions as the second largest oil port on the east coast of the U.S., and as valuable fishing port (Monroe No Date). For a more detailed history of Portland and the surrounding fishing communities, refer to Hall Arber et al. (2001).

#### 6.6.2.6.2 Commercial Fishing

Portland's landings come primarily from the large-mesh groundfish species and from lobster, with over $14 million and $12 million respectively over the 10-year average (Table 36). Monkfish and herring are also important species. There was also a variety of other species landed in Portland between the years 1997-2006. Both the number of vessels homeported and number of vessels registered with owner's living in Portland slightly decreased between 1997 and 2006. The level of fishing homeport value increased until 2006, where there was a drop from over $18 million in the previous year to about $13 million. The level of fishing landed experienced a similar trend, with a dip from 2005 to 2006 of over $6 million (Table 37).

Table 36 - Dollar value of Federally managed groups landed in Portland Harbor

| Federal Group | Average from 1997-2006[d] | 2006 only[d] |
|---|---|---|
| Large-mesh Groundfish[a] | $14,433,950 | $10,756,311 |
| Lobster | $12,616,286 | $8,737,373 |
| Monkfish | $4,908,022 | $3,094,679 |
| Herring | $2,524,047 | $4,423,437 |
| Other[b] | $2,007,356 | $684,362 |
| Scallop | $65,950 | $72,250 |
| Small-mesh Groundfish[c] | $44,811 | $168 |
| Skate | $44,582 | $933 |
| Squid, Mackerel, Butterfish | $17,444 | CONFIDENTIAL |
| Tilefish | $15,623 | CONFIDENTIAL |
| Summer Flounder, Scup, Black Sea Bass | $12,334 | CONFIDENTIAL |
| Dogfish | $12,023 | $12,211 |
| Bluefish | $151 | $73 |

Notes:

a. "Other" species includes any species not accounted for in a federally managed group.

b Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

c Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

d All values are reported in nominal U.S. dollars.

Table 37 - Commercial Fishing Trends in Portland

| Year | Number of vessels with Portland homeport | Number of vessels whose owner receives mail in Portland | Value of landings among vessels homeported in Portland[a] | Value of fisheries landed in Portland[a] |
|---|---|---|---|---|
| 1997 | 123 | 49 | $14,260,267 | $43,219,804 |
| 1998 | 104 | 43 | $11,898,155 | $35,203,041 |
| 1999 | 116 | 47 | $14,781,969 | $42,393,247 |
| 2000 | 115 | 43 | $16,486,230 | $45,434,740 |
| 2001 | 109 | 39 | $15,488,517 | $34,356,660 |
| 2002 | 107 | 40 | $15,208,020 | $40,396,946 |
| 2003 | 114 | 40 | $15,478,904 | $28,892,963 |
| 2004 | 111 | 38 | $17,763,527 | $34,690,050 |
| 2005 | 111 | 43 | $18,051,059 | $34,613,266 |
| 2006 | 104 | 44 | $13,255,702 | $27,825,058 |

Note:

a All values are reported in nominal U.S. dollars.

### 6.6.2.7 Portsmouth, New Hampshire

Portsmouth (43.03° N, 70.47°W) (USGS 2008) is located in Rockingham County, New Hampshire. Portsmouth Harbor is located by the mouth of the Piscataqua River, which allows deep water access (State of New Hampshire DHR 2006). Portsmouth is located along the State's seaboard that only totals about 18 miles.

#### 6.6.2.7.1 History

The City of Portsmouth is the second oldest city in New Hampshire. It was originally settled in 1623 as Strawberry Banke and was incorporated as Portsmouth in 1631. Fishing, farming, shipbuilding, and coastal trade were the major industries throughout New Hampshire in the 1600s. By 1725, Portsmouth was a thriving commercial port, exporting timber products and importing a wide range of goods (Wallace 2006). However, the 1800s brought change to Portsmouth as the seacoast declined as a commercial center. Many nearby towns, like Dover, Newmarket, and Somersworth, turned to textile manufacturing (Wallace 2006). The Portsmouth Naval Shipyard, established in June 1800, is the oldest naval shipyard continuously operated by the United States Government (PNS No Date). In recent times, high-tech industries and an increase in tourism has transformed Portsmouth and all of southern New Hampshire, making New Hampshire into the fastest growing state in the Northeast (State of New Hampshire DHR 2006).

#### 6.6.2.7.2 Commercial Fishing

Large-mesh groundfish and monkfish were the most valuable landings in Portsmouth between the years 1997 and 2006 (Table 38). Additionally, lobster, "other" species, and sea scallops accounted for a large portion of the value of species landed in Portsmouth. The value of landings of most of these species groupings had declined in 2006 from the 1997-2006 average; lobster landings had increased considerably, however, and were the most valuable landings for Portsmouth in 2006.

The number of homeported vessels has varied between the years 1997 and 2006, but overall showed an increasing trend. In 1997, there were 54 vessels which increased to a high of 67 vessels in 2004. The number of vessels where the owner's city is Portsmouth varies slightly over the years with no consistent trend (Table 39).

Table 38 - Dollar value of Federally managed groups landed in Portsmouth

| Federal Group | Rank Value of Average Landings from 1997-2006[d] |
|---|---|
| Large-mesh Groundfish[a] | 1 |
| Monkfish | 2 |
| Lobster | 3 |
| Other[b] | 4 |
| Scallop | 5 |
| Dogfish | 6 |
| Herring | 7 |
| Small-mesh Groundfish[c] | 8 |
| Skate | 9 |
| Bluefish | 10 |
| Squid, Mackerel, Butterfish | 11 |
| Summer Flounder, Scup, Black Sea Bass | 12 |
| Tilefish | 13 |

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] Only rank value is provided because value information is confidential in ports with fewer than three vessels or fewer than three dealers, or where one dealer predominates in a particular species and would therefore be identifiable.

Table 39 – Commercial Fishing Trends in Portsmouth

| Year | Number of vessels with Portsmouth homeport | Number of vessels whose owner receives mail in Portsmouth |
|---|---|---|
| 1997 | 54 | 26 |
| 1998 | 44 | 20 |
| 1999 | 45 | 18 |
| 2000 | 62 | 21 |
| 2001 | 63 | 22 |
| 2002 | 59 | 25 |
| 2003 | 54 | 21 |
| 2004 | 67 | 29 |
| 2005 | 64 | 20 |
| 2006 | 66 | 19 |

### 6.6.3 Economic Status of Commercial Harvesting Sector

#### 6.6.3.1 DAS Allocation and Use

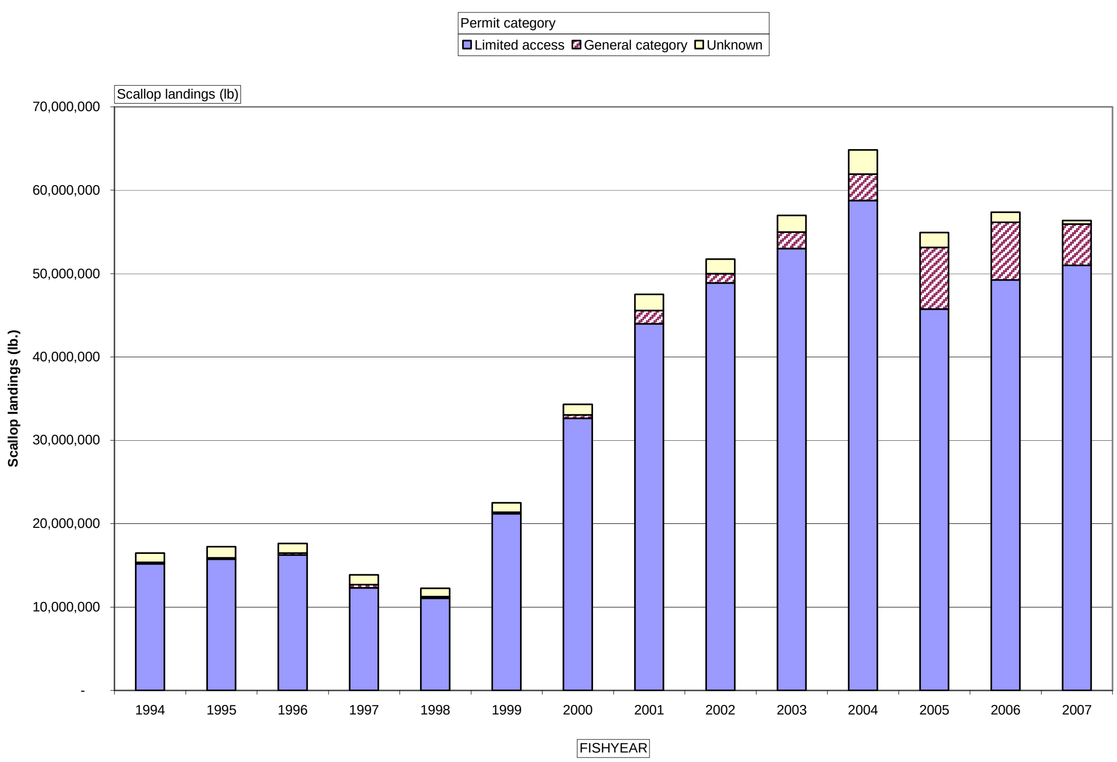
#### 6.6.3.2 DAS Leasing and Transfer History

### 6.6.4 Economic Status of Scallop Fleet

#### 6.6.4.1 Trends in Landings, prices and revenues

In the fishing years 2002-2007, the landings from the northeast sea scallop fishery stayed above 50 million pounds, surpassing the levels observed historically (Figure 16). The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16 million pounds during the 1994-1998 fishing years, less than one-third of the present level of landings. The increase in the abundance of scallops coupled with higher scallop prices increased the profitability of fishing for scallops by the general category vessels. As a result, general category landings increased from less than 0.4 million pounds during the 1994-1998 fishing years to more than 5 million pounds during the last three fishing years (2005-2007), peaking at 7 million pounds in 2005 or 13.5% of the total scallop landings.

Figure 16. Scallop landings by permit category and fishing year (dealer data)



**Data source and uncertainties:** Figure 16 is based on information obtained from the dealer database. The permit categories were not always identified correctly in the dealer data, such that some limited access landings were recorded incorrectly as ‘‘general category”. Based on the data review done in 2006, some corrections were made to the outlier data items. State of Connecticut landings were shown as a sum of landings by all vessels regardless of the permit category. For that reason, the composition of landings in terms of the permit category cannot be identified for the ‘unknown” category. The landings from Connecticut will be reported by permit after 2007 on (Greg Power e-mail).

Figure 17 shows that total fleet revenues for the limited access vessels tripled from about $100 million in 1994 to over $300 million in 2007 in inflation-adjusted 2006 dollars. Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the main factor that led to the increase in revenue in the recent years compared to 1994-1998 and in fact, the inflation adjusted ex-vessel price of scallops in 2007 was lower than the price in 1994. The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active limited access vessels during the same period. Figure 18 shows that average landings and revenue per limited access vessel more than doubled in recent years compared to the period 1994 -1998. The number of active vessels increased by 50 % (from about 220 in 1994 to 346 in fishing year 2007) resulting in tripling of total fleet scallop landings and revenue in 2007 compared to 1994 (Figure 18).

Figure 17. Trends in total scallop landings, revenue and ex-vessel price by fishing year (limited access fishery only)

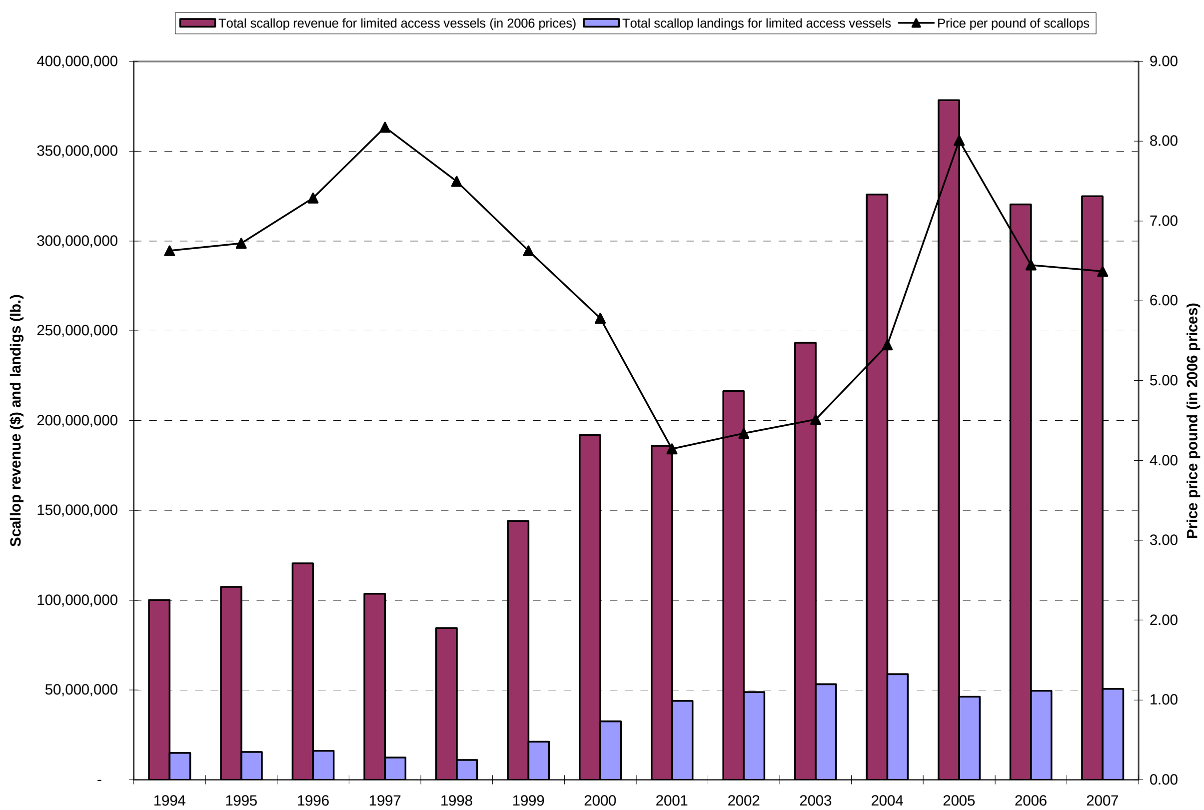
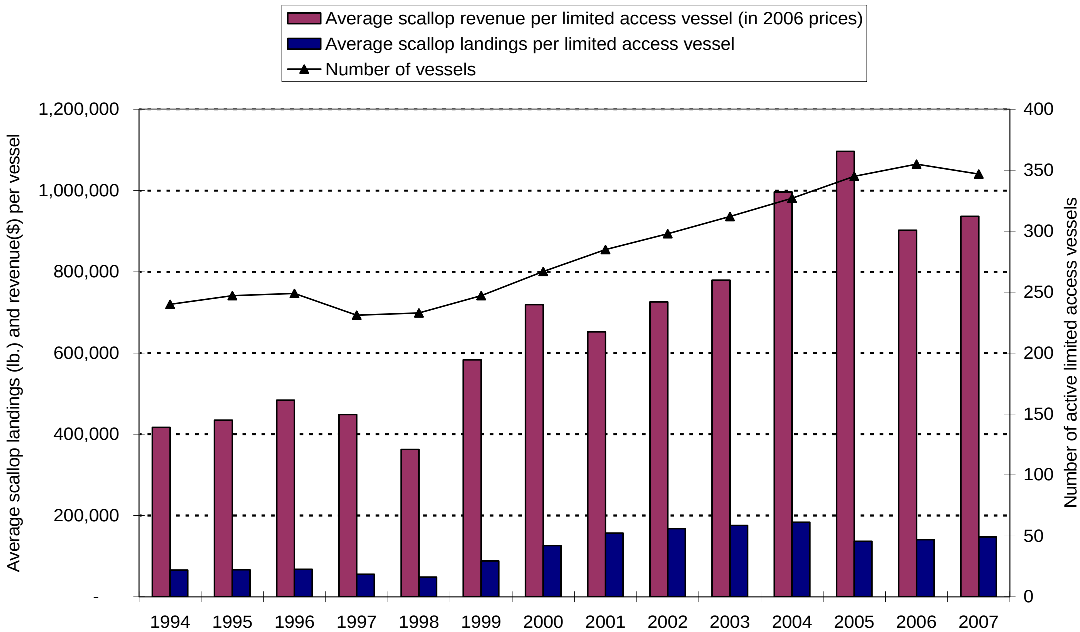


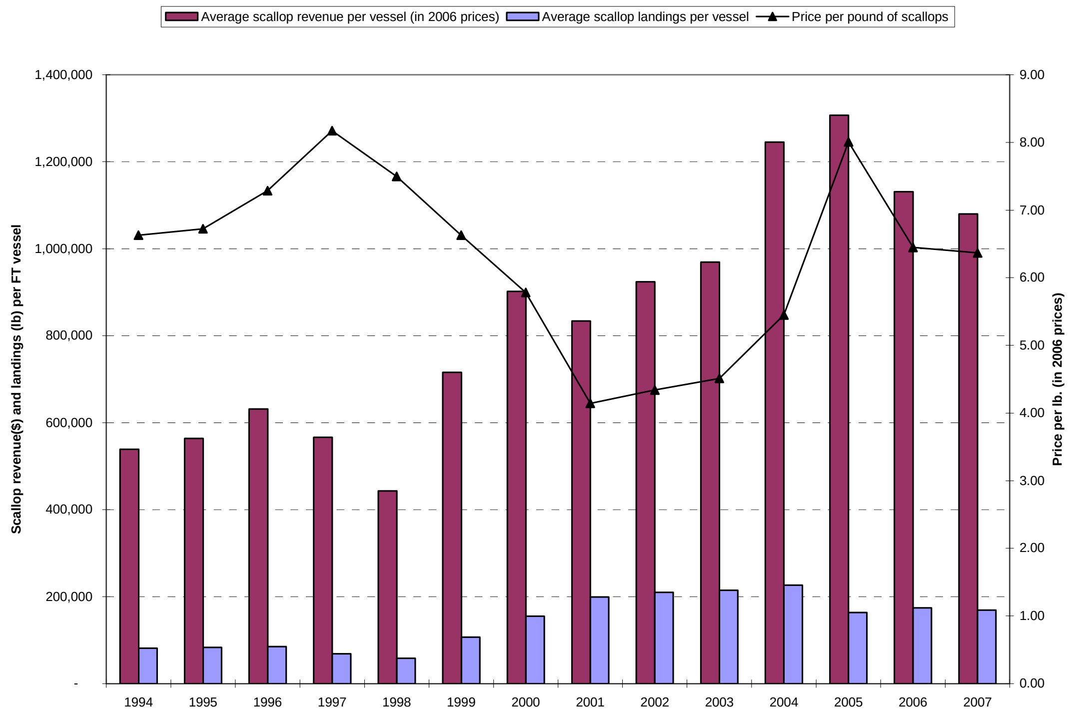
Figure 18. Trends in average scallop landings and revenue per full time vessel and number of active vessels (including full-time, part-time and occasional vessels)




The trends in revenue per full-time vessel were similar to the trends for the fleet as a whole. The following analyses show the trends for 124 full-time vessels that were active in the scallop fishery for 14 years; that is, for every year from fishing year 1994 to the end of fishing year 2007. In addition, each vessel in this group used more than 50% of their DAS allocation, and average HP was 904 and GRT was 167 for this group of vessels. This group was selected so that the average trends will not be biased by including vessels that participated in the fishery only a few years, mainly in the recent years. For example, there were about 56 full-time vessels that were active for 4 years or less as of the 2006 fishing year. These vessels had a lower fishing power (smaller HP and GRT) and consequently had lower revenues and profits than the 124 full-time vessels included in the sample. Including these smaller vessels would reduce the average profits and revenues in the recent years relative to the earlier fishing years and would underestimate the increase in average profit per full-time vessel in recent years. Similarly, the full-time vessels that used less than 50% of their DAS allocation either because of choice or because of data inaccuracies are not included in the sample group of full-time vessels, because including them would either underestimate the average revenue or trip costs per vessel, resulting in lower profits in the first and higher profits in the second case.

Figure 19 shows that average scallop revenue per full-time vessel in the sample of 124 vessels doubled from about $538,000 in 1994 to over 1,080,000 in 2007 despite the fact that inflation adjusted ex-vessel price per pound of scallops was slightly higher in 1994 ($6.60 per pound) compared to the ex-vessel price in 2007 ($6.40 per pound). In other words, the doubling of revenue was the result of the doubling of the average scallop landings per vessel in 2007 (over 169,000 pounds) from its level in 1994 (over 81,500 pounds). The total fleet revenue for all the limited access vessels more than tripled during the same years as new vessels became active. Average scallop revenue per full-time vessel peaked in the 2005 fishing year to over $1.3 million as a result of higher landings combined with an increase in ex-vessel price to about $8.00 per pound of scallops.

Figure 19. Trends in average scallop landings and revenue per full time vessel (sample of 124 vessels)




## 6.6.4.2 Trends in effort

### 6.6.4.2.1 Trends in DAS-used

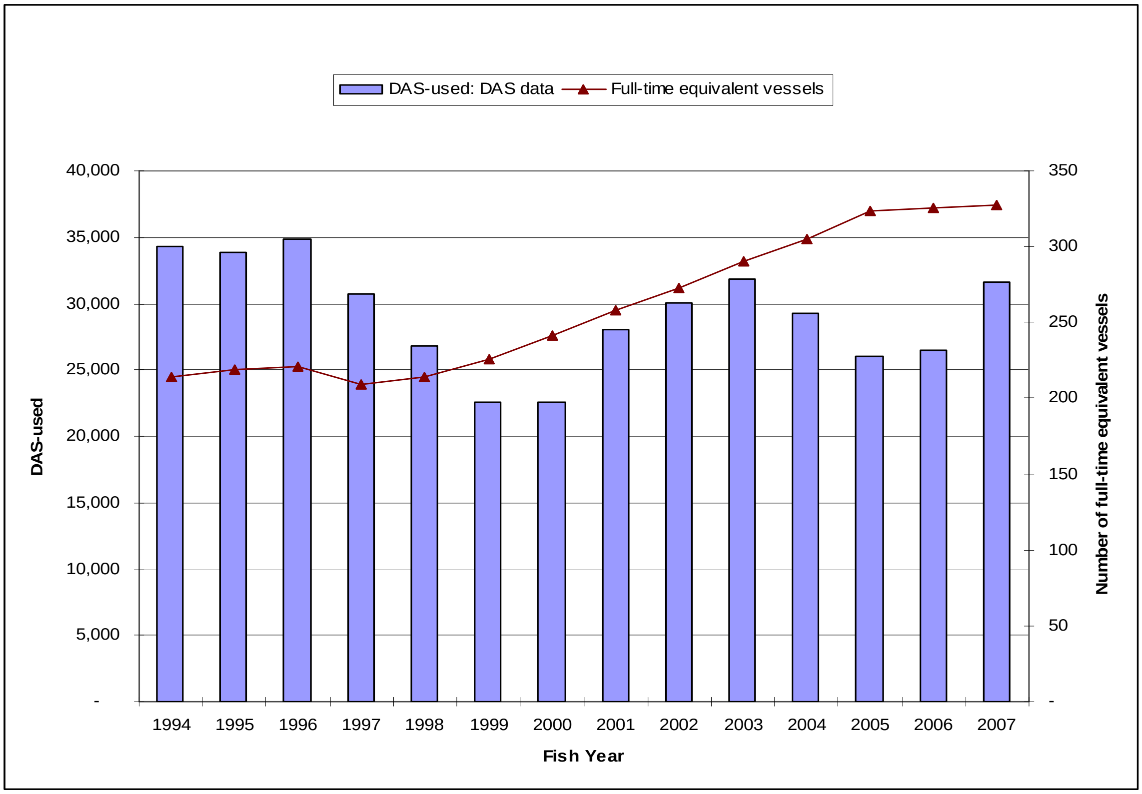
There has been a steady decline in the total DAS used by the limited access scallop vessels from the 1994 to 2001 fishing years as a result of the effort-reduction measures of Amendment 4 (1994) and Amendment 7 (1999)). DAS allocations during this period were reduced almost by half from 204 DAS in 1994 to 120 DAS for the full-time vessels and in the same proportions for the part-time and occasional vessels from their base levels in 1994 (Table 40). As a result, DAS used reached the lowest levels of about 22,550 days in the 1999 and 2000 fishing years from about 34,000 days in 1994, even though the number of full-time equivalent vessels increased during these years from 214 vessels in 1994 to 241 vessels in 2000 (Figure 20). Average DAS used per full-time vessel declined from 161 days in 1994 to 93 days in 2000. The low levels of resource abundance discouraged many vessels from fishing for scallops during those years.

Table 40. DAS and trip allocations per full-time vessel

| Year | Allocations based on the Management Action | Total DAS Allocation (1) | Estimated Open area DAS allocations (2) | Access area trip allocations (3) | DAS charge or equivalent per access area trip (4) | Equivalent (estimated) DAS allocation for access areas (5) |
|---|---|---|---|---|---|---|
| 1994 | Amendment 4 | 204 | None | None | | None |
| 1995 | Amendment 4 | 182 | None | None | | None |
| 1996 | Amendment 4 | 182 | None | None | | None |
| 1997 | Amendment 4 | 164 | None | None | | None |
| 1998 | Amendment 4 | 142 | None | None | | None |
| 1999 | Amendment 7, Framework 11 | 120 | 90 to 120 | 3 | 10 | 0 to 30 |
| 2000 | Framework 13 | 120 | 60 to 120 | 6 | 10 | 0 to 60 |
| 2001 | Framework 14 | 120 | 90 to 120 | 3 | 10 | 0 to 30 |
| 2002 | Framework 14 | 120 | 90 to 120 | 3 | 10 | 0 to 30 |
| 2003 | Framework 15 | 120 | 90 to 120 | 3 | 10 | 0 to 30 |
| 2004 | Framework 16 | 126 | 42 (MAX.62) | 7 | 12 | 84 |
| 2005 | Framework 16 | 100 | 40 (MAX.117) | 5 | 12 | 60 |
| 2006 | Framework 18 | 112 | 52 | 5 | 12 | 60 |
| 2007 | Framework 18 | 111 | 51 | 5 | 12 | 60 |

(1) Total DAS allocation per full-time vessel represents a rough estimate for years 2004-07 since DAS is allocated for open areas only. DAS allocation for access areas is estimated by assuming an equivalent 12 days-at-sea allocation for each access area trip with a possession limit of 18,000 pounds

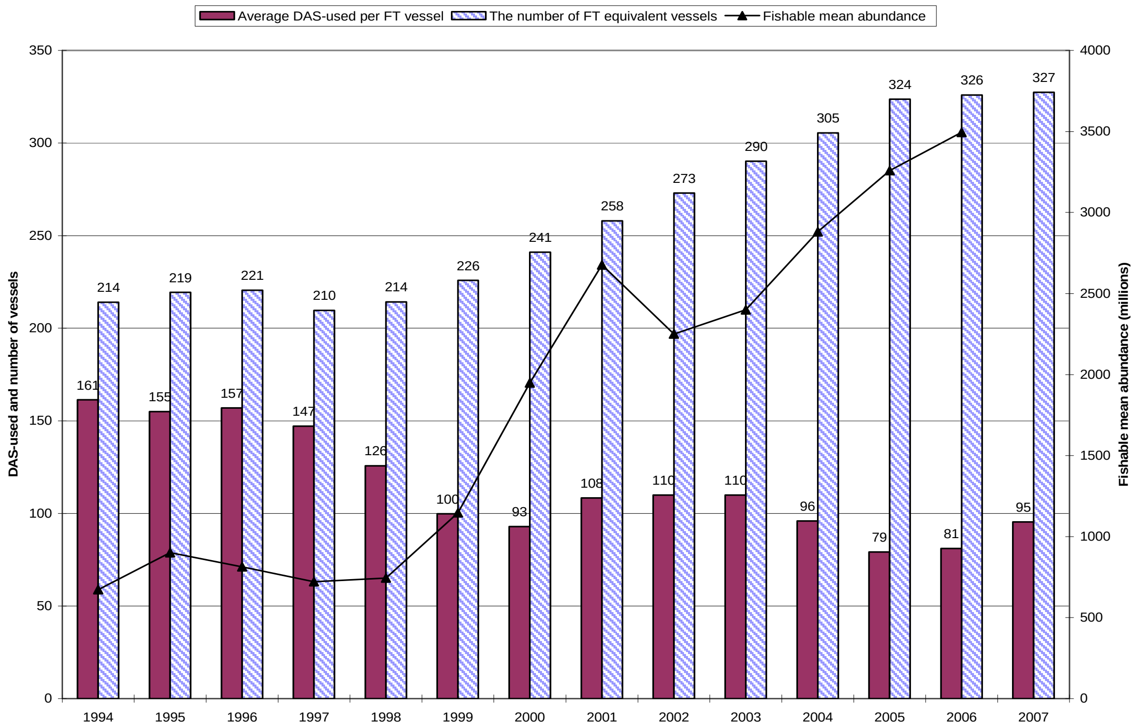
Figure 20.Total DAS-used and the number of active (full-time equivalent) vessels in the sea scallop fishery




| | | |
|---|---|---|
| **DAS Data sources:** Reporting changes cause uncertainty in comparing trends in DAS-used. | | |
| 1994-2003 | SOLE | Enforce.FISHYY |
| 2004-05 | CUDA1 | DAS.trips |

After fishing year 2000, fishing effort started to increase as vessels spent more DAS and more limited access vessels participated in the sea scallop fishery. The increase in total effort was mostly due to the increase in the number of vessels. The DAS used per full-time vessel increased to 110 days during 2002-2003 fishing years from 93 days in 2000. This level was still significantly lower than DAS used in the mid-1990s (over 150 days, Figure 21). During those years there was no change in the total DAS allocations (120 DAS per full-time vessel).The recovery of the scallop resource and the dramatic increase in fishable abundance after 1999 increased the profits in the scallop fishery, thus leading to an increase in participation by the limited access vessels that had been inactive during the previous years. Georges Bank closed areas were opened to scallop fishing starting in 1999 by Framework 11 (CAII) and later by Framework 13 (CAII, CAI, NLS), encouraging many vessel owners to take the opportunity to fish in those lucrative areas. Frameworks 14 and 15 provided controlled access to Hudson Canyon and VA/NC areas. As a result, 49 new full-time equivalent vessels became active in the sea scallop fishery after 2000 during the next three fishing years. The total number of full-time equivalent vessels reached to 290 in 2003 and total fishing effort by the fleet increased to 31,800 days in 2003 from about 22,600 in 2000 (Figure 20).

Figure 21. Average DAS-used per full-time vessel, the number of full-time equivalent active vessels and fishable mean abundance in the sea scallop fishery (excluding general category fishery)




Total fishing effort (DAS-used) declined after 2003 even though the number of active vessels increased to 326 vessels in 2006 from 290 vessels in 2003. With the implementation of Amendment 10 (2004) the limited access vessels were allocated DAS for open areas and a number of trips for the specific access areas with no open area trade-offs. The open area allocations were reduced to 42 DAS in 2004 whereas full-time vessels were allocated 7 access area trips in the same year (Table 40, Framework 16). Even though total DAS equivalent allocations remained around the same levels during 2005-07 (at about 110 equivalent days, Table 40), the fishing effort, i.e., fleet DAS used increased in the 2007 fishing year as many vessels took their unused 2005 HCA trips in that year. If not for those HCA trips, the total effort in the scallop fishery would probably have stayed constant during 2005-2007 with almost all qualified limited access vessels participating in the fishery.

#### 6.6.4.2.2 Effort by open and access areas

Until 2004, DAS was allocated for the whole fishing area. Starting with Framework 16, DAS was allocated for the open areas only whereas for access areas the vessels received trip allocations. The unused Georges Bank controlled access area trips could be transferred to open areas due to the closure of access areas when yellowtail flounder catch reaches annual TAC. For example, a vessel that has taken two of three controlled access trips, may fish for 12 additional DAS in the open areas (totaling 42+12=54 DAS for the fishing year). In 2004, the DAS allocation for open areas without access trips was 62 days, meaning that a vessel can transfer no more than 20 DAS from a closed controlled access to open areas. So a vessel that has taken only one of three or has not yet fished in a closed controlled access area, may transfer no more than 20 DAS to the open areas, totaling 62 open area DAS for the fishing year. Table 40 provides the maximum number of DAS that could have been used in open areas due to transferring DAS from unused controlled access trips. DAS transfers were allowed only for the Georges Bank access areas and would exclude Mid-Atlantic access areas. As a results of these transfers and carry-over DAS used by some vessels, average open area DAS-used by full-time vessels were about 52 days in 2004, and 44 days in 2005, higher than the base open area allocations in either year.

Table 41. DAS-used and the number of trips by full-time vessels by area

| AREA | DATA | FISHYEAR | | | |
|---|---|---|---|---|---|
| | | 2004 | 2005 | 2006 | 2007 |
| ACCESS | Allocated number of trips | 7 | 5 | 5 | 5 |
| | Average DAS-used per vessel | 45 | 37 | 30 | 49 |
| | Average number of trips per vessel | 6 | 5 | 5 | 8 * |
| | Average trip length | 8 | 8 | 6 | 6 |
| | Total number of trips | 1636 | 1371 | 1386 | 2390 |
| | Total DAS-used | 12864 | 11039 | 8681 | 15492 |
| | Number of full-time vessels fished | 289 | 302 | 289 | 317 |
| OPEN | DAS allocation per vessel | 42 | 40 | 52 | 51 |
| | Average DAS-used per vessel | 52 | 44 | 54 | 46 |
| | Number of trips | 8 | 8 | 7 | 6 |
| | Average trip length | 8 | 7 | 8 | 9 |
| | Total number of trips | 2214 | 2360 | 2261 | 1749 |
| | Total DAS-used | 15328 | 13656 | 16915 | 14620 |
| | Number of full-time vessels fished | 293 | 312 | 317 | 319 |
| ALL AREAS | Average DAS used per vessel | 97 | 81 | 84 | 95 |
| | Total DAS-used | 28192 | 24695 | 25596 | 30112 |
| | Total number of active vessels | 293 | 312 | 317 | 319 |

(*) Because of carry-over trips taken in HCA in 2007, number of trips is greater than the number of allocated trips. See Table 43 below.

Framework 16 allocated 4 trips to HCA in 2004 and 3 trips to HCA in 2005 (18,000 pounds each). Because the catch rates were lower than expected in this area, many vessels chose to delay taking their 2005 access trips. For example, Table 43 shows that only 237 out of 312 active full-time vessels took some of their trips to HCA in 2005, averaging about 2.5 trips per vessel.   Framework 18 extended Hudson Canyon access program – such that vessels that did not take their HC trips could take them in either 2006 and/or 2007.  Many of these vessels postponed taking those trips until 2007. The number of trips shown could be larger than allocated since some of these trips are compensation trips. The use of HC trips in 2007 is the major reason behind the increase in total effort in 2007 compared to 2006 given that DAS allocations, number of access area trip allocations and the number of active vessels were similar in each year. Table 43 shows that about 5,500 DAS-used in HCA in 2005 which is almost equal to the difference in total effort in 2006 and 2007 fishing years. It also explains that on the average there were more access area trips taken per vessel in 2007 than the allocated 5 trips per vessel by F18. (8 trips per vessel that used that fished in the access areas whereas only 5 trips were allocated by Framework 18). Again, the inclusion of the compensation trips probably overestimates the number of HCA and other access area trips per vessel in Table 41 and Table 43 .

Table 42. Framework 18 DAS and access area trip allocations

| Framework 18 allocations | Open area DAS per FT vessel | Controlled access area trips | Elephant Trunk | Hudson Canyon | Delmarva | Total DAS per FT vessel |
|---|---|---|---|---|---|---|
| DMV - 20K open area DAS in 2006 and 2007 (Proposed Alternative) | | | | | | |
| 2006 | 52 | 1 CAI, 2 CAII, 2 NLS (60 DAS) | Closed | 2005 trips | Open | 112 |
| 2007 | 51 | 1 CAI, 1 NLS, 3 ETA ( 84 DAS) | 5 trips* | 2005 trips | Closed | 111 |

*Originally F18 allocated 5 trips to ETA which were reduced later to 3 by emergency action.

Table 43. DAS-used and the number of trips by full-time vessels in Hudson Canyon Access Area

| Fishyear | Number of trips per vessel | Average DAS-used per vessel | Total DAS-used | Total number of trips | Number of full-time vessels fished |
|---|---|---|---|---|---|
| 2004 | 4.1 | 34.0 | 9734 | 1163 | 286 |
| 2005 | 2.6 | 26.1 | 6181 | 605 | 237 |
| 2006 | 1.7 | 12.2 | 709 | 99 | 58 |
| 2007 | 2.8 | 24.0 | 5501 | 633 | 229 |

#### 6.6.4.2.3 Trends in effective fishing effort and vessel characteristics

Figure 22. Number of limited access vessels by permit category

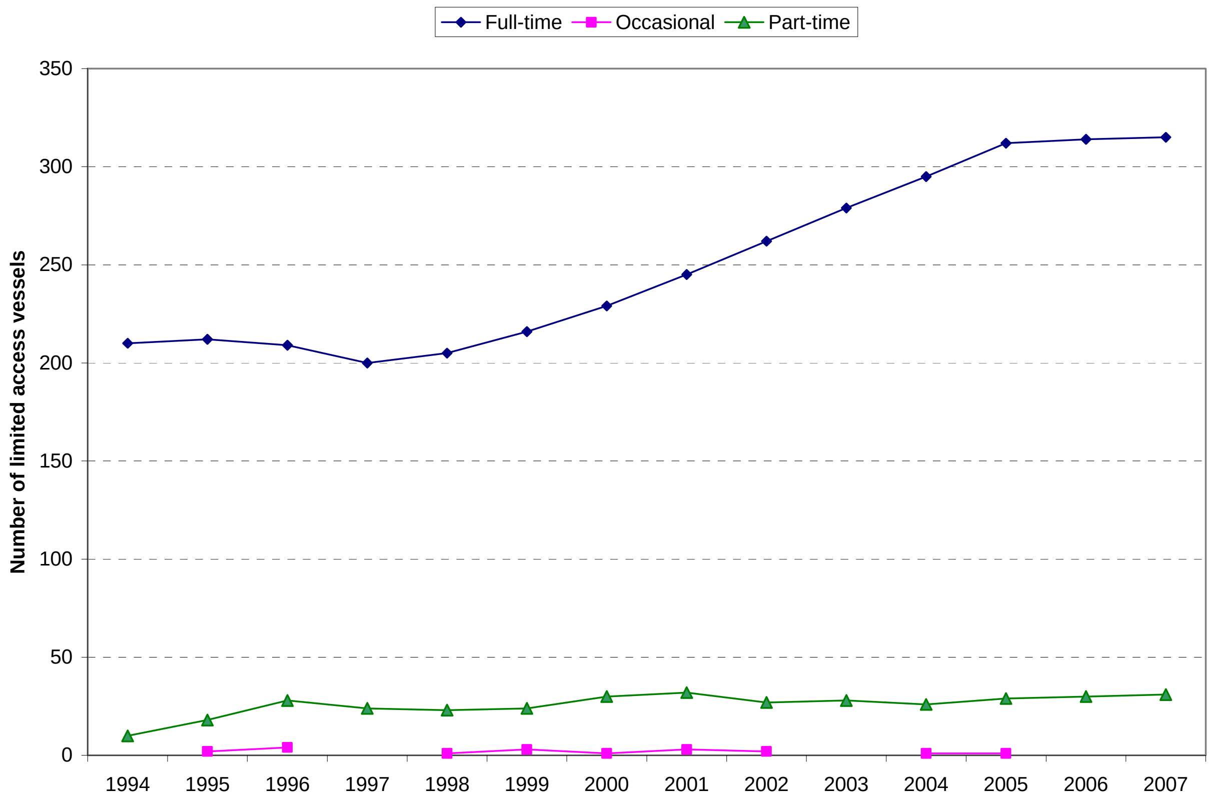



Figure 23. Number of full-time vessels by permit category

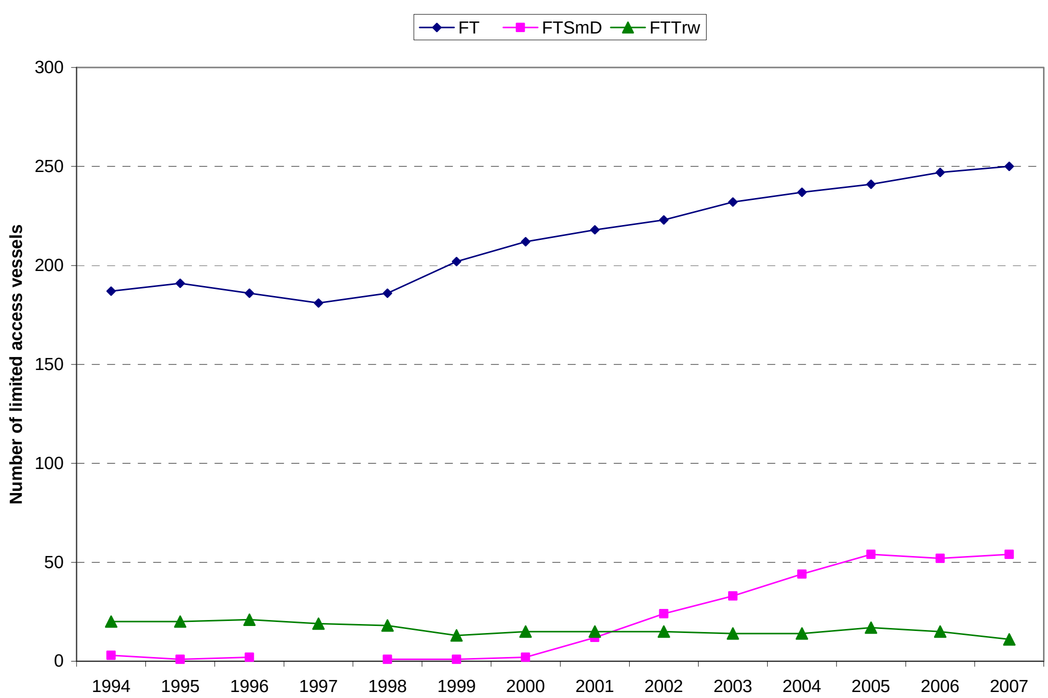
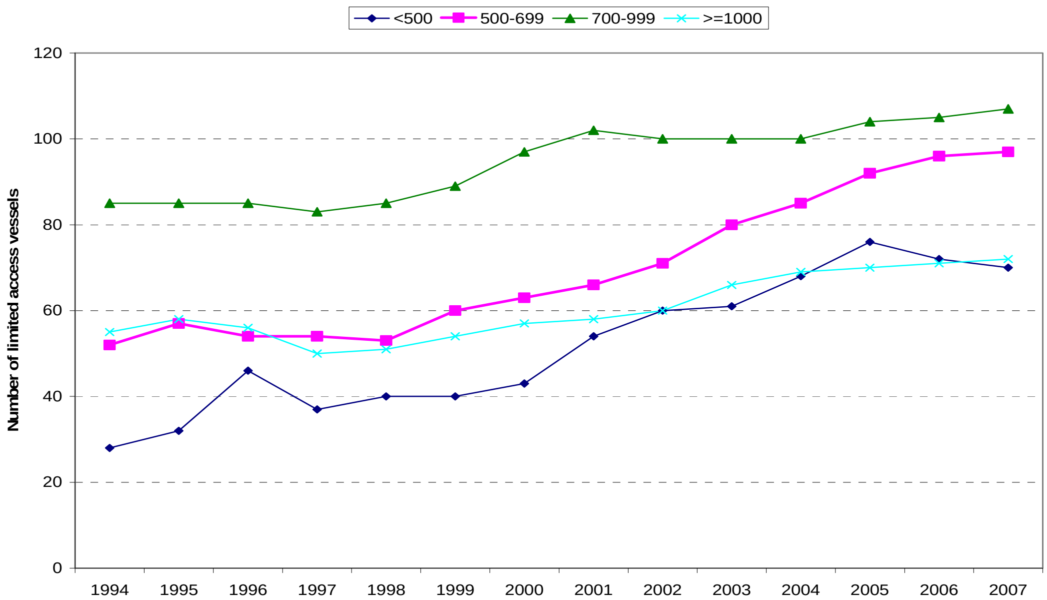


Figure 24. Number of limited access vessels by horsepower (including part-time and occasional vessels)




The majority of the small dredges had a horsepower of less than 500.

Table 44. Number of limited access vessels by years active

| Number of vessels | Years Active | | | | |
|---|---|---|---|---|---|
| FISHYEAR | <5 years | 5-9 years | 10-13 years | 14 years | Grand Total |
| 1994 | 28 | 22 | 40 | 150 | 240 |
| 1995 | 22 | 24 | 51 | 150 | 247 |
| 1996 | 20 | 24 | 55 | 150 | 249 |
| 1997 | 6 | 22 | 53 | 150 | 231 |
| 1998 | 1 | 28 | 54 | 150 | 233 |
| 1999 | 3 | 35 | 59 | 150 | 247 |
| 2000 | 4 | 47 | 66 | 150 | 267 |
| 2001 | 4 | 67 | 64 | 150 | 285 |
| 2002 | 3 | 79 | 66 | 150 | 298 |
| 2003 | 4 | 92 | 66 | 150 | 312 |
| 2004 | 27 | 88 | 62 | 150 | 327 |
| 2005 | 55 | 86 | 54 | 150 | 345 |
| 2006 | 75 | 84 | 46 | 150 | 355 |
| 2007 | 84 | 79 | 34 | 150 | 347 |

There is a slight difference in the trend for fishing effort weighted by horsepower from the total fleet DAS-used as Figure 26. Average HP, GRT and crew declined slightly from 1994 to 2007 because more small vessels became active in the fishery, reducing marginally the rise of HP weighted DAS-used compared to the total DAS-used in 2007 (Figure 25).

Figure 25. Average HP, GRT and crew size of limited access vessels

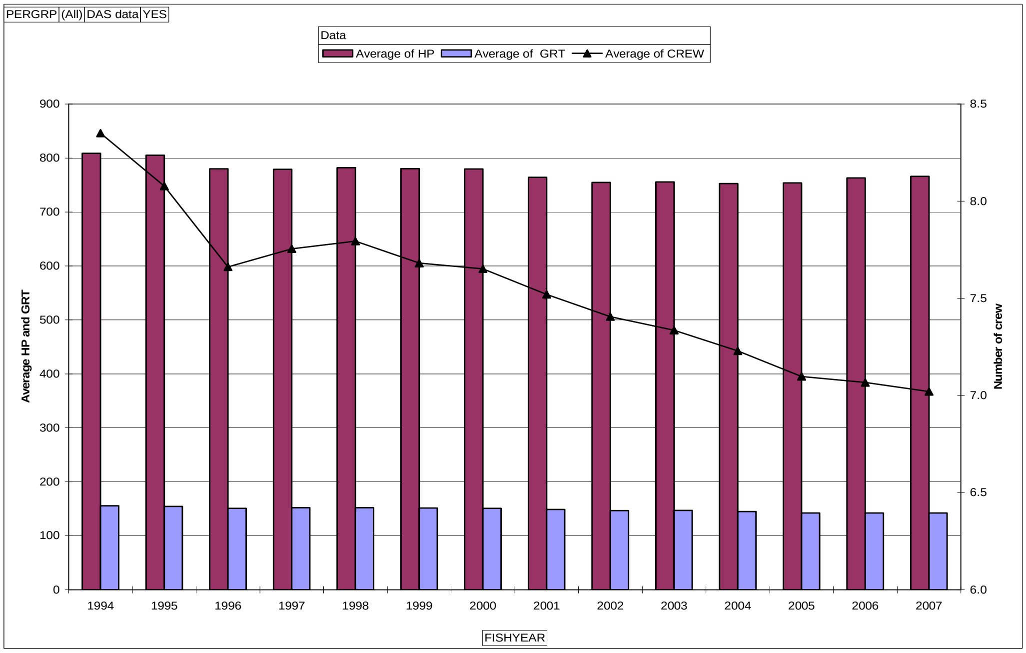
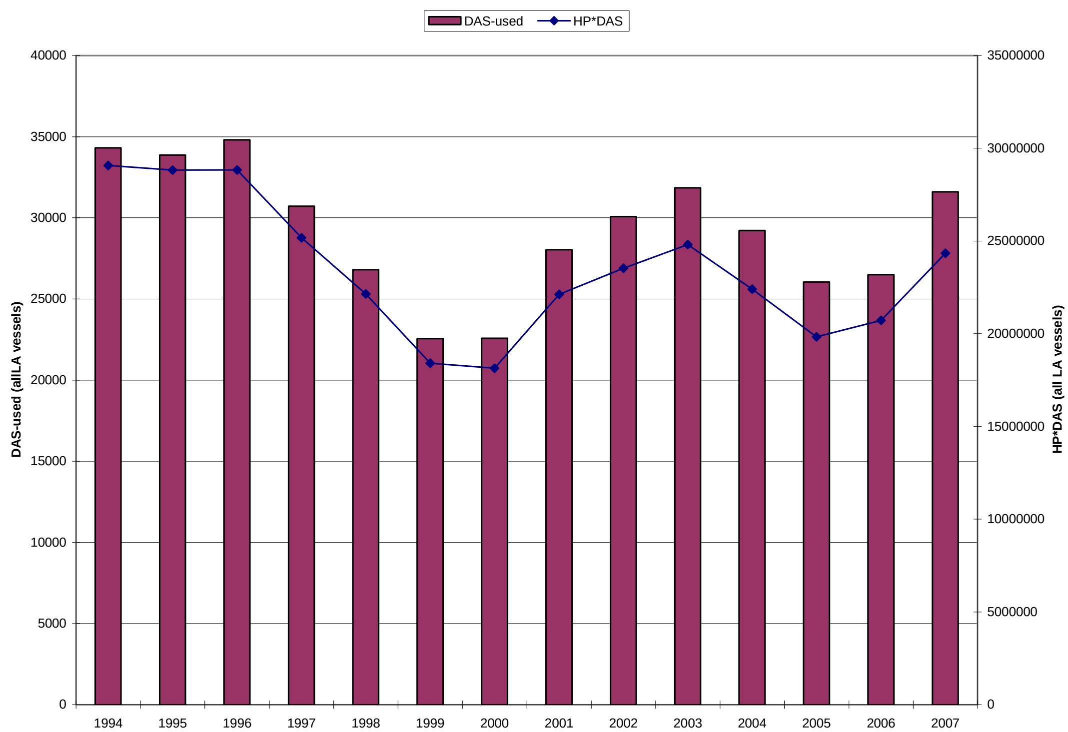



Figure 26. Trends in fishing effort by limited access vessels




### 6.6.4.3 Trends in BIOMASS, LPUE and participation

The annual average LPUE increased constantly after 1998 as the scallop resource recovered and fishable mean biomass increased from about 750 million in 1998 to over 3500 million in 2006 (Figure 27).

Average LPUE for a full-time increased from 540 pounds per DAS in 1994 to over 2000 pounds per day in 2004, but declined afterwards to 1,700 pounds per DAS in 2007 (Table 45). The increased in scallop abundance provided incentive for new limited access vessels to participate in the fishery especially after 1999 fishing year, probably having a negative impact on the LPUE per vessel due to the increased competition for fish although the extent of this impact requires more analysis.

Figure 27. Fishable biomass, LPUE (annual landings/ DAS) and number of limited access vessels (all vessels)

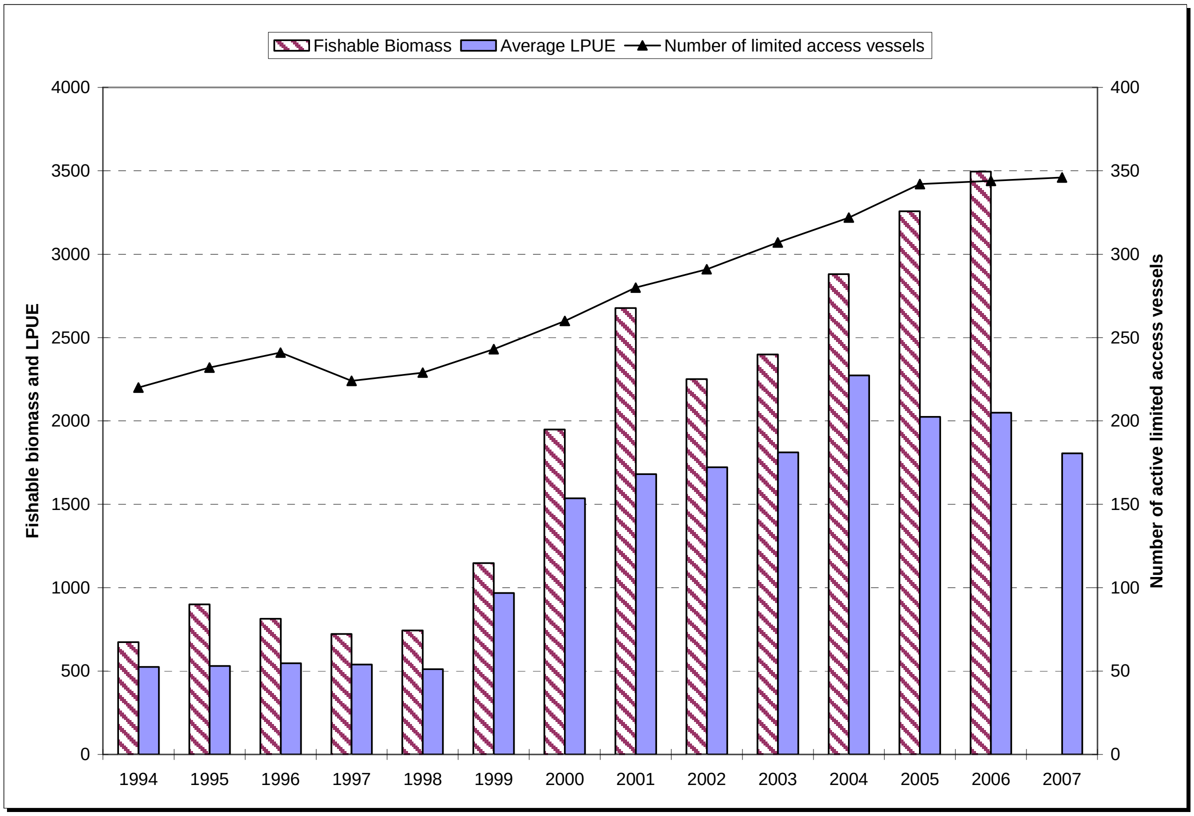


Table 45. Trends in LPUE for full-time vessels (including small dredge and scallop trawls) and fishable mean abundance

| FISHYEAR | FT vessels that landed an average of less than 400 pounds of scallops per DAS as an average per year (Group A) | FT vessels that landed 400 pounds or more scallops per DAS as an average per year (Group B) | Average LPUE per full-time vessel (includes all vessels in Groups A and B) | Average LPUE per full-time vessel that landed 400 pounds or more scallops per DAS (Group B) | Maximum LPUE (Rounded numbers) All FT vessels) | Fishable mean abundance * (Whole stock, all sizes, millions) |
|---|---|---|---|---|---|---|
| 1994 | 87 | 117 | 437 | 543 | 970 | 673 |
| 1995 | 57 | 148 | 471 | 540 | 850 | 900 |
| 1996 | 65 | 137 | 474 | 549 | 900 | 813 |
| 1997 | 107 | 87 | 414 | 537 | 1500 | 722 |
| 1998 | 97 | 103 | 416 | 517 | 750 | 744 |
| 1999 | 6 | 200 | 943 | 963 | 1800 | 1147 |
| 2000 | Less than 5 | 219 | 1487 | 1504 | 2700 | 1948 |
| 2001 | Less than 5 | 237 | 1604 | 1623 | 2700 | 2677 |
| 2002 | Less than 5 | 254 | 1627 | 1638 | 3700 | 2250 |
| 2003 | Less than 5 | 269 | 1691 | 1713 | 4700 | 2399 |
| 2004 | 6 | 284 | 2083 | 2124 | 4500 | 2881 |
| 2005 | Less than 5 | 304 | 1856 | 1866 | 4700 | 3258 |
| 2006 | 9 | 302 | 1868 | 1918 | 4000 | 3495 |
| 2007 | Less than 5 | 307 | 1693 | 1714 | 3800 | NA |

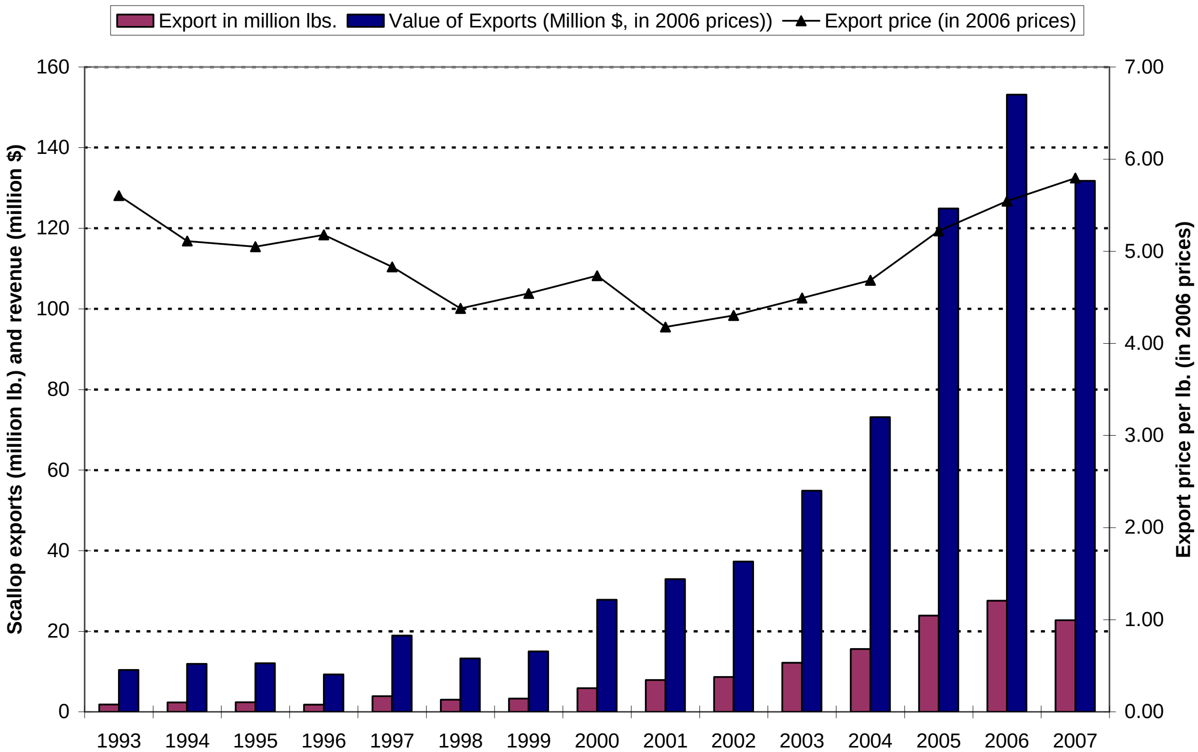
* 45th Stock Assessment Report for Atlantic Sea Scallops (Sept, 2007), Table B5-5, p.183.

### 6.6.4.4 Trends in foreign trade

#### 6.6.4.4.1 Exports

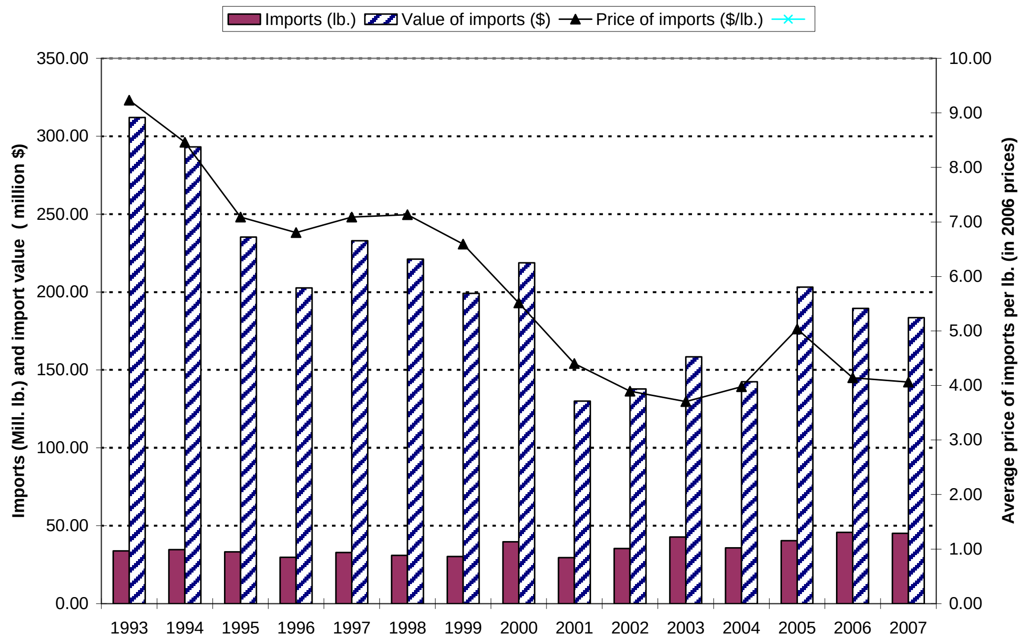
Figure 28 shows exports from NE and Mid-Atlantic ports and includes fresh, frozen and processed scallops. The exports from all other states and areas totaled only about $1 million in 2006 and 2007, and thus was not significant.

Figure 28. Scallop exports from New England and Mid-Atlantic (by calendar year)




### 6.6.4.4.2 Imports

Figure 29. Imports, value of imports and import price of scallops (by calendar year)




#### 6.6.4.4.3 The Trends in fishing by gear type

Table 46 through Table 48 describe general category landings by gear type. These tables are generated by VTR data and since all VTR records do not include gear information, the number of vessels in these tables will differ from other tables that summarize general category vessels and landings from dealer data. Primary gear is defined as the gear used to land more than 50% of scallop pounds. Most general category effort is and has been from vessels using scallop dredge and other trawl gear (
Table 46). The number of vessels using scallop trawl gear increased through 2006 but has declined in recent years. In terms of landings, most scallop landings under general category are with dredge gear (Table 2), with significant amounts also landed by scallop trawls and other trawls. Table 48 shows the percent of general category landings by primary gear and year. The percentages of scallop landings with other trawl gear in 2008 and 2009 were the highest they have been since 2001, but were still significantly less than dredge landings.

Table 46. Number of general category vessels by primary gear and fishing year

| FISHING YEAR | DREDGE, OTHER | DREDGE, SCALLOP | MISC | TRAWL, OTHER | TRAWL, SCALLOP |
|---|---|---|---|---|---|
| 1994 | 1 | 33 | 4 | 42 | 1 |
| 1995 | 4 | 91 | 5 | 48 | 4 |
| 1996 | 7 | 101 | 13 | 49 | 1 |
| 1997 | 6 | 118 | 9 | 55 | * |
| 1998 | 10 | 100 | 8 | 52 | 1 |
| 1999 | 10 | 87 | 3 | 61 | 5 |
| 2000 | 7 | 78 | 9 | 91 | 3 |
| 2001 | 4 | 122 | 7 | 118 | 6 |
| 2002 | 3 | 147 | 3 | 104 | 9 |
| 2003 | 6 | 155 | 2 | 116 | 17 |
| 2004 | 8 | 217 | 10 | 183 | 35 |
| 2005 | 26 | 280 | 3 | 183 | 60 |
| 2006 | 29 | 366 | 9 | 159 | 65 |
| 2007 | 26 | 280 | 4 | 125 | 30 |
| 2008 | 9 | 129 | 5 | 66 | 21 |
| 2009 | 8 | 117 | 1 | 53 | 22 |

Table 47. General category scallop landings by primary gear (pounds)

| FISHING YEAR | DREDGE, OTHER | DREDGE, SCALLOP | MISC | TRAWL, OTHER | TRAWL, SCALLOP |
|---|---|---|---|---|---|
| 1994 | 111 | 144,139 | 260 | 9,564 | 2,601 |
| 1995 | 4,812 | 501,910 | 1,146 | 43,585 | 11,797 |
| 1996 | 1,352 | 578,884 | 3,314 | 19,460 | 1,644 |
| 1997 | 3,253 | 682,270 | 3,465 | 30,227 | * |
| 1998 | 6,049 | 334,930 | 2,443 | 19,677 | 3,750 |
| 1999 | 18,322 | 236,482 | 599 | 17,537 | 3,970 |
| 2000 | 6,446 | 303,168 | 1,411 | 173,827 | 8,179 |
| 2001 | 91,939 | 1,254,153 | 6,518 | 404,709 | 28,276 |
| 2002 | 21,888 | 1,266,144 | 919 | 74,686 | 41,977 |
| 2003 | 22,614 | 1,590,575 | 484 | 171,511 | 196,376 |
| 2004 | 36,260 | 2,624,753 | 2,259 | 487,620 | 373,980 |
| 2005 | 198,736 | 4,934,735 | 1,441 | 744,027 | 892,154 |
| 2006 | 198,400 | 5,607,142 | 8,386 | 418,708 | 599,508 |
| 2007 | 142,044 | 4,517,800 | 724 | 226,131 | 395,683 |
| 2008 | 87,186 | 2,593,870 | 1,502 | 528,252 | 287,362 |
| 2009 | 63,368 | 1,940,047 | 400 | 574,555 | 211,598 |

Table 48. Percentage of general category scallop landings by primary gear

| FISHING YEAR | DREDGE, OTHER | DREDGE, SCALLOP | MISC | TRAWL, OTHER | TRAWL, SCALLOP |
|---|---|---|---|---|---|
| 1994 | 0.07% | 92.00% | 0.17% | 6.10% | 1.66% |
| 1995 | 0.85% | 89.11% | 0.20% | 7.74% | 2.09% |
| 1996 | 0.22% | 95.74% | 0.55% | 3.22% | 0.27% |
| 1997 | 0.45% | 94.86% | 0.48% | 4.20% | * |
| 1998 | 1.65% | 91.30% | 0.67% | 5.36% | 1.02% |
| 1999 | 6.62% | 85.40% | 0.22% | 6.33% | 1.43% |
| 2000 | 1.31% | 61.49% | 0.29% | 35.26% | 1.66% |
| 2001 | 5.15% | 70.24% | 0.37% | 22.67% | 1.58% |
| 2002 | 1.56% | 90.08% | 0.07% | 5.31% | 2.99% |
| 2003 | 1.14% | 80.27% | 0.02% | 8.66% | 9.91% |
| 2004 | 1.03% | 74.46% | 0.06% | 13.83% | 10.61% |
| 2005 | 2.94% | 72.88% | 0.02% | 10.99% | 13.18% |
| 2006 | 2.90% | 82.07% | 0.12% | 6.13% | 8.77% |
| 2007 | 2.69% | 85.53% | 0.01% | 4.28% | 7.49% |
| 2008 | 2.49% | 74.15% | 0.04% | 15.10% | 8.21% |
| 2009 | 2.27% | 69.54% | 0.01% | 20.59% | 7.58% |

#### 6.6.4.4.4 Trends in scallop landings by port

The landed value of scallops by port landing fluctuated from 1994 through 1998 for many ports. During the past five years, six ports brought in the most landed value: New Bedford, MA; Cape May, NJ; Newport News, VA; Barnegat Light/Long Beach, NJ, Seaford, VA, and Hampton, VA (Table 49). In addition to bringing in the most landed value, in 1994 scallop landings represented more than 30% of the total landed value for New Bedford, MA and Cape May, NJ, and more than 65% of the total landed value for Newport News and Hampton, VA (Table 50). This has increased in 2008 to 74% and 84% for New Bedford, MA and Cape May, NJ, respectively, and 93% and 84% for Newport News and Hampton, VA, respectively.

Landed value has increased steadily from 1999-2008; but, some leveling off is apparent in recent years (Table 4). In the most recent two years of data (2007-2008), 43% of ports saw a decrease in the percentage of landed scallop value to total landed value (Table 48). However, many of these decreases are very small, on the order of 1-3%.

Between 2003 and 2005, 10 ports increased their landed value for scallops, potentially from an increase in general category landings. The average landed value has increased from $2 million in 1994 to a peak of $12 million in 2005. In 2006-2008, the average landed value has hovered between $9 and $10 million.

Table 49. Landed value of scallops (in thousands of dollars) by port of landing, FY 1994-2008.

* Includes only ports of landings with landed value of scallops in excess of $100,000 during FY2008. X = confidential data, with landings that are greater than 100,000 but less than 1.25 million, X* = less than 70,000. Data run August 7, 2009, based on dealer weighout data YTD.

| **Port and County** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Bedford MA (Bristol County) | 30981 | 36553 | 48436 | 45514 | 34687 | 70554 | 88491 | 80357 | 96011 | 104664 | 150121 | 206784 | 210517 | 211847 | 172603 |
| Cape May NJ (Cape May County) | 9360 | 8874 | 8656 | 6945 | 5588 | 9765 | 14158 | 18626 | 20237 | 28530 | 46530 | 51421 | 21619 | 45517 | 55522 |
| Newport News VA (Newport News City) | 9289 | 11917 | 13457 | 11173 | 11275 | 15207 | 23092 | 25535 | 30494 | 37361 | 48424 | 39467 | 22708 | 33363 | 37328 |
| Barnegat Light/Long Beach NJ (Ocean County) | 2653 | 2727 | 3007 | 3105 | 2693 | 3941 | 6733 | 6753 | 8071 | 10021 | 15641 | 21367 | 16651 | 16694 | 17275 |
| Seaford VA (York County) | 0 | 0 | 0 | 5553 | 4543 | 6540 | 11168 | 10465 | 11841 | 13043 | 18572 | 16364 | 11701 | 15340 | 14401 |
| Hampton VA (Hampton City) | 12425 | 7863 | 6346 | 3258 | 4557 | 5084 | 8289 | 9195 | 13803 | 19012 | 19978 | 14147 | 9180 | 15513 | 13620 |
| Fairhaven MA (Bristol County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5280 | 10103 | 8892 | 9166 |
| Point Pleasant NJ (Ocean County) | 315 | 532 | 1401 | 2207 | 1590 | 1854 | 3784 | 3197 | 3530 | 3973 | 3523 | 8574 | 7544 | 8751 | 8119 |
| Stonington CT (New London County) | 0 | 0 | 232 | 2573 | 2717 | 3302 | 3459 | 4944 | 5669 | 7463 | 10363 | 7402 | 4997 | 7680 | 5243 |
| Wildwood NJ (Cape May County) | 7 | 14 | X* | 0 | X* | 0 | 120 | 1246 | 2056 | 2194 | 3557 | 3942 | 2113 | 3690 | 3836 |
| Ocean City MD (Worcester County) | 11 | 24 | 43 | 5 | 15 | 25 | 118 | 79 | 99 | 212 | 174 | 4871 | 5631 | 2815 | 3504 |
| Point Lookout NY (Nassau County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 33 | X* | 1075 | 3001 |
| Avalon NJ (Cape May County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | 1563 | 3468 | 2808 |
| New London CT (New London County) | 0 | 0 | 0 | 0 | 0 | 843 | 817 | 943 | 886 | 1026 | 1203 | 1736 | 1465 | X | 2588 |
| Chatham MA (Barnstable County) | 0 | 0 | X* | 0 | 0 | 0 | X* | 588 | 117 | 409 | 1927 | 2996 | 3154 | 2056 | 1715 |
| Atlantic City NJ (Atlantic County) | 15 | 1 | 0 | 0 | 1 | 0 | 0 | X* | 0 | 0 | 382 | 2308 | 2048 | 2706 | 1518 |
| Other Connecticut (Not-Specified County) | 700 | 1665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96 | 1421 |
| Point Judith RI (Washington County) | 1 | 58 | 4 | 7 | X* | 242 | 734 | 596 | 83 | 274 | 622 | 4638 | 7358 | 2835 | 1371 |
| Montauk NY (Suffolk County) | X* | X* | X* | X* | 0 | 7 | 6 | 8 | 0 | 1 | 435 | 1367 | 1878 | 2187 | 1346 |
| Engelhard NC (Hyde County) | 0 | 0 | 0 | 0 | 0 | X* | X* | X* | 0 | 140 | 22 | 124 | 311 | 709 | 817 |
| Newport RI (Newport County) | 23 | 229 | 101 | 784 | 534 | 447 | 700 | X* | 3 | X* | 1382 | 8412 | 13070 | 6031 | 747 |
| Hampton Bays NY (Suffolk County) | X* | 5 | 5 | 22 | 6 | 53 | 426 | 454 | 94 | 155 | 533 | 1588 | 846 | 422 | 574 |
| Belford NJ (Monmouth County) | X* | X* | X* | 21 | X* | 3 | 2 | X* | X* | X* | X* | 33 | X* | 16 | 548 |
| Other Atlantic NJ (Atlantic County) | 387 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 874 | 1017 | 542 |
| Chincoteague VA (Accomack County) | 2 | 0 | X* | 0 | X* | 7 | 210 | 803 | 1115 | 1957 | 4058 | 11892 | 7253 | 1153 | 489 |
| New Haven CT (New Haven County) | 0 | 0 | X* | 0 | X* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| Gloucester MA (Essex County) | X* | X* | 232 | 357 | 104 | 161 | 1014 | 1543 | 783 | 557 | 682 | 1217 | 890 | 487 | 352 |
| Sandwich MA (Barnstable County) | 23 | 37 | 284 | 128 | 243 | 213 | 157 | 218 | 249 | 266 | 136 | 243 | 403 | 707 | 337 |
| Provincetown MA (Barnstable County) | 45 | 24 | 92 | 97 | 114 | 57 | 120 | 2130 | 540 | 648 | 637 | 1684 | 1046 | 595 | 320 |
| Other Cape May NJ (Cape May County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X* | 0 | 0 | X* | 825 | 104 | X |
| Indian River DE (Sussex County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X* | 114 | 1 | 245 |
| Wellfleet MA (Barnstable County) | 0 | X* | X* | 70 | X* | 23 | X* | 66 | 32 | 112 | 47 | 284 | 64 | X* | 244 |
| Other Monmouth NJ(Monmouth County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X* | X | X | X |
| Hyannisport MA (Barnstable County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 648 | 473 | 262 | 222 |
| Addison ME (Washington County) | 0 | 0 | 0 | X | X | 0 | 0 | 0 | X | 0 | X | X | 49 | 268 | 151 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nantucket MA (Nantucket County) | 5 | X* | 8 | X* | 1 | 0 | X | X* | X* | 2 | 58 | 282 | 187 | 195 | 129 |
| Harwich Port MA (Barnstable County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 590 | 110 | 318 | 462 | 770 | 115 | 171 | X |
| Wanchese NC (Dare County) | 0 | 0 | 0 | X* | 0 | 31 | 64 | 1350 | 1023 | 262 | 382 | 75 | 127 | X* | X |
| Shinnecock Hills NY (Suffolk County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X* | 317 | 210 | 44 | 118 |
| Bucks Harbor ME (Washington County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | X | 0 | 111 |
| Barnstable MA (Barnstable County) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 184 | 607 | 326 | 108 |
| Falmouth MA (Barnstable County) | 0 | 0 | 0 | 0 | 0 | 0 | X* | 0 | X* | X* | X* | 71 | 36 | 235 | X |

## Table 50. Percentage of landed value of scallops to total landed value by port of landing, FY 1994-2006

* Includes only ports of landings with landed value of scallops in excess of $100,000 during FY2008. Data run August 2, 2007, based on dealer weighout data YTD.

| Port Name | County | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW BEDFORD | BRISTOL | 39 | 41 | 45 | 44 | 36 | 53 | 57 | 53 | 58 | 58 | 70 | 75 | 77 | 76 | 74 |
| CAPE MAY | CAPE MAY | 33 | 33 | 35 | 29 | 23 | 44 | 59 | 68 | 69 | 76 | 75 | 81 | 71 | 80 | 80 |
| NEWPORT NEWS | NEWPORT NEWS (CITY) | 67 | 71 | 76 | 73 | 73 | 79 | 86 | 84 | 89 | 92 | 92 | 94 | 92 | 90 | 93 |
| BARNEGAT LIGHT/LONG BEACH | OCEAN | 28 | 29 | 32 | 30 | 26 | 30 | 47 | 47 | 57 | 60 | 73 | 78 | 73 | 69 | 75 |
| SEAFORD | YORK | . | . | . | 95 | 94 | 98 | 99 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 |
| HAMPTON | HAMPTON (CITY) | 71 | 66 | 63 | 47 | 55 | 61 | 73 | 75 | 82 | 83 | 76 | 74 | 74 | 78 | 84 |
| FAIRHAVEN | BRISTOL | . | . | . | . | . | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 90 | 90 | 87 |
| POINT PLEASANT | OCEAN | 2 | 5 | 10 | 13 | 10 | 10 | 21 | 17 | 18 | 18 | 19 | 39 | 34 | 38 | 40 |
| STONINGTON | NEW LONDON | . | . | 24 | 39 | 38 | 35 | 36 | 52 | 67 | 77 | 82 | 71 | 66 | 78 | 68 |
| WILDWOOD | CAPE MAY | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 21 | 32 | 32 | 51 | 82 | 75 | 90 | 96 |
| OCEAN CITY | WORCESTER | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 3 | 0 | 42 | 45 | 26 | 35 |
| POINT LOOKOUT | NASSAU | . | . | . | . | . | . | . | 0 | 0 | 0 | 3 | 4 | 0 | 58 | 80 |
| AVALON | CAPE MAY | . | . | . | . | . | . | . | . | . | . | 0 | 99 | 99 | 98 | 98 |
| NEW LONDON | NEW LONDON | . | . | 0 | 0 | 0 | 21 | 32 | 24 | 21 | 22 | 21 | 29 | 34 | 39 | 73 |
| CHATHAM | BARNSTABLE | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 4 | 18 | 19 | 19 | 14 | 11 |
| ATLANTIC CITY | ATLANTIC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 12 | 8 | 10 | 8 |
| OTHER CONNECTICUT | NOT-SPECIFIED | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 46 |
| POINT JUDITH | WASHINGTON | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 2 | 12 | 16 | 8 | 4 |
| MONTAUK | SUFFOLK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 9 | 11 | 12 | 9 |
| ENGELHARD | HYDE | . | . | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 1 | 5 | 8 | 10 | 12 |
| NEWPORT | NEWPORT | 0 | 2 | 1 | 10 | 7 | 5 | 8 | 0 | 0 | 0 | 16 | 59 | 64 | 49 | 12 |
| HAMPTON BAYS | SUFFOLK | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 1 | 2 | 8 | 23 | 12 | 7 | 12 |
| BELFORD | MONMOUTH | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 17 |
| OTHER ATLANTIC | ATLANTIC | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 35 | 38 | 27 |
| CHINCOTEAGUE | ACCOMACK | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 33 | 39 | 47 | 54 | 78 | 75 | 27 | 14 |
| NEW HAVEN | NEW HAVEN | . | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 85 |
| GLOUCESTER | ESSEX | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 4 | 2 | 1 | 2 | 2 | 2 | 1 | 1 |
| SANDWICH | BARNSTABLE | 1 | 1 | 8 | 3 | 9 | 6 | 3 | 4 | 4 | 4 | 2 | 4 | 9 | 20 | 11 |
| PROVINCETOWN | BARNSTABLE | 2 | 1 | 4 | 4 | 4 | 2 | 3 | 38 | 13 | 19 | 18 | 35 | 28 | 17 | 10 |
| OTHER CAPE MAY | CAPE MAY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 35 | 8 | 22 |
| INDIAN RIVER | SUSSEX | . | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 23 | 0 | 47 |
| WELLFLEET | BARNSTABLE | . | 0 | 16 | 23 | 35 | 31 | 7 | 34 | 11 | 25 | 7 | 9 | 2 | 4 | 7 |
| OTHER MONMOUTH | MONMOUTH | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 46 | 4 |
| HYANNISPORT | BARNSTABLE | . | . | . | . | . | . | . | . | . | . | 9 | 19 | 20 | 10 | 9 |
| ADDISON | WASHINGTON | . | . | . | . | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 4 |
| NANTUCKET | NANTUCKET | 8 | 1 | 3 | 1 | 1 | 0 | 15 | 0 | 0 | 0 | 9 | 19 | 12 | 9 | 9 |
| HARWICH PORT | BARNSTABLE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 2 | 14 | 19 | 25 | 6 | 14 | 10 |
| WANCHESE | DARE | . | . | 0 | 1 | 0 | 0 | 0 | 13 | 11 | 3 | 3 | 1 | 1 | 0 | 1 |
| SHINNECOCK HILLS | SUFFOLK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 45 | 31 | 6 | 15 |
| BUCKS HARBOR | WASHINGTON | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 42 | 0 | 3 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARNSTABLE | BARNSTABLE | . | . | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 29 | 19 | 5 |
| FALMOUTH | BARNSTABLE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 9 | 0 | 7 | 3 | 14 | 6 |

## Table 51. Landed Value of scallops, linked to Vessel Homeport, ranked by fishing year 2008.

Table only includes ports with either more than 1M in 2008 landed value, or more than 250K in landed value with at least 10% port total scallops. X = confidential, less than 1M; XX = confidential, more than 1M. Data run, August 9, 2009.

| Port | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW BEDFORD | 28300 | 32429 | 39317 | 31568 | 25804 | 44363 | 59779 | 65845 | 79089 | 88962 | 126049 | 159634 | 145917 | 156801 | 145392 |
| CAPE MAY | 6979 | 7453 | 7528 | 7957 | 5876 | 10546 | 16725 | 17891 | 23178 | 30267 | 46347 | 63443 | 59236 | 72497 | 62532 |
| NEWPORT NEWS | 1840 | 2250 | 2547 | 3263 | 3495 | 9017 | 12438 | 14089 | 16328 | 16788 | 22516 | 24306 | 20803 | 21774 | 18929 |
| BARNEGAT LIGHT | 3041 | 3370 | 3297 | 2821 | 2335 | 4406 | 6676 | 6978 | 7811 | 9853 | 15276 | 19351 | 15873 | 16626 | 16503 |
| NORFOLK | 14803 | 15818 | 16234 | 14093 | 10970 | 14765 | 18015 | 14287 | 16563 | 17464 | 20074 | 13893 | 11111 | 12474 | 11390 |
| NEW BERN | X | X | X | X | 837 | 2322 | 2650 | 3292 | 4235 | 6431 | 7885 | 7747 | 8314 | 12106 | 10785 |
| WANCHESE | 46 | 14 | 3 | 1 | 485 | 1 | 816 | 2769 | 3378 | 4401 | 5707 | 6652 | 4990 | 7053 | 6559 |
| NEW LONDON | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 | 0 | X | X | 2296 | 4389 | 3131 | 5799 |
| FAIRHAVEN | 2708 | 3245 | 4453 | 4318 | 3720 | 6776 | 11794 | 6628 | 7133 | 7214 | 9021 | 10669 | 8406 | 7503 | 5415 |
| POINT PLEASANT | 953 | 977 | 1179 | 1504 | 1016 | 1386 | 2232 | 2374 | 2588 | 2938 | 3896 | 6835 | 6441 | 5532 | 5043 |
| LOWLAND | 6 | 120 | 445 | 0 | X | 963 | 1466 | 1786 | 2176 | 2897 | 3834 | 6114 | 4439 | 4579 | 4692 |
| SEAFORD | X | X | X | 0 | 0 | 0 | 0 | X | 2399 | 3452 | 3874 | 4551 | 2693 | 5540 | 4603 |
| STONINGTON | 0 | 1 | 0 | 536 | 73 | 0 | X | 698 | 1471 | 852 | 1270 | 3 | 59 | 464 | 4337 |
| HAMPTON | 4113 | 4413 | 4001 | 3014 | 2602 | 3704 | 4998 | 4103 | 4318 | 3742 | 6815 | 3576 | 5424 | 5213 | 4030 |
| ATLANTIC CITY | X | X | X | X | X | 0 | X | X | 0 | 2 | 96 | 3657 | 3484 | 3945 | 3154 |
| ORIENTAL | X | X | 174 | X | 890 | 1627 | 1776 | 1260 | 2059 | 3688 | 4397 | 7161 | 4572 | 4333 | 3151 |
| POINT PLEASANT BEACH | X | 0 | 0 | 0 | 0 | X | X | X | X | X | 456 | 1147 | 720 | 1589 | 2725 |
| CAPE CANAVERAL | X | X | X | X | X | X | X | X | XX | 1673 | 2380 | 3651 | 2574 | 2260 | 2441 |
| MONTAUK | X | 0 | X | 1 | 0 | 3 | 65 | 19 | 6 | X | 116 | 1206 | 386 | 2535 | 2386 |
| BEAUFORT | 42 | X | X | X | 0 | X | X | 244 | 256 | 67 | 289 | 1953 | 855 | 1473 | 2240 |
| BARNSTABLE | 2227 | 1968 | 1368 | 650 | 396 | 384 | 891 | 939 | 970 | 798 | 1152 | 2017 | 2649 | 2476 | 2164 |
| CARROLLTON | X | X | X | X | X | XX | XX | XX | XX | XX | XX | XX | XX | XX | XX |
| WILDWOOD | 4 | 5 | 149 | X | X | X | 805 | 1001 | 843 | 792 | 1855 | 2464 | 1559 | 1952 | 1776 |
| GLOUCESTER | 171 | 11 | 317 | 372 | 251 | 986 | 636 | 597 | 757 | 846 | 1681 | 2262 | 1654 | 1387 | 1449 |
| BAYBORO | X | X | X | X | X | X | X | 671 | 998 | 1512 | 2141 | 809 | 1235 | 1643 | XX |
| BEDFORD | X | X | X | X | X | X | X | XX | X | XX | XX | XX | XX | XX | XX |
| BOSTON | 265 | 334 | 454 | 454 | 162 | 449 | 512 | 706 | 880 | 1021 | 639 | XX | 1037 | 719 | XX |
| CHATHAM | 0 | 0 | 0 | 0 | 0 | X | 0 | 296 | 42 | 273 | 478 | 1285 | 1557 | 1723 | 1120 |
| MANAHAWKIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | XX | XX | XX | XX |
| SOUTHWEST HARBOR | 168 | 405 | 521 | 482 | 282 | 763 | 1086 | 590 | 529 | 674 | X | XX | XX | XX | XX |
| TREMONT | X | X | X | 338 | 226 | X | X | X | 554 | 787 | 1051 | XX | XX | XX | X |
| AURORA | X | X | X | X | X | X | X | X | X | XX | XX | XX | XX | XX | X |
| SUFFOLK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X |
| PLYMOUTH | X | X | X | 66 | 12 | X | X | X | 126 | X | 253 | 1568 | 845 | 1678 | 960 |
| NEWPORT | X | X | X | X | X | X | X | X | X | X | X | X | 891 | X | X |
| OCEAN CITY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X | X | X | X |
| KEY WEST | X | 0 | 0 | X | 0 | 0 | 0 | 0 | X | X | X | X | X | X | X |
| JACKSONVILLE | X | 0 | 0 | X | X | X | X | X | X | 0 | X | 1414 | XX | X | X |
| TILGHMAN ISLAND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 590 | 859 | 483 | 800 |
| OWLS HEAD | X | 235 | 87 | X | X | X | X | 516 | 395 | 371 | 347 | 682 | 487 | 239 | 745 |
| OCEAN CITY | X | 11 | 1 | X | 0 | X | 7 | 23 | 27 | 14 | 583 | 1906 | 1887 | 737 | 725 |
| HAMPTON BAYS | 3 | 4 | 19 | 7 | 5 | 7 | 320 | 307 | 42 | 80 | 398 | 1235 | 763 | 379 | 509 |
| WESTPORT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 420 | 491 | 555 | 421 |
| SWAN QUARTER | 0 | 0 | X | X | X | X | 827 | X | X | 749 | 1509 | 2775 | 941 | 444 | 404 |
| PROVINCETOWN | 15 | 27 | 72 | 86 | 36 | 72 | 96 | 1867 | 352 | 351 | 391 | 1495 | 932 | 811 | 381 |
| TOMS RIVER | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X | X | 0 | X | X | X |
| NANTICOKE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X | X |
| POINT LOOKOUT | 0 | 0 | X | X | 0 | X | 0 | 0 | 0 | 0 | 19 | X | X | X | X |
| GLOUCESTER POINT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X |
| GALLOWAY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X |
| SCRANTON | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X | X | X | X |
| BELMAR | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 187 | 250 | X | X |
| HULL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X | X | X | X | X | X |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW YORK | 0 | 0 | 0 X | 0 X | X | X | X | X | X | 0 X | 0 X |

The largest numbers of permitted limited access scallop vessels currently are in the ports of New Bedford, MA and Cape May, NJ, which represent 37% and 19% of the total, respectively (Table 52). Of the 348 permitted limited access vessels in 2009, 203 originate from New Bedford, MA and Cape May, NJ. Although the number of permitted limited access vessels has only increased from 308 in 1994 to a peak of 380 in 2005 and New Bedford has always had the largest number of permitted limited access vessels, the port with the next greatest number of contributors shifted from Norfolk, VA (18% in 1994 to 3% in 2009) to Cape May, NJ (9% in 1994 to 19% in 2009).

In addition to having the greatest number of permitted limited access scallop vessels, New Bedford, MA also has the greatest number of general category scallop vessels. Cape May, NJ, Barnegat Light, NJ, and Gloucester, MA also have high numbers of general category scallop vessels. Generally, ports that had a higher number of general category scallop vessels from 1994-2004, such as New Bedford, Gloucester, and Chatham, have seen a significant decrease in these vessels in recent years. Increases have been seen in ports that originally had no to very few permitted general category scallop vessels, such as Belhaven and Engelhard, NC (Table 52). Although the largest increases have been from many ports in NC, they have increased from 1 or no permitted general category scallop vessels to only about 6 or 7, which results in a 600-700% increase. Regardless of this increase, these ports only had a landed value for scallops of $311,000 or less. Other ports that saw an increase of 300% in general category vessels, such as Chincoteague, VA and Barnegat Light, NJ, had a landed value of $7.3 million and $16.9 million, respectively (Table 49). Although some ports, such as New Bedford and Gloucester have experienced a decline in the number of general category scallop vessels, the simultaneous increase in permitted limited access boats has aided to increase the landed value of scallops in those ports to $202.5 million and $812,000, respectively. As Table 54 shows, however, the general category fleet is not homogeneous, but varies over space and time, with some ports showing a general category fleet that mirrors limited access vessels in size (for example Atlantic City NJ), and others showing the more traditionally smaller-scale vessels (such as Fairhaven MA). Thus impacts to the general category fishery as a whole can be experienced differently in different ports.

Table 52. Permitted limited access scallop vessels, by homeport, 1994-2009.

| Homeport | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Bedford, MA (Bristol county) | 94 | 91 | 79 | 75 | 73 | 78 | 81 | 96 | 105 | 110 | 115 | 130 | 136 | 136 | 137 | 136 |
| Cape May, NJ (Cape May county) | 33 | 31 | 31 | 33 | 33 | 34 | 38 | 39 | 45 | 53 | 58 | 72 | 71 | 75 | 70 | 67 |
| Newport News, VA (Newport News City) | 8 | 9 | 10 | 10 | 12 | 17 | 19 | 21 | 21 | 21 | 22 | 23 | 19 | 19 | 18 | 18 |
| Barnegat Light, NJ (Ocean county) | 9 | 9 | 9 | 9 | 8 | 8 | 10 | 10 | 9 | 11 | 13 | 12 | 11 | 11 | 11 | 11 |
| New Bern, NC (Craven county) | 1 | 2 | 2 | 4 | 4 | 6 | 6 | 8 | 8 | 8 | 8 | 13 | 13 | 14 | 11 | 11 |
| Norfolk, VA (Norfolk City) | 65 | 67 | 63 | 58 | 51 | 42 | 35 | 27 | 27 | 27 | 22 | 13 | 12 | 11 | 11 | 11 |
| Wanchese, NC (Dare county) | 4 | 3 | 2 | 2 | 2 | 1 | 4 | 8 | 7 | 7 | 6 | 6 | 8 | 8 | 8 | 8 |
| Lowland, NC (Pamlico county) | 6 | 6 | 7 | 6 | 6 | 8 | 7 | 7 | 7 | 8 | 9 | 8 | 8 | 8 | 7 | 7 |
| Hampton, VA (Hampton City) | 15 | 15 | 11 | 11 | 8 | 7 | 6 | 6 | 6 | 6 | 7 | 5 | 7 | 7 | 7 | 6 |
| Seaford, VA (York county) | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | 4 | 4 | 5 | 6 | 5 | 5 | 6 |
| Beaufort, NC (Carteret county) | 6 | 6 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 5 |
| Fairhaven, MA (Bristol county) | 12 | 13 | 10 | 10 | 13 | 12 | 15 | 11 | 9 | 9 | 8 | 9 | 8 | 6 | 5 | 5 |
| New London, CT (New London county) | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 5 | 5 | 5 |
| Point Pleasant, NJ (Ocean county) | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 5 |
| Oriental, NC (Pamlico county) | 2 | 2 | 3 | 2 | 4 | 5 | 4 | 5 | 5 | 7 | 9 | 9 | 14 | 11 | 7 | 4 |
| Stonington, CT (New London county) | 3 | 3 | 5 | 6 | 6 | 4 | 5 | 7 | 7 | 8 | 8 | 4 | 4 | 5 | 4 | 4 |
| Atlantic City, NJ (Atlantic county) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 3 |
| Montauk, NY (Sufflolk county) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 3 |
| Narragansett, RI (South county) | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 3 | 4 | 4 | 3 | 3 |
| Barnstable, MA (Barnstable county) | 12 | 9 | 9 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| Bayboro, NC (Pamlico county) | 1 | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 4 | 3 | 3 | 2 | 3 | 2 | 2 | 2 |
| Cape Canaveral, FL (Brevard county) | 3 | 4 | 4 | 3 | 3 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Carrollton, VA (Isle Of Wight county) | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Owls Head, ME (Knox county) | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Plymouth, MA (Plymouth county) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 3 | 2 | 2 |
| Swan Quarter, NC (Hyde county) | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 2 |
| Wildwood, NJ (Cape May county) | 5 | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| Bedford, MA (Middlesex county) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Boston, MA (Suffolk county) | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Essex, CT (Middlesex county) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Jacksonville, FL (Duval county) | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| Key West, FL (Monroe county) | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Manahawkin, NJ (Ocean county) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Newport, NC (Carteret county) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ocean City, MD (Worcester county) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Point Pleasant Beach, NJ (Ocean county) | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Poquoson, VA (York county) | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| Southwest Harbor, ME (Hancock county) | 6 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Suffolk, VA (Suffolk (City) county) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Tremont, ME (Hancock county) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Westport, MA (Bristol county) | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Table 53. Permitted general category scallop vessels, by homeport, 2005-2009. All ports that had at least 1 GC permit in 2009 are included.

| Port | County | State | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| NEW BEDFORD | PLYMOUTH | MA | 86 | 88 | 83 | 67 | 72 |
| CAPE MAY | SUFFOLK | MA | 30 | 48 | 54 | 25 | 28 |
| BARNEGAT LIGHT | HANCOCK | ME | 29 | 30 | 31 | 28 | 27 |
| GLOUCESTER | HANCOCK | ME | 38 | 49 | 55 | 23 | 26 |
| POINT PLEASANT | WASHINGTON | ME | 17 | 22 | 24 | 14 | 15 |
| PROVINCETOWN | PLYMOUTH | MA | 14 | 16 | 15 | 11 | 11 |
| HAMPTON BAYS | BARNSTABLE | MA | 13 | 21 | 21 | 7 | 10 |
| NEW BERN | PLYMOUTH | MA | 5 | 6 | 5 | 5 | 10 |
| NARRAGANSETT | DARE | NC | 37 | 44 | 50 | 5 | 8 |
| CHATHAM | OCEAN | NJ | 23 | 27 | 29 | 7 | 7 |
| STONINGTON | BRISTOL | MA | 16 | 19 | 15 | 5 | 7 |
| BELHAVEN | SAGADAHOC | ME | 12 | 9 | 8 | 5 | 6 |
| SEABROOK | CARTERET | NC | 2 | 4 | 9 | 4 | 6 |
| SOUTH BRISTOL | WICOMICO | MD | 6 | 8 | 7 | 6 | 6 |
| BEAUFORT | BEAUFORT | NC | 14 | 14 | 14 | 4 | 5 |
| ENGELHARD | CRAVEN | NC | 7 | 8 | 7 | 5 | 5 |
| LOWLAND | GLOUCESTER | VA | 5 | 5 | 5 | 2 | 5 |
| OCEAN CITY | SUSSEX | DE | 12 | 17 | 15 | 4 | 5 |
| PORTLAND | CARTERET | NC | 24 | 22 | 19 | 6 | 5 |
| RYE | DUVAL | FL | 3 | 6 | 8 | 3 | 5 |
| BOSTON | MONMOUTH | NJ | 13 | 11 | 13 | 3 | 4 |
| HAMPTON | SUFFOLK | NY | 7 | 7 | 6 | 4 | 4 |
| MONTAUK | ROCKINGHAM | NH | 17 | 17 | 20 | 5 | 4 |
| NEWBURYPORT | NEWPORT | RI | 6 | 7 | 5 | 4 | 4 |
| POINT PLEASANT BEACH | WASHINGTON | ME | 3 | 3 | 2 | 5 | 4 |
| PORT CLYDE-TENANTS HARBOR | DARE | NC | 2 | 2 | 6 | 4 | 4 |
| PORTSMOUTH | CARTERET | NC | 12 | 12 | 12 | 6 | 4 |
| ROCKPORT | CUMBERLAND | NJ | 3 | 5 | 5 | 4 | 4 |
| SCITUATE | SUFFOLK | NY | 8 | 7 | 8 | 4 | 4 |
| NEW YORK | DUVAL | FL | 2 | 3 | 3 | 2 | 3 |
| NORFOLK | YORK | ME | 7 | 7 | 5 | 3 | 3 |
| TILGHMAN ISLAND | NEW LONDON | CT | 7 | 10 | 9 | 3 | 3 |
| WANCHESE | NEWPORT | RI | 14 | 13 | 10 | 4 | 3 |
| WILDWOOD | CAPE MAY | NJ | 5 | 5 | 6 | 4 | 3 |
| WOODS HOLE | NASSAU | NY | 3 | 4 | 5 | 5 | 3 |
| ATLANTIC CITY | ATLANTIC | NJ | 20 | 22 | 17 | 2 | 2 |
| FRIENDSHIP | WASHINGTON | ME | 2 | 3 | 3 | 3 | 2 |
| KENNEBUNKPORT | ATLANTIC | NJ | 0 | 0 | 0 | 2 | 2 |
| MARSHFIELD | HAMPTON (CITY) | VA | 2 | 3 | 3 | 2 | 2 |
| MILLVILLE | SUFFOLK | NY | 1 | 3 | 4 | 2 | 2 |
| MOUNT DESERT | CUMBERLAND | ME | 1 | 1 | 1 | 3 | 2 |
| NEW LONDON | SUFFOLK | NY | 6 | 8 | 6 | 2 | 2 |
| NEWPORT NEWS | YORK | ME | 6 | 5 | 6 | 2 | 2 |
| SACO | WASHINGTON | ME | 0 | 1 | 2 | 2 | 2 |
| SALISBURY | SUSSEX | NJ | 1 | 2 | 3 | 2 | 2 |
| SHALLOTTE | CHARLESTON | SC | 2 | 2 | 2 | 2 | 2 |
| STEUBEN | MONMOUTH | NJ | 2 | 3 | 3 | 2 | 2 |
| SWAN QUARTER | CRAVEN | NC | 5 | 9 | 7 | 2 | 2 |
| WELLFLEET | NEWPORT NEWS (CIT | VA | 5 | 4 | 5 | 2 | 2 |
| WILMINGTON | CAPE MAY | NJ | 6 | 6 | 5 | 2 | 2 |
| YORK HARBOR | NEW CASTLE | DE | 0 | 1 | 1 | 2 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BARNSTABLE | OCEAN | NJ | 9 | 9 | 9 | 1 | 1 |
| BATH | OCEAN | NJ | 2 | 3 | 3 | 1 | 1 |
| BELMAR | PAMLICO | NC | 2 | 2 | 1 | 1 | 1 |
| BREMEN | BEAUFORT | NC | 2 | 4 | 3 | 1 | 1 |
| CAPE CANAVERAL | SUFFOLK | MA | 7 | 6 | 5 | 2 | 1 |
| CAPE MAY COURT HOUSE | BARNSTABLE | MA | 1 | 1 | 1 | 1 | 1 |
| CHEBEAGUE ISLAND | FAIRFIELD | CT | 0 | 2 | 0 | 1 | 1 |
| CUSHING | CAPE MAY | NJ | 2 | 2 | 2 | 1 | 1 |
| CUTLER | CAPE MAY | NJ | 2 | 3 | 5 | 2 | 1 |
| EAST CENTRAL WASHINGTON | CUMBERLAND | ME | 1 | 1 | 1 | 1 | 1 |
| EASTPORT | MOBILE | AL | 0 | 2 | 2 | 1 | 1 |
| FAIRHAVEN | KNOX | ME | 6 | 6 | 4 | 2 | 1 |
| GLOUCESTER COURTHOUSE | HANCOCK | ME | 0 | 0 | 0 | 1 | 1 |
| GREEN HARBOR-CEDAR CREST | WICOMICO | MD | 0 | 2 | 4 | 1 | 1 |
| HAMPTON FALLS | WASHINGTON | ME | 1 | 1 | 1 | 1 | 1 |
| HARPSWELL | DUKES | MA | 8 | 14 | 16 | 1 | 1 |
| HARWICH PORT | HYDE | NC | 5 | 8 | 6 | 0 | 1 |
| HULL | BRISTOL | MA | 1 | 1 | 1 | 1 | 1 |
| KITTERY | SAGADAHOC | ME | 5 | 6 | 6 | 1 | 1 |
| LEWES | CARTERET | NC | 3 | 3 | 3 | 1 | 1 |
| LUBEC | PAMLICO | NC | 9 | 7 | 4 | 2 | 1 |
| LYNN | PLYMOUTH | MA | 0 | 0 | 0 | 1 | 1 |
| MACHIASPORT | SUFFOLK | NY | 6 | 6 | 7 | 3 | 1 |
| MANAHAWKIN | SUFFOLK | NY | 0 | 0 | 0 | 1 | 1 |
| MARSHALLBERG | ROCKINGHAM | NH | 1 | 1 | 2 | 1 | 1 |
| MONTVILLE | HANCOCK | ME | 0 | 0 | 0 | 1 | 1 |
| MOREHEAD CITY | CUMBERLAND | ME | 1 | 1 | 1 | 1 | 1 |
| NANTICOKE | BARNSTABLE | MA | 1 | 2 | 2 | 1 | 1 |
| NASSAWADOX | MONMOUTH | NJ | 1 | 2 | 1 | 1 | 1 |
| NEPTUNE | PAMLICO | NC | 1 | 1 | 1 | 1 | 1 |
| NEWPORT | WASHINGTON | ME | 12 | 13 | 12 | 1 | 1 |
| OCEAN BLUFF-BRANT ROCK | SUSSEX | DE | 2 | 1 | 2 | 1 | 1 |
| ORIENTAL | CUMBERLAND | ME | 5 | 13 | 8 | 1 | 1 |
| OWLS HEAD | PAMLICO | NC | 3 | 6 | 5 | 3 | 1 |
| PHIPPSBURG | WASHINGTON | ME | 0 | 1 | 1 | 1 | 1 |
| PLYMOUTH | HILLSBOROUGH | FL | 8 | 9 | 12 | 1 | 1 |
| POINT LOOKOUT | ESSEX | MA | 1 | 2 | 2 | 1 | 1 |
| PORT NORRIS | PLYMOUTH | MA | 7 | 7 | 7 | 2 | 1 |
| RICHLANDS | SUFFOLK | NY | 0 | 0 | 0 | 0 | 1 |
| ROCKLAND | CUMBERLAND | NJ | 4 | 7 | 3 | 1 | 1 |
| SCRANTON | NEW LONDON | CT | 1 | 1 | 1 | 2 | 1 |
| SOUTH THOMASTON | WASHINGTON | RI | 0 | 1 | 0 | 1 | 1 |
| SOUTHAMPTON | WASHINGTON | RI | 1 | 1 | 1 | 1 | 1 |
| SOUTHPORT | NORTHAMPTON | VA | 0 | 0 | 0 | 1 | 1 |
| SPRUCE HEAD | MONMOUTH | NJ | 0 | 0 | 0 | 0 | 1 |
| SWAMPSCOTT | BRISTOL | MA | 2 | 1 | 1 | 1 | 1 |
| TANGIER | NEW LONDON | CT | 1 | 1 | 1 | 1 | 1 |
| TOMS RIVER | NEW YORK | NY | 0 | 1 | 1 | 1 | 1 |
| TOWNSEND | NEW YORK | NY | 2 | 2 | 3 | 2 | 1 |
| TREMONT | ESSEX | MA | 1 | 0 | 1 | 1 | 1 |
| WAKEFIELD-PEACEDALE | NEW CASTLE | DE | 3 | 3 | 3 | 1 | 1 |
| WEST SAYVILLE | SUFFOLK | NY | 0 | 0 | 0 | 0 | 1 |
| WESTPORT | PLYMOUTH | MA | 7 | 7 | 7 | 1 | 1 |
| WINTER HARBOR | WORCESTER | MD | 3 | 5 | 6 | 2 | 1 |

Table 54. Average GRT (gross registered tons), average length, and number of permitted scallop vessels by top 20 homeports, 1994-2008.

| | | | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlantic, NC | Limited access | Avg. Length | 78 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | . | . |
| | | Avg. GRT | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | . | . |
| | | No. permits | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 |
| | General Category | Avg. Length | 73 | 70 | 70 | 68 | 68 | 68 | 63 | 63 | 63 | 63 | 63 | 54 | 63 | . | . |
| | | Avg. GRT | 108 | 108 | 108 | 100 | 100 | 100 | 75 | 75 | 75 | 75 | 75 | 48 | 75 | . | . |
| | | No. permits | 3 | 3 | 3 | 4 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 |
| Atlantic City, NJ | Limited access | Avg. Length | . | . | . | . | . | . | . | . | . | . | . | 75 | 75 | 75 | 75 |
| | | Avg. GRT | . | . | . | . | . | . | . | . | . | . | . | 125 | 121 | 123 | 123 |
| | | No. permits | . | . | . | . | . | . | . | . | . | . | . | 1 | 2 | 3 | 3 |
| | General Category | Avg. Length | 59 | 56 | 54 | 64 | 62 | 60 | 61 | 78 | 83 | 81 | 77 | 81 | 83 | 59 | 59 |
| | | Avg. GRT | 73 | 62 | 62 | 99 | 90 | 84 | 90 | 124 | 145 | 139 | 121 | 119 | 128 | 68 | 68 |
| | | No. permits | 5 | 6 | 5 | 7 | 9 | 12 | 11 | 18 | 23 | 22 | 26 | 35 | 37 | 2 | 2 |
| Aurora, NC | Limited access | Avg. Length | 75 | 75 | 75 | 75 | 75 | 83 | 68 | 73 | 73 | 56 | 73 | 73 | 73 | 68 | . |
| | | Avg. GRT | 116 | 116 | 116 | 116 | 116 | 133 | 114 | 125 | 125 | 85 | 125 | 125 | 125 | 114 | . |
| | | No. permits | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 0 |
| | General Category | Avg. Length | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| | | Avg. GRT | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| | | No. permits | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Barnegat Light, NJ | Limited access | Avg. Length | 69 | 69 | 69 | 69 | 69 | 69 | 65 | 65 | 69 | 68 | 68 | 67 | 67 | 67 | 67 |
| | | Avg. GRT | 117 | 117 | 117 | 117 | 110 | 110 | 97 | 97 | 108 | 107 | 107 | 102 | 101 | 101 | 101 |
| | | No. permits | 9 | 9 | 9 | 9 | 8 | 8 | 10 | 10 | 9 | 11 | 13 | 12 | 11 | 11 | 11 |
| | General Category | Avg. Length | 63 | 59 | 50 | 58 | 60 | 52 | 51 | 52 | 52 | 53 | 52 | 49 | 50 | 55 | 56 |
| | | Avg. GRT | 91 | 79 | 44 | 63 | 73 | 53 | 48 | 56 | 54 | 54 | 50 | 38 | 40 | 57 | 58 |
| | | No. permits | 9 | 14 | 10 | 12 | 11 | 27 | 35 | 48 | 51 | 59 | 63 | 63 | 62 | 28 | 27 |
| Barnstable, MA | Limited access | Avg. Length | 79 | 82 | 81 | 68 | 70 | 70 | 78 | 78 | 78 | 78 | 70 | 70 | 70 | 70 | 70 |
| | | Avg. GRT | 128 | 141 | 133 | 80 | 96 | 90 | 89 | 89 | 89 | 89 | 76 | 76 | 76 | 76 | 76 |
| | | No. permits | 11 | 9 | 9 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| | General Category | Avg. Length | 45 | 42 | 41 | 39 | 40 | 43 | 40 | 40 | 41 | 42 | 42 | 39 | 40 | 42 | 42 |
| | | Avg. GRT | 42 | 36 | 33 | 29 | 27 | 31 | 26 | 25 | 25 | 26 | 27 | 21 | 23 | 27 | 27 |
| | | No. permits | 21 | 25 | 23 | 20 | 22 | 22 | 23 | 29 | 29 | 23 | 22 | 19 | 16 | 1 | 1 |
| Cape Canaveral, FL | Limited access | Avg. Length | 73 | 72 | 72 | 73 | 73 | 81 | 83 | 79 | 76 | 76 | 76 | 76 | 76 | 76 | 76 |
| | | Avg. GRT | 136 | 132 | 132 | 136 | 136 | 175 | 160 | 142 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| | | No. permits | 3 | 4 | 4 | 3 | 3 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | General Category | Avg. Length | 81 | . | . | . | . | . | . | . | | 74 | 67 | 69 | 65 | 74 | 68 |
| | | Avg. GRT | 175 | . | . | . | . | . | . | . | . | 108 | 93 | 98 | 92 | 108 | 111 |
| | | No. permits | 1 | . | . | . | . | . | . | . | . | 2 | 8 | 10 | 9 | 2 | 1 |
| Cape May, NJ | Limited access | Avg. Length | 82 | 82 | 83 | 82 | 81 | 80 | 80 | 80 | 78 | 74 | 74 | 74 | 75 | 77 | 77 |
| | | Avg. GRT | 151 | 152 | 155 | 149 | 148 | 146 | 145 | 146 | 143 | 132 | 130 | 128 | 131 | 135 | 133 |
| | | No. permits | 33 | 31 | 31 | 33 | 33 | 34 | 38 | 39 | 45 | 53 | 58 | 72 | 71 | 70 | 67 |
| | General Category | Avg. Length | 77 | 78 | 78 | 67 | 72 | 67 | 63 | 60 | 61 | 54 | 56 | 52 | 55 | 68 | 73 |
| | | Avg. GRT | 126 | 130 | 137 | 109 | 122 | 104 | 92 | 88 | 81 | 65 | 63 | 56 | 62 | 93 | 118 |
| | | No. permits | 30 | 28 | 28 | 29 | 26 | 36 | 42 | 43 | 42 | 48 | 63 | 73 | 82 | 25 | 28 |

| | | | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fairhaven, MA | Limited access | Avg. Length | 86 | 87 | 88 | 89 | 89 | 91 | 89 | 89 | 87 | 87 | 90 | 89 | 89 | 98 | 98 |
| | | Avg. GRT | 158 | 158 | 160 | 166 | 164 | 171 | 172 | 166 | 158 | 158 | 168 | 162 | 161 | 185 | 185 |
| | | No. permits | 12 | 13 | 10 | 10 | 13 | 12 | 15 | 11 | 9 | 9 | 8 | 9 | 8 | 5 | 5 |
| | General Category | Avg. Length | 43 | 42 | 45 | 43 | 42 | 43 | 46 | 45 | 45 | 46 | 46 | 46 | 45 | 80 | 94 |
| | | Avg. GRT | 31 | 29 | 36 | 31 | 29 | 31 | 38 | 42 | 40 | 41 | 39 | 34 | 32 | 155 | 192 |
| | | No. permits | 22 | 19 | 21 | 27 | 28 | 22 | 22 | 23 | 26 | 30 | 27 | 26 | 27 | 2 | 1 |
| Hampton, VA | Limited access | Avg. Length | 78 | 78 | 77 | 77 | 77 | 76 | 77 | 77 | 77 | 76 | 76 | 75 | 75 | 62 | 73 |
| | | Avg. GRT | 152 | 152 | 152 | 152 | 154 | 152 | 162 | 162 | 162 | 160 | 158 | 140 | 124 | 89 | 112 |
| | | No. permits | 15 | 15 | 11 | 11 | 8 | 7 | 6 | 6 | 6 | 6 | 7 | 5 | 7 | 7 | 6 |
| | General Category | Avg. Length | 67 | . | . | 42 | 62 | 62 | 39 | 46 | 39 | 62 | . | 73 | 73 | 45 | 45 |
| | | Avg. GRT | 97 | . | . | 17 | 61 | 61 | 25 | 44 | 25 | 61 | . | 114 | 116 | 25 | 25 |
| | | No. permits | 1 | . | . | 1 | 1 | 1 | 3 | 4 | 3 | 1 | . | 3 | 4 | 1 | 1 |
| Lowland, NC | Limited access | Avg. Length | 73 | 73 | 73 | 73 | 73 | 74 | 73 | 73 | 73 | 72 | 75 | 77 | 78 | 81 | 81 |
| | | Avg. GRT | 92 | 92 | 97 | 92 | 92 | 107 | 106 | 106 | 106 | 102 | 103 | 112 | 114 | 118 | 118 |
| | | No. permits | 6 | 6 | 7 | 6 | 6 | 8 | 7 | 7 | 7 | 8 | 9 | 8 | 8 | 7 | 7 |
| | General Category | Avg. Length | 68 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 62 | 73 | 70 | 69 | 78 | 82 |
| | | Avg. GRT | 75 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 103 | 99 | 92 | 95 | 105 |
| | | No. permits | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 7 | 7 | 2 | 5 |
| New Bedford, MA | Limited access | Avg. Length | 87 | 88 | 87 | 87 | 87 | 87 | 86 | 85 | 84 | 84 | 85 | 82 | 82 | 84 | 84 |
| | | Avg. GRT | 172 | 173 | 174 | 174 | 176 | 175 | 173 | 169 | 164 | 163 | 164 | 153 | 154 | 158 | 160 |
| | | No. permits | 94 | 91 | 79 | 75 | 73 | 78 | 81 | 96 | 105 | 110 | 115 | 130 | 136 | 137 | 136 |
| | General Category | Avg. Length | 66 | 66 | 67 | 69 | 68 | 68 | 66 | 66 | 66 | 65 | 64 | 61 | 61 | 78 | 75 |
| | | Avg. GRT | 101 | 102 | 103 | 110 | 109 | 107 | 103 | 101 | 103 | 102 | 98 | 94 | 96 | 140 | 133 |
| | | No. permits | 160 | 156 | 146 | 146 | 118 | 113 | 117 | 123 | 123 | 124 | 128 | 130 | 128 | 67 | 72 |
| New Bern, NC | Limited access | Avg. Length | 84 | 73 | 71 | 73 | 73 | 75 | 77 | 75 | 77 | 79 | 79 | 83 | 76 | 81 | 81 |
| | | Avg. GRT | 198 | 89 | 89 | 94 | 94 | 103 | 115 | 106 | 114 | 113 | 113 | 122 | 114 | 122 | 121 |
| | | No. permits | 1 | 2 | 2 | 4 | 4 | 6 | 6 | 8 | 8 | 8 | 8 | 13 | 13 | 11 | 11 |
| | General Category | Avg. Length | 75 | . | 75 | . | 67 | . | . | 67 | . | . | 43 | 69 | 60 | 79 | 70 |
| | | Avg. GRT | 81 | . | 81 | . | 79 | . | . | 97 | . | . | 18 | 98 | 80 | 113 | 90 |
| | | No. permits | 1 | . | 1 | . | 1 | . | . | 1 | . | . | 1 | 5 | 6 | 5 | 10 |
| New London, CT | Limited access | Avg. Length | . | . | . | . | . | 86 | 86 | 86 | 86 | 86 | 86 | 83 | 81 | 81 | 81 |
| | | Avg. GRT | . | . | . | . | . | 147 | 147 | 147 | 147 | 147 | 147 | 188 | 168 | 168 | 168 |
| | | No. permits | . | . | . | . | . | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 5 | 5 |
| | General Category | Avg. Length | 73 | 73 | 61 | 53 | 49 | 50 | 51 | 54 | 52 | 56 | 53 | 54 | 54 | 50 | 50 |
| | | Avg. GRT | 125 | 125 | 85 | 65 | 55 | 55 | 59 | 63 | 52 | 57 | 49 | 52 | 52 | 30 | 30 |
| | | No. permits | 3 | 3 | 5 | 7 | 9 | 9 | 8 | 11 | 10 | 8 | 11 | 10 | 10 | 2 | 2 |
| Newport News, VA | Limited access | Avg. Length | 76 | 78 | 79 | 79 | 79 | 79 | 79 | 78 | 78 | 78 | 79 | 79 | 77 | 78 | 78 |
| | | Avg. GRT | 131 | 138 | 143 | 148 | 149 | 149 | 148 | 146 | 146 | 145 | 142 | 143 | 140 | 141 | 141 |
| | | No. permits | 8 | 9 | 10 | 10 | 12 | 17 | 19 | 21 | 21 | 21 | 22 | 23 | 19 | 18 | 18 |
| | General Category | Avg. Length | . | . | 52 | 50 | 69 | 64 | 64 | . | 63 | 63 | 52 | 56 | 67 | 55 | 55 |
| | | Avg. GRT | . | . | 42 | 42 | 92 | 88 | 88 | . | 86 | 86 | 52 | 74 | 101 | 51 | 51 |
| | | No. permits | . | . | 1 | 1 | 4 | 1 | 1 | . | 1 | 1 | 2 | 8 | 5 | 2 | 2 |

| | | | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Norfolk, VA | Limited access | Avg. Length | 77 | 79 | 79 | 78 | 79 | 79 | 78 | 79 | 80 | 80 | 81 | 79 | 80 | 80 | 80 |
| | | Avg. GRT | 137 | 138 | 138 | 138 | 136 | 133 | 132 | 133 | 135 | 137 | 140 | 139 | 139 | 141 | 141 |
| | | No. permits | 65 | 67 | 63 | 58 | 51 | 42 | 35 | 27 | 27 | 27 | 22 | 13 | 12 | 11 | 11 |
| | General Category | Avg. Length | 66 | 63 | 66 | 69 | 70 | 63 | 59 | 60 | 60 | 57 | 55 | 52 | 51 | 81 | 81 |
| | | Avg. GRT | 85 | 75 | 84 | 92 | 92 | 77 | 76 | 74 | 72 | 62 | 57 | 48 | 46 | 129 | 129 |
| | | No. permits | 41 | 35 | 26 | 30 | 21 | 20 | 14 | 18 | 20 | 18 | 17 | 16 | 14 | 3 | 3 |
| Oriental, NC | Limited access | Avg. Length | 71 | 71 | 70 | 73 | 76 | 75 | 76 | 75 | 66 | 68 | 79 | 80 | 67 | 72 | 79 |
| | | Avg. GRT | 101 | 101 | 108 | 121 | 127 | 126 | 127 | 123 | 100 | 99 | 115 | 118 | 94 | 102 | 123 |
| | | No. permits | 2 | 2 | 3 | 2 | 4 | 5 | 4 | 5 | 5 | 7 | 9 | 9 | 14 | 7 | 4 |
| | General Category | Avg. Length | . | . | . | . | 70 | 69 | 69 | 70 | 65 | 65 | 68 | 68 | 59 | 40 | 40 |
| | | Avg. GRT | . | . | . | . | 109 | 105 | 105 | 109 | 88 | 88 | 92 | 88 | 74 | 23 | 23 |
| | | No. permits | . | . | . | . | 2 | 3 | 3 | 2 | 4 | 4 | 10 | 9 | 15 | 1 | 1 |
| Point Judith, RI | Limited access | Avg. Length | 85 | 85 | 76 | 76 | 76 | 80 | 80 | 76 | 76 | 76 | 82 | 81 | 79 | 78 | 78 |
| | | Avg. GRT | 175 | 175 | 149 | 149 | 149 | 161 | 161 | 149 | 149 | 149 | 166 | 164 | 157 | 151 | 151 |
| | | No. permits | 1 | 1 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 3 |
| | General Category | Avg. Length | 59 | 58 | 60 | 58 | 59 | 57 | 57 | 56 | 57 | 56 | 56 | 56 | 55 | 46 | 62 |
| | | Avg. GRT | 73 | 74 | 78 | 73 | 74 | 71 | 70 | 67 | 70 | 70 | 67 | 68 | 67 | 31 | 91 |
| | | No. permits | 71 | 76 | 72 | 82 | 78 | 81 | 76 | 79 | 80 | 84 | 87 | 90 | 93 | 5 | 8 |
| Point Pleasant, NJ | Limited access | Avg. Length | 75 | 75 | 79 | 79 | 83 | 83 | 83 | 82 | 82 | 82 | 82 | 82 | 82 | 71 | 76 |
| | | Avg. GRT | 108 | 108 | 120 | 120 | 131 | 131 | 131 | 122 | 122 | 122 | 122 | 122 | 122 | 94 | 106 |
| | | No. permits | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 5 |
| | General Category | Avg. Length | 49 | 52 | 52 | 55 | 53 | 50 | 48 | 49 | 48 | 51 | 53 | 56 | 56 | 64 | 66 |
| | | Avg. GRT | 48 | 53 | 53 | 60 | 59 | 47 | 43 | 45 | 44 | 48 | 51 | 56 | 56 | 78 | 79 |
| | | No. permits | 24 | 20 | 20 | 21 | 25 | 27 | 29 | 33 | 34 | 31 | 35 | 37 | 41 | 14 | 15 |
| Seaford, VA | Limited access | Avg. Length | 86 | 86 | 82 | . | . | . | . | 83 | 87 | 84 | 84 | 86 | 87 | 87 | 87 |
| | | Avg. GRT | 125 | 125 | 181 | . | . | . | . | 141 | 154 | 147 | 147 | 143 | 142 | 145 | 148 |
| | | No. permits | 1 | 1 | 1 | . | . | . | . | 2 | 3 | 4 | 4 | 5 | 6 | 5 | 6 |
| | General Category | Avg. Length | 42 | 42 | . | . | . | . | . | 88 | . | . | . | 50 | 50 | . | . |
| | | Avg. GRT | 6 | 6 | . | . | . | . | . | 135 | . | . | . | 48 | 48 | . | . |
| | | No. permits | 1 | 1 | . | . | . | . | . | 1 | . | . | . | 1 | 1 | . | . |
| Wanchese, NC | Limited access | Avg. Length | 102 | 108 | 123 | 123 | 85 | 80 | 78 | 79 | 78 | 80 | 81 | 81 | 81 | 81 | 81 |
| | | Avg. GRT | 150 | 148 | 143 | 143 | 164 | 129 | 136 | 143 | 145 | 151 | 152 | 152 | 151 | 151 | 151 |
| | | No. permits | 4 | 3 | 2 | 2 | 2 | 1 | 4 | 8 | 7 | 7 | 6 | 6 | 8 | 8 | 8 |
| | General Category | Avg. Length | 76 | 76 | 75 | 70 | 74 | 68 | 65 | 63 | 59 | 57 | 54 | 54 | 54 | 66 | 73 |
| | | Avg. GRT | 122 | 122 | 129 | 107 | 122 | 99 | 91 | 87 | 75 | 67 | 63 | 63 | 63 | 92 | 115 |
| | | No. permits | 10 | 11 | 9 | 12 | 10 | 14 | 14 | 15 | 18 | 22 | 26 | 32 | 30 | 4 | 3 |

### 6.6.5 Status of Proposed Groundfish Sector Membership

Amendment 16 established 17 new sectors and reauthorized the two existing sectors. People who held groundfish permits were required to sign up for sectors by September 1st, 2009. The following section presents an overview of sector membership as of the September 2009 registration date. However, there are no regulations that require NMFS to hold any person to sector membership prior to May 1st of 2010, so anyone is allowed to leave a sector for the common pool prior to that date unless bound by a private contract with the sector. The actual number of people fishing in sectors in 2010 is therefore subject to change. NMFS recently announced that permit owners can choose to join a sector until November 20th, 2009.

Roughly half of the groundfish permits have chosen to remain in the common pool (757 of 1480). The sector with the greatest number of permits is the Sustainable Harvest Sector (93 permits), followed closely by the GB Cod Fixed Gear Sector (88 permits). The NEFS XII has the smallest number of permits with 10. The common pool has the most Category A DAS allocated under Amendment 16 (3601.2 days), while the Northeast Coastal Communities Sector has the least (143 days). Permits that have signed up for the common pool are associated with vessels that have a smaller average base length (39.7 ft.) than any sector except the GB Cod Fixed Gear Sector. The sector with the largest average base length for vessels is the NEFS IX (81.1 ft.).

Table 55 – Status of sector membership as of September 1st, 2009, with respect to A16 A DAS, number of permits, and average base length

| SECTOR NAME | Sum of A16 Category A DAS | Number of Permits | Average Base Length (in ft.) |
|---|---|---|---|
| Common Pool | 3601.2 | 757.0 | 39.7 |
| GB Cod Fixed Gear Sector | 1470.3 | 88.0 | 38.5 |
| Northeast Coastal Communities Sector | 143.0 | 19.0 | 40.2 |
| NEFS II | 1736.3 | 75.0 | 52.6 |
| NEFS III | 1453.1 | 74.0 | 40.2 |
| NEFS IV | 1152.6 | 47.0 | 54.4 |
| NEFS IX | 1134.2 | 44.0 | 81.1 |
| NEFS V | 798.6 | 39.0 | 66.2 |
| NEFS VI | 588.0 | 21.0 | 71.0 |
| NEFS VII | 660.7 | 25.0 | 79.7 |
| NEFS VIII | 567.1 | 22.0 | 79.2 |
| NEFS X | 663.8 | 33.0 | 46.1 |
| NEFS XI | 1047.0 | 47.0 | 43.1 |
| NEFS XII | 210.0 | 10.0 | 43.6 |
| NEFS XIII | 703.2 | 31.0 | 75.3 |
| Port Clyde Community Groundfish Sector | 762.0 | 39.0 | 42.3 |
| Sustainable Harvest Sector | 2753.0 | 93.0 | 68.2 |
| Tri-State Sector | 419.1 | 16.0 | 65.7 |
| Grand Total | 19863.1 | 1480.0 | 47.6 |

The state with the greatest number of permits in the common pool is Massachusetts (291 permits). The next states with the most common pool permits are New York (100), Maine (91), and New Jersey (88).

Table 56 – Common pool owner mailing addresses, state and number of permits

| | |
|---|---|
| CT | 17 |
| DE | 2 |
| FL | 2 |
| GA | 1 |
| MA | 291 |
| MD | 6 |
| ME | 91 |
| NC | 12 |
| NH | 37 |
| NJ | 88 |
| NY | 100 |
| RI | 65 |
| VA | 17 |

Of the vessels in the common pool, 477 have no DAS allocated. The remaining 280 permits have 3,601 DAS, or an average of 12.8 DAS. The distribution of DAS is shown in Table 6 – 93 percent of common pool vessels have 20 DAS or fewer. Of the 280 permits with DAS, 105 did not land a single GOM cod during the qualification period. Permits that did land GOM cod during the qualification period have 2,572 DAS.

Table 57 - Category A DAS allocated to common pool vessels

| *Cat A DAS Allocated* | *Frequency* | *Cumulative %* |
|---|---|---|
| 0 | 477 | 63.10% |
| >0 – 10 | 116 | 78.44% |
| > 10 – 20 | 112 | 93.25% |
| > 20 – 30 | 48 | 99.60% |
| > 30 – 40 | 3 | 100.00% |
| 50 | 0 | 100.00% |
| More | 0 | 100.00 |

The size distribution (permit baseline length) of vessels in the common pool that have DAS is similar to the size of all vessels eligible for sectors, but the common pool actually has a smaller percentage of large vessels.

| With DAS, in common pool | | | All Permits | | |
|---|---|---|---|---|---|
| *Length* | *Frequency* | *Cumulative %* | *Length* | *Frequency* | *Cumulative %* |
| 0 | 0 | 0.00% | 0 | 0 | 0.00% |
| >0 - 30 | 15 | 5.38% | 30 | 68 | 5.11% |
| >30 - 50 | 137 | 54.48% | 50 | 677 | 55.93% |
| > 50 - 75 | 100 | 90.32% | 75 | 362 | 83.11% |
| More | 27 | 100.00% | More | 225 | 100.00% |

The vessels that are in the common pool based on September 1, 2009 rosters have small PSCs for pollock. This suggests these permits do not have a history of targeting pollock in the past. It is unclear whether these vessels will choose to target a low value species like pollock under the proposed effort controls.

Table 58 – Distribution of FY 2010 pollock ACE/DAS for permits eligible to join sectors

| *Pollock/DAS* | *Frequency* | *Cumulative %* |
|---|---|---|
| 0 | 83 | 8.57% |
| 250 | 679 | 78.72% |
| 500 | 83 | 87.29% |
| 1000 | 62 | 93.70% |
| 1500 | 27 | 96.49% |
| 2000 | 15 | 98.04% |
| More | 19 | 100.00% |

The total PSC for allocated multispecies stocks for each sector is shown in Table 59. NEFS II, III, and XI and the Sustainable Harvest Sector have the largest shares of GOM cod. GB cod allocations are largest for the GB Cod Fixed Gear Sector, NEFS IX, and the Sustainable Harvest Sector. The largest GOM haddock allocations are to the NEFS II and III sectors and the Sustainable Harvest Sector. GB Haddock allocations are largest for the NEFS II, XIII, and Sustainable Harvest Sectors. NEFS II and XI and the Sustainable Harvest Sectors have the largest allocations of pollock.

Table 59 – Total PSC allocations for sectors according to September 1, 2009 membership rosters

| SECTOR NAME | GOM Cod | GB Cod | GOM Haddock | GB Haddock | CCGOM YTF | GB YTF | SNE/MA YTF | Pollock | Redfish | White Hake | Plaice | GOM Winter Flounder | GB Winter Flounder | Witch Flounder |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Pool | 0.0738 | 0.0506 | 0.0475 | 0.0279 | 0.0672 | 0.0648 | 0.2735 | 0.0431 | 0.0341 | 0.0474 | 0.0645 | 0.1649 | 0.0297 | 0.0495 |
| GB Cod Fixed Gear | 0.0190 | 0.2796 | 0.0129 | 0.0640 | 0.0183 | 0.0001 | 0.0018 | 0.0780 | 0.0289 | 0.0592 | 0.0055 | 0.0224 | 0.0003 | 0.0080 |
| Northeast Coastal Communities | 0.0051 | 0.0016 | 0.0025 | 0.0012 | 0.0046 | 0.0084 | 0.0053 | 0.0046 | 0.0048 | 0.0090 | 0.0024 | 0.0047 | 0.0007 | 0.0027 |
| NEFS II | 0.1894 | 0.0547 | 0.1767 | 0.1163 | 0.1932 | 0.0170 | 0.0164 | 0.1226 | 0.1654 | 0.0610 | 0.0836 | 0.1988 | 0.0167 | 0.1327 |
| NEFS III | 0.1539 | 0.0106 | 0.1085 | 0.0016 | 0.0892 | 0.0005 | 0.0040 | 0.0679 | 0.0113 | 0.0451 | 0.0423 | 0.1081 | 0.0003 | 0.0291 |
| NEFS IV | 0.0855 | 0.0471 | 0.0659 | 0.0542 | 0.0719 | 0.0216 | 0.0268 | 0.0562 | 0.0638 | 0.0785 | 0.0857 | 0.0763 | 0.0071 | 0.0912 |
| NEFS IX | 0.0164 | 0.1197 | 0.0475 | 0.0997 | 0.0918 | 0.1672 | 0.0645 | 0.0372 | 0.0578 | 0.0407 | 0.0721 | 0.0255 | 0.3245 | 0.0747 |
| NEFS V | 0.0025 | 0.0306 | 0.0068 | 0.0552 | 0.0170 | 0.0943 | 0.2534 | 0.0055 | 0.0060 | 0.0052 | 0.0262 | 0.0071 | 0.0244 | 0.0290 |
| NEFS VI | 0.0213 | 0.0273 | 0.0356 | 0.0295 | 0.0226 | 0.0210 | 0.0490 | 0.0378 | 0.0561 | 0.0437 | 0.0412 | 0.0339 | 0.0270 | 0.0471 |
| NEFS VII | 0.0058 | 0.0614 | 0.0064 | 0.0517 | 0.0526 | 0.1690 | 0.0449 | 0.0077 | 0.0054 | 0.0077 | 0.0423 | 0.0323 | 0.1755 | 0.0411 |
| NEFS VIII | 0.0047 | 0.0736 | 0.0020 | 0.0661 | 0.0729 | 0.1593 | 0.0596 | 0.0064 | 0.0044 | 0.0051 | 0.0244 | 0.0336 | 0.2063 | 0.0313 |
| NEFS X | 0.0428 | 0.0079 | 0.0212 | 0.0068 | 0.0966 | 0.0134 | 0.0096 | 0.0141 | 0.0056 | 0.0091 | 0.0129 | 0.1195 | 0.0068 | 0.0192 |
| NEFS XI | 0.1368 | 0.0040 | 0.0323 | 0.0004 | 0.0221 | 0.0000 | 0.0001 | 0.0928 | 0.0188 | 0.0485 | 0.0187 | 0.0213 | 0.0000 | 0.0186 |
| NEFS XII | 0.0151 | 0.0002 | 0.0036 | 0.0000 | 0.0057 | 0.0000 | 0.0004 | 0.0014 | 0.0007 | 0.0011 | 0.0043 | 0.0043 | 0.0002 | 0.0033 |
| NEFS XIII | 0.0075 | 0.0732 | 0.0059 | 0.1342 | 0.0315 | 0.1397 | 0.0983 | 0.0218 | 0.0447 | 0.0177 | 0.0337 | 0.0149 | 0.1002 | 0.0446 |
| Port Clyde Community Groundfish | 0.0464 | 0.0020 | 0.0231 | 0.0005 | 0.0071 | 0.0000 | 0.0065 | 0.0429 | 0.0255 | 0.0461 | 0.0630 | 0.0179 | 0.0001 | 0.0434 |
| Sustainable Harvest | 0.1601 | 0.1452 | 0.3520 | 0.2724 | 0.0982 | 0.0696 | 0.0802 | 0.3474 | 0.4562 | 0.4191 | 0.3416 | 0.0575 | 0.0639 | 0.3021 |
| Tri-State | 0.0141 | 0.0108 | 0.0495 | 0.0184 | 0.0375 | 0.0541 | 0.0055 | 0.0127 | 0.0104 | 0.0557 | 0.0356 | 0.0571 | 0.0163 | 0.0324 |
| Total | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

# 7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF IMPACTS

## 7.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality. Impacts on habitat and endangered or threatened species are discussed in separate sections. Impacts of the Proposed Action are discussed in relation to impacts on regulated groundfish, other species, and bycatch (as defined by the M-S Act).

### 7.1.1 ACL Specifications – Impacts on Groundfish Stocks

#### 7.1.1.1 Option One – No Action

The No Action alternative described in section 4.1.1considers that M-S Act requirements mandate the implementation of ACLs in FY 2010 for stocks that are subject to overfishing. As a result, it is likely that NMFS would implement these provisions through either an interim or emergency action. While NMFS may implement ACLs at some level in order to meet statutory requirements, the agency is not likely to make allocation decisions typically considered the purview and responsibility of the Council. This may include the determination of adjustments to the ABC for management uncertainty, any changes to the distribution of available catch to fishery sub-components, and the allocation of yellowtail flounder between the groundfish and scallop fisheries. This is the assumption used to evaluate the biological impacts of the No Action alternative. Absent a clear statement of how NMFS would act, this seems the prudent course to follow, but this may over-estimate the negative biological impacts of the No Action alternative.

The No Action alternative assumes that NMFS will use the ABCs recommended by the Council's Science and Statistical Committee (SSC) as the limits on catch, or ACLs. The impacts on stocks size of limiting catch to these levels can be estimated for stocks with age-based assessments and projections. Projection assumptions are fully described in Appendix III, and projection output is provided in Appendix IV. These projection results are shown in Figure 30 through Figure 43. On the surface, there is no difference between Option I - No Action and Option Two – Proposed Specifications with respect to future stock sizes. Because No Action considers that the ACL may be set equal to the ABC, however, there is less certainty about future stock size. Without an ACL adjustment for management uncertainty, AMs may not be triggered in time to keep catch below the ABC, or to modify future measures to account for an overage of the ABC/ACL.

Under No Action, a specific allocation of yellowtail flounder would not be made to the groundfish and scallop fisheries because while Amendment 16 proposes such an allocation the values are not specified. The only fishery catching yellowtail flounder that would be subject to an ACL and AM would be the groundfish fishery. The alternative assumes that NMFS would not determine a set-aside or assumed scallop fishery catch, so all of the yellowtail flounder would be allocated to the groundfish fishery, state waters, or other sub-components. That portion of the fishery subject to hard TACs (i.e. sectors beginning in FY 2010 and the common pool in FY 2012) might have a TAC allocated that does not consider yellowtail flounder catches by the scallop fishery. This increases the likelihood that the catch of yellowtail flounder may exceed the ABC if the part of the fishery subject to hard TACs catches its full allocation and scallop catches are as estimated. Overfishing of yellowtail flounder is likely to result, which would threaten the rebuilding plans for the three stocks. This would be particularly problematic for GB and SNE/MA yellowtail flounder, the two stocks where successful rebuilding seems to be most at risk given the Council's current rebuilding progress and the selected rebuilding strategies.

The No Action alternative would not adopt U.S./Canada Resource Sharing Understanding TACs for FY 2010. Such TACs are developed by the Transboundary Management Guidance Committee, or TMGC. While the TMGC agreed to FY 2010 TACs for EGB cod and haddock, the group did not reach agreement for GB yellowtail flounder.

Under the U.S. management system, EGB cod and EGB haddock are a subset of the GB cod and haddock stocks that are assessed as a unit. EGB cod and EGB haddock are considered management units and not separate stocks; target catch levels (such as the ABC) for the U.S. fishery are based on the mortality requirements for the stock as a whole. Failure to adopt the U.S./Canada TACs for these two stocks thus affects where catch might be taken – since there is no limit on the catch from the U.S./Canada area – but should not affect overall catches unless no provision is made for the Canadian portion of the catch. This is most problematic for components of the fishery subject to hard TACs, since if Canadian harvests are ignored the TACs would be set too high and would likely lead to overfishing. For components of the fishery subject to effort controls, if the relative proportions caught by the Canadian and U.S. fisheries remain similar to recent shares then the effort controls should be correctly designed to control fishing mortality. There would be less certainty about achieving mortality targets for these two stocks since no part of the catch would be controlled by a hard TAC.

With respect to GB yellowtail flounder, the entire stock is subject to the U.S./Canada Resource Sharing Understanding. No agreement was reached by the TMGC for this stock. Under No Action a specific TAC would not be specified by the U.S. This means that the stock could not be managed with a hard TAC as has been the case since FY 2004. This hard TAC has been effective at controlling catches but overfishing still occurred in 2005 through 2008 because of assessment uncertainty. Under the No Action alternative there would be less certainty about controlling catches but this may or may not lead to more uncertainty about achieving mortality targets.

For all three stocks, it is not clear how the Canadian management authorities would react to the U.S. not implementing the TMGC recommendations as would occur under No Action. If Canadian authorities were to follow suit and not limit Canadian fishery catches to the TMGC levels, then the likelihood of overfishing increases. This could also threaten future agreements over catch levels and lead to longer term rebuilding problems.

#### 7.1.1.2 Option Two – Fishery Specifications and ACLs for FY 2010 – 2012

This option proposes to adopt specifications and ACLs for FY 2010 -2012. This measure includes not only the identification of ACLs as required by the M-S Act and as implemented by Amendment 16; it includes the allocation of yellowtail flounder between the groundfish and scallop fisheries as part of the ACL process. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS, and it adopts the TACs for Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder that are applicable to the U.S./Canada Resource Sharing Understanding. The biological impacts of each of these elements will be discussed in this section.

As described in Section 4.1.2, this action defines the Overfishing Level (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limits (ACLs) for the multispecies fishery. The OFLs are based on an estimate of stock size and $F_{MSY.}$ The ABCs are reduced below the OFL and are based on a control rule for each stock. These control rules were identified in Amendment 16. In most cases, the ABC is based on a fishing mortality of either 75 percent of $F_{MSY}$ or an Frebuild, whichever is lower. The ABC is thus below the OFL and if catches are kept at or below the ABC, overfishing is unlikely to occur. The ACL is set lower than the ABC to account for management uncertainty. The ABCs – and thus the ACLs - that are specified for FY 2010 through FY 2012 are based on the fishing mortality targets adopted by Amendment 16. These targets were designed to end overfishing and to rebuild groundfish stocks consistent with the requirements of the M-S Act and the Council's rebuilding goals. The ABCs were set by the Science and Statistical Committee (SSC). In all cases the ACL is lower than the ABC. The calculation of these values is described in detail in Appendices I through IV.

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

For stocks that have an age-based assessment and an age-based projection model, the impacts on stock size of setting the ABCs can be estimated using short-term projections. These project the estimated median stock size expected to result by limiting catches to the ABC. While these projections are based on the scientific advice of the GARM III and TRAC panels, the SSC, and the Groundfish Plan Development Team, projections are subject to uncertainty and future stock size may differ from the trajectories illustrated here. Since the ACL is lower than the ABC, these projections may under-estimate stock rebuilding. The ACL, however, is designed to increase the likelihood of achieving the ABC. These short-term projections differ slightly from those reported in Amendment 16 because they use more recent data that was not able for preparation of that document. The calculations are described in detail in Appendix III. As an overview, these projections used estimated catch for 2008 and assumed that 2009 fishing mortality is that estimated to result from management measures adopted by an interim action.

The projection results are shown in Figure 30 through Figure 42. Each figure includes the upper quartile, median, and lower quartile of the projected stock size, the most recent estimate of stock size, and the target stock size, or $SSB_{MSY}$. Note that for GB yellowtail flounder two figures are shown. This stock was assessed at the Transboundary Resources Assessment Committee (TRAC) in 2008. At that meeting, two assessment models were put forward. One model (labeled "including") includes the Canadian survey results for 2008 and 2009; the second model (labeled "excluding") does not. The "excluding model gives lower estimates of stock size.

Projections for most stocks indicate increases in stock size during the three years FY 2010 through FY 2012. Two exceptions are the two haddock stocks. GB haddock stock size is expected to decline as the exceptional 2003 year class is subject to fishing and natural mortality, but should remain above $SSB_{MSY}$ in the short term. GOM haddock stock size is also projected to decline to slightly less than $SSB_{MSY}$ over the next three years. If the projections prove accurate, GOM cod, GB haddock, plaice, redfish, and perhaps GB yellowtail flounder (if the "including" assessment model proves accurate) will be above $SSB_{MSY}$ during this three year period. GOM haddock, GB yellowtail flounder (under either assessment model), CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, witch flounder, white hake, and GB winter flounder should increase to more than the minimum biomass threshold and will no longer be overfished. These latter stocks, however, are not expected to reach their target biomass. The projections indicate GB cod, SNE/MA winter flounder, and Atlantic halibut will remain overfished in FY 2012.

Similar estimates cannot be developed for GOM winter flounder, the two windowpane flounder stocks, ocean pout, pollock, and Atlantic wolffish as projections are considered unreliable for those stocks.

Figure 30 – GB cod: short-term projection with catch at ABC

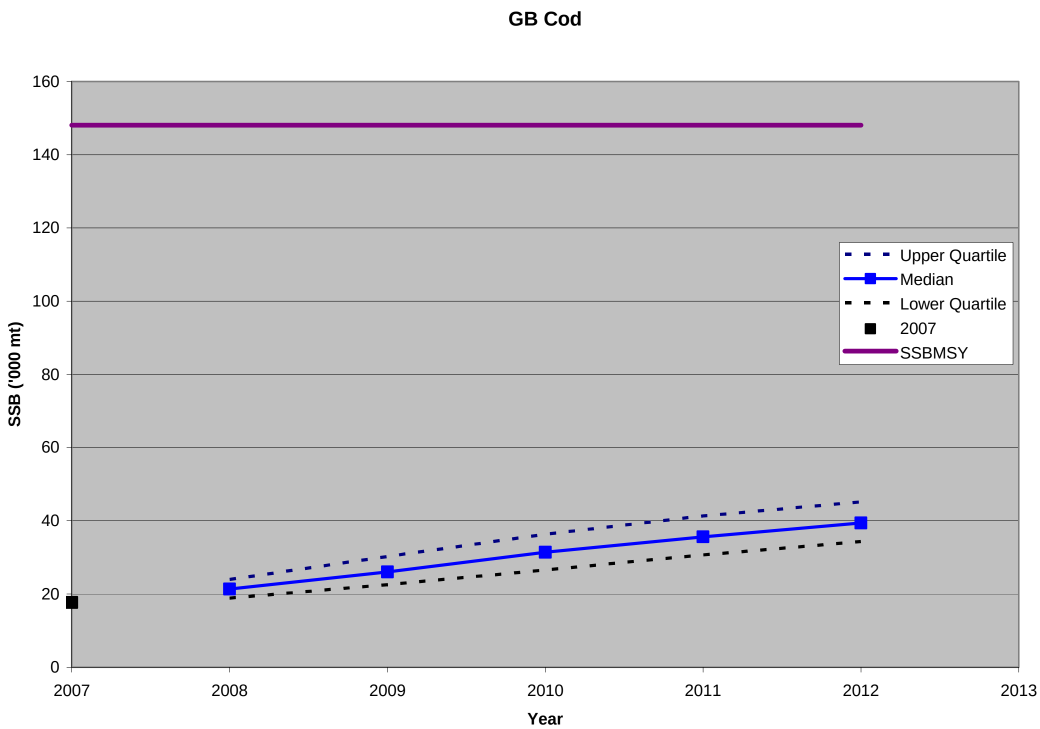



Figure 31 – GOM cod: short-term projection with catch at ABC

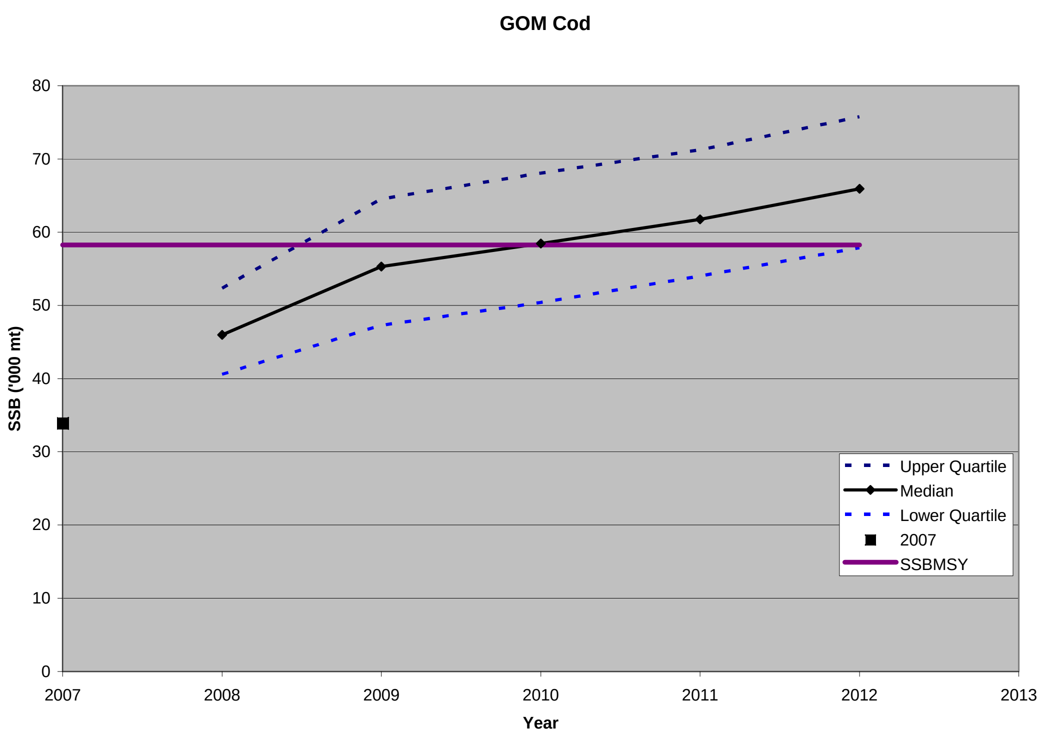


Figure 32 – GB haddock: short-term projection with catch at ABC

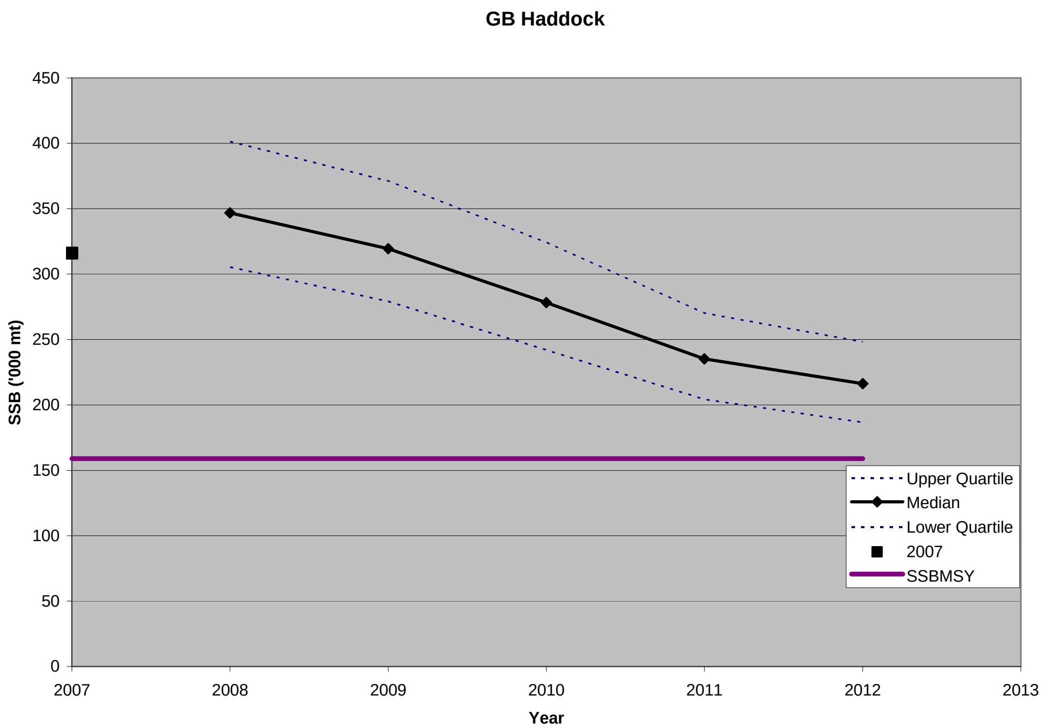



Figure 33 – GOM haddock: short-term projection with catch at ABC

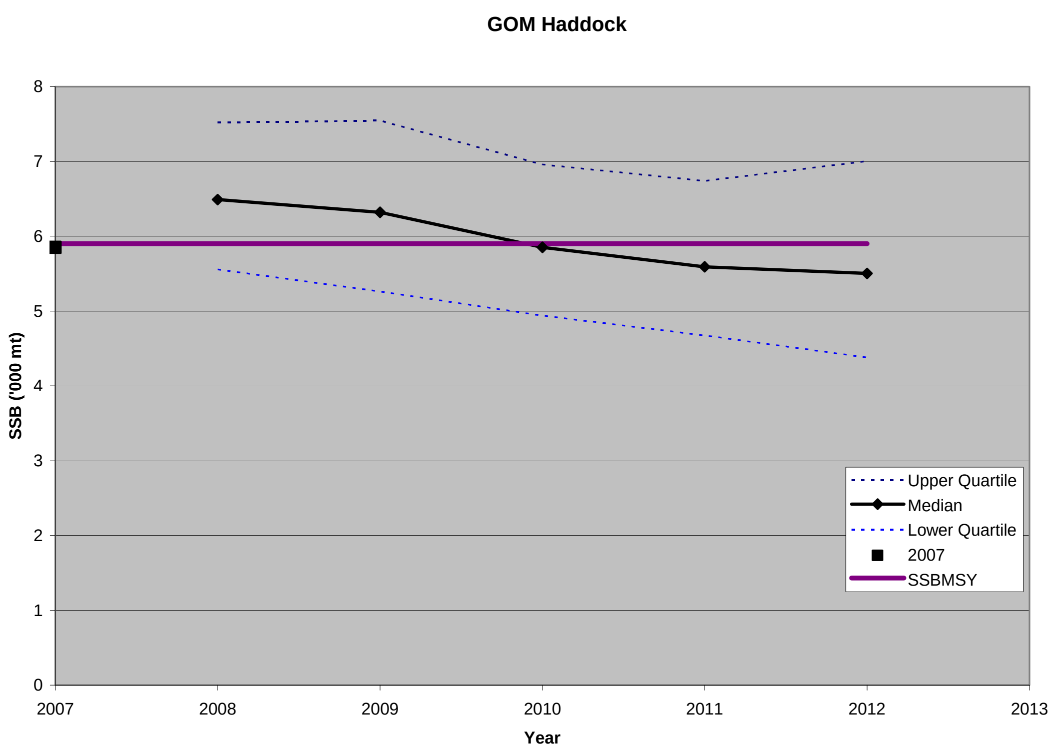


Figure 34 – GB yellowtail flounder (including): short-term projection with catch at ABC

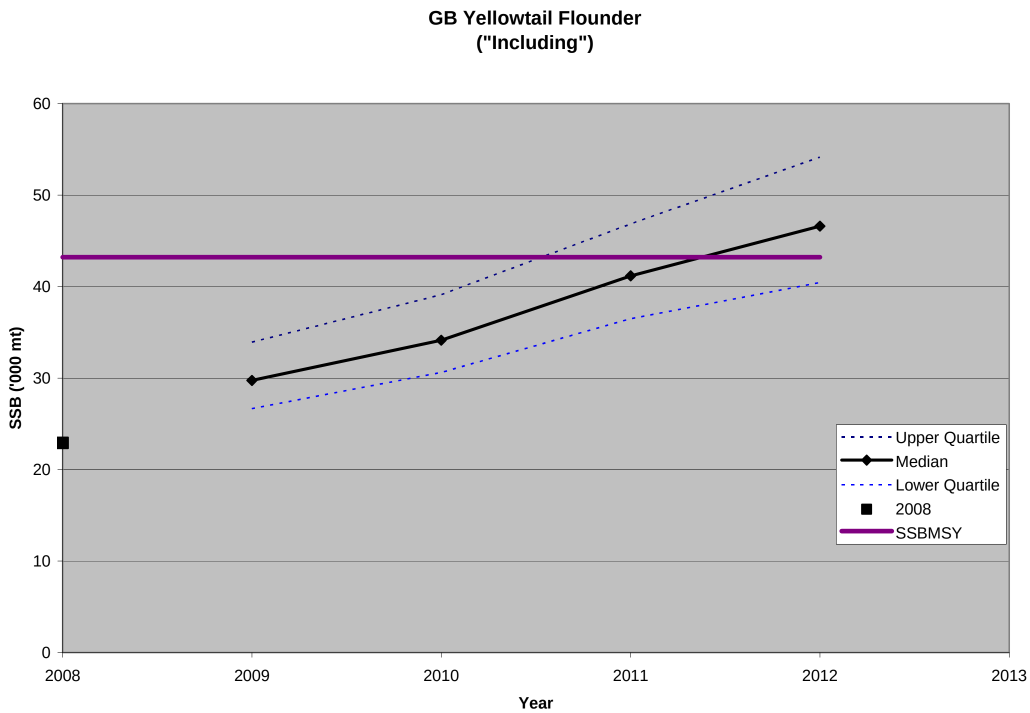



Figure 35 – GB yellowtail flounder (excluding): short-term projection with catch at ABC

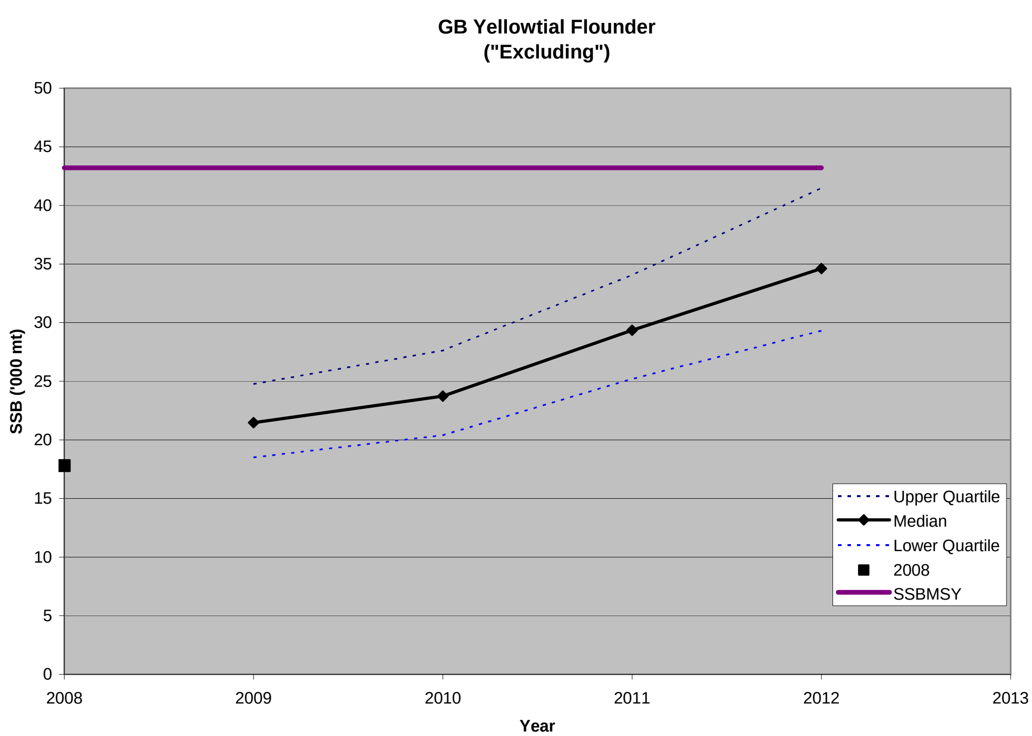


Figure 36 – CC/GOM yellowtail flounder: short-term projection with catch at ABC

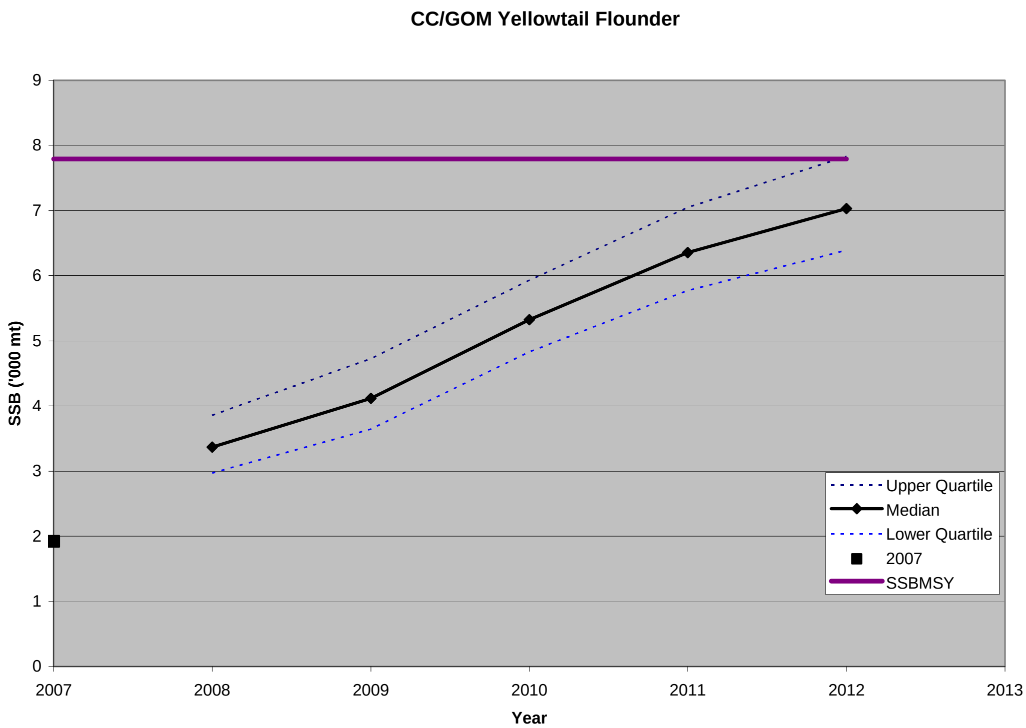



Figure 37 – SNE/MA yellowtail flounder: short-term projection with catch at ABC

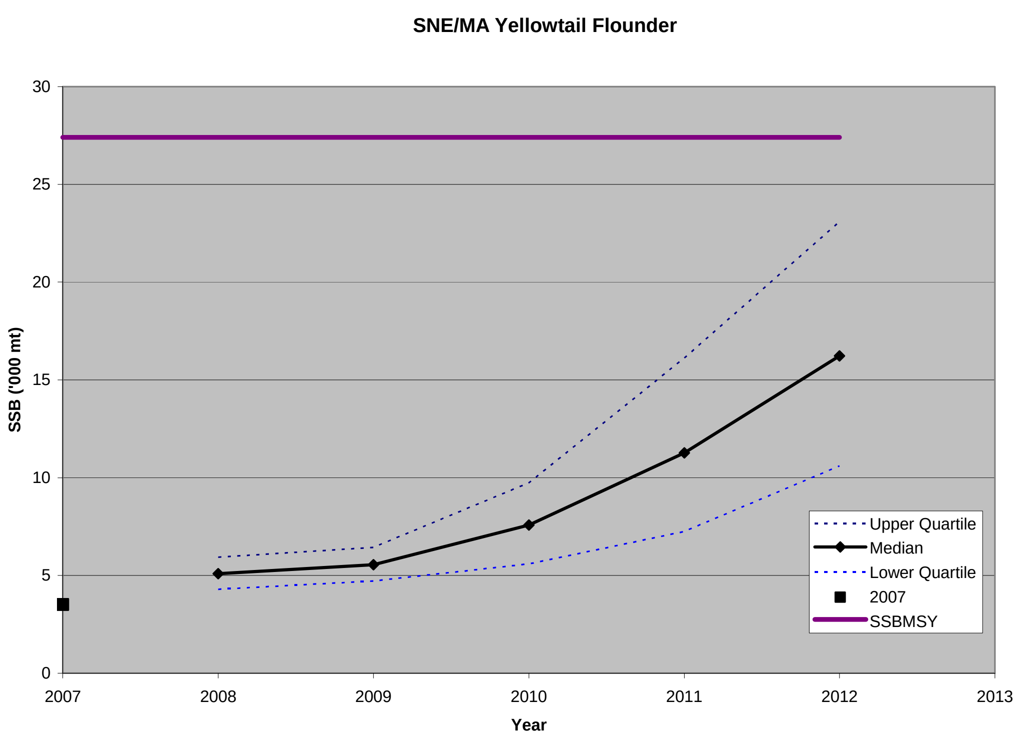


Figure 38 - American plaice: short-term projection with catch at ABC

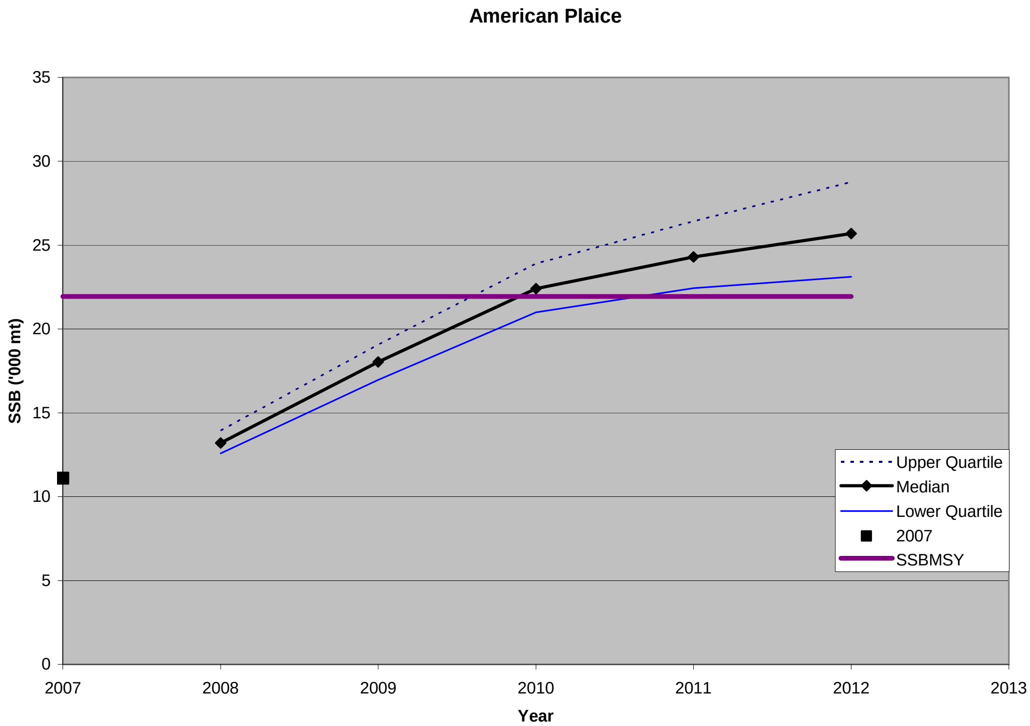



Figure 39 – Witch flounder: short-term projection with catch at ABC

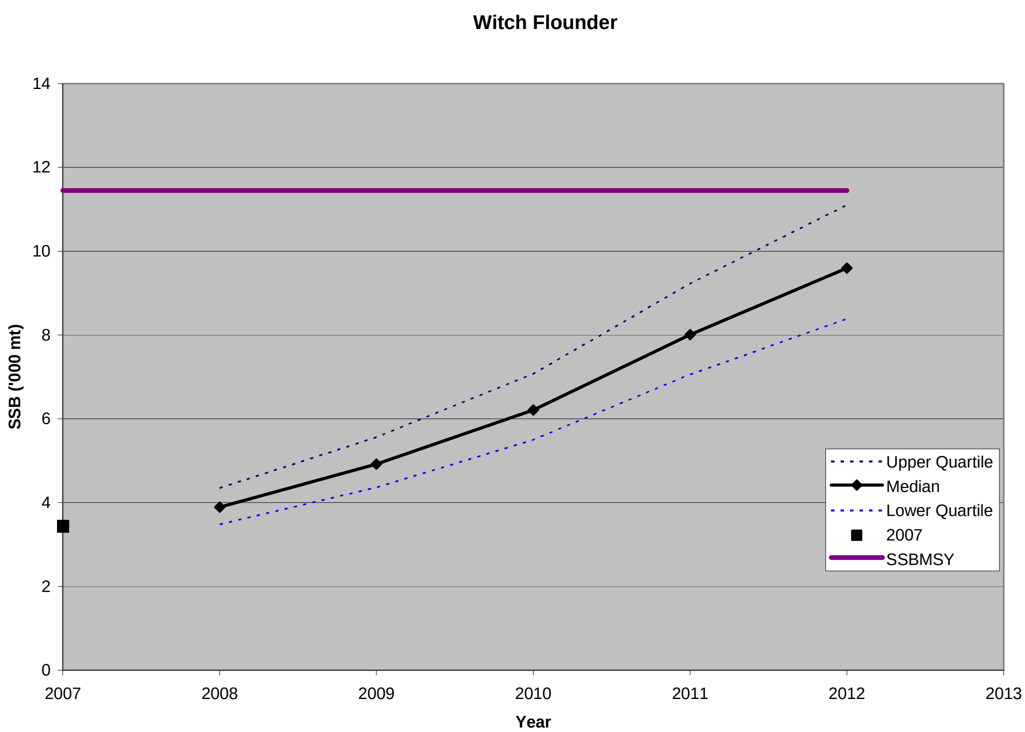


Figure 40 – GB winter flounder: short-term projection with catch at ABC

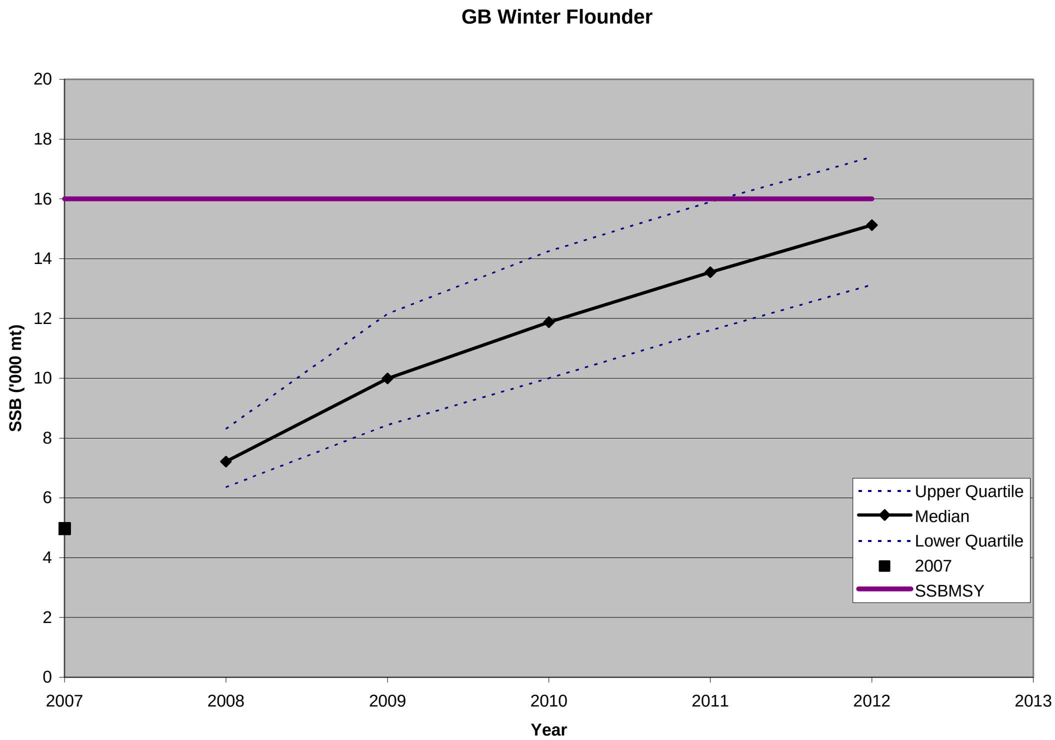



Figure 41 – SNE/MA winter flounder: short-term projection with catch at ABC

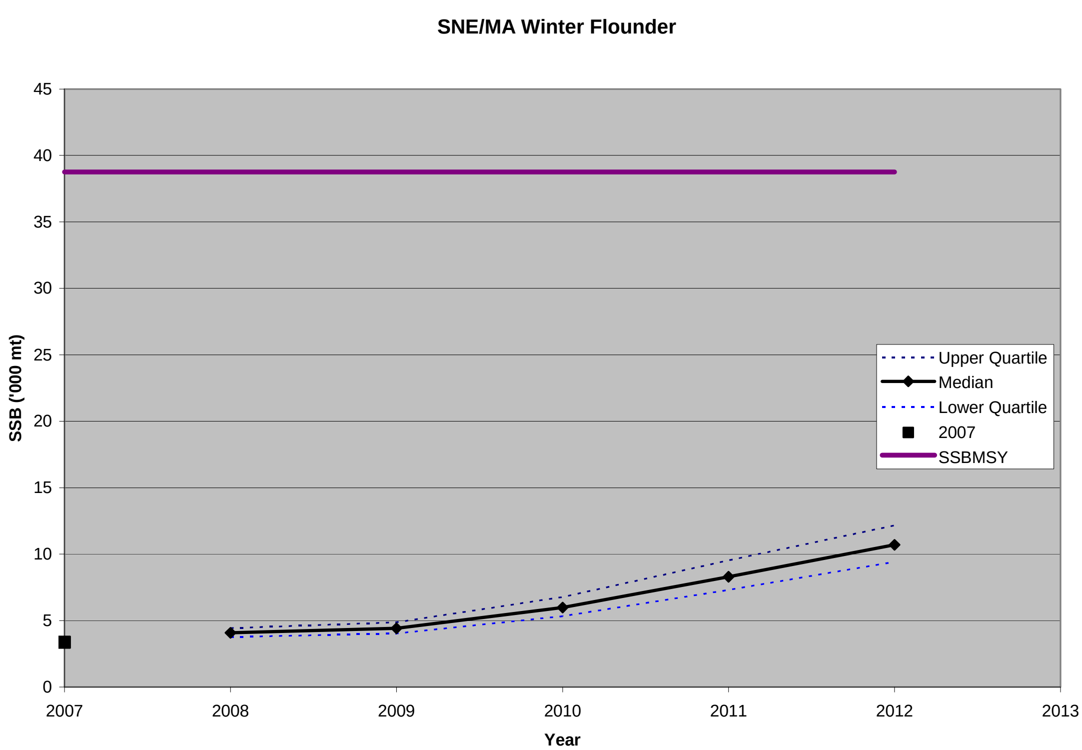


Figure 42 – Redfish: short-term projection with catch at ABC

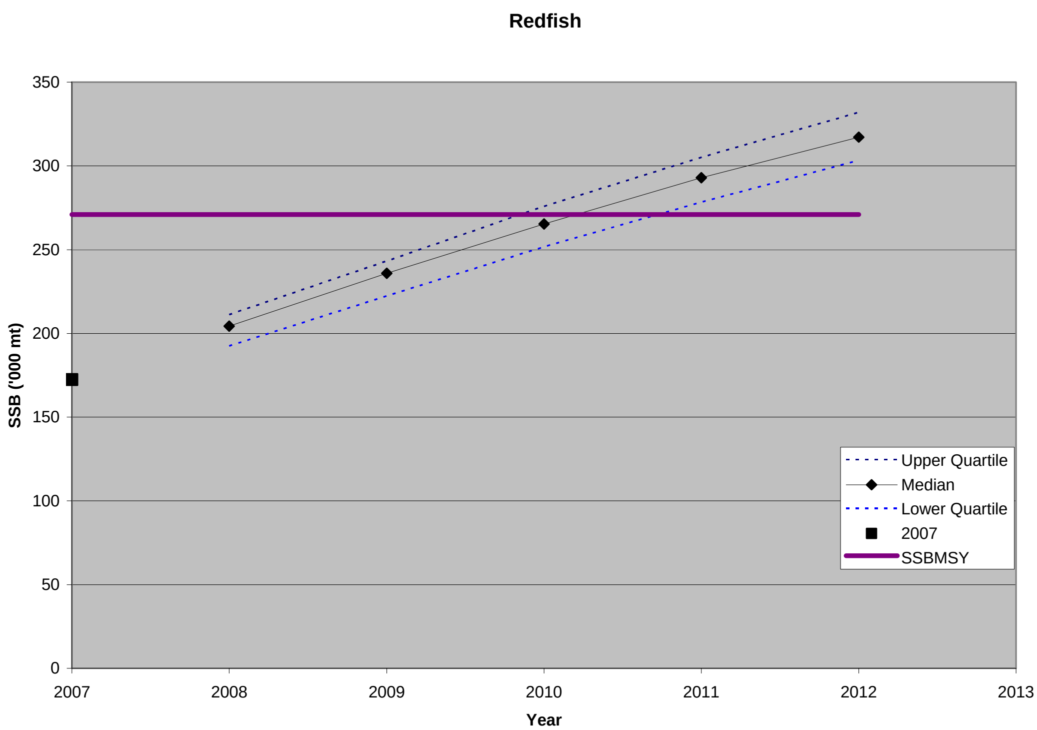
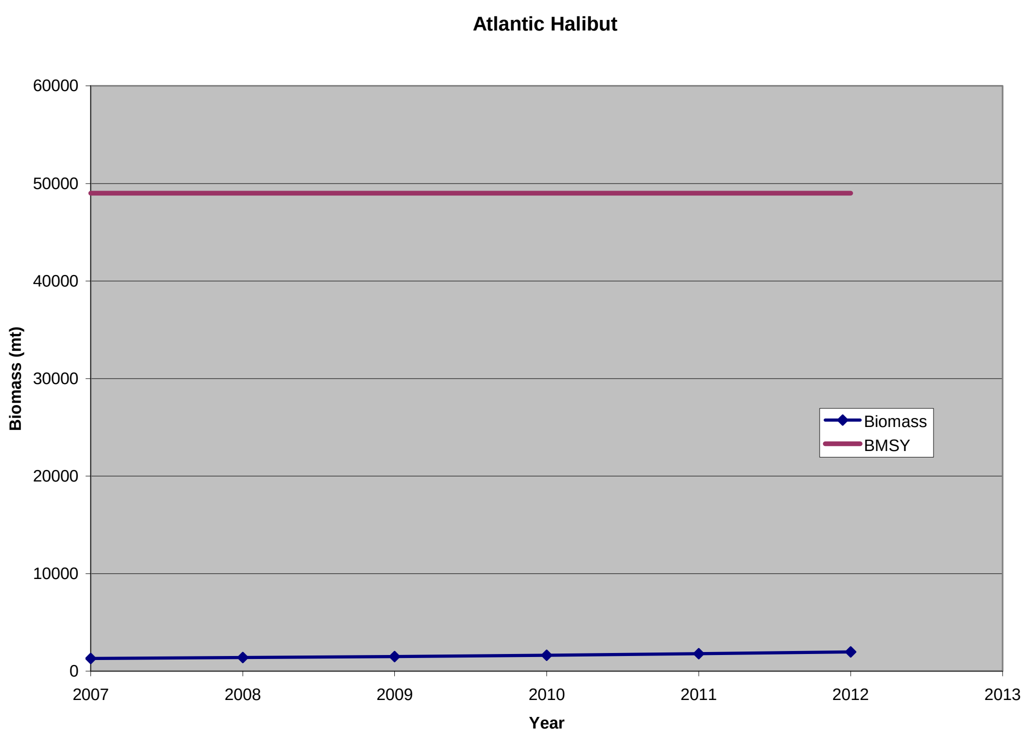



Figure 43 – Atlantic halibut: short-term projection with catch at ABC



As part of the ACL process, the ABC of each stock is distributed to various sub-components. As described in Amendment 16, some of these sub-components are considered sub-ACLs and are subject to AMs. These include the groundfish fishery ACL for all stocks. For GOM haddock and GOM cod, the recreational and commercial groundfish fishery components receive an allocation that is a sub-ACL subject to AMs. Within the commercial groundfish fishery, the ACL is distributed to the common-pool and sector vessels based on sector membership. In the case of GB and SNE/MA yellowtail flounder, the scallop fishery receives a specific allocation. While in FY 2010 this is considered a sub-component that does not have specific AMs, beginning in FY 2011 these allocations are treated as sub-ACLs and the scallop fishery will be subject to AMs if they are exceeded.

There are two components that are not considered ACLs and are not subject to individual AMs: state waters catches that occur outside of the management plan (that is, by state permitted vessels) and an "other" sub-component that accounts for small catches of each stock in a number of fisheries. In most instances these values are five percent or less. There are a few exceptions. Recreational catches of GOM and SNE/MA winter flounder occur primarily in state waters and result in a larger percentage of the ABC assumed caught in state waters. This is also the case with pollock, but to a lesser extent. Commercial catches of windowpane flounder within state waters also result in an increased proportion assumed to be caught in state waters by vessels with state permits.

The overall result of the distribution of the ABC and the ACL to the various components is that the portion of the catch that is controlled by the FMP differs from stock to stock. In particular, AMs are only applicable to a portion of the fishery and thus there may be some uncertainty over the ability of the management plan to control catches. As an example, the federal management plan has no authority to control catches within state waters by vessels that do not hold a federal permit. In the case of SNE/MA winter flounder, this means that as much as 30 percent of the ABC may not be controlled by the federal plan. The attainment of mortality goals will either require more onerous restrictions on federal permit holders or complementary action by state authorities. To the extent the proposed specifications correctly capture the proportion of each stock that is caught by these other sub-components, the plan is more likely to achieve the mortality targets.

Table 60 summarizes the proportion of each stock that is subject to the federal management measures based on the distributions proposed or assumed in this action. Some components – primarily the state waters catch – are not allocated by the Council, but represent an estimate of what will be harvested in state waters.

Table 60 – Percent of each stock's ABC expected to be subject to Northeast Multispecies FMP management measures

| Stock | Percent of ABC |
|---|---|
| GB Cod | 95% |
| GOM Cod | 85%[1] |
| GB Haddock | 95% |
| GOM Haddock | 95% |
| GB Yellowtail Flounder | 95% |
| SNE/MA Yellowtail Flounder | 95% |
| CC/GOM Yellowtail Flounder | 95% |
| Plaice | 95% |
| Witch Flounder | 95% |
| GB Winter Flounder | 95% |
| GOM Winter Flounder | 70% |
| SNE/MA Winter Flounder | 87% |
| Redfish | 95% |
| White Hake | 95% |
| Pollock | 88% |
| N. Windowpane Flounder | 70% |
| S. Windowpane Flounder | 70% |
| Ocean Pout | 95% |
| Atlantic Halibut | 45% |
| Atlantic Wolffish | 95% |

(1) An unknown portion is caught by recreational vessels in state waters outside the FMP.

As previously noted there are some distributions to sub-ACLs, each subject to AMs. While these allocations do not change the size of the ABC/ACL, they may have different biological impacts because the exact measures that control catch may differ between the sub-components. As an example, there are separate allocations to the commercial common-pool and sector vessels for most groundfish stocks (the exceptions are the windowpane flounder stocks, ocean pout, SNE/MA winter flounder, and Atlantic wolffish). In this instance the allocation is based on the vessels that commit to sectors – the sum of the Potential Sector Contribution (PSC) for the vessels within sectors determines how much is allocated. Based on the sector rosters as of September 1, 2009, the majority of the allocated stocks will be assigned to sectors (see Table 59). This means that the majority of these stocks allocated to the groundfish fishery will be subject to a hard TAC and extensive monitoring requirements. The assumption is that these types of measures will increase the likelihood that fishing mortality targets are met. In the case of GOM cod and GOM haddock, because parts of these stocks are allocated to the recreational fishery, a substantial portion of the stocks will have less certain management controls. These factors were considered in determining the difference between the ABC and the ACL for each stock, and stock-specific evaluations are described in Appendix III.

In the case of yellowtail flounder there may be different impacts over the period addressed by this action. While in FY 2010 the yellowtail flounder allocated to the scallop fishery is treated as an other sub-component and is not subject to a scallop-fishery AM, in subsequent years these allocations will be subject to specific AMs. So in FY 2010 there may be less certainty about achieving mortality targets, but this likelihood should increase in FY 2011 and beyond. While there are AMs on the portion of the scallop fishery catch of yellowtail flounder taken in the CAI, CAII, and NLCA access areas, these do not control overall catches of yellowtail flounder by the scallop fishery.

This measure also implements incidental catch TACs for special management programs. Incidental catch TACs were established to limit catches of groundfish stocks of concern when vessels in the common pool use Category B DAS to target healthy stocks. They apply to the Category B regular DAS program and certain special access programs (SAPs). The incidental catch TACs are a percentage of the common pool ACL and thus do not result in an increase in catch. The size of these TACs depends on the number of vessels that remain in the common pool and the PSC associated with those vessels. Based on the September 1 sector rosters, the incidental catch TACs are small for many stocks in some programs. In some cases they are small enough that NMFS may not be able to allow the SAP to open because of an inability to monitor the small TACs. If this occurs, then access to healthy stocks will be limited and fishing mortality for those stocks may be lower than if the SAP opens. Based on the September 1, 2009 sector rosters, it is not likely that the lack of access to special management programs will have a noticeable impact on the fishing mortality of healthy stocks because the small incidental catch TACs will limit the catches within those programs if they are open. In FY 2007 and FY 2008 only small amounts of the incidental catch TACs were caught (see Table 61).

Table 61 – Recent catches of incidental catch TAC stocks. Values in metric tons unless otherwise described

| | FY 2007 | | FY 2008 | |
|---|---|---|---|---|
| | TAC | Total - mt | TAC | Total - mt |
| GB Cod | | 3.3 | | 0.6 |
| GOM Cod | 99 | 3.6 | 103.9 | 2.4 |
| GB YTF | | 0.0 | | 0.0 |
| CC/GOM YTF | 10.8 | 0.3 | 14.1 | <=10 lbs. |
| SNE/MA YTF | 2.1 | 0.0 | 3.1 | 0.0 |
| GB WFL | 32.1 | <=10 lbs. | 35.6 | <= 50 lbs. |
| SNE/MA WFL | 30.2 | 0.1 | 35.8 | <=10 lbs. |
| Plaice | 205.2 | 1.3 | 256.1 | 0.1 |
| Witch | 253.8 | 1.6 | 216.6 | 0.1 |

Impacts on Non-Groundfish Species

Adopting the proposed specifications is not expected to have direct impacts on non-groundfish species. Indirect effects are generally likely to be beneficial. The specifications, when combined with the AMs adopted by Amendment 16, could reduce groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects the biological impacts should not be negative.

#### 7.1.1.3 Suboption 1 - Yellowtail Flounder Allocation to the Scallop Fishery

This measure also allocates a portion of the yellowtail flounder ACL to the scallop fishery to account for incidental catches in that fishery. In FY 2010, the allocations to the scallop fishery are considered an "other sub-component" and are not subject to specific scallop fishery AMs. In subsequent years the allocation is considered a sub-ACL and the scallop FMP will adopt AMs to control these catches. Two options are considered for the amounts that will be allocated, each with slightly different biological impacts to groundfish stocks. In general, both options merely allocate part of the annual catch limit between the two fisheries and should not lead to catches that exceed mortality targets. But the options may distribute the catches differently, which may have some impacts.

Allocations are proposed for two stocks - GB yellowtail flounder and SNE/MA yellowtail flounder – and are based on 90 percent of the amount the scallop fishery is expected to catch if they harvest the projected scallop yield. These amounts of yellowtail flounder were estimated by comparing recent discard rates, projected increases in scallop and yellowtail flounder abundance, and future scallop yields. The scallop fishery catch of CC/GOM yellowtail flounder is estimated to be a small amount and so a specific allocation is not made; catches are considered part of the "other sub-components."

In FY 2010, as mentioned, the yellowtail flounder allocations do not have specific AMs that control the overall yellowtail flounder catch. If the scallop fishery fishes in CAI, CAII, or the NLCA, it is limited to harvesting 10 percent of the ACL from within those areas, but there are no controls on the catch outside those areas. Should the scallop fishery exceed the amount of yellowtail flounder that is allocated, then if the groundfish fishery harvests its allocation the total catch of yellowtail flounder could exceed the ACL. While the ACL is set well below the overfishing level for both stocks and it is unlikely that total catches will approach this amount, rebuilding fishing mortality targets may not be met since the ACL is set closer to the ABC.

This result is less likely in subsequent years. While the exact scallop fishery AMs are still being developed, these AMs will create an incentive for scallop fishermen to control yellowtail flounder catches to avoid triggering the AMs. The result may be reduced catches of yellowtail flounder by the scallop fishery.

With respect to CC/GOM yellowtail flounder, this measure does not identify a specific allocation for the scallop fishery. The measure proposes that scallop fishery catches of this stock be considered part of the "other sub-components" part of the overall ACL. Scallop dredge discards as a percentage of the total catch from this stock have fluctuated during the period 2003 – 2007, in recent years, ranging from 0.6% to 5.6% percent (see Table 62). The amounts expected to be harvested by the scallop fishery are within this range. Other fisheries that may take small amounts of CC/GOM yellowtail flounder include state waters fisheries, the whiting fisheries, and the northern shrimp fishery. If scallop fishery catches remain low, then considering this catch part of an other sub-component does not risk mortality targets. As the scallop fishery catch increases, however, it becomes more likely that the total catch by these other fisheries may exceed the amount allocated to the other sub-component category. The likelihood of this occurring can be partially controlled by the selection of scallop management alternatives that minimize yellowtail flounder catches.

Table 62 – Recent scallop dredge catch of CC/GOM yellowtail flounder (Source: GARM III)

| Year | Scallop Dredge Catch | Total Catch | Dredge Discards as Percentage of Total Catch |
|---|---|---|---|
| 2003 | 25 | 1970 | 1.3% |
| 2004 | 18 | 1186 | 1.5% |
| 2005 | 6 | 997 | 0.6% |
| 2006 | 11 | 620 | 1.8% |
| 2007 | 35 | 627 | 5.6% |

This option does not modify the amount of yellowtail flounder than can be taken inside the Georges Bank access areas. That amount is still limited to 10 percent of the ABC. The distribution proposed in this action will not have any impact on the amount of yellowtail flounder that can be taken by the scallop fishery within the CAI, CAII, and NLCA access areas. In this respect this option does not differ from No Action.

Impacts on Non-Groundfish Stocks

The allocation of yellowtail flounder to the scallop fishery will have the most direct impacts on scallop stocks. If scallop fishermen cannot control the rate of incidental catches to the amount of yellowtail that is allocated, some scallop yield will be foregone. This could reduce fishing mortality on sea scallops. The extent that this occurs will depend not only on actual discard rates, but on what AMs are in place for the scallop fishery in future years. There are not expected to be noticeable difference in these impacts between the two options under consideration.

There may also be impacts on other stocks caught in the sea scallop and groundfish fisheries. For example, if sea scallop fishing activity is reduced because of yellowtail flounder incidental catches, catches of skates, monkfish, and other species caught by scallop fishermen may be reduced. Similar effects on a wider range of species may occur if the groundfish fishery loses effort as a result of allocating yellowtail flounder to the scallop fishery. Catches could be reduced of monkfish, skates, lobster, fluke, and other species caught by trawl fishermen.

#### 7.1.1.4 Suboption 2 – U.S/Canada Resource Sharing Understanding TACs

The proposed TACs were set at levels that correspond to the fishing mortality rates consistent with the management strategy agreed to under the Understanding, as well as with the recommendation of the Science and Statistical Committee (SSC; for GB yellowtail flounder). Under the Understanding, the strategy is to maintain a low to neutral risk of exceeding the fishing mortality limit reference ($F_{ref}$ = 0.18, 0.26, 0.25, for cod, haddock, and yellowtail flounder, respectively). When stock conditions are poor, fishing mortality rates should be further reduced to promote rebuilding. The recommended 2010 TACs for cod, haddock, and yellowtail flounder were based upon the most recent stock assessments (TRAC 2009a, 2009b, 2009c). The 2010 TACs for Eastern GB cod and haddock were recommended by the Transboundary Management Guidance Committee (TMGC), based upon the fishing mortality strategy shared by both the United States and Canada. The proposed TAC for GB yellowtail flounder was based upon the requirements of the Northeast Multispecies Fishery Management Plan (FMP) and the recommendation of the SSC. The full justification for the proposed TACs is described in Section 4.1.2.2 of this EA.

Based upon fishing years 2004 through 2008, information on catch (landings and discards) from the U.S. Canada Management Area, the management measures implemented by Amendment 13 and subsequent framework adjustments have restrained the catches of GB cod, haddock, and yellowtail flounder, to below their respective TACs with one minor exception. In FY 2007, the catch of GB yellowtail flounder exceeded the TAC by nine percent due to some late reporting and because a portion of the yellowtail catch by the scallop fleet was not considered until after the end of the fishing year. A downward adjustment was made in the size of the 2008 TAC. In order to prevent such an overharvest from recurring, the monitoring methodology was modified to evaluate the amount of yellowtail catch from the scallop fishery more frequently.

Based upon preliminary information, NMFS does not anticipate that there will be an overage (i.e., the catch will not exceed the TAC) for FY 2009 for Eastern GB cod, Eastern GB haddock, or GB yellowtail flounder.

Although it is not possible to separate out the precise impact of the hard TACs on the overall pattern of fishing behavior and landings, the TACs and associated regulations have played an important role in determining fishing patterns on GB, as further explained in the Economic Impacts of the proposed TACs. Because the proposed TACs are based upon fishing mortality rates that are in accordance with the Understanding and the FMP, and the management measures that are associated with the U.S. Canada Management Area have been demonstrated to effectively control fishing effort, the proposed TACs are appropriate and will contribute toward the growth of the GB cod and yellowtail flounder stocks, and the maintenance of the GB haddock stock. Because the TACs will contribute toward the growth and maintenance of the stocks, the biological impacts will be positive. As a result of the likely implementation of Amendment 16 in FY 2010 there will be a wide range of substantive regulatory changes and potential changes in fishing behavior in the groundfish fishery, which arguably could result in a greater risk that the U.S./Canada TACs will be exceeded. However, it should be noted that the ACLs specified in FW 44 account for management uncertainty, and Amendment 16 management measures include many tools for monitoring of the fishery.

In contrast, as described in Section 20.1.1, the biological impacts of the No Action Alternative, would be primarily negative. The No Action Alternative does not represent the appropriate level of TACs from a biological perspective, and would allow fishing mortality to be too high. Allowing an excessive amount of fish to be caught would represent a level of fishing mortality that exceeded the desired level of fishing mortality. If the appropriate levels of fishing mortality were exceeded, it is likely that stock rebuilding would be slowed. Under the No Action Alternative (with no TACs specified), it is possible that excessive harvest could occur for all three shared stocks. Since 2004, the U.S./Canada TACs have proved effective at controlling fishing effort on the shared stocks, in a precise manner, which would not be possible under the DAS system in place in the NE multispecies fishery at-large.

A delay in the opening of the Eastern U.S./Canada Area to trawl vessels (for both Sector and non-sector vessels) until August 1, 2010, will likely result in a reduced chance that the cod TAC will be caught or exceeded because trawl vessels will not have access to the area during the period when cod is typically caught at a relatively high rate.

Implementation of a relatively low trip limit such as 5,000 lb trip limit of GB yellowtail flounder, will have little biological impact other than slowing the rate of yellowtail catch. It is difficult to predict what impact a 5,000 lb trip limit will have on the discard rate. During the 2008 fishing year the percent of total catch of yellowtail estimated to be discards was 28 %. During the 2008 fishing year, the trip limit varied from 2,500 lb to 5,000 lb per trip.

The measures for the U.S./Canada Management Area will be neutral to somewhat positive for protected species. The size of the cod and yellowtail flounder TACs and the rate of harvest determine the amount of fishing effort in the U.S./Canada Area. A reduction in TACs for cod and yellowtail flounder would be expected to result in some reduction in fishing effort.

It is difficult to evaluate the effect of a zero allocation of trips in the Closed Area II SAP because Under Amendment 16 rules, there would still be fishing effort allowed in CA II under the expanded access allowed for haddock (August 1 through January 31). Compared to the past, there is likely to be an increase in fishing effort in the Eastern U.S./Canada Area due to the opportunity to fish in CA II, which has not been accessible to the groundfish fishery since 2004. An increase in effort would have limited effect on ESA-listed cetaceans given the measures that are already in place under the ALWTRP for the use of gear in the groundfish fishery, and would have limited effect on ESA-listed sea turtles given their distribution and abundance on Georges Bank.

Delay of the use of trawl gear in the U.S./Canada Management Area until August 1, 2010 would be of benefit to those protected species, such as small cetaceans, that occur in the management area and can be captured in trawl gear. A delay in the use of trawl gear would not change the effects to large cetaceans given that these species are not captured in trawl gear. The delay would also not change the effects to sea turtles given the relatively low abundance and distribution of sea turtles in the U.S./Canada Management Area.

### 7.1.2 Commercial Fishery Effort Control Modification

#### 7.1.2.1 Option One – No Action

Under the No Action alternative, the effort control measures adopted by Amendment 16 would apply to common-pool groundfish fishing vessels – that is, those that do not join a sector. These measures were evaluated in Amendment 16 to meet the mortality targets of the amendment. The expected changes in exploitation for groundfish stocks are shown in Table 63.

Table 63 – Option 3A changes in exploitation (needed difference for pollock reflects impacts of changes to the Category B regular DAS program)

| Spec | AREA | Needed Difference | Amendment 16 Impacts % Difference |
|---|---|---|---|
| COD | GBANK | -50% | -54% |
| COD | GM | -37% | -52% |
| HADDOCK | GBANK | 202% | -53% |
| HADDOCK | GM | 24% | -54% |
| WINTER | GBANK | 48% | -52% |
| WINTER | GM | | -45% |
| WINTER | SNEMA | -100% | -67% |
| PLAICE | ALL | 39% | -56% |
| WITCH | ALL | -46% | -56% |
| WHK | ALL | 28% | -63% |
| WINDOWPANE | NORTH | | -59% |
| WINDOWPANE | SOUTH | | -61% |
| YTF | CCGOM | -34% | -57% |
| YTF | GBANK | -15% | -59% |
| YTF | SNEMA | -39% | -39% |
| POLLOCK | ALL | -66% | -61% |
| REDFISH | ALL | 271% | -62% |

As discussed in Amendment 16, these expected impacts were estimated using an analytic tool referred to as the Closed Area Model (CAM). Because of uncertainty over sector membership, analyses in Amendment 16 assumed all permits remained in the common pool and would be subject to effort controls. Throughout the development of Amendment 16 it was clear that the development of effort controls was more uncertain than in the past because it was not known which vessels would choose to join sectors and which vessels would choose to fish under the effort controls. If the vessels that choose to fish in the common pool are not representative of the vessels in the model, then the model results might not accurately predict impacts. The ability to model the 24-hour clock added additional uncertainty.

Concerns have been expressed that the model over-estimates the exploitation reductions, in particular for GOM cod and pollock. Another source of uncertainty is the estimate of cod discards. The Closed Area Model (CAM) parameters reflect revealed preferences based on catch rates in gear/block/month combinations. If catch rates in the model are lower than actual catch rates due to low estimates of discards, then some areas may be seen as less favorable within the model than is actually the case, and the model may over-estimate changes in exploitation. When the effort control alternative was developed there was a considerable buffer between the needed changes in exploitation for GOM cod and the model's predicted results, but this gap was essentially eliminated when the Council adopted the revised ABC control rules.

Based on sector rosters as of September 1, 2009, a large number of permits have been committed to sectors. These commitments can still be reversed until May 1, 2010, so sector membership is still not known with certainty. The permits that have not committed to sectors are described in Section 6.6.5. Given the trip limits adopted by Amendment 16 for GOM cod (200 lbs./DAS) and pollock (no trip limit), these permits have the potential to catch more GOM cod and pollock under effort controls than within sectors. There may be other permits that are presently committed to sectors that may be able to do the same. While the decision to join sectors does not hinge solely on these two species, the possibility that other permit holders may elect to fish in the common pool adds uncertainty to the success of the effort control measures.

An example for GOM cod illustrates the potential issue should the No Action alternative be adopted. With 3,600 DAS in the common pool and a 2,000 lb./DAS trip limit, if the full trip limit is caught on every DAS the vessels that are not committed to sectors could land 3,266 mt of GOM cod. By comparison, the ACL for these same vessels is approximately 337 mt. While it is unrealistic to assume the trip limit will be caught on every DAS used, and that every DAS will be used, there remains a large difference between the ACL and the potential catch of these vessels. Should additional vessels choose to remain in the common pool, the potential catch increases, but so does the common-pool ACL.

To the extent fishing behavior changes in ways not predicted by the CAM and other analyses in Amendment 16, there may be less certainty about achieving the mortality objectives of Amendment 16 if the No Action alternative is selected.

#### 7.1.2.2 Option Two – Modification of Trip Limits

This option proposes to modify the trip limit for GOM cod to 800 lbs/DAS with a maximum of 4,000 lbs./trip. A trip limit for pollock is also adopted, at 1,000 lbs./DAS and 10,000 lbs./trip. These two trip limits will be implemented at the start of the fishing year. If Option 3 is also adopted (Section 4.2.4) the Regional Administrator may adjust the limits during the course of the fishing year to allow the ACL to be harvested or to reduce the likelihood that it will be exceeded. Finally, the yellowtail flounder trip limits applicable to scallop dredge vessels are removed. These changes will be discussed in order for their impacts on groundfish stocks.

Adopting the trip limit for reduces the amount of cod that the common pool vessels are able to land. The limit reduces, but does not eliminate, the difference between the ACL for the common pool and the potential landings from these vessels. The maximum landings if every DAS is used and the trip limit is caught on every DAS is reduced to about 1,306 mt, or roughly four times the ACL for the common pool vessels (based on September 1, 2009 sector rosters). This comparison is made without regard to the possible application of differential DAS (see Section 4.2.3); the impacts of adopting both this trip limit and the differential DAS rate will be discussed in a following section.

The sector rosters, however, may change before the beginning of the fishing year since permits can be withdrawn from sectors until May 1, 2010. Some sense of the impacts of this proposed trip limit if permits do withdraw from sectors can be obtained by making assumptions about sector membership. While participation in sectors is likely based on a number of factors, if assumed that the decision is primarily based on the amount of GOM cod that can be caught the permits can be identified that have the potential to land more cod in the common pool than in sectors if the proposed trip limit is adopted. This assumption is likely not valid but does provide some idea of the effect of the trip limit under different levels of sector membership. With the proposed trip limit of 800 lbs./DAS, approximately 15,700 DAS would be expected to remain in the common pool if the decision was based solely on potential GOM cod landings. The resulting ACL for the common pool would be approximately 1,700 mt while the potential landings under DAS would be about 6,700 mt.

These simplistic calculations have several weaknesses. First, only baseline allocated DAS are used; there could be carry-over DAS that increase the number of DAS available to the fleet. The percentage of baseline DAS that do no get used – and thus are available as carry-over DAS in the following year – has averaged 16.7 percent since FY 2004, within a narrow range of 15.2 percent to 17.4 percent. Second, the analyses assume that the full trip limit is caught on every DAS. This has never been the case; some DAS get used in other areas, and even for DAS used in the GOM the GOM cod trip limit is not caught on every DAS and on every trip. Second, the analysis assumes that every DAS is used. Again, this has never occurred. Information in Section 6.6.5 shows that DAS used as a percentage of all DAS allocated (baseline and carry-over DAS) has ranged between 62.6 percent and 67.6 percent since FY 2004. Even if only the DAS are considered that are allocated (or acquired through leasing) to permits that use DAS, the percentage of DAS used has been between 70 and 76 percent since FY 2004; a slowly increasing trend is evident.

If the observed trends in carry-over DAS continue, permits committed to the common pool would have about 4,600 DAS available. If the rate of use matches recent observations, about 65 percent would be used. Multiplying these values by the proposed trip limit results in potential landings of 1,093 mt, or about 16 percent less than the initial estimate.

Landings are only one source of fishing mortality; discards also contribute. One likely result of the 800 lb./trip limit is that GOM cod discards would remain high. Current stock size is projected to be close to, or perhaps even higher than, $SSB_{MSY}$ (see Figure 31), yet the proposed trip limit is the same as that adopted in Amendment 13 when stock size was less than one-fourth the current projected stock size. There is evidence that discards of GOM cod increased with increases in stock size[5] in recent years (see Figure 44), and the ratio of cod discarded to cod landed has increased as well (see Figure 45). To the extent that regulatory discards of GOM cod are proportional to increases in stock size, discard rates for common pool vessels are likely to increase under this measure from recently seen values. Under the No Action alternative, the trip limit is larger, so regulatory discards resulting from the trip limit would likely be smaller; this measure would probably increase discards when compared to No Action as well.

This measure also adopts a pollock trip limit of 1,000 lbs./DAS and 10,000 lbs./trip. Under existing regulations and the No Action alternative there is no trip limit for pollock. This makes it difficult to do an analysis similar to that for GOM cod because it is not clear how much pollock the vessels in the common pool can catch absent a trip limit. As noted in Section 6.6.5 the vessels committed to the common pool as

[5] Regulatory discards are presumed sensitive to trip limits. During the period described the trip limit for GOM cod was 800 lbs./DAS with the exception of May – November 2006 when it was reduced to 600 lbs./DAS.

of September 1, 2009 only have small PSCs for pollock that total 4.31 percent, indicating they did not actively target this species during the qualification period. The pollock ACL for these vessels is about 118 mt, or 261,110 lbs. Unlike cod, pollock is a relatively low value species and large volumes are needed to be profitable. It is not clear if these identified common pool vessels will target pollock if a trip limit is not adopted, nor is it clear that other vessels will leave sectors based solely on potential pollock catches.

Figure 44 – Commercial discards of GOM cod, CY 2004 – 2008. Values for 2008 are preliminary.

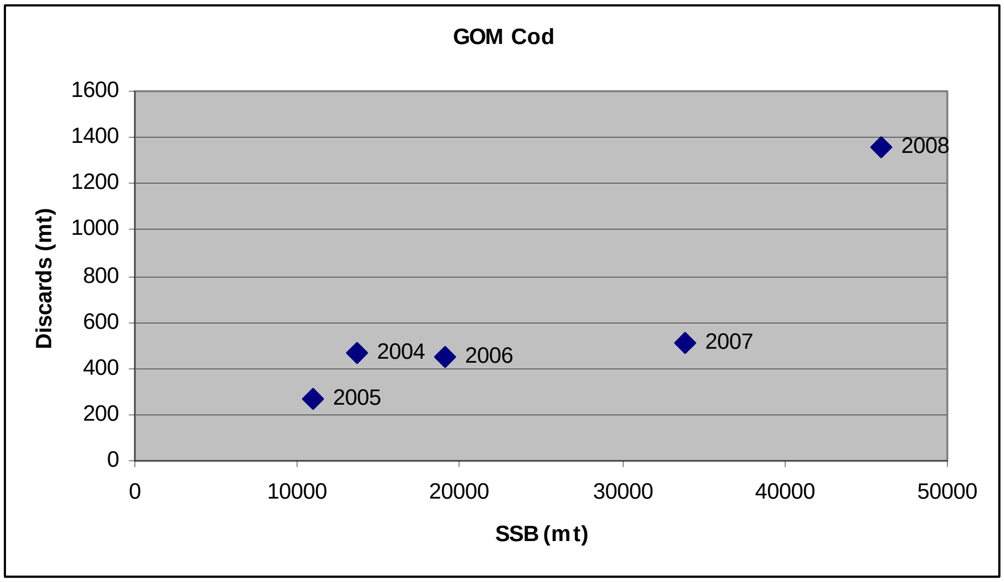
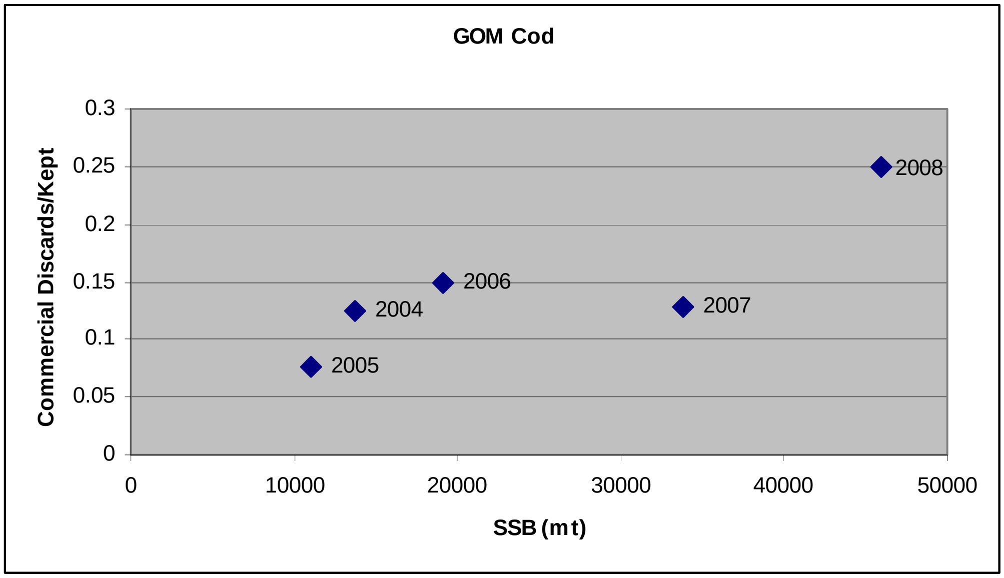



Figure 45 – Commercial discard/kept ratio for GOM cod, CY 2004 – 2008. Values for 2008 are preliminary.




The adoption of the pollock trip limit does cap the potential landings by common pool vessels at 1,632 mt if the trip limit is landed on all baseline DAS and all DAS are used. When carry-over DAS and DAS use rates are taken into account the landings are capped at 1,366 mt. Either value is well above the ACL for the common pool. And as is the case with GOM cod, these estimates do not consider discards. Analysis of this trip limit for Amendment 16 suggested that it would result in increased discards of pollock to 58 percent of landings.

This measure also proposes to remove the yellowtail flounder trip limit for scallop vessels and require scallop vessels to land all legal-sized yellowtail flounder. As recommended by the Groundfish Committee, this regulation would apply to all scallop vessels, both limited access and general category. Adopting this requirement should reduce discards of yellowtail flounder as compared to No Action – almost all yellowtail flounder caught by limited access vessels is presently discarded, while general category scallop vessels are not allowed to land yellowtail flounder and all that they catch is discarded. Recent discards by these fleets are summarized below.

If this measure merely converts existing discards to landings, fishing mortality on yellowtail flounder would not increase from this change. If scallop vessels – which have considerably reduced yellowtail flounder bycatch in recent years through gear modifications and revised management measures – decide to take advantage of this change and actively target yellowtail flounder then mortality targets may not be achieved. This is more of a concern in FY 2010 when the scallop catch of yellowtail flounder is not a sub-ACL and is not subject to scallop fishery AMs. It is probably more of an issue with the General Category Scallop fleet as well. These vessels are limited to landing 400 lbs. of scallop meat weights per trip and do not have DAS restrictions. At a price of $7.50/lb., scallop revenues per trip are $3,000. A relatively modest amount of yellowtail flounder at $1.50 per pound may provide enough revenue to encourage targeting behavior. Yellowtail flounder revenues will likely be less attractive to limited access scallop vessels landing on the order of 15,000 – 18,000 lbs. of scallop meat weights worth $112,500 - $135,000 per trip. A review of observer data shows that average catches (landings and discards) by scallop dredge vessels are usually below 300 lbs. for limited access vessels and are less than 50 lbs/ for general category vessels (Table 64).

Requiring scallop vessels to land these fish may have ancillary benefits. Discard estimates are subject to error. To the extent that vessels comply with the requirement, better estimates of scallop vessel catches of yellowtail flounder should result.

Other biological impacts may result from the combination of this measure and the scallop fisher access area program. Again, if fishing behavior is not altered as a result of this measure, catches within the access area should not change and discards will be converted to landings. But if the vessels choose to take advantage of this regulation and target yellowtail flounder then catches could increase and if this occurs in the access areas it may reduced the contribution of those areas to groundfish rebuilding. This could be an issue for CAII. Recent assessments indicate that the GB yellowtail flounder stock is heavily concentrated in this area. To the extent that the area is providing benefits to rebuilding by serving as a refuge for yellowtail flounder, increased targeting by any vessels in this area may slow rebuilding. It is not clear, however, that the area is serving in this fashion.

Table 64 – Number of observed trips and average yellowtail flounder caught per trip (2009 through July)

| YEAR | PROGRAM | Limited Access Trips Observed | General Category Trips Observed | Total Trips Observed | Average YTF/Trip Limited Access (lbs.) | Average YTF/Trip General Category (lbs.) |
|---|---|---|---|---|---|---|
| 2007 | Open | 25 | 19 | 44 | 230 | 5 |
| | Train | 2 | 6 | 8 | 0 | 6 |
| | Turtle Chain | 52 | 9 | 61 | 322 | 23 |
| | NLCA | 25 | 51 | 76 | 74 | 7 |
| | CAI | 33 | 18 | 51 | 107 | 16 |
| | HUDS | 35 | | 35 | 2 | |
| | ELF | 53 | 2 | 55 | 1 | 0 |
| 2007 Total | | 225 | 105 | 330 | 125 | 9 |
| 2008 | Open | 42 | 13 | 55 | 222 | 4 |
| | Train | 8 | 5 | 13 | 82 | 0 |
| | Turtle Chain | 83 | 10 | 93 | 226 | 8 |
| | NLCA | 35 | 106 | 141 | 146 | 8 |
| | CAI | 2 | | 2 | 179 | |
| | HUDS | 6 | | 6 | 0 | |
| | ELF | 189 | 142 | 331 | 1 | 0 |
| 2008 Total | | 365 | 276 | 641 | 94 | 4 |
| 2009 | Open | 37 | 16 | 53 | 68 | 21 |
| | Train | 3 | | 3 | 177 | |
| | Turtle Chain | 53 | 11 | 64 | 237 | 2 |
| | CAII | 23 | | 23 | 1162 | |
| | ELF | 100 | 111 | 211 | 0 | 0 |
| | DELMARVA | 18 | 32 | 50 | 0 | 0 |
| 2009 Total | | 234 | 170 | 404 | 181 | 2 |
| Grand Total | | 824 | 551 | 1375 | 127 | 4 |

#### 7.1.2.3 Option Three – Modification to DAS Counting

This measure proposes to count common-pool vessel DAS at a 2:1 rate in the GOM differential DAS area at the beginning of the fishing year. This measure will reduce fishing effort by common pool vessels in this area. In recent years nearly 92 percent of GOM cod landings came from this area, so the measure would be expected to have the most impact on this stock. But it would also reduce fishing mortality from common pool vessels on other stocks caught form this area, including GOM haddock, pollock, plaice, CC/GOM yellowtail flounder, and GOM winter flounder.

With respect to the potential landings of GOM cod by vessels committed to sectors as of September 1, 2009, the maximum impact of this measure would occur if these vessels used all their DAS in the differential DAS area. Effectively this would reduce the potential landings in half, or to 1,633 mt if every baseline DAS is used. When combined with the proposed 800 lbs./DAS trip limit the results show a larger decline. If 3,600 baseline DAS are used, the potential landings are 653 mt. with the two combined measures. When carry-over DAS are incorporated into the analysis, and if only 65 percent of available DAS are used, then the potential landings are 546 mt.

Unlike a revised trip limit, this measure is not likely to lead to increased discards of GOM cod or pollock. One possible adverse impact could occur if common pool vessels shift fishing operations into other areas and fish on weaker stocks. This could occur either through the permit holders actually fishing in other areas or if they lease their DAS to vessels fishing in other areas. For example, if effort moves onto GB cod it could make it more difficult to reduce fishing mortality on that stock. There would be similar concerns if the effort shifted to SNE/MA yellowtail flounder.

#### 7.1.2.4 Option 4 – Effort Control Measure Adjustments

This measure authorizes the Regional Administrator to adjust trip limits or DAS counting rates during the fishing year in order to facilitate harvesting the ACL or to reduce the likelihood the ACL is not exceeded. Since sector membership will not be known with certainty until May 1, 2010, there is more uncertainty about the effectiveness of the effort control measures than with prior management actions. This option gives the Regional Administrator two tools that can be readily used should the measures prove to be misaligned with fishing activity in the common pool. The result is that there should be more certainty about maintaining catch at or below the applicable ACLs, increasing the likelihood that fishing mortality targets will be achieved.

There is evidence in recent groundfish management that suggests this measure can be effectively applied. The Regional Administrator has effectively used authority to modify trip limits and other measures to control the catch of GB yellowtail flounder under the provisions adopting the U.S./Canada Resource Sharing Understanding.

## 7.2 Impact to EFH of Proposed Action

## 7.3 Impacts on Endangered and Other Protected Species

## 7.4 Economic Impacts

### 7.4.1 ACL Specifications

#### 7.4.1.1 Option One – No Action

(To be determined)

#### 7.4.1.2 Option Two – Fishery Specifications and ACLs for FY 2010 – 2012

There are three elements to this option which may have economic impacts. The first is the setting of ACLs, the second is the allocation of yellowtail flounder to the scallop and groundfish fisheries, and the third is the specification of TACs for the U.S./Canada area.

Amendment 16 noted that the economic impacts of the ACL setting process introduce substantial transaction costs into groundfish management. These include the costs of the administrative process for setting and monitoring the ACLs and implementing AMs should the ACLs be exceeded. In addition, the amendment noted that setting an ACL below the ABC imposes opportunity costs on the fishery. With the specification of numeric values for the different allocations, it is possible to develop a rough estimate of the revenues available from groundfish harvests using recent average prices. These estimates can be further divided into the various components of the fishery. While future prices may change, this at least provides a way to evaluate the potential fishery revenues under the ACLs and to compare these revenues to those if catches were at the ABC rather than the ACL and this gives a sense of the opportunity costs of management uncertainty. These analyses should be viewed with caution: it is not clear that the groundfish fishery will be able to harvest all ACLs, as is assumed below. Indeed, recent experience suggests the opposite. Neither of the two original sectors have ever harvested their full allocation of GB cod; the combined common pool and sector vessels have never harvested the available GB haddock or redfish; and catches of many other stocks have been less than the target TACs in recent years.

Using average of 2007 and 2008 prices and assuming the entire ACL is landed, the potential revenues from the proposed ACLs are $228 million in FY 2010, increase to $248 million in FY 2011, and decline to $239 million in FY 2012 (Table 65). These revenues are highly dependent on landings of GB haddock, which account for more than half the total revenues. It is more realistic to assume GB haddock landings may increase from current levels but the entire ACL is not harvested since the ACL is several times larger than any recent landings amount. If GB haddock landings increase to 10,000 mt in FY 2010 and another 2,000 mt in each following year, potential ACL revenues range from $133 million to $170 million over the next three years. By way of contrast, the revenues at the catch associated with ABC range from $237 million in FY 2010, increase to $259 million in FY 2011, and decline to $249 million in FY 2012. nominal groundfish revenues were $82 million in 2007 and $88.5 million in 2008.

Table 65 – Potential revenues assuming entire ABC or ACL catch is landed

| | ABC | ACL |
|---|---|---|
| 2010 | $237,914,966 | $228,066,529 |
| 2011 | $259,260,370 | $248,421,339 |
| 2012 | $249,570,197 | $239,247,880 |

### 7.4.1.3 Suboption 1 – Yellowtail Flounder Allocation to Scallop Fishery

The allocation of yellowtail flounder between the scallop and groundfish fisheries may affect the fishing opportunities of the respective fleets. Determining the exact impact of the allocations is difficult because of the different management measures between the two fisheries. In particular, the AMs that apply to the fisheries shape the extent of the impacts.

Elements of the groundfish fishery actively target yellowtail flounder, particularly in the GB stock area. The species is also caught while fishing for other stocks, particularly other flatfish. Under sector provisions, sector vessels can only fish in a stock area with gear that catches yellowtail flounder if they have Annual Catch Entitlement (ACE) remaining. Since sectors are subject to hard TACs, reducing the amount of yellowtail flounder available to the sectors may limit their opportunities to fish for other species. For vessels in the common pool the issue is more complex. Because common pool vessels are governed by effort controls and a differential DAS AM in FY 2010 and FY 2011, a reduction in yellowtail flounder available to this component does not necessarily result in an immediate loss of opportunities; but exceeding an ACL in the first year triggers the AM in the second year, so ultimately fishing opportunities are affected. In the U.S./Canada area the impacts are more immediate since the catch of GB yellowtail flounder is controlled by a hard TAC and by in-season AMs such as changes in trip limits, gear requirements, and the loss of access to the Eastern U.S./Canada area. Beginning in FY 2012 with the adoption of the hard TAC AM for common pool vessels, any change in yellowtail flounder allocations has immediate impacts on the common pool fleet.

For the scallop fishery, yellowtail flounder is an important incidental catch species. . Since 2004, scallop fishery catches of yellowtail flounder have not showed clear trends even while yellowtail stocks rebuild (Table 66). As a portion of the total catch, their percentage has increased as the restrictions on the groundfish fleet reduced overall harvest. To date, the only limits on yellowtail flounder catch applicable to this fishery have been on the amount that can be harvested from within the CAI, CAII, and NLCA closed area access programs. Regulatory requirements establish this limit as 10 percent of the target TAC for the GB or SNE/MA stocks. The scallop management measures, however, compensate scallop vessel with trips in open areas if an access area is closed due to yellowtail flounder catches. With the adoption of an allocation and AMs applicable to the scallop fishery the possibility exists that the amount of yellowtail flounder available to this fishery could limit access to scallops in all areas. In FY 2010, this allocation is treated as an “other sub-component” of the yellowtail flounder ACL and there are no scallop fishery AMs should it be exceeded. In FY 2011 and beyond, there will be AMs for the scallop fishery. The exact nature of those AMs is still under development and it is not clear how they will impact scallop vessels.

The relative value of yellowtail flounder to the two fisheries was calculated, but the characterization of this value as a loss or gain to either fishery is complicated by the different management measures just described. For the scallop fishery, future discard rates were calculated based on past observed discard rates in open and access areas and future changes in yellowtail flounder and scallop biomass. These rates were applied to the expected scallop yield under three different scallop management scenarios to estimate the yellowtail flounder the fishery would be expected to harvest absent other limits. This “expected” or “needed” yellowtail flounder was then reduced by ten percent as proposed by this action. The entire reduction was assumed to be taken from open areas, and open area catch was reduced accordingly. The differences in revenues were then calculated between the expected yellowtail flounder catch and the reduced yellowtail flounder catch.

The results of these calculations are shown in Table 67 through Table 71. Each metric ton of yellowtail flounder is more valuable to the scallop fishery in areas with lower discard rates because more scallops are landed for each metric ton allocated. Because of higher discard rates on GB – particularly in the CAII access area – the lowest values of yellowtail flounder are in this area. Overall, allocating 90 percent of the expected yellowtail flounder catch in GB and SNE/MA may reduce scallop vessels revenues by $29 to $37 million, depending on the scallop management scenario selected for FY 2010 – FY 2012. This ranges from 7% to 12% of forecast scallop revenues. As previously explained, in FY 2010 these revenue changes are unlikely to be realized by the scallop fishery since there are no specific measures that limit overall scallop fishing if the yellowtail flounder allocation is exceeded.

Table 66 – Scallop fishery yellowtail flounder catches, CY 2004-2008

| | Fishing Year | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| CC/GOM | Total TAC | 881 | 1233 | 650 | 1078 | 1406 |
| | Total TAC for scallop fishery* | 86.3 | 120.8 | 63.7 | 105.6 | 137.8 |
| | Scallop AA open or closed | N/A | N/A | N/A | N/A | N/A |
| | Total YT catch by dredge gear (landings and discards) | 18 | 6 | 12 | 35 | 5 |
| | Total YT Catch (all gear) | 1186 | 997 | 620 | 627 | 727 |
| | Scallop catch as percent of total catch | 1.5% | 0.6% | 1.9% | 5.6% | 0.7% |
| SNE | Total TAC | 707 | 1982 | 146 | 213 | 312 |
| | Total TAC for scallop fishery* | 69 | 194 | 14 | 21 | 31 |
| | Scallop AA open or closed | open | closed | open | open | open |
| | Total YT catch by dredge gear (landings and discards) | 125 | 130 | 168 | 188 | 151 |
| | Total YT Catch (all gear) | 614 | 367 | 369 | 396 | 504 |
| | Scallop catch as percent of total catch | 20.3% | 35.4% | 45.5% | 47.5 % | 29.9 % |
| GB | Total TAC | 6000 | 4260 | 2070 | 900 | 1869 |
| | Total TAC for scallop fishery* | 588 | 417 | 203 | 88 | 183 |
| | Scallop AA open or closed | open | open | open | open | close d |
| | Total YT catch by dredge gear (landings and discards) | 84 | 194 | 254 | 122 | 134 |
| | Total YT Catch (all gear, U.S. only) | 6386 | 3637 | 1573 | 1564 | 1118 |
| | Scallop catch as percent of total catch | 1.3% | 5.3% | 16.1% | 7.8% | 12.0 % |

Table 67 – Summary of YT needed by scallop fishery in 2010-2012 in MT and % of total YT ABC

| | | total YT needed (mt) | | | % YT needed | | |
|---|---|---|---|---|---|---|---|
| **No Closure - F=0.20** | | **2010** | **2011** | **2012** | **2010** | **2011** | **2012** |
| | **CC** | 30 | 26 | 32 | 3.40% | 2.40% | 2.80% |
| | **GB** | 110 | 226 | 353 | **9.2%** | **20.9%** | **28.8%** |
| | **SNE** | 111 | 96 | 151 | 22.5% | 14.0% | 15.0% |
| **No Closure - F=0.24** | | **2010** | **2011** | **2012** | **2010** | **2011** | **2012** |
| | **CC** | 39 | 26 | 32 | 4.5% | 2.5% | 2.8% |
| | **GB** | 146 | 230 | 320 | **12.2%** | **21.2%** | **28.7%** |
| | **SNE** | 135 | 98 | 151 | 27.3% | 14.3% | 15.1% |
| **Closure F=0.18** | | **2010** | **2011** | **2012** | **2010** | **2011** | **2012** |
| | **CC** | 17 | 13 | 10 | 2.0% | 1.3% | 0.9% |
| | **GB** | 182 | 256 | 320 | **15.2%** | **23.7%** | **26.1%** |
| | **SNE** | 179 | 130 | 151 | 36.3% | 19.0% | 15.1% |

Table 68 – Yellowtail flounder allocated to the scallop fishery under the Groundfish Committee recommendation (90 percent of amount expected to be harvested). Not reduced for management uncertainty. Note the Committee did not recommend a specific allocation for CC/GOM yellowtail flounder.

| | YTF Allocated, By Stock Area and Scallop Management Scenario | | |
|---|---|---|---|
| | *CC* | GB | SNEMA |
| **NC, F=0.2** | | | |
| 2010 | *27* | 99 | 99.9 |
| 2011 | *23.4* | 203.4 | 85.5 |
| 2012 | *28.8* | 317.7 | 135 |
| **NC, F=.24** | | | |
| 2010 | *35.1* | 131.4 | 121.5 |
| 2011 | *23.4* | 207 | 88.2 |
| 2012 | *28.8* | 316.8 | 135.9 |
| **CL, F=0.18** | | | |
| 2010 | *15.3* | 163.8 | 161.1 |
| 2011 | *11.7* | 230.4 | 117 |
| 2012 | *9* | 288 | 135.9 |

Table 69 – Change in scallop fishery revenues per mt of yellowtail flounder allocated, by year, YTF stock area and scallop management scenarios. Assumes allocation is 90 percent of expected harvest.

| Year/ Scenario | Change in Revenue/mt YTF, Dollars | | | Change as Percent of Revenues from YTF Stock Area | | |
|---|---|---|---|---|---|---|
| | CC | GB | SNE/MA | CC | GB | SNEMA |
| **NC, F=0.2** | | | | | | |
| 2010 | $1,721,301 | $157,963 | $2,469,361 | 3.3% | 0.9% | 1.1% |
| 2011 | $3,500,027 | $116,969 | $3,544,078 | 3.8% | 0.2% | 1.3% |
| 2012 | $3,809,121 | $271,570 | $1,778,705 | 3.1% | 0.3% | 0.7% |
| **NC, F=.24** | | | | | | |
| 2010 | $1,702,671 | $157,540 | $2,051,633 | 2.6% | 0.7% | 0.8% |
| 2011 | $3,317,598 | $109,586 | $3,297,153 | 3.8% | 0.2% | 1.2% |
| 2012 | $3,535,475 | $252,150 | $1,727,238 | 3.1% | 0.3% | 0.7% |
| **CL, F=0.18** | | | | | | |
| 2010 | $2,116,906 | $185,627 | $1,883,399 | 5.9% | 0.5% | 0.6% |
| 2011 | $3,875,276 | $100,106 | $2,405,464 | 7.7% | 0.2% | 0.8% |
| 2012 | $4,641,334 | $241,138 | $1,952,471 | 10.0% | 0.3% | 0.7% |

Table 70 – Change in scallop revenues if YTF allocation is 90 percent of amount expected to be harvested for all stocks

| Scenario | Year 2010 | 2011 | 2012 |
|---|---|---|---|
| NCF=.2 | $34,311,399 | $43,656,154 | $48,456,161 |
| NCF=.24 | $36,596,510 | $43,656,154 | $46,356,842 |
| CF=.18 | $40,652,329 | $39,015,938 | $41,918,146 |
| **As Percent of Total Scallop Revenues** | | | |
| NCF=.2 | 11% | 9% | 9% |
| NCF=.24 | 10% | 9% | 8% |
| CF=.18 | 13% | 8% | 7% |

Table 71 – Change in scallop revenues if YTF allocation is 90 percent of amount expected to be harvested for GB and SNE/MA stocks, and no specific allocation for CC/GOM YTF stock (*Sub-Option 1 -Groundfish Committee recommendation*)

| Scallop Scenario | Year 2010 | 2011 | 2012 |
|---|---|---|---|
| NCF=.2 | $29,147,495 | $35,030,399 | $36,266,973 |
| NCF=.24 | $29,956,093 | $35,030,399 | $35,043,322 |
| CF=.18 | $37,053,589 | $33,978,079 | $37,276,812 |
| **As Percent of Total Scallop Revenues** | | | |
| NCF=.2 | 9% | 7% | 6% |
| NCF=.24 | 8% | 7% | 6% |
| CF=.18 | 12% | 7% | 7% |

A similar analysis was performed for the groundfish fishery for the GB and SNE/MA yellowtail flounder stocks. In both stocks areas two calculations were developed. The first is a straightforward estimate of the value of each metric ton of yellowtail flounder based on 2007 and 2008 data. The second calculation determined the total value of all species landed on groundfish trips in the area, and then determined the value of this total per metric ton of yellowtail flounder landed. This high value is most appropriate for those vessels in sectors, or for FY 2012 when the hard TAC AM affects common pool vessels, since it shows the loss of all revenue if yellowtail flounder leads to a complete loss of access to a stock area. On Georges Bank this was further refined for common pool vessels by taking into account discard rates and the different management measures in the Eastern and Western U.S./Canada areas. Since the Eastern Area closes if the yellowtail flounder TAC is exceeded, all revenues were sacrificed from this area, while fishing continues in the Western Area. This provides a third, or expected, value per metric ton. In the SNE/MA area, only trips that landed yellowtail flounder were considered in the analysis. These values were multiplied by the allocations under consideration to determine the revenue reductions for the groundfish fishery under the proposed allocation and the three scallop management scenarios under consideration.

Results are summarized in Table 72and Table 73. The value of each metric ton of yellowtail flounder to the groundfish fishery ranges from a low of $3,296 to a high of $41,176. GB yellowtail flounder is more valuable than SNE/MA yellowtail flounder because of the increased groundfish fishing opportunities on GB. The total losses to the fishery range from a low of $715,000 to a high of $16.9 million over the next three years under the three possible scallop management scenarios. To put these values in context, FY 2005 to FY 2007 groundfish revenues averaged $101 million and total revenues on groundfish trips averaged $158 million, but Amendment 16 may reduce groundfish revenues by 15% and total revenues by 18%. The changes estimated here thus fall in the range of less than one percent to 19.6% of groundfish revenues, and less than one percent to 11.9% of total revenues on groundfish trips.

Table 72 – Change in revenues on groundfish trips per mt of YTF; average of 2007 and 2008. See groundfish PDT report for details. For GB, expected revenues consider difference in management measures for common pool vessels between EGB and WGB.

| | GB | SNE/MA |
|---|---|---|
| YTF Revenues/mt | $3,296 | $3,895 |
| Total Revenues/mt | $41,176 | $28,708 |
| Expected Revenues/mt | $12,674 | |

Table 73 – Reduction in groundfish revenues if scallop fishery is allocated 90 percent of expected harvest of YTF for GB and SNE/MA YTF stock areas. These values represent the difference between potential groundfish revenues if there is no scallop fishery catch of yellowtail flounder and the proposed allocation. Based on 2007/2008 revenues.

| | Georges Bank | | | SNE/MA | |
|---|---|---|---|---|---|
| | **Low** | **High** | **Expected** | **Low** | **High** |
| **NC, F=0.2** | | | | | |
| 2010 | $326,304 | $4,076,424 | $1,254,726 | $389,111 | $2,867,929 |
| 2011 | $670,406 | $8,375,198 | $2,577,892 | $333,023 | $2,454,534 |
| 2012 | $1,047,139 | $13,081,615 | $4,026,530 | $525,825 | $3,875,580 |
| **NC, F=.24** | | | | | |
| 2010 | $433,094 | $5,410,526 | $1,665,364 | $473,243 | $3,488,022 |
| 2011 | $682,272 | $8,523,432 | $2,623,518 | $343,539 | $2,532,046 |
| 2012 | $1,044,173 | $13,044,557 | $4,015,123 | $529,331 | $3,901,417 |
| **CL, F=0.18** | | | | | |
| 2010 | $539,885 | $6,744,629 | $2,076,001 | $627,485 | $4,624,859 |
| 2011 | $759,398 | $9,486,950 | $2,920,090 | $455,715 | $3,358,836 |
| 2012 | $949,248 | $11,858,688 | $3,650,112 | $529,331 | $3,901,417 |

All of these estimates assume no changes in fishing behavior by either fishery. In both cases changes in fishing practices could mitigate potential revenue losses. For example, if the ratio of yellowtail flounder caught to scallops landed can be decreased through either gear modifications or fishing practices, then the scallop fishery will harvest more of its available yield prior to triggering any AMs that may be adopted for FY 2011 and beyond. If the groundfish fishery can do the same – reducing the yellowtail flounder caught while fishing for other species – the same result can be expected and revenue losses would not be as large as estimated here. There is evidence in observed groundfish fishing trips that this may be possible, at least for roundfish species.

Compared to the No Action alternative, this measure is likely to reduce scallop fishery revenues. Under No Action, no specific allocation is made to the scallop fishery and thus the scallop yield should approach that estimated for the adopted scallop management scenario. For the groundfish fishery the differences between this option and No Action are less certain. If an allocation is not made to the scallop fishery, then the overall yellowtail ACL would serve as the trigger for groundfish AMs. Since the scallop fishery presumably would still catch yellowtail flounder without any limit, it is possible that excessive yellowtail flounder catches would result in groundfish AMs and lost fishing opportunities for this fleet.

#### 7.4.1.4 Suboption 2 – U.S./Canada Resource Sharing Understanding TACs

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

The economic impacts of the proposed hard TACs are difficult to predict because of the 5 effects noted above, the fact that FY 2010 will include many new regulations and new sectors, and the fact that these effects interact in a complex manner. The amount of fish landed and sold will not be equal to the sum of the TACs, but will be reduced as a result of discards, and may be further reduced by limitations on access to stocks that may result from the associated rules. Reductions to the value of the fish may result from fishing derby behavior and potential impact on markets.

The cod and yellowtail TACs specified under the Understanding represent reductions to the size of the TACs compared to those specified for FY 2009 as shown in Table 74 below.

Table 74 – TACs for U.S./Canada stocks in FY 2009 and 2010

| Stock | 2009 TAC (mt) | 2010 TAC (mt) | Difference |
|---|---|---|---|
| GB yellowtail | 1,617 | 1,106 | - 32 % |
| Eastern GB cod | 527 | 338 | - 36 % |
| Eastern GB haddock | 11,100 | 11,988 | + 7 % |

A further reduction to the TAC will result from the allocation of GB yellowtail flounder to the scallop fishery. Although the allocation to the scallop fleet is larger than in the past, the amount of yellowtail caught by the scallop fleet is not likely to increase substantially over historical levels.

As noted above, it is difficult to predict the fishing patterns that are likely to occur in FY 2010 due to the many regulatory changes anticipated. Although there may be increased efficiencies as a result of sectors, as well as decreased discarding, which may increase revenue and/or profitability, the substantially reduced TACs will never-the-less result in reduced overall revenue. The reduced revenue will be due to both the decreased potential landings of cod and yellowtail, as well as a loss of revenue from other stocks caught on trips to the Eastern Area, when vessels lose access to this area when the TAC is projected to be caught. If the new management measures result in vessels being able to harvest more haddock, some of the decreased revenue described above may be recouped through increases in haddock landings.

Providing an estimate of possible catch levels and the associated revenue, based upon multiple assumptions, may be the most useful way of estimating economic impacts. Table 75 contains estimates of

2008 revenue from the U.S./Canada Area, based upon 'matched' dealer data, and extrapolations based on total trip length to trip length on matched trips.

Table 75 – Revenue from U.S./Canada Area for Fishing Year 2008

| | |
|---|---|
| Eastern Georges Bank Cod | $ 1,610,820 |
| Eastern Georges Bank Haddock | $ 3,797,560 |
| Georges Bank Yellowtail Flounder | $ 3,205,300 |
| All Species (including other groundfish and non-groundfish species) | $ 41,819,778 |

Table 76 provides an estimate of revenue associated with the proposed 2010 TACs, based upon the range of historical U.S./Canada Area catches, 2008 discard to catch ratios, and 2008 prices. Average price estimates are based on dealer reports submitted to the NMFS Fisheries Statistics Office. Catch and landings data are based upon VMS and dealer report data, and adjusted according to the methods described by Caless, Wilhelm and Wang, 2005. The estimate of the percentage of the TAC caught is based upon historic catch rates. It is likely that cod will be the most limiting stock.

Table 76 – Revenue Estimates from Landings of Shared Stocks from U.S./Canada Management Area for 2010

| Stock | TAC | % of TAC Caught | Price/lb | Revenue |
|---|---|---|---|---|
| Eastern GB Cod | 338 | 90 % | $ 1.71 | $ 974,757 |
| Eastern GB Haddock | 1,106 | 13 % | $ 1.09 | $ 3,595,090 |
| GB Yellowtail | 11,988 | 93 % | $ 1.33 | $ 2,171,422 |

* Discard rates: 15 %, 4 %, and 28 % (cod, haddock, and yellowtail, respectively)

According to Table 75 and Table 76 above, for 2008 the total revenue from Eastern GB cod, Eastern GB haddock, and GB yellowtail was approximately $ 8,613,680. For 2010, the estimate of the total revenue from Eastern GB cod, Eastern GB haddock, and GB yellowtail is $ 6,741,269 , a 22 % reduction from 2008.

When considering the revenue associated with the landings of cod, haddock, and yellowtail flounder from the U.S./Canada Area, and the impact of interannual fluctuations in the size of the TACs, it is important to note that many other species are landed from trips to the U.S./Canada Area. If the time period during which vessels have access to the area is prolonged, there would also be increased landings of other groundfish and non-groundfish species, resulting in additional revenue. Due to the implications of catching a TAC for either the common pool or sector vessels on access to resources in addition to cod, haddock and yellowtail flounder, the reduced size of the 2010 cod and yellowtail TACs will affect total revenue in 2010. However, it is very difficult to estimate the potential revenue for *other stocks* caught on trips to the U.S./Canada Area for FY 2010 due to the fact that the number of vessels fishing in the common pool and in sectors is not finalized, and the regulations in FY 2010 will be significantly different from 2008. The U.S./Canada TACs will be divided between the common pool and sectors. When the common pool cod, haddock, or yellowtail flounder TAC is projected to be caught, common pool vessels may no longer fish in the Eastern U.S. Canada Area, and lose all fishing opportunity in the Eastern Area. If the yellowtail flounder TAC is caught, a common pool vessel may still fish in the Western U.S./Canada Area, but may not retain yellowtail flounder. When a particular sector catches its TAC of Eastern U.S.

cod or haddock the implications are the same (as for a common pool vessel), however when a sector catches its TAC (ACE) for GB yellowtail flounder they lose fishing opportunity throughout the yellowtail stock area.

The estimated total revenue from 2007 was $ 34,906,263 and there were 1,272 trips total, and 138 trips to the Eastern Area ($ 27,442/trip based on total trips). During 2008, there were 1,273 trips, and 714 trips to the Eastern Area ($ 32,851/trip based on total trips). Given the percentage reductions in the TAC proposed for GB yellowtail and Eastern GB cod, and the fact that both these TACs, when reached may curtail access to the U.S./Canada Area, it is possible that total revenue may be reduced by up to 30 percent from 2009 revenues. The U.S./Canada TACs in 2009 were slightly lower than the TACs in 2008. It also should be noted that the amount of haddock that has been harvested from the U.S./Canada Area has been increasing, but it is unknown whether this trend will continue.

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

### 7.4.2 Commercial Fishery Effort Control Modifications

#### 7.4.2.1 Option One – No Action

Under the No Action alternative, the impacts of the common pool effort controls would not differ from those described in Amendment 16. While these indicate that reductions in revenue can be expected for most vessels under the Amendment 16 provisions, no additional reductions would be likely to occur. As noted in Amendment 16, there is some uncertainty about these impacts given the uncertainty over sector membership.

#### 7.4.2.2 Options 2 and 3 (GOM cod trip limit and differential DAS counting)

*Impacts on Common-Pool Vessels*

Impacts of these measures, as descried here, are marginal impacts; that is, the y are in addition to any changes in revenue that occur under Amendment 16. The economic impact of the proposed measures was evaluated by imposing the trip limits and differential DAS counting to observed activity for vessels that were in the common pool as of September 1, 2009 and had at least one Category A DAS. Vessel trip reports submitted for trips taken during FY 2007 were used as a measure of activity. Monthly average prices calculated from dealer data were used to assign calculated revenues for each trip. The FY 2007 data were adjusted to account for the fact that possession of windowpane flounder, SNE winter flounder, Atlantic wolfish, and ocean pout would be prohibited under Amendment 16. Days absent for each trip were calculated as the elapsed time between the sailing and landing date reported in the VTR. Days absent were then adjusted to reflect the 24-hour clock that would be implemented under Amendment

16and Amendment 16 DAS allocations. To approximate Amendment 16 conditions the trips taken during FY 2007 were filtered to eliminate trips that landed groundfish, monkfish, or skates that would have exceeded the A DAS allocations for each permit holder. These trips were filtered by ordering each groundfish trip from highest gross stock to lowest. Any trip for which the running total of calculated days absent exceeded the allocated A DAS was deleted. Summing across all remaining trips provides and approximation of the fishing conditions that each of the common pool permits would be operating under the effort control provisions of Amendment 16.

The same set of trips was then evaluated under the proposed action. Specifically, trips that occurred that landed groundfish within the differential DAS area were counted at a rate of 2:1 and any trips landing pollock were adjusted to reflect the proposed pollock trip limit. No adjustment for GOM cod was required since the proposed action would retain the GOM cod trip limit at FY07 levels**.** The DAS allocations under both scenarios were the same since FW44 would not change initial allocations.

The analytical approach provides a basis of comparison between the effort control program as proposed under Amendment 16 and the proposed modifications under FW44. The approach is limited in that adjustments to fishing locations or strategies are not considered. Additionally, the possibility for leasing DAS to offset the impacts of either the simulated Amendment 16 or FW44 scenarios was not considered For this reason, the estimated impacts may reflect an upper bound condition in terms of adverse impacts.

As of September 1, 2009 there were 279 permits with an A DAS allocation that had enrolled in the common pool. Of these permits 79 did not record any activity through a VTR during FY 2007. These permits were eliminated from further consideration. An additional 98 permits did not report any trip where groundfish, monkfish, or skates were landed and were also eliminated from further consideration. This left 104 current common pool permits that were retained for further analysis. Among the remaining 104 common pool members the majority (93) would not be affected either by the change in the pollock trip limit or the differential DAS counting area either because they either 1) did not fish for groundfish in the GOM, or 2) landed relatively low quantities of pollock, or 3) had sufficient DAS allocations so they were not constrained by DAS or 4) some combination of the three.

Among the 9 affected vessels the estimated reduction in total revenue ranged widely to approximately 10% to nearly 70%. Estimated revenue losses for about half of the vessels were less than 15% while revenue losses for the others, was much larger ranging between 33% and 70%.

Whether the current roster of vessels enrolled in the common pool is representative of the vessels that may end up in the common pool on May 1, 2010 is uncertain. For the most part, the current roster appears to be comprised of vessels that are primarily engaged in fisheries other than groundfish. During FY 2007 of the 200 vessels that showed any activity only 50 took any more than 1/3 of total trips in the GOM. These 50 vessels took 3,458 trips of which 3,200 were to a GOM statistical area. However, the majority of these GOM trips (2,428) did not land any groundfish, skates, or monkfish leaving a total of 772 trips where groundfish was landed. Note that cod was landed on every trip taken to the GOM that landed groundfish. However, the 800 pound trip limit was constraining on only 188 occasions. Pollock was landed on less than half (304) of the 772 GOM groundfish trips, but with the exception of 46 occasions landings of pollock were below the proposed 1,000 pound per day trip limit.

*Impacts on Sector Membership*

As of September 1, 2009, permits committed to sectors accounted for over 90 percent of the PSC for most stocks. Permit holders must make a decision whether to remain in a sector or to choose to fish under the common-pool effort controls by May 1, 2010. Permit holders can be expected to make this decision based at least in part on whether they think they will be more profitable in a sector or in the common-pool. An element of this evaluation is the amount of fish they can land under either set of rules. This is a complicated decision that is difficult to model given 20 groundfish stocks and because of the possibility that fishing behavior may change. If the decision is based solely on GOM cod landings, the effect on probable sector membership of the proposed differential DAS counting measure and the proposed GOM cod trip limit can be evaluated. Table 77 shows the probable sector membership if the decision is based solely on the potential GOM cod landings under the effort control measures proposed as compared to the sector PSCs. This comparison assumes that every DAS is used on the GOM and the trip limit is caught on every DAS. Note that even with fewer vessels in sector than in the common pool, under all three scenarios modeled the sector total PSC is higher than the common pool total PSC. The proposed measures have more impact on those vessels with a high history of GOM cod landings and those vessels can catch more GOM cod in sectors than in the common pool. Conversely, the permits that remain in the common pool are those that do not have recent history (FY 1996 – FY 2006) of landing large amounts of GOM cod. As noted above, many of these permits fish in other areas.

Table 77 – Probable sector membership if decision is based solely on potential GOM cod landings

| | **800 lb./DAS** | **2:1 Diff DAS** | **800 lbs/DAS and 2:1 Diff DAS** |
|---|---|---|---|
| Vessels in Common Pool w/DAS | 812 | 862 | 666 |
| Vessels in Sectors w/DAS | 162 | 112 | 308 |
| GOM Cod Common Pool PSC | 37% | 49% | 14% |
| GOM Cod Sector PSC | 63% | 51% | 86% |

#### 7.4.2.3 Option 4 – Effort Control Measure Adjustments

This option authorizes the regional Administrator to change trip limits or DAS counting in order to either facilitate harvesting the ACL of a stock or to reduce the likelihood of exceeding the ACL for a stock. This provision complicates the decision that permit holders make while choosing to join a sector or to remain in the common pool. Any business plan evaluating the potential profitability of the common pool must consider that the trip limits or DAS counting may change over the course of the year and alter the possible revenues the permit can earn. There are no bounds on the changes that may be made, and similar authority in the past led to a 33 pound trip limit for GOM cod. Any estimates of common pool revenue will have much more uncertainty due to the possibility of regulatory changes that make the planning invalid. This may sway some permit holders to prefer the relative certainty of the sector allocations over the common pool.

Another possible impact of this provision is that it may skew the DAS leasing and transfer markets. Prices paid before a change in either a trip limit or differential DAS adjustment may not reflect the earnings potential of those DAS should a change be implemented. Buyers and sellers may choose to negotiate a price that is dependent on the regulations in effect when the DAS are used; this would seem to shift part of the risk to the seller of the DAS since most fishermen expect regulations to become more stringent over time.

Finally, this measure may encourage fishermen to alter fishing practices to fish under known conditions rather than risk a devaluing of their effort should trip limits be reduced or DAS counting rates be increased. This could create a derby that leads actually precipitates such changes. It may also depress prices and interrupt the flow of product to markets should all vessels choose to fish early in the year before any such changes can be announced. To some extent the existence of sectors may help mitigate these effects on markets if sector vessels avoid fishing at the same time.

## 7.5 Social Impacts

The need to assess social impacts emanating from federally mandated fishing regulations stems from National Environmental Protection Agency (NEPA) and M-S Act mandates that the social impacts of management measures be evaluated. NEPA requires the evaluation of social and economic impacts in addition to the consideration of environmental impacts. National Standard 8 of the M-S Act demands that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of over fishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C.§1851(2)(8)). The analysis that follows provides a context for understanding possible social impacts resulting from the proposed measures in Framework 44.

Amendment 13 identified five social impact factors: regulatory discarding, safety, disruption in daily living, changes in occupational opportunities and community infrastructure, and formation of attitudes. All of these factors can be affected by changes in management measures. Fishermen find regulatory discarding both distasteful and wasteful of valuable fishery resources. Modifications to daily routines can make long-term planning difficult. New gear requirements such as netting and some equipment must be ordered months in advance resulting in changes to daily routines when these modifications cannot be met in a time and cost efficient manner. Further the cost of making such changes may prove to be a burden for some vessel owners. Changes in management measures that limit access to fishing may increase the likelihood of safety risks. Increased risk can result when fishermen spend longer periods at sea in order to minimize steam time to and from fishing grounds, operate with fewer crew, and fish in poor weather conditions. Formation of attitudes refers to the positive or negative feelings or beliefs expressed by members of the communities that will be affected by the Proposed Action. The effect of the Proposed Action on these factors will be discussed below. It is important to note that, as in the case with the biological and economic impacts analyses for this framework, social impacts are very difficult to predict. FY 2010 will include many new regulations and new sectors, and these effects interact in a complex manner.

Amendment 13 also identified primary and secondary port groups that are most affected by changes in groundfish management. The criteria port groups identified for this action are discussed in Section 6.6.2. It not likely that this action would affect all of these port groups to the same extent. Those port groups that are more dependent on groundfish would likely have more social impacts than those that participate in a range of fisheries. Even among communities with similar dependence on groundfish, there are likely to be different impacts since some measures have localized impacts. The following discussion will also highlight the differences between port groups, where appropriate.

### 7.5.1 ACL Specifications

#### 7.5.1.1 Option One – No Action

The No Action alternative for specifications, if adopted, would entail the failure to adopt ACLs for the fishery, as well as a lack of TACs for the U.S./Canada area and no special allocation of yellowtail flounder to the scallop fishery. This alternative is not legally viable. A description of the social impacts of using ACLs in the management of the groundfish fishery can be found in Amendment 16.

The Amendment 16 analysis of ACLs stated that, “The adoption of the ABC control rules may lead to concerns that the fishery is being managed in an overly conservative manner.” The No Action alternative contemplates the use of the ABC numbers in lieu of the ACLs proposed in Option 2. It should be noted that the proposed ACLs are actually more conservative than the ABCs due to the fact that the former are set lower in order to account for management uncertainty.

#### 7.5.1.2 Option Two – Northeast Multispecies Fishery ACL Specifications for Fishing Years 2010 – 2012

This option proposes to adopt specifications and ACLs for FY 2010 -2012. This measure includes not only the identification of ACLs as required by the M-S Act and as implemented by Amendment 16; it includes the allocation of yellow tail flounder between the groundfish and scallop fisheries as part of the ACL process. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS, and it adopts the TACs for Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder that are applicable to the U.S./Canada Resource Sharing Understanding. The social impacts of each of these elements will be discussed in this section.

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

The adoption of the ACLs may lead to concerns that the fishery is being managed in an overly conservative manner. This is not likely to occur until after stocks are rebuilt. Fishermen may view fishing at less than 75% of FMSY on a rebuilt stock as limiting their ability to benefit from rebuilding. This could affect attitudes towards the management program since it will be viewed as limiting occupational opportunities unnecessarily.

Because the ACLs are simply caps on the amount of catch that can occur for each stock in the fishery, the adoption of ACLs numbers itself does not have major social impacts. Rather, low ACLs drive conservative management strategies, and the methods for reducing effort or allocating the ACL are the largest contributors to impacts of a social nature. The sector and effort control systems for FY 2010 – 2012 were adopted in Amendment 16 and impacts of each measure were described in that document. Impacts of alternatives that would change allocations and management measures in FW 44 are analyzed below.

#### 7.5.1.3 Suboption One - Yellowtail Flounder Allocation to the Scallop Fishery

This measure allocates a portion of the yellowtail flounder ACL to the scallop fishery to account for incidental catches in that fishery. In FY 2010, the allocations to the scallop fishery are considered an “other sub-component” and are not subject to specific scallop fishery AMs. In subsequent years the allocation is considered a sub-ACL and the scallop FMP will adopt AMs to control these catches. Also, scallop vessels are required to land all yellowtail flounder that is caught. The measure may distribute the catches differently than has been done in the past, which may have some social impacts on both fleets.

Allocations are proposed for two stocks - GB yellowtail flounder and SNE/MA yellowtail flounder – and are based on 90 percent of the amount the scallop fishery is expected to catch if they harvest the projected scallop yield. These amounts of yellowtail flounder were estimated by comparing recent discard rates, projected increases in scallop and yellowtail flounder abundance, and future scallop yields. The scallop fishery catch of CC/GOM yellowtail flounder is estimated to be a small amount and so a specific allocation is not made; catches are considered part of the “other sub-components.”

In addition to specific concerns about catch levels and rebuilding timelines, any measure that shifts allocation from one fishery to another may have impacts on some of the other social impact categories. *Changes in occupational opportunities* could occur if the allocation provides more opportunities in either fleet: if the scallop fishery is seen as advantaged from the allocation, then effort could shift into that fishery. *Formation of attitudes* could clearly be affected if constituents of either fishery feel disadvantaged by the measure with respect to the other fishery.

#### 7.5.1.4 Suboption Two – U.S./Canada Resource Sharing Understanding TACs

The proposed hard TACs for the U.S./Canada area are not expected to have significant social impacts. The TACs were determined in the same way as has been done in recent years. TACs of the three co-managed species vary from year to year, and the FW 44 numbers are within the range of numbers that have been used in the past 5 years for cod and yellowtail flounder. For haddock, the allocation in the area is the largest in the most recent 5-year span. Although discarding may occur in the area as it does in the rest of the fishery, it is unlikely to be a special issue.

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

### 7.5.2 Commercial Fishery Effort Control Modification

#### 7.5.2.1 Option One – No Action

Under the No Action alternative, the effort control measures adopted by Amendment 16 would apply to common-pool groundfish fishing vessels – that is, those that do not join a sector. These measures were evaluated in Amendment 16 to determine the social impacts.

Based on sector rosters as of September 1, 2009, a large number of permits have been committed to sectors. These commitments can still be reversed until May 1, 2010, so sector membership is still not known with certainty. The permits that have not committed to sectors are described in Section 6.6.5. The social impacts to the fishery will be determined, in large part, by the number and makeup of permits that ultimately fish in sectors in 2010.

To the extent fishing behavior changes in ways not predicted by the analyses in Amendment 16, there may be less certainty about achieving the mortality objectives of Amendment 16 if the No Action alternative is selected. A failure to meet mortality objectives would result in further decreases to fishing effort in the future, and a delayed appreciation on the benefits of a rebuilt fishery.

No Action could lead more people to be in the common pool in comparison with the other alternatives. This could have social impacts, although it is not possible to determine what the exact impacts would be. The social impacts of sectors are explored in Amendment 16; if more people join sectors, these impacts would be amplified. Such impacts are complex and will depend upon the success of rebuilding strategies and sector implementation. Since sectors were projected to have primarily positive social impacts, especially in the long-term, it can be assumed that the No Action alternative will lead to fewer long-term positive impacts.

#### 7.5.2.2 Option Two – Modification of Trip Limits

This option proposes to modify the trip limit for GOM cod to 800 lbs./DAS with a maximum of 4,000 lbs./trip. A trip limit for pollock is also adopted, at 1,000 lbs./DAS and 10,000 lbs./trip. These two trip limits will be implemented at the start of the fishing year. If Option 4 is also adopted (Section 4.2.4) the Regional Administrator may adjust the limits during the course of the fishing year to allow the ACL to be harvested or to reduce the likelihood that it will be exceeded. Finally, the yellowtail flounder trip limits applicable to scallop dredge vessels are removed and scallop vessels are required to land all legal-sized yellowtail flounder. As recommended by the Groundfish Committee, this regulation would apply to all scallop vessels, both limited access and general category.

Trip limits are most likely to affect *regulatory discarding* and *formation of attitudes*. In general, trip limits can affect the structure of a fishery. If the trip limit is set very low, the inshore sector of the fleet can sometimes manage to fish economically, while the offshore sector of the fleet cannot cover trip expenses to direct fishing effort on the species managed by the trip limit. This can change the structure of revenues generated in the fishery and can ultimately change the long-term structure of the fishery itself. These types of outcomes, however, have not been evident to a large extent in the GOM cod fishery because trip limits have been set too low for most vessels to target GOM cod.

Social impacts have resulted because the trip limits themselves hold a socially-undesirable characteristic – *regulatory discarding*. The impacts of regulatory discarding are discussed *infra*.
In the past, different trip limits for cod on Georges Bank and in the Gulf of Maine also have created perceptions of inequity between some sectors of the fishery. Although they are separate stocks of cod and there are many reasons for different trip limits, codfish are marketed similarly no matter where they are caught (sometimes prices may vary depending on how they are caught). Fishermen in the Gulf of Maine may be disadvantaged in terms of the fresh fish market for cod. Moreover, larger vessels from Gulf of Maine ports may be able to fish on Georges Bank and land more cod, increasing perceptions of inequity in some communities. This often exacerbates conflicts between sectors of the industry, which create social impacts in the form of intracommunity conflicts and loss of community cohesion.

The extent of the impacts of proposed trip limits will depend upon which permits ultimately fish in sectors. The sector rosters may change before the beginning of the fishing year since permits can be withdrawn from sectors until May 1, 2010. Setting low trip limits for GOM cod and pollock may cause some vessels that would have otherwise opted to fish in the common pool to register for sectors, since the amount of these valuable species that they will be able to catch will decrease. The social impacts of sectors themselves are analyzed in Amendment 16, and those impacts will be more pronounced if more vessels join sectors as a result of this trip limit measure.

One likely result of the 800 lb./trip limit is that GOM cod *regulatory discards* would remain high. Current stock size is projected to be close to, or perhaps even higher than, $SSB_{MSY}$ (see Table 2), yet the proposed trip limit is the same as that adopted in Amendment 13 when stock size was less than one-fourth the current projected stock size. To the extent that regulatory discards of GOM cod are proportional to increases in stock size, discard rates for common pool vessels are likely to increase under this measure from recently seen values. Under the No Action alternative, the trip limit is larger, so regulatory discards resulting from the trip limit would likely be smaller; this measure would probably increase discards when compared to No Action as well.

This measure also adopts a pollock trip limit of 1,000 lbs./DAS and 10,000 lbs./trip. Under existing regulations and the No Action alternative there is no trip limit for pollock. It is not clear how much pollock the vessels in the common pool can catch absent a trip limit, and so it is difficult to tell whether *regulatory discards* will increase dramatically as a result of this measure. It is not clear if these identified common pool vessels will target pollock if a trip limit is not adopted, nor is it clear that other vessels will leave sectors based solely on potential pollock catches.

It is difficult to determine whether fishing behavior will be significantly altered by the measure requiring scallop vessels to land all yellowtail flounder. If fishing behavior is not greatly altered, catches within the access area should not change and *regulatory discards* will be converted to landings. Adopting this requirement should reduce *regulatory discards* of yellowtail flounder as compared to No Action – almost all yellowtail flounder caught by limited access vessels is presently discarded, while general category scallop vessels are not allowed to land yellowtail flounder and all that they catch is discarded. That change would have positive social impacts, both on the scallop fleet that reduces discards and on the groundfish fleet which will have a positive view of the reduction in discards. But if the vessels choose to take advantage of this regulation and target yellowtail flounder then catches could increase and if this occurs in the access areas it may reduced the contribution of those areas to groundfish rebuilding. This could be an issue for CAII. Recent assessments indicate that the GB yellowtail flounder stock is heavily concentrated in this area. To the extent that the area is providing benefits to rebuilding by serving as a refuge for yellowtail flounder, increased targeting by any vessels in this area may slow rebuilding. It is not clear, however, that the area is serving in this fashion. Not only would slower rebuilding result in decreased catch for fishermen (which would have similar impacts to the ACL measures described above), but the long-term positive social impacts anticipated by the rebuilding program will be delayed.

#### 7.5.2.3 Option Three – Modification to DAS Counting

This measure proposes to count common-pool vessel DAS at a 2:1 rate in the GOM differential DAS area at the beginning of the fishing year. This measure will reduce fishing effort by common pool vessels in this area.

Changes in the way that DAS are counted can sometimes equate to DAS reductions. If DAS are counted at a 2.25:1 rate year-round in the inshore Gulf of Maine area, for example, vessels that are able to fish only in that area effectively receive a further reduction in the DAS available for them to use. For vessels that may be able to access other areas to fish at a 1:1 DAS counting rate, it is likely that they will move to those areas where the regulation may not impact them. This could be farther from shore, possibly compromising their *safety*.

Social impacts of DAS reductions tend to be more far-reaching and long-term in nature than social impacts from other management measures like trip limits, gear restrictions, and seasonal area closures. They tend to have the most significant impacts on *disruption in daily living* and *changes in occupational opportunities and community infrastructure*, although as mentioned they also can affect *safety*. Unlike a revised trip limit, though, this measure is not likely to lead to increased *regulatory discards* of GOM cod or pollock. Impacts on the other factors result from direct reductions in groundfish fishing opportunities and revenues for vessels that are most active in the fishery. Reductions in groundfish fishing opportunities through the loss of DAS also compromise vessels' flexibility and can have direct impacts on fishing activity within a port, consequently impacting the shoreside facilities that are dependent on the affected vessels. Other impacts of DAS reductions include increased uncertainty and instability in the fishery and/or community; problems finding and keeping crew members on a year-round basis; social impacts related to family and business financial problems; overall increased stress at the individual, family, and community level; and reductions in perceptions about job satisfaction.

Indirect negative social impacts resulting from DAS reductions relate to adaptations that vessels make to compensate for reduced opportunity and reduce income, which can oftentimes increase their risk-taking and compromise their safety at sea. As income is reduced, some fishermen will try to minimize their operating costs in order to stay viable, sometimes reducing or eliminating crew, especially on smaller vessels. More owners of smaller vessels could be forced to fish alone for some or all of the year. Vessels may also try to maximize their remaining DAS by fishing during the winter when prices are usually better. Winter weather is more extreme and less predictable, increasing dangers that fishermen may encounter.

In addition, the disproportionate impacts of DAS reductions or differential DAS counting areas can create perceptions of inequity, which often exacerbate social impacts occurring in communities involved in groundfish fishing harvesting. Some people think that DAS allocations from Amendments 5 and 7 were unfair and created inequities and tensions between sectors involved in the fishery. Those who switched from groundfish to other fisheries with the decline of the groundfish stocks feel that they were punished by not receiving their true historical allocation of DAS. Many fishermen feel that they have sacrificed more than their share to rebuild the resource and are concerned about their future ability to realize the benefits of their sacrifices.
Vessels that stand to be the most impacted by differential DAS counting in this framework are those that currently fish in the inshore GOM. As a result, some vessel owners may feel unfairly treated and disproportionately impacted by the capacity alternatives.

The economic impacts of DAS reductions that are being considered in this amendment are discussed in the economic impacts section. Certainly the most significantly impacted vessels from an economic perspective will be those that currently fish in the inshore GOM. Similarly, the most significantly impacted communities will be those that are geographically proximate to the area or that serve as the homeport for vessels that fish there. Northern New England ports such as Portland, Boston, Gloucester, the NH Seacoast, and Portsmouth, exhibit a relatively high dependence on the inshore GOM fishing area and the GOM cod fishery.

With respect to the potential landings of GOM cod by vessels committed to sectors as of September 1, 2009, the maximum impact of this measure would occur if these vessels used all their DAS in the differential DAS area. Effectively this would reduce the potential landings in half, and would be the equivalent to a 50% DAS cut for vessels that fish in the area. When combined with the proposed 800 lbs./DAS trip limit the results show a larger decline. However, if vessels can shift effort into other areas or other stocks, the impacts will be lessened.

#### 7.5.2.4 Option 4 – Effort Control Measure Adjustments

This measure authorizes the Regional Administrator to adjust trip limits or DAS counting rates during the fishing year in order to facilitate harvesting the ACL or to reduce the likelihood the ACL is not exceeded. Since sector membership will not be known with certainty until May 1, 2010, there is more uncertainty about the effectiveness of the effort control measures than with prior management actions. This option gives the Regional Administrator two tools that can be readily used should the measures prove to be misaligned with fishing activity in the common pool. The result is that there should be more certainty about maintaining catch at or below the applicable ACLs, increasing the likelihood that fishing mortality targets will be achieved.

This measure is administrative in nature and is not, in itself, likely to have negative impacts on any of the social factors with the possible exception of *formation of attitudes*. If the RA is perceived to overstep its authority or make in-season modifications that are not satisfactory to fishery participants, such perceptions could lead to hostility toward the management agency. However, this is not guaranteed to happen because other social factors may be positively impacted.

*Disruptions in daily living*, for example, could be mitigated by this measure. One rationale for endowing this authority upon the RA is to slow fishing effort throughout the year in order to avoid a derby fishery after the hard TAC AM is implemented in 2012. A derby fishery would cause major disruptions in daily living by concentrating fishing activity at the beginning of a year. Conversely, if the RA implements severe measures during the fishing year that prohibit some fishermen from making profitable trips, disruptions could actually increase because of this measure.

Finally, *safety* could have positive impacts in a similar manner as *disruptions in daily living*. The possibility of a derby fishery has negative safety implications as fishermen race to fish often in spite of poor weather or crew conditions, so any measure that reduces its possibility will have a positive impact on safety.

## {remainder of document to be completed}

## Impacts on Other Fisheries

The M-S Act requires that fishery management plans or amendments assess, specify, and describe the likely effects, if any, of the conservation and management measures on participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of the participants. The Mid-Atlantic Fishery Management Council (MAFMC) manages several fisheries that take place off the coast of southern New England. The geographic range of these fisheries overlaps the range of the multispecies fishery, and many multispecies permit holders participate in these other fisheries. The principal fisheries managed by the MAFMC that may be affected by this action are for:

- Dogfish (jointly managed with the NEFMC)
- Scup
- Black Sea Bass
- Squid
- Summer Flounder

Three fisheries managed by the NEFMC – monkfish, skates, and the scallop fishery – may also be affected by this action.

## 7.6 Mid-Atlantic Fisheries

## 7.7 Scallop Fishery

## 7.8 Skate Fishery

## 7.9 Monkfish

## *7.10 Cumulative Effects Analysis*

## *7.11 Comparison of Alternatives*

### 7.11.1 Comparison of Impacts

### 7.11.2 Biological Impacts