Framework Adjustment 40B

To the

Northeast Multispecies Fishery Management Plan

Including an

Environmental Assessment

Regulatory Impact Review

Initial Regulatory Flexibility Analysis

Initial Framework Meeting: January 28, 2004
Final Framework Meeting: November 17, 2004
Date Submitted: January 28, 2004
Date Resubmitted: February 15, 2005

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1.0 EXECUTIVE SUMMARY

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

For several stocks, the mortality targets adopted by Amendment 13 represented substantial reductions from existing levels. For other stocks, the targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design measures that will selectively change mortality for individual species. The management measures adopted by the amendment to reduce mortality where necessary are also expected to reduce fishing mortality unnecessarily on other, healthy stocks. As a result of these lower fishing mortality rates, yield from healthy stocks is sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation.

In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. A brief review of the primary effort control used in the multispecies fishery is in order. The FMP restricts the number of days that vessels can fish by allocating each limited access permit a specific amount of days-at-sea (DAS). Amendment 13 further defined three categories of DAS. For each permit, the number of DAS in each category was determined based on the vessels history of fishing for regulated groundfish during the period 1996 through 2001 (based on fishing years). The DAS categories are:

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

In addition, Amendment 13 defined two sub-categories for Category B DAS:

- Category B (regular): According to Amendment 13, these DAS would be used to target healthy stocks, but the details were not defined.
- Category B (reserve): These DAS can only be used in Special Access Programs (SAPs) – programs with specific requirements defined based on data that show the activity will not harm stocks of concern.

In order to create additional opportunities to target healthy groundfish stocks, Framework Adjustment 40A (FW 40A) was submitted by the Council in July, 2004 and became effective November 19, 2004. FW 40A adopted two special access programs (SAPs) to target Georges Bank haddock: one in the Eastern U.S./Canada area using trawl gear, and a second in Closed Area I using longline gear. In addition, FW 40A adopted a pilot program that allows vessels to use Category B (regular) DAS outside of an SAP.

Since the implementation of Amendment 13 and submission of FW 40A, several issues have been raised concerning the overall approach to controlling effort. The **primary purpose** of this action is to improve the effectiveness of the Amendment 13 effort control program, including the opportunities developed to use effort to target healthy stocks and other measures that were adopted to facilitate adaptation to the amendment's effort reductions. The Council considered measures to clarify the DAS allocations and provide a small allocation to all permit holders, modify the DAS leasing and transfer programs, improve opportunities to target healthy stocks, and adjust the GB cod hook sector provisions in order to meet this purpose.

The **secondary purpose** of this action is to consider measures developed to address interactions between the herring fishery and regulated groundfish. This fishery is not allowed to fish for, possess, or land groundfish. Catches of groundfish that occur are wasted and do not contribute to optimum yield in the groundfish fishery.

Proposed Action

The proposed action implements twelve specific management measures. A general description of these measures is provided below. For the specific details of each measure as well as the rationale for its adoption, refer to the description of the proposed action in section 4.0.

Changes to the DAS leasing and transfer conservation tax (Measure A.1): Amendment 13 adopted two programs that allow DAS to be exchanged between limited access permit holders. The DAS leasing program allows for the temporary exchange of DAS between two permits, while the DAS transfer program allows for the permanent exchange of DAS. Both programs are subject to a number of restrictions that govern which vessels can exchange DAS and what (if anything) happens to the permits of the vessel that is selling or leasing DAS to another vessel. As adopted by Amendment 13, DAS that are permanently exchanged through the transfer program are subject to a forty percent conservation tax (Category A and B DAS). The proposed action would reduce that tax to twenty percent. While the Council considered imposing a tax on DAS that are leased, the proposed action does not adopt a tax on leased DAS.

Incidental Catch TACs (Measure B): FW 40A adopted several programs that allow vessels to use Category B DAS to target healthy stocks. The catch of stocks of concern - that is, stocks that are overfished or are subject to overfishing – when using these DAS is controlled through the use of Incidental Catch TACs. This action modifies these TACs to account for an additional special access program and to provide for a research set-aside for Georges Bank cod. The total incidental catch TACs are not revised from those adopted by FW 40A (as implemented).

Western Gulf of Maine Closed Area Rod/Reel SAP (Measure C.2): The proposed action implements an SAP to target GOM haddock in the Western Gulf of Maine (WGOM) Closed Area using hand-operated rod and reel. The SAP is only authorized for two months – March and April. The catch (kept and discarded) of haddock is limited to fifty metric tons, while the catch of cod is limited to five percent of the Gulf of Maine cod incidental catch TAC. Vessels are not allowed to retain cod. Vessels must have a limited access multispecies permit to participate (including a Handgear A permit), must use a

Vessel Monitoring System (VMS), are subject to several notification and reporting requirements, and cannot fish outside of the SAP.

Closed Area II Yellowtail Flounder SAP (Measure C.3): Amendment 13 adopted a SAP to target yellowtail flounder in the southern half of CAII from June 1 through December 31. A total of 320 trips was authorized, with vessels limited to two trips per month. The possession limit for yellowtail flounder was set at 30,000 pounds. The proposed action modifies several of the provisions of this SAP. The total number of trips allowed will be set by the National Marine Fisheries Service after considering the Georges Bank yellowtail flounder TAC (set in accordance with the U.S./Canada Resource Sharing Understanding) and the amount of yellowtail flounder that will be caught outside of the SAP. (It is likely that this process will result in there not being any trips in the SAP in FY 2005). In addition, the SAP will not open until July 1, vessels will be limited to one trip per month, and the possession limit will be 10,000 pounds per trip. NMFS has the authority to increase the possession limit to 30,000 pounds per trip.

Minimum Effective Effort Allocation (Measure D): Amendment 13 categorized the DAS allocated to each permit based on recent fishing history. As described above, only Category A and B DAS can be used. About 400 vessels did not receive any Category A or B DAS, and thus have no opportunity to fish for groundfish with their limited access permit. The proposed action will re-categorize ten Category C DAS as Category B (reserve) DAS for these permits. These DAS can only be used in specifically identified SAPs.

GB Cod Hook Sector (Measure E): Amendment 13 established the GB Cod Hook Sector and allocates GB cod to the sector based on the history of the sector participants. As implemented, only permits with a past history of using hook gear can join the sector, and only cod landed using hook gear is used to determine the sector's cod allocation. The proposed action modifies these requirements by allowing any vessel to join the sector and all cod landings of sector participants, regardless of gear, will be used to determine the sector's allocation. Sector participants are required to use hook gear once in the sector and the maximum share of the GB cod TAC that the sector can be allocated to the sector is twenty percent.

Change to the DAS Baseline Calculation (Measure F): Amendment 13 determined a DAS baseline for each limited access DAS permit. The baseline was calculated as the maximum DAS used in any single fishing year during the period FY 1996 through FY 2001. Only years when a permit landed 5,000 pounds of regulated groundfish were considered, and the maximum allocation was capped by the permit's allocation in FY 2001. The Council considered, but did not adopt, removing the cap on the allocation. The proposed action does not change the DAS allocations implemented for FY 2004.

Removal of Tonnage from the DAS Transfer Program Requirements (Measure G): In order to exchange DAS using the DAS transfer program implemented under Amendment 13, the permits selling and purchasing the DAS must have similar permit baseline characteristics for length, horsepower, and gross tonnage. The proposed action removes the requirement that tonnage must be similar, making the requirements for the transfer program similar to those for the DAS leasing program.

One Time Permit Baseline Characteristics Downgrade (Measure H): In order to lease DAS, the permits involved in the transaction must have similar permit baseline characteristics for length and horsepower. In general, permits with smaller baseline characteristics have a larger pool of candidates with which to exchange DAS using the leasing program. Some permit holders have placed permits on vessels with physical characteristics that are smaller than the baseline characteristics of the permit. This limits the number of vessels that can be candidates for leasing DAS. The proposed action would allow these permit holders a one-time downgrade of the permit baseline characteristics to the physical characteristics of the vessel using the permit. This change is only used for the DAS leasing program and does not affect any

other permit actions. In effect, if a permit holder exercises this option, the permit now has two baselines: one for leasing transactions and another that applies to all other permit transactions (upgrades, transfers, etc.). In addition, if the permit is moved to another vessel, the leasing baseline reverts to the permit baseline and cannot be downgraded again.

DAS Credit for Standing By Entangled Whales (Measure I): Teams that attempt to free entangled large whales are often frustrated by an inability to relocate the whale after the initial report. In order to encourage reporting by fishing vessels, the proposed action provides a mechanism for a limited access groundfish vessel to obtain DAS credit for the time spent standing by a large entangled whale.

Herring Vessel Interactions With Regulated Groundfish (Measure J): Recent reports of the catch of regulated groundfish in herring fishing vessels (most notably mid-water trawl vessels) have prompted an interest in gaining a better understanding of the scope of this problem. The proposed action requires vessels with a Category I herring permit that fish in the Gulf of Maine or Georges Bank Regulated Mesh Areas to notify the NMFS observer program seventy-two hours before beginning a trip. In addition, if an observer is not provided for the trip, the vessel must notify NMFS enforcement via VMS prior to offloading the catch. These provisions are intended to improve the ability to place an observer on herring vessels and to monitor offloads.

Trip Gillnet Net Limitations (Measure K): Prior to May 1, 2002, trip gillnet vessels did not have a regulatory limit on the number of nets that could be fished. These vessels must return all nets to port when ending a trip and are limited only by the number of nets that can be carried. Effort is thus limited by the size of the vessel as well as the number of DAS allocated, similar to the approach used for trawl gear. Net limits were first adopted for this group of vessels by the interim regulations adopted to implement a court order. Amendment 13 revised the number of nets that could be carried, but did not remove the limit completely. The proposed action removes the limit on the number of nets that can be used by trip gillnet fishing vessels.

Summary of Environmental Consequences

The Environmental Consequences of the Proposed Action, and the alternatives to the proposed action, are described in section 7.0. The Biological Impacts of the Proposed Action are described in section 7.2.1, while the Habitat Impacts are in section 7.2.1.3 and the Impacts on Endangered, Threatened, and Protected Species are discussed in section 7.2.3. Economic Impacts are analyzed in section 7.2.4, followed by Social Impacts in section 7.2.5. Safety Considerations are discussed in section 7.2.6 and Impacts on Other Fisheries in section 7.2.7. Cumulative Effects of the Proposed Action are discussed in section 7.2.8.

Biological Impacts

The proposed action will not have substantial nor significant biological impacts on regulated groundfish or other species when compared to the No Action alternative. Several measures are adopted that modify provisions of the DAS leasing and transfer programs. While these provisions are expected to increase exchanges of DAS between permit holders, these increases are expected to be small. It is not possible to predict how these changes will impact fishing mortality since the impacts will depend on how the DAS that are exchanged are used. The WGOM Rod/Reel Haddock SAP is expected to result in a minor increase in fishing mortality for GOM haddock, but the small haddock TAC allocated to this SAP is a fraction of the total target TAC and the increase will not threaten Amendment 13 mortality objectives. This SAP is also subject to a restrictive TAC for GOM cod to ensure that any bycatch of cod does not threaten the rebuilding program for that stock. The modifications to the CAII Yellowtail Flounder SAP will not increase mortality on yellowtail flounder and may help control mortality since the number of trips in the SAP will more closely match the available TAC. The modified provisions for the GB Cod Hook Sector will not increase mortality of any stock, and may contribute to reduced mortality on some flounder

stocks should gillnet or trawl vessels choose to join the sector. Maintaining the current DAS baselines will have no biological impacts. Requiring herring vessels to provide additional notice of sailing and landing times may provide additional information but will not have any other biological impacts. Removing the net limit for trip gillnet vessels may result in slight increases in mortality for regulated groundfish, and could result in increased mortality for monkfish. Any increases are expected to be minor given the analysis of the imposition of the net limit that was included in Amendment 13.

Habitat Impacts

The proposed action is expected to have minimal impacts on habitat and EFH.

Impacts on Endangered, Threatened, and Other Protected Species

The proposed action is expected to account for few, if any, impacts on protected species beyond those already identified in Amendment 13 and Framework 40A.

Economic Impacts

The proposed action will likely have only modest economic effects. The changes to the DAS transfer and leasing programs will have positive economic effects as the will increase the ability of fishermen to operate their businesses in an efficient manner. The changes to the Closed Area II Yellowtail Flounder SAP may have the broadest economic effect. The changes create an explicit link between the yellowtail flounder TAC and the SAP, increasing the probability that maximum economic benefits will be realized from this stock. Removing the net limit for trip gillnet vessels will increase the operating flexibility for these vessels and will improve economic performance. The WGOM Rod/Reel SAP will provide limited increased revenues (about $140,000) to a small group of vessels. Other measures are likely to have minor economic effects.

Social Impacts

The proposed action is expected to have only minimal social benefits. The modifications to the DAS leasing and transfer program provisions would have positive social impacts, as would the Minimum Effective Effort allocation. Changes to the Closed Area II Yellowtail Flounder SAP would have the broadest social benefits. The WGOM Rod/Reel Haddock SAP may have interactive effects with the Minimum Effective Effort Allocation if those vessels receiving ten Category B (reserve) DAS are able to use them in the SAP.

Impacts on Other Fisheries

Most of the measures in the Proposed Action are expected to have negligible impacts on other fisheries. The exception is the removal of the net limitation for trip gillnet vessels, which could lead to increased fishing effort on monkfish, particularly in the Gulf of Maine. If this measure increases monkfish mortality in this area, it could lead to additional restrictions in the monkfish fishery in the future.

Cumulative Effects

The cumulative effects of this action are not likely to have a substantial impact on any of the valuable ecological components (VECs) associated with the multispecies fishery. The overall reductions in fishing effort adopted by previous actions will have a positive impact on groundfish stocks. While the proposed action may result in a small increase in effort, enough controls are included that these increases will not threaten the mortality objectives of the management plan. The cumulative impacts of this proposed action will mitigate some of the negative economic and social impacts of Amendment 13.

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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

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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 twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout) off the New England and Mid-Atlantic coasts. Commercial and recreational fishermen harvest these species, in some cases sub-divided into different stock areas. The FMP has been updated through a series of amendments and framework adjustments. The most recent amendment was Amendment 13, approved by the National Marine Fisheries Service in March, 2004 and effective on May 1, 2004. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act. Subsequent to Amendment 13, FW 40A was implemented November 19, 2004 in order to create opportunities to target healthy groundfish stocks.

3.2 Purpose and Need for Action

For several stocks, the mortality targets adopted by Amendment 13 represented substantial reductions from existing levels. For other stocks, the targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design measures that will selectively change mortality for individual species. The management measures adopted by the amendment included a reduction in fishing opportunities through limits on days-at-sea and additional gear requirements. These measures that were designed to reduce mortality where necessary are also expected to reduce fishing mortality on healthy stocks. As a result, yield from healthy stocks is sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation. In recognition of the **need** (mandated by the M-S Act) to achieve optimum yield from the Northeast Multispecies fishery, Amendment 13 also included provisions designed to help fishing businesses adapt

to the effort reductions. These provisions included opportunities to fish selectively on healthy stocks as well as provisions that allowed the exchange of days-at-sea between vessels.

In order to meet mortality targets, Amendment 13 adopted changes to the days-at-sea (DAS) program used to control fishing effort. The amendment established the effective effort (DAS baseline) for each permit based on recent fishing history and then reduced the number of DAS that can be used to target any groundfish stock. As a result of this measure, some permits did not receive any DAS that can be used in the fishery. The amendment included two programs that allowed DAS to be exchanged between permits so that fishing businesses can adapt to the DAS reductions in the amendment. In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment proposed four specific programs, but only two were approved and implemented on May 1, 2004. Framework Adjustment 40A, submitted by the Council in July 2004 and implemented November 19, 2003, proposed two additional special access programs (SAPs) and a Category B (regular) DAS pilot program that were designed to harvest healthy stocks.

Since the implementation of Amendment 13, several issues have been raised concerning the overall approach to controlling effort. The **primary purpose** of this action is to improve the effectiveness of the Amendment 13 effort control program, including the opportunities developed to use effort to target healthy stocks and other measures that were adopted to facilitate adaptation to the amendment's effort reductions. The Council considered measures to clarify the DAS allocations and provide a small allocation to all permit holders, modify the DAS leasing and transfer programs, improve opportunities to target healthy stocks, and adjust the GB cod hook sector provisions in order to meet this purpose.

The **secondary purpose** of this action is to consider measures developed to address interactions between the herring fishery and regulated groundfish. This fishery is not allowed to fish for, possess, or land groundfish. Catches of groundfish that occur are wasted and do not contribute to optimum yield in the groundfish fishery.

3.3 Brief History of the Northeast Multispecies Fishery 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, 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 have been 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 Amendment 13, the Council submitted FW 40A to increase fishing opportunities on healthy stocks. Three programs were adopted by this action: a SAP to target GB haddock in the eastern U.S./CA area, a Category B (regular) DAS Pilot Program, and a SAP to target GB haddock using longlines in CAI.

This action also considers measures designed to address interactions between the herring and groundfish fisheries. Herring fishing is managed under the Atlantic Herring FMP (implemented in 2000), which is closely coordinated with the Atlantic States Marine Fishery Commission's Interstate Fishery Management Plan (ISFMP) for Atlantic Herring. The first herring FMP written under the authority of the M-S Act was the Sea Herring FMP, implemented in December 1978. The Secretary of Commerce withdrew approval of this FMP in September 1982. In the absence of an FMP, fishing for Atlantic Herring in federal waters was managed through a Preliminary Management Plan that focused on foreign fishing and joint venture operations. An ISFMP was also adopted by ASMFC during this period. As a result of the lack of a final federal management plan, restrictions on herring fishing activity were often included as part of the groundfish management regulations adopted through the 1980s and 1990s.

In 1981, the Interim Groundfish Plan was adopted. This plan allowed the use of small mesh to target herring, mackerel and other species under the Optional Settlement Program. Participants could only catch a specified percentage of regulated groundfish (determined by the Regional Director) while in the program. Trawl and purse seine gear was not allowed in two seasonal closed areas on Georges Bank that were adopted to protect spawning groundfish. The Groundfish Plan, implemented in 1986, replaced the Optional Settlement Program with the Exempted Fisheries program. Vessels were allowed to use small mesh to target herring and mackerel using mid-water trawls in the Gulf of Maine (December through May only) and on Georges Bank (year round) with the bycatch of regulated species held at one percent. In addition, the plan allowed mid-water trawl gear to fish in three seasonal closed areas (two on Georges Bank and one in Southern New England) subject to the restriction that there was zero bycatch of regulated groundfish. The Council adopted Amendment 1 to the FMP in May 1987. This amendment eliminated the exempted fishery status of the mid-water trawl fishery for herring and mackerel, but allowed it to continue in the Gulf of Maine (December through May only) and on Georges Bank (year round) with the adoption of a bycatch possession limit of one percent of regulated species. While this change had little impact on the prosecution of the fishery, it simplified participation by removing the burden of exempted fishery sign-in and reporting requirements. Mid-water trawl gear only landed a small percentage of the total herring catch during this period.

The next change that affected mid-water trawl fisheries was implemented as part of Amendment 5 in 1994. One of the key elements of Amendment 5 was the requirement for a minimum mesh size in the Gulf of Maine and on Georges Bank. Vessels fishing with small mesh in these areas (including purse seine and mid-water trawl vessels fishing for herring and mackerel) were restricted to possessing 500 pounds or less of regulated groundfish. In addition, mid-water trawl vessels were allowed to fish year round in the Gulf of Maine. Purse seine and mid-water trawl vessels were not allowed in Closed Area I, Closed Area II, or the Nantucket Lightship Closed Area, which were still seasonal closed areas. Nine months after the adoption of Amendment 5, the Secretary of Commerce adopted emergency regulations to protected declining groundfish stocks (December 1994). These regulations adopted Closed Area I, II, and the Nantucket Lightship Closed Areas as year round closures without changing the prohibition on using mid-water trawls in the areas. The emergency action was adopted by the Council as Framework Adjustment 9.

Regulations for mid-water trawl and purse seine vessels were revised by Amendment 7, adopted in May 1996. After adoption of Amendment 5, a series of framework actions implemented seasonal restrictions on gillnet gear in the inshore Gulf of Maine in order to reduce harbor porpoise takes. Ultimately there were three closures along the coast: the Northeast Closure Area (August 15 – September 13), the Mid-coast Closure Area (November 1 through December 31) and the Massachusetts Bay Closure Area (March). Amendment 7 extended these closures to all gear capable of catching groundfish and specifically prohibited the use of mid-water trawls in these areas during the closures. At this point, mid-water trawls were thus prohibited from fishing along the Gulf of Maine coast during these closures and

could not fish in CAI, CAII, or the NLCA. Another key element of Amendment 7 was a further change to the regulations governing small mesh fisheries. Two programs were created: a Certified Bycatch Fishery program that required verification of a bycatch of regulated species of five percent or less by weight, and a program for generally exempted gears. Exempted gears were exempted from the provisions of the FMP but were prohibited from possessing regulated groundfish. Purse seines and mid-water trawl vessels were included in this list. With the exception of mid-water trawl vessels, Amendment 7 said exempted gears were allowed to fish in closed areas, but the implementing regulations did not specify purse seine gear could fish in CAI, CII, or the NLCA. Amendment 7 stated that mid-water trawl vessels might be allowed into the closed areas through a future action after a review of observer data.

Framework Adjustment 18 reviewed the available data and proposed allowing mid-water trawl vessels into all groundfish closed areas. While this action was being developed, the Council modified the Mid-Coast Closure area by replacing it with a smaller closure on Jeffery's Ledge. Framework 18 reviewed observer data from six mackerel tows in the southern New England regulated mesh area and seven herring tows in the Gulf of Maine. None of the tows caught any regulated groundfish, though the mackerel tows caught small quantities of monkfish, other flounders, and other groundfish. Based on these data, mid-water trawl vessels were granted access to all groundfish closed areas in February 1998. Over the next several years, as additional groundfish closed areas were defined (the WGOM Closed Area and the Cashes Ledge Closed Area, as well as seasonal closures on Georges Bank and in the Gulf of Maine), all exempted gears (including mid-water trawls) were allowed access.

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 impacts are not expected to be significant. The required NEPA elements for an EA are discussed in section 8.2. 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 Introduction

A brief explanation of terminology as used in Council documents is appropriate because there has been some confusion in the past over the differenced between an alternative, a measure, and an option. As used in this document, a *measure* is a completely detailed management proposal that accomplishes one specific task. There may be *options* for some of the details of the measure while the measure is being considered, but particular options must be selected when the proposed action decision is made. For some measures, the options may not be exclusive – more than one option may be selected. An *alternative* is a combination of measures that is being submitted as a package. Because many management measures interact with each other, alternatives must be defined so the impacts of the actions being considered can be evaluated and understood. Because the impacts on an alternative must be described and understood before a decision can be made, there is only a limited ability to mix and match measures when the Council selects the proposed action. Only measures that have minor impacts, or impacts that are not likely to interact with other measures – referred to as independent, or attendant, measures – can be freely moved between alternatives. The following matrix (Table 1) provides a quick reference to the *measures* that are being considered for each *alternative* in this action, including the proposed action. The independent measures are also identified. During development of this action, each measure was identified by an alpha-numeric symbol so that similar measures in different alternatives can be readily identified.

The details of each measure are shown for the Proposed Action and in the discussion of Alternative 1 (see section 5.2). In the discussion of other alternatives, the measures are listed and only those measures with different elements than Alternative 1 are described in full.

Measure	Alternative					
	Proposed Action	No Action	One	Two	Three	Four
Measure A: DAS Leasing and Transfer Provisions						
A.1: Changes to the DAS leasing and transfer conservation tax	X Option 1		X	X		X
A.2: DAS Transfer Program Modifications			X		X	
Measure B: Incidental Catch TACs	X		X	X	X	X
Measure C: Special Access Programs						
C.1: GB Haddock Fishery SAP			X		X	X
C.2: WGOM Closed Area Rod/Reel SAP	X Option 1		X	X		X
C.3: CAII Yellowtail Flounder SAP	X		X	X	X	X
Measure D: Minimum effective effort allocation	X		X	X		
Measure E: GB Cod Hook Sector Allocation	X		X	X		
Measure F: Change to DAS Baseline Calculation	X Option 1		X	X	X	X
Independent Measures						
Measure G: Removal of tonnage from DAS transfer program restrictions *(Proposed)*						
Measure H: One-time Permit Baseline Characteristics Downgrade *(Proposed)*						
Measure I: DAS Credit for Standing by Entangled Whales *(Proposed)*						
Measure J: Herring Vessel Interactions With Regulated Groundfish *(Proposed – Option 4)*						
Measure K: Trip Gillnet Net Limitations *(Proposed)*						
Measure L: Category B DAS Observer Requirement						

Table 1 – Matrix of measures included in the proposed action and each alternative

4.2 Changes to the DAS Leasing and Transfer Programs Conservation Tax (Measure A.1)

Amendment 13 adopted two programs that allow the transfer of DAS from one groundfish permit to another. The DAS leasing program allows the temporary transfer of Category A DAS for a period not to exceed one year. The DAS transfer program allows for the permanent transfer of Category A, B and C DAS from one permit to another. Both programs are subject to additional restrictions that limit the transfer of DAS to similarly sized vessels. In addition, under the DAS transfer program, the vessel losing DAS must exit all fisheries. Under the terms of the DAS transfer program, DAS that are transferred to another permit are reduced by a fixed percentage that is commonly referred to as a conservation tax. DAS transferred under the leasing program, however, are not subject to any such tax. The Council considered changes to the conservation tax for both the leasing and transfer programs.

This action changes the conservation tax for the DAS transfer program. Category A or B DAS that are transferred under the DAS transfer program will be reduced by twenty percent. Category C DAS will continue to be reduced by ninety percent. This action does not adopt a conservation tax for DAS transferred under the DAS leasing program

Rationale: This measure reduces the conservation tax for the DAS transfer program to make that program more attractive. This may increase the number of permanent transfers of DAS. Permanent transfers will provide more stability to the industry compared to the temporary transfers that take place through the leasing program.

4.3 Incidental Catch TACs (Measure B)

In order to ensure that any catch (landings and discards) of stocks of concern taken while using a Category B (regular or reserve) DAS does not threaten the mortality objectives of Amendment 13, catches of those stocks taken on a Category B DAS are constrained by a "hard" incidental catch TAC adopted by FW 40A. These TACs are based on a percentage of the overall TAC for the stock of concern. The percentages used, and the incidental catch TACs that result for FY 2005 and 2006, are shown in Table 6.

The incidental catch TACs are allocated to programs developed to use Category B (regular or reserve) DAS where appropriate. The percentage of the TAC allocated to these programs can be adjusted through a management action such as a framework or amendment. Since this action proposes to adopt one additional SAP, the allocations made in FW 40A must be revised to account for these additional programs. The allocations proposed for this action are shown as percentages of the incidental catch TAC in Table 7. These TACs will remain effective until changed through a future management action.

The GB cod incidental catch TAC is reduced by up to 10 percent in order to allow for the conduct of experiments. This TAC will be released to the Category B DAS programs on May 1 if no applications have been received to use this TAC. This creates a research set-aside of 9.7 mt in FY 2005 and 12.7 mt in FY 2006. Current estimates of the revised GB cod incidental catch TACs for FY 2005 and FY 2006 are shown in Table 8. Current estimates of the revised GOM cod incidental catch TACs for FY 2005 and 2006 are shown in Table 9.

Rationale: The management measures in Amendment 13 are designed to meet the mortality objectives of the amendment. They were evaluated on the basis of Category A DAS use only. Any used Category B DAS represent an increase in effort, and if the catch of stocks of concern from fishing on a Category B DAS is not controlled, it is possible that additional catches will threaten the mortality objectives of the amendment. If the use of Category B DAS is constrained by an incidental catch TAC, then the catches of stocks of concern resulting from Category B DAS will not threaten the Amendment 13

mortality objectives. Incidental catch TACs are not specified for ocean pout, southern windowpane flounder, and Atlantic halibut, three stocks of concern, because catches of these stocks are insignificant.

A two-tier approach for establishing the appropriate TACs was adopted by FW 40A. For some stocks, the Amendment 13 management measures are expected to reduce mortality more than is required, and the catch estimated in 2003 will be less than the 2004 TAC. These stocks are limited to five percent of the total TAC. For other stocks, the Amendment 13 measures are expected to more closely match the required mortality reduction, and the expected catch in 2003 is not less than the 2004 TAC. The rationale and development of the incidental catch TACs is explained in section 7.2 of FW 40A.

Where appropriate, the incidental catch TACs are allocated to the programs that use Category B (regular or reserve) DAS. An incidental catch TAC for a specific stock is only allocated to a program if there is likelihood that stock will be caught in the program. If an incidental catch TAC were defined for each program regardless if that stock were likely to be caught, it would add administrative complexity without providing any conservation benefit. For example, a program that takes place on Georges Bank need not be allocated a TAC for a stock that is only located in Southern New England. Similarly, a program limited to hook gear is not likely to need a TAC for yellowtail flounder, since they are rarely taken on hooks.

FW 40A proposed incidental catch TACs for two SAPs (CAI Hook Gear Haddock SAP and the CAII Haddock SAP Pilot Program) and the Category B (regular) DAS Pilot Program. The CAI Hook Gear Haddock SAP was not approved for those vessels that would use the incidental catch TAC. Since this action proposes an additional SAP and a research set-aside for GB cod, the incidental catch TACs must be re-specified.

		Incidental Catch TAC	
	Percentage of Total Target TAC	**2005**	**2006**
GOM cod	Two	127	149
GB cod	Two	97	127
CC/GOM yellowtail	Two	25	21
Plaice	Five	181	151
White Hake	Two	76	76
SNE/MA Yellowtail	Five	99	166
SNE/MA Winter Flounder	Five	178	222
Witch Flounder	Five	350	383

Table 2 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year

	Category B (regular) DAS Pilot Program	**CAII Haddock SAP**	**WGOM Haddock SAP**	**Research Set-Aside**
GOM cod	95	NA	5	NA
GB cod	59.4	30.6	NA	10
CC/GOM yellowtail	100	NA	NA	NA
Plaice	100	NA	NA	NA
White Hake	100	NA	NA	NA
SNE/MA Yellowtail	100	NA	NA	NA
SNE/MA Winter Flounder	100	NA	NA	NA
Witch Flounder	100	NA	NA	NA

Table 3 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	52.1	57.6	75.5
CAII Haddock SAP	27	29.7	38.9
GB Cod research set aside	0	9.7	12.7

Table 4 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	97	120.7	141.5
WGOM Rod/Reel Haddock SAP	0	6.3	7.5

Table 5 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006

4.4 Special Access Programs (Measure C)

4.4.1 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

This SAP would allow hand-tended rod/reel commercial fishing vessels to target haddock inside the WGOM closed area. Participants are most likely to be smaller vessels that typically fish with handlines, longlines, or gillnets in the Gulf of Maine.

Rationale: This SAP is intended to provide an opportunity for vessels that fish in the GOM to use Category B DAS and mitigate the impacts of Amendment 13. As described in sections 6.4.2.3 and 6.4.2.4, landings and revenues of regulated groundfish by hook and line, gillnet, and longline vessels have not increased since FY 1996. Landings of regulated groundfish by hook and line were lower in FY 2003 than any year since 1996. This SAP provides a limited, small-scale opportunity for these vessels to benefit from the rebuilding haddock resource in the GOM as required by NSG 4 (recovery benefits must be allocated fairly among the sectors of the fishery). Consistent with section 3.4.5.1 of Amendment 13, the SAP includes strict requirements on the gear that can be used, the season for the fishery, and hard TACs to limit the catches of cod and haddock in order to prevent interference with the mortality objectives of Amendment 13.

The Council recognizes that the WGOM Closed Area Rod/Reel Haddock SAP is problematic because of limited data that support the suggestion that haddock can be targeted in this area without catching cod (see section 7.2.1). To address this concern, the Council adopted a very small cod bycatch limit, a limited season, allowed use of handgear only, adopted extensive reporting requirements (including the use of VMS), limits the SAP to a short trial period, and provides the Regional Administrator extensive authority to terminate the SAP. The Council views this SAP as critical to provide opportunities for hook fishermen in the GOM, a sector that data show has been severely impacted by the regulations since the adoption of low trip limits and has not yet benefited from rebuilding stocks. While the economic analysis suggests limited benefits from this program, many of the likely participants are small fishing operations and even modest revenue increases are important. If successful the season for this SAP could be modified in the future to increase the benefits returned. The selection of season, while raising safety concerns due to poor weather and the small size of the vessels likely to participate, was based on a need to provide the best opportunity to target haddock without catching cod. Safety concerns are mitigated to some extent by the fact most boats in this fishery are dayboats and are able to plan fishing for periods of better weather and because this SAP provides additional opportunities to fishermen.

4.4.1.1 General Provisions

Participants: Vessels with limited access multispecies permits (including Handgear A permits)

Rationale: Vessels possessing a commercial open access permit are not allowed to participate in this SAP because the number of permits is not controlled in any way.

Location: The Western Gulf of Maine Closed Area (see Figure 4)

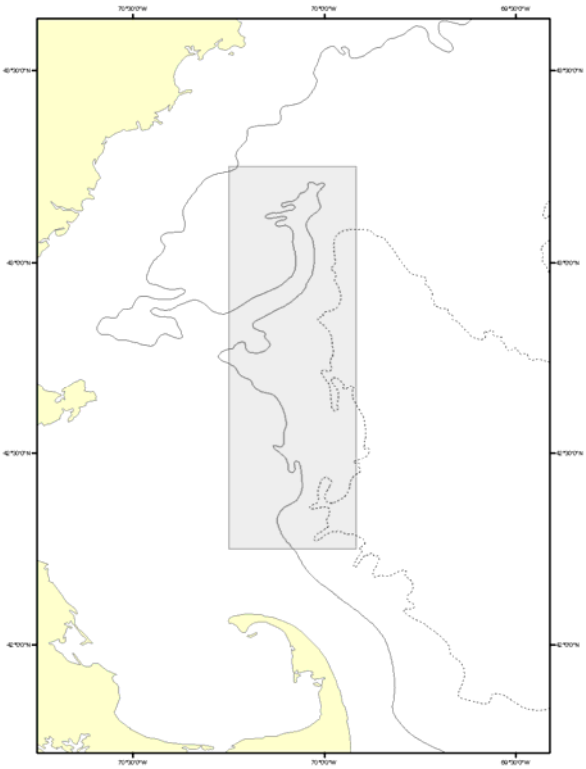


Figure 1 – WGOM Closed Area (shaded)

Haddock Catch Restrictions: This SAP is limited to 50 mt of haddock (kept and discarded). When the TAC is projected to be caught, participation in the SAP will be prohibited.

Incidental Catch Restrictions: This SAP is restricted to an incidental catch (cod cannot be retained) TAC for GOM cod of five percent of the GOM cod incidental catch TAC. All cod caught in this SAP, whether on a DAS (any type) or not, will count against the incidental catch TAC. Participation in the SAP will be prohibited on the date projected that the TAC will be caught. The current estimate of this TAC for FY 2005 is 6.3 mt, and for FY 2006 is 7.5 mt.

Landing/Possession Limits:

(1) Participants in this program are not allowed to retain any cod.
(2) Landing limits for haddock and other species will be as specified in existing regulations.

Rationale: The prohibition on retaining cod will encourage fishing vessels to avoid catching any cod, reducing the likelihood the cod TAC will be caught and the SAP will be closed before the haddock TAC is reached.

Gear: (1) Vessels can only use hand-tended rod/reel gear as defined in 50 CFR 648.2, with the exception that treble hooks cannot be used. (Mechanical jigging devices or "bandit" gear are not allowed, and all reels must be manual).
(2) Full circle hooks must be used when using bait.

Rationale: This SAP is limited to selective rod and reel fishing. For vessels using bait, the full circle hook will help reduce discard mortality.

Reporting Requirements:

(1) All vessels participating in the SAP must be use an approved Vessel Monitoring System (VMS).
(2) Vessel operators must notify NMFS through VMS when beginning a trip into the WGOM Closed Area Rod/Reel Haddock SAP.
(3) Vessel operators must provide daily reports of catch (kept and discarded) of all regulated groundfish species, by statistical area, through VMS. These reports must be submitted in accordance with instructions issued by the RA.

Observer Coverage:
(1) Vessel operators must provide the observer program three days (seventy-two hours prior to sailing) advance notice of a WGOM Rod/Reel Haddock SAP Trip.
(2) Observer coverage will be sufficient to ensure the goals of the program are met.

Rationale: The observer program needs advance notice so that observers can be identified and meet the fishing vessels prior to departure.

Other Provisions:

(1) The Regional Administrator may close this access program if the catch of cod to haddock exceeds a ratio of 1:2, by weight. Closure of the program will be announced through notice action consistent with the Administrative Procedures Act (APA).
(2) Vessels may not fish in any other area while participating in the SAP.

Rationale: This program facilitates the targeting of GOM haddock by commercial vessels. This restriction will reduce the likelihood that party/charter vessels will get a commercial hand gear permit, fish in the access program for part of the year, and then fish in the closed area targeting cod with a party/charter permit for the remainder of the year.

Duration: This SAP will expire two years after implementation of this action, unless extended by the Regional Administrator. Any extension will be announced through a notice action consistent with the Administrative Procedures Act. The Regional Administrator will allow this SAP to continue if all of the following conditions are met:

- The monitoring and enforcement provisions of the SAP prove sufficient to reliably document the catch of cod and haddock.
- In each of the two years that the SAP is conducted, the catch of cod does not exceed the cod TAC and the catch of haddock does not exceed the haddock TAC.
- The ratio of cod to haddock catch is less than 1:2, by weight.

Season: March and April

4.4.1.2 Provisions for Limited Access DAS Permit Holders

(1) A vessel must elect to participate in this program for a minimum of seven days.
(2) A vessel may not fish for groundfish or monkfish in any other area, and no groundfish or monkfish gear can be set in any other area, during the period that a vessel has elected to participate in this program.

Rationale: The requirement to sign-in to the program for a minimum of seven days will facilitate enforcement and encourage vessels to remove all other gear while in the program. The prohibition on setting gear in other areas while in the program also facilitates enforcement and administration of the program, making it easier to track the catch of vessels participating in the SAP.

4.4.2 Closed Area II Yellowtail Flounder SAP (Measure C.3)

The season for the CAII Yellowtail Flounder SAP is revised to July 1 through December 31. Vessels participating in this SAP will be limited to one trip per month. The yellowtail flounder landing limit for this SAP will be 10,000 pounds/trip unless adjusted by the Regional Administrator. Prior to June 1, the Regional Administrator, after consulting with the Council, will announce the number of trips authorized and the yellowtail flounder landing limit (not to exceed 30,000 pounds per trip). This announcement will be made as a notice action consistent with the Administrative Procedures Act.

When determining the number of trips and the appropriate trip limit, the Regional Administrator will consider the following factors:

- The available yellowtail flounder TAC under the US/CA Resource Sharing Understanding
- The potential catch of GB yellowtail flounder by all vessels (all gears) fishing outside of the SAP
- Recent discard estimates in all fisheries that catch yellowtail flounder
- Expected number of participants in the SAP

After consideration of these factors, the Regional Administrator will authorize the number of trips and appropriate trip limit that will provide for achieving but not exceeding the GB yellowtail flounder TAC and will result in a low risk of catching the GB yellowtail flounder TAC before the end of the fishing year. If the Regional Administrator determines that the available catch is not enough to support 150 trips with a trip limit of 15,000 lbs. of yellowtail flounder, the Regional Administrator may choose not to authorize any trips into the area.

The catch for this TAC should be based on the best estimate of the difference between the TAC and the catch that will be taken while fishing outside of the SAP on Category A DAS. Recent catches (landings and discards, all fisheries) have averaged about 3,750 mt. Based on this information, the suggested formula for determining the appropriate number of trips for FY 2005 is:

(TAC- 4,000 mt)/10,000 lbs.

This formula can be revised by the Regional Administrator if it is determined that the catch outside of the SAP will be different than the 4,000 mt assumed by the formula, or if the Regional

Administrator adjusts the landing limit. Factors to consider in adjusting the landing limit include the amount of fish available to the SAP, the number of participants, and the risk that catch of yellowtail flounder from all fisheries will exceed the TAC.

All other provisions for this SAP remain the same.

Rationale: The CAII Yellowtail Flounder SAP is designed to help attain OY on the GB yellowtail flounder stock. As implemented in Amendment 13, the SAP was limited to a specific number of trips with no provisions for an adjustment if stock conditions change. This measure provides the Regional Administrator the ability to adjust the number of trips if the GB yellowtail flounder TAC changes, and provides guidance so that the catch on the SAP is unlikely to result in closure of the eastern US/CA area due to catching the GB yellowtail flounder TAC. This will make it unlikely that the SAP will interfere with the harvest of other species in this area (in particular GB haddock), since the eastern US/Canada area will close if the GB yellowtail flounder TAC is caught. This change will also reduce the possibility that the GB yellowtail flounder TAC will be exceeded, since some yellowtail flounder may be discarded in the Western U.S./Canada area after the TAC is reached.

The SAP, as adopted in Amendment 13, begins on June 1. This date conflicts with spawning months for yellowtail flounder on Georges Bank. In addition to the concerns over interfering with spawning fish, fish quality is poor and there is lower demand (and consequently lower prices) as a result. Changing the programs starting date by one month will increase the benefits of this program because higher quality fish will be landed at a better price. Limiting participating vessels to one trip per month will help to extend the season, as will reducing the landing limit to 10,000 pounds per trip. The Regional Administrator is granted authority to prevent the SAP from taking place if the available catch is not sufficient to support a minimum number of trips with a trip limit of 15,000 lbs.

4.5 Minimum Effective Effort Allocation (Measure D)

For any permit that was not allocated any Category A or B DAS under the provisions of Amendment 13, ten of the permit's Category C DAS will be re-categorized to ten Category B (reserve) DAS. If these DAS are carried over into a following fishing year, they remain Category B (reserve) DAS. These DAS can only be used in the following existing or proposed SAPs (consistent with any other provisions for these SAPs):

- WGOM Closed Area Rod/Reel Haddock SAP (proposed in this action)
- CAI Hook Gear Haddock SAP (implemented through FW 40A)

Rationale: Under Amendment 13 provisions, roughly 400 vessels did not receive any Category A or B DAS. As a result, the future access of these vessels to the groundfish fishery is in doubt, and they cannot currently access the fishery. By providing a minimum of ten Category B (reserve) DAS to all vessels, these vessels are provided a limited opportunity to participate in some existing SAPs (albeit at a very low effort level) and have more hope of future participation as stocks rebuild. They can only participate in SAPs that do not have a DAS flip provision, since this provision requires that vessels have Category A DAS available. At present, only one SAP is authorized for all vessels that does not include the DAS flip provision, and a second SAP is authorized for vessels in the GB cod hook sector.

4.6 GB Cod Hook Sector Revisions (Measure E)

To determine the share of GB cod allocated to the GB hook sector, member's GB cod landings during the qualification period will be used, regardless of the gear used that produced those landings. The sector's overall share remains capped at a maximum of twenty percent of the overall target TAC.

Any vessel is eligible to join the sector, regardless of type of gear used in the past. Fishermen in the sector, however, must use hook gear.

Rationale: When Amendment 13 implemented the GB Cod Hook Sector, it specified that vessels entering the sector only bring their history of fish caught by hooks into the sector. The general rules for a sector adopted by Amendment 13, however, provide that the members of the sector bring all their catch history into the sector, regardless of how caught. This measure will make the allocation decisions for the GB cod hook sector consistent with those of any other sector that forms in the future. It will probably increase the allocation of cod to the sector.

4.7 Change to DAS Effective Effort Calculation (Measure F)

No changes are made by this action to the DAS allocations or default measures implemented by Amendment 13. A permit's effective effort (baseline allocation) is based on the maximum number of DAS used in any fishing year between 1996 and 2001, limited by the permit's allocation in FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation.

Rationale: This measure keeps the DAS allocations as implemented for FY 2004 under Amendment 13. The Council considered two options that would have removed the restriction that Amendment 13 DAS are limited by a permit's allocation in FY 2001. The Council did not adopt either of these options and decided to keep allocations and the future default DAS reductions as implemented by Amendment 13.

4.8 *Removal of the Tonnage Criterion for the DAS Transfer Program (Measure G)*

Vessels can only transfer DAS under the DAS transfer program if the vessel baseline characteristics of the two permits involved fall within the guidelines for the vessel permit upgrade restrictions for length and horsepower. Tonnage of the two vessels will not be considered.

Rationale: Under the current provisions of the DAS transfer program, DAS can only be transferred between vessels between vessels whose permit baseline characteristics fall within the vessel permit upgrading restrictions for length, horsepower, and tonnage. This measure removes the requirement that vessels fall within the tonnage permit upgrade restrictions. This makes the requirements of the DAS transfer program more similar to the requirements for the DAS leasing program.

4.9 Permit Baseline Characteristics Downgrade (Measure H)

Solely for the purposes of the DAS leasing program, permit holders are allowed to make a one-time downgrade of the baseline characteristic of their permit (length, horsepower). Only one downgrade is allowed for each permit, and all vessel characteristics associated with the DAS Leasing Program Baseline must be changed to match the characteristics of the vessel that is currently using the permit. A

downgraded DAS leasing baseline would remain in effect until the DAS leasing program expires (i.e., until April 30, 2006 unless the Council extends the DAS leasing program). This new permit baseline will only be used for the DAS leasing program. This downgrade does not change a permit's multispecies baseline that is used for vessel upgrades, DAS transfers, etc.

If, after the permit's leasing baseline is downgraded, the permit is placed on another vessel in accordance with the vessel replacement regulations, the DAS Leasing Program Baseline would change to the permit's original DAS Leasing Program Baseline as of January 29, 2004 (i.e. the original DAS Leasing Program Baseline implemented under Amendment 13).

Under current regulations, the vessel using a permit can be replaced, but any increase in length, horsepower, gross and net tonnage is limited. Horsepower can only be changed once, and length, gross, and registered tonnage can only be changed once. The proposed measure does not change the replacement vessel restrictions – that is, if the permit was placed on an "upgraded" vessel, it cannot be placed on a second upgraded vessel after the baseline characteristics are downgraded. Conversely, if the permit has never been placed on an upgraded vessel, the permit retains its eligibility for an upgrade.

Rationale: Exchanges of DAS under the DAS leasing program are limited by a vessel's permit baseline characteristics. For vessels with "large" characteristics, this limits the number of candidate permits with which to conduct an exchange. In some cases, vessels are actually smaller than the permit baseline attached to the vessel. This measure would allow permit owners to make a one-time downgrade of their permit so that the permit baseline matches the characteristics of the vessel currently using the permit. All characteristics would have to be downgraded to the actual physical characteristics of the vessel currently using the permit, and this change cannot be reversed. This measure will facilitate use of the DAS leasing programs for those vessels and will reduce the amount of latent fishing capacity inherent in those permits.

Allowing any increase in fishing capacity resulting from a downgraded leasing baseline being used on a larger replacement vessel would compromise the conservation neutrality of this measure inconsistent with the intent of the measure and the objectives of Amendment 13. Reinstatement of the original leasing baseline if a vessel is replaced would be consistent with Amendment 13 and would result in no additional impacts beyond those assessed in Amendment 13. This measure would also be relatively easy to administer and result in fewer complications to the vessel replacement program.

4.10 DAS Credit for Standing By Entangled Whales (Measure I)

Limited access groundfish vessels may be provided a DAS credit for standing by an entangled whale. The requirements for receiving this credit are as follows:

(1) The vessel must notify the appropriate organization of the entangled whale (current guidance advises mariners to contact the U.S. Coast Guard or the Center for Coastal Studies). The vessel must also be in contact with the Center for Coastal Studies, either directly or through the Coast Guard.
(2) Only one vessel at a time will receive credit for standing by the whale. It is permissible for a vessel to hand off the activity to a second vessel while waiting for the rescue team to arrive. Additional vessels could also receive credit for standing by the whale.
(3) Ideally, the vessel would remain on scene until the rescue team arrives, but this may not be possible in all circumstances. The stand-by vessel must be available to answer questions on the

condition of the animal, possible species identification, severity of entanglement, gear information, etc.
(4) Credit will be granted for a verified report whether or not the rescue team arrives on scene or a rescue is attempted.
(5) This provision applies to all species of live whale, whether alive or dead.
(6) The permit holder or his representative must submit a request to NMFS NERO for a DAS credit. After a review of the circumstances, NMFS will notify the permit holder of any adjustment that is made, or explain the reasons that an adjustment is not made.

Rationale: In 2003 there were thirty-four confirmed reports of large whale entanglements and only nine whales disentangled. Attempts were not made on eleven whales because they could not be relocated after the initial report. With the DAS reductions in Amendment 13, groundfish fishing vessels are reluctant to take the time to provide information on entangled whales because they lose valuable DAS time while standing-by. This measure will provide a limited DAS credit to vessels that report and stand-by entangled whales. The credit is given whether the whale is alive or dead since valuable information can be obtained form a carcass on the cause of death, condition of the whale, etc. – information that is especially important for northern right whales.

4.11 Herring Vessel Interactions With Regulated Groundfish (Measure J)

Herring purse seine and mid-water (both single and paired trawls) are allowed to fish in all regulated mesh areas. Recently obtained information suggests that herring vessels catch regulated groundfish.

Herring fishing vessels with Category 1 herring permits that catch or intend to catch herring in the Georges Bank or Gulf of Maine Regulated Mesh areas (see Figure 2) must call NMFS and request an observer at least 72 hours in advance of any herring fishing trip in these areas. If NMFS is unable to provide an observer and an observer waiver is granted, the vessel must notify NMFS enforcement via VMS of the time and place of landing prior to crossing the VMS demarcation line so that enforcement agents can attempt to observe the offload.

Rationale: There is insufficient information available to estimate regulated groundfish discard rates in the herring fishery and determine if groundfish bycatch in the herring fishery is a concern. This option will facilitate collection of additional information through increased observer coverage and witnessing of offloads by enforcement. It is recognized that enforcement agents will not be able to witness every offload due to resource limitations, but the notification requirement will make it possible for more offloads to be observed. In addition to these requirements, the Council will ask NMFS to have observers record information on footrope height above the bottom and document the reason for any tows not brought on board the vessel.

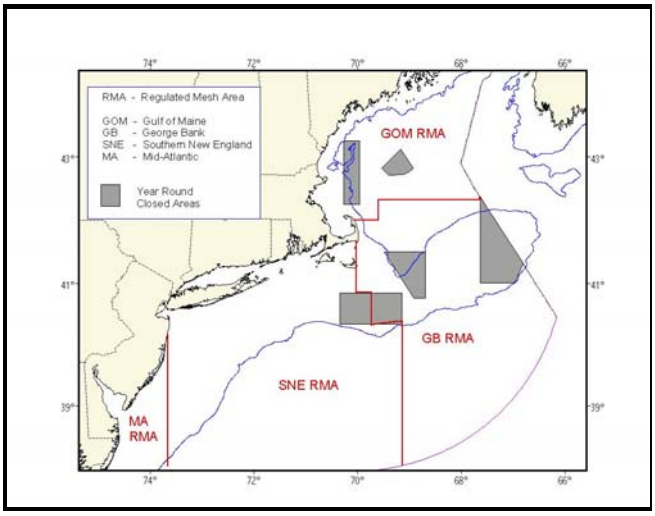


Figure 2 – Northeast Multispecies Regulated Mesh Areas, with year-round mortality closures

4.12 Removal of Net Limit for Trip Gillnet Vessels (Measure K)

The restriction on the number of nets that can be carried by trip gillnet vessels fishing in any regulated mesh area is removed. As is currently required, trip gillnet vessels must remove all gillnets from the water and carry those nets on board when returning to port.

Rationale: Trip gillnet vessel fishing effort is controlled through the use of DAS and the physical ability of the vessels to carry nets. The net limit is an additional restriction on effort that is unnecessary. In order to enforce the net limitation adopted by Amendment 13, trip gillnet vessel operators must use net tags on their nets. Trip gillnet vessels often change their target species while at sea from groundfish to monkfish. Since they are provided a limited number of net tags, this means they must change the net tags while at sea. This is difficult to do. Removing the net restriction will remove the requirement for the net tags and will make it easier for these vessels to target a mix of species on a trip, rather than focus on groundfish.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

This section summarizes the alternatives to the proposed action that were considered. The details of measures are discussed under Alternative 1.

5.1 No Action

The Council considered not adopting any of the proposed measures. Under this alternative, the management measures for the Northeast Multispecies Fishery would not be revised and the most recent measures adopted by Amendment 13 and Framework Adjustment 40A, as implemented, would remain in effect. Amendment 13 adopted a suite of measures to manage the multispecies fishery. The implementing regulations can be found at 50 CFR 648 Subpart F. The Amendment 13 measures can be sorted into the following broad categories:

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

FW 40A modified the Amendment 13 management measures by providing additional opportunities to target healthy fish stocks. The provisions of FW 40A applicable to this action will be explained below.

Of the Amendment 13 and FW 40A management measures that would not be changed if the No Action alternative were selected, the ones that bear most directly on the proposed action are the rebuilding programs, the DAS baseline and DAS categories, the DAS leasing and transfer programs, the GB Cod Hook Sector, the SAPs that were implemented, and trip gillnet net limitations. Amendment 13 did not change provisions that allowed herring vessel access to year-round groundfish closed areas. In order that the No Action alternative can be clearly contrasted with the proposed action, these management measures will be described in further detail. Other measures adopted by Amendment 13 or other actions will not be changed by the proposed action and as a result are not described in this section. For additional details, please refer to the implementing regulations.

Amendment 13 adopted formal rebuilding programs for regulated groundfish stocks that are overfished. “Overfished” stocks are those that are at low biomass levels. Stocks also need a rebuilding program if they were previously identified at low biomass levels and have not yet finished rebuilding. These programs take the form of a strategy that identifies target fishing mortality rates for these stocks.

No Action

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

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

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

Amendment 13 established limitations on the different DAS categories. Category A DAS can be used to target any groundfish stock, subject to the limitations of Amendment 13 (including landing limits, gear requirements, closed areas, reporting requirements, etc.). Category B DAS can only be used in specific programs that are designed to target healthy groundfish stocks. Category C DAS cannot be used at this time, but may be made available at some time in the future. Under the regulations implementing Amendment 13, only one opportunity was created to use Category B DAS. A SAP was implemented that allows vessels to use either Category A or Category B DAS to fish in part of CAII to target GB yellowtail flounder. This SAP opens on June 1, allows for 320 trips, and has a trip limit of 30,000 pounds of yellowtail flounder.

The number of DAS that can be used (whether Category A or Category B) can affect the rebuilding programs. The management measures in Amendment 13 were designed to achieve the target fishing mortality rates, but were based on Category A DAS use only. Programs that allow for the use of Category B DAS must be carefully designed so that they do not unacceptably increase the risk that rebuilding fishing mortality targets will not be met (mortality will be too high). If the No Action alternative were selected, then additional Category B DAS would not be used and the effort used would more closely match the analyses in Amendment 13 and FW 40A.

Amendment 13 also changed the number of nets that can be used by trip gillnet fishing vessels. Prior to May 2002, trip gillnet vessels were allowed to fish an unlimited number of nets with the requirement that all nets be removed from the water when a trip ended. As a result of a court order, a limit on the number of nets was in effect from May 2002 through April 2004. This limit varied for different areas fished, ranging from 50 nets in the GB regulated mesh area to 150 nets in the GOM regulated mesh area. Amendment 13 increased the number of nets that can be fished on GB to 150 nets.

Amendment 13 adopted two programs that facilitate the exchange of DAS between limited access permit holders. The DAS leasing program allows the temporary transfer of DAS from one permit to another. The vessels exchanging DAS must have similar vessel lengths and horsepower. The DAS transfer program allows for the permanent transfer of DAS between two vessels. For the transfer program, the two vessels involved must have similar length, horsepower, gross, and net tonnage. In addition, the vessel selling DAS must exit all state and federal fisheries and any non-groundfish permits expire.

Amendment 13 provided a mechanism for a group of fishermen to operate as a sector, and established the GB Cod Hook Sector. The rules for the sector stated that only vessels with a history of using hook gear could join the sector. The sector is granted a portion of the GB cod TAC that is based on the catch history of the sector participants. Only cod that was caught with hook gear is used to calculate the sector's share of GB cod.

Herring vessel access to groundfish closed areas has been managed through a series of actions (see section 3.3 for a summary). Under existing regulations, herring mid-water trawl vessels are allowed to fish in any groundfish closed area, while purse seine vessels are allowed to fish in the WGOM closed area and the Cashes Ledge closed area. Both of these gears are referred to as exempted gear – that is, gear that is deemed not capable of catching groundfish.

FW 40A (as implemented) provided opportunities to target healthy groundfish stocks by establishing two additional SAPs and one program to use Category B (regular) DAS. GB haddock can be targeted using longline gear through the CAI Hook Gear Haddock SAP by participants in the GB cod sector, and by vessels using trawl gear in the Eastern U.S/Canada Haddock SAP Pilot Program. Each of these programs controls the catch of cod and haddock through a hard TAC supported by additional reporting and gear requirements. The Category B (regular) DAS Pilot Program allows vessels to target healthy stocks while using Category B (regular) DAS. For all of these programs, the catch of stocks of concern is limited by hard TACs (referred to as "incidental catch TACs") that are monitored through additional reporting requirements. In addition, the program is limited to 1,000 DAS per quarter for four consecutive quarters. If the No Action alternative were selected, these two SAPs, the CAII Yellowtail Flounder SAP and the Category B (regular) DAS Pilot Program would be the only opportunity to use Category B DAS.

5.2 Alternative 1

5.2.1 DAS Leasing/DAS Transfer Provisions Alternatives (Measure A)

5.2.1.1 Changes to the DAS Leasing and Transfer Programs Conservation Tax (Measure A.1)

Amendment 13 adopted two programs that allow the transfer of DAS from one groundfish permit to another. The DAS leasing program allows the temporary transfer of Category A DAS for a period not to exceed one year. The DAS transfer program allows for the permanent transfer of Category A, B and C DAS from one permit to another. Both programs are subject to additional restrictions that limit the transfer of DAS to similarly sized vessels. In addition, under the DAS transfer program, the vessel losing DAS must exit all fisheries. Under the terms of the DAS transfer program, DAS that are transferred to another permit are reduced by a fixed percentage that is commonly referred to as a conservation tax. DAS transferred under the leasing program, however, are not subject to any such tax. The Council is considering changes to the conservation tax for both the leasing and transfer programs.

At present, only whole DAS can be leased. If a conservation tax is applied to the DAS leasing program (Options 2 or 3), this provision will remain in place. The tax will be applied to the whole DAS from the lessee, and the lessor will receive the resulting DAS. For example, with a tax of 10 percent, if Vessel A leases 12 DAS to Vessel B, Vessel B will receive (12 DAS – 10 percent tax), or 10.8 DAS.

5.2.1.1.1 Option 1 – 20/0 (Measure A.1.a)

Under this option, any Category A or B DAS that are transferred under the DAS transfer program would be reduced by twenty percent. Category C DAS would continue to be reduced by ninety percent. There would be no conservation tax for DAS transferred under the DAS leasing program

Rationale: This measure reduces the conservation tax for the DAS transfer program to make that program more attractive.

5.2.1.1.2 Option 2 – 20/20 (Measure A.1.b)

Under this option, any Category A or B DAS that are transferred under the DAS transfer program would be reduced by twenty percent. Category C DAS would continue to be reduced by ninety percent. DAS transferred under the DAS leasing program would be reduced by twenty percent.

Rationale: This measure reduces the conservation tax for the DAS transfer program and adopts the same conservation tax for the DAS leasing program. As a result, DAS will be treated the same under both programs, so the decision on which program to use to transfer DAS will be based on other factors.

5.2.1.1.3 Option 3 – 10/10 (Measure A.1.c)

Under this option, any Category A or B DAS that are transferred under the DAS transfer program would be reduced by ten percent. Category C DAS would continue to be reduced by ninety percent. DAS transferred under the DAS leasing program would be reduced by ten percent.

Rationale: This measure reduces the conservation tax for the DAS transfer program and adopts the same conservation tax for the DAS leasing program. As a result, DAS will be treated the same under both programs, so the decision on which program to use to transfer DAS will be based on other factors. In both programs, the tax is lower than in Measure A.1.b, which will facilitate transfers of DAS.

5.2.1.2 DAS Transfer Program Modifications (Measure A.2)

The following modifications to the DAS transfer program are being considered in order to encourage the use of this program. Vessels using the DAS transfer program will be offered the following choices:

5.2.1.2.1 Option 1 (Measure A.2.1) – Accepting Non-Groundfish Permits

A vessel operator obtaining additional DAS through the DAS transfer program can accept all the limited access permits of the vessel selling the DAS. Any duplicate permits expire. If both vessels have a permit in a fishery but the permits have different categories, the vessel obtaining the permits can select which permit category to retain. Only groundfish DAS can be consolidated unless other management plans authorize consolidation of DAS. Any groundfish DAS that are consolidated are reduced by the applicable conservation tax.

Example (1): Permit A has a multispecies permit (52 DAS), monkfish Category C, and a scallop general category permit. Permit B has a multispecies combination permit (20 DAS), a monkfish Category C permit, and a full-time scallop permit. Permit A accepts all endorsements from Permit B and chooses to keep the combination permit and the full time scallop permit. Permit A now has 72 groundfish DAS (less any conservation tax on the 20 DAS transferred) on its multispecies combination permit, a full-time scallop permit, and a monkfish Category C permit. Permit A does not get additional monkfish DAS, since the monkfish FMP does not currently allow DAS transfers. The vessel for Permit B cannot fish in any state or federal fishery (see Option 3 below).

Example (2): Permit A has a multispecies permit (52 DAS), monkfish Category C, and a scallop general category permit. Permit B has a multispecies permit (20 DAS), monkfish Category E permit, fluke moratorium permit, and a scallop general category permit. Permit A accepts the multispecies permit and the fluke permit. Permit A now has a multispecies permit with 72 groundfish DAS (less any conservation tax on the 20 DAS transferred), a monkfish Category C permit, a fluke moratorium permit, and a scallop general category permit. Permit A does not get additional monkfish DAS, since the monkfish FMP does not currently allow DAS transfers. Permit B does not have any permits, since the duplicate monkfish and general category scallop permits expire and the groundfish permit was transferred. The vessel for Permit B must be cannot fish in any state or federal fishery (see Option 3 below).

5.2.1.2.2 Option 2 (Measure A.2.2) – Refusing Non-Groundfish Permits

A vessel operator obtaining additional DAS through the DAS transfer program can waive acceptance of all limited access permits from the selling vessel and as a result the DAS transferred will not be subject to a conservation tax.

Example (3): Permit A has a multispecies permit (52 DAS), monkfish Category C, and a scallop general category permit. Permit B has a multispecies permit (20 DAS), monkfish Category C permit, fluke moratorium permit, and a scallop general category permit. Permit A accepts only the multispecies permit. Permit A now has a multispecies permit with 72 DAS (no conservation tax is applied), a monkfish Category C, and a scallop general category permit. Permit B does not have any permits, since all permits expire when the groundfish DAS are transferred. The vessel for Permit B cannot fish in any state or federal fishery (see Option 3 below).

5.2.1.2.3 Option 3 (Measure A.2.3) – Removal of Proxy Vessel

When selling groundfish DAS, the DAS transfer program requires that a vessel be removed from all state and federal fisheries. The selling vessel owner can identify a proxy vessel with a permit baseline that falls within the range of the permit upgrading restrictions that can be removed from all fisheries in place of the selling vessel.

Example (4): Vessel A purchases DAS from Vessel B through the DAS transfer program. The owner of permit B identifies a third vessel with comparable baselines (Vessel C) that is scrapped in place of Vessel B. Vessel B will not have any permits attached, but other permits can be attached to the vessel and it can continue to fish in state and/or federal fisheries.

Rationale: These three options will make the DAS transfer program more attractive to permit holders. The current requirement that all endorsements expire when groundfish DAS are transferred effectively increases the cost of those DAS, making the program unattractive. Allowing the removal from all fisheries of a substitute vessel will enable the fleet to keep the vessel operating that is in the best condition, improving fleet safety.

5.2.2 Incidental Catch TACs (Measure B)

In order to ensure that any catch (landings and discards) of stocks of concern taken while using a Category B (regular or reserve) DAS does not threaten the mortality objectives of Amendment 13, catches of those stocks taken on a Category B DAS are constrained by a "hard" incidental catch TAC adopted by FW 40A. These TACs are based on a percentage of the overall TAC for the stock of concern. The percentages used, and the incidental catch TACs that result for FY 2005 and 2006, are shown in Table 6.

The incidental catch TACs are allocated to programs developed to use Category B (regular or reserve) DAS where appropriate. The percentage of the TAC allocated to these programs can be adjusted through a management action such as a framework or amendment. Since this action proposes to adopt two additional SAPs, the allocations made in FW 40A must be revised to account for these additional programs. The allocations proposed for this action are shown as percentages of the incidental catch TAC in Table 7.

The GB cod incidental catch TAC is reduced by up to 10 percent in order to allow for the conduct of experiments. This TAC will be released to the Category B DAS programs on May 1 if no applications have been received to use this TAC. This creates a research set-aside of 9.7 mt in FY 2005 and 12.7 mt in

FY 2006. Current estimates of the revised GB cod incidental catch TACs for FY 2005 and FY 2006 are shown in Table 8. Current estimates of the revised GOM cod incidental catch TACs for FY 2005 and 2006 are shown in Table 9.

Rationale: The management measures in Amendment 13 are designed to meet the mortality objectives of the amendment. They were evaluated on the basis of Category A DAS use only. Any used Category B DAS represent an increase in effort, and if the catch of stocks of concern from fishing on a Category B DAS is not controlled, it is possible that additional catches will threaten the mortality objectives of the amendment. If the use of Category B DAS is constrained by an incidental catch TAC, then the catches of stocks of concern resulting from Category B DAS will not threaten the Amendment 13 mortality objectives. Incidental catch TACs are not specified for ocean pout, southern windowpane flounder, and Atlantic halibut, three stocks of concern, because catches of these stocks are insignificant.

A two-tier approach for establishing the appropriate TACs was adopted by FW 40A. For some stocks, the Amendment 13 management measures are expected to reduce mortality more than is required, and the catch estimated in 2003 will be less than the 2004 TAC. These stocks are limited to five percent of the total TAC. For other stocks, the Amendment 13 measures are expected to more closely match the required mortality reduction, and the expected catch in 2003 is not less than the 2004 TAC. The rationale and development of the incidental catch TACs is explained in section 7.2 of FW 40A.

Where appropriate, the incidental catch TACs are allocated to the programs that use Category B (regular or reserve) DAS. An incidental catch TAC for a specific stock is only allocated to a program if there is likelihood that stock will be caught in the program. If an incidental catch TAC were defined for each program regardless if that stock were likely to be caught, it would add administrative complexity without providing any conservation benefit. For example, a program that takes place on Georges Bank need not be allocated a TAC for a stock that is only located in Southern New England. Similarly, a program limited to hook gear is not likely to need a TAC for yellowtail flounder, since they are rarely taken on hooks.

FW 40A adopted incidental catch TACs for two SAPs (CAI Hook Gear Haddock SAP and the CAII Haddock SAP Pilot Program) and the Category B (regular) DAS Pilot Program. Since this action proposes additional SAPs, the incidental catch TACs must be re-specified.

		Incidental Catch TAC	
	Percentage of Total Target TAC	**2005**	**2006**
GOM cod	Two	127	149
GB cod	Two (less ten percent research set aside)	87.3	114.3
CC/GOM yellowtail	Two	25	21
Plaice	Five	181	151
White Hake	Two	76	76
SNE/MA Yellowtail	Five	99	166
SNE/MA Winter Flounder	Five	178	222
Witch Flounder	Five	350	383

Table 6 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year

	Category B (regular) DAS Pilot Program	**CAI Hook Gear SAP**	**CAII Haddock SAP**	**WGOM Haddock SAP**	**GB Haddock North of CAI SAP**
GOM cod	95	NA	NA	5	NA
GB cod	45	13	34	NA	8
CC/GOM yellowtail	100	NA	NA	NA	NA
Plaice	100	NA	NA	NA	NA
White Hake	100	NA	NA	NA	NA
SNE/MA Yellowtail	100	NA	NA	NA	NA
SNE/MA Winter Flounder	100	NA	NA	NA	NA
Witch Flounder	100	NA	NA	NA	NA

Table 7 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	39.5	39.3	51.4
CAI Hook Gear Haddock SAP	12.6	11.3	14.9
CAII Haddock SAP	27	29.7	38.9
Haddock Fishery North of CAI SAP	0	7	9.1
GB Cod research set aside	0	9.7	12.7

Table 8 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	97	120.7	141.5
WGOM Rod/Reel Haddock SAP	0	6.3	7.5

Table 9 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006

5.2.3 Special Access Programs (Measure C)

5.2.3.1 GB Haddock Fishery North of Closed Area I SAP (Measure C.1)

This SAP would allow the use of any type of DAS (including Category B (regular or reserve) DAS) to target haddock north of CAI while using appropriate gear. (This SAP does not prevent vessels from fishing in the area under the regulations required for using a Category A DAS).

Participants: Vessels possessing a commercial multispecies permit.

Location: This SAP would be allowed to take place in an area north of CAI defined by the following coordinates (see Figure 3):

41º –30' N 68º –30' W
41º –30' N 69º –23' W
41º –35' N 69º –23' W
41º –35' N 68º –30' W

Season: December 1 through April 30

Haddock Catch Limitation: This SAP is limited to a haddock catch (kept and discarded) of 1,000 mt. Fishing in this SAP will end on the date that NMFS projects the TAC will be caught. The Regional Administrator can adjust the haddock TAC on or about January 1 and will make any adjustment through a notice action consistent with the Administrative Procedures Act (APA). The TAC can be increased to a maximum of 2,000 mt. provided the following criteria are met:

- The Regional Administrator, based on available information, projects that the target TAC for GB haddock would not be exceeded by the end of the fishing year; and
- The Regional Administrator, based on available information, projects that existing management measures, including haddock TACs associated with approved SAPs, would harvest less than 75 percent of the target TAC for GB haddock by the end of the fishing year.

Incidental Catch Limitations: This SAP is limited to an incidental catch TAC of GB cod of eight percent of the GB cod incidental catch TAC. For FY 2005, the incidental catch TAC will be 7 mt, and the current estimate of this TAC for FY 2006 is 9.1 mt. All cod caught (kept and discarded) while using a Category B DAS will be applied against this TAC. Fishing in this SAP under a Category B DAS will end when the incidental catch TAC is projected to be caught.

Landing/Possession Limits:

(1) Landing limits for all stocks other than cod will be as described in Amendment 13.
(2) The cod possession limit for vessels fishing in the Haddock Fishery North of CAI SAP is 100 lbs/DAS to a maximum of 1,000 lbs./trip.
(3) Vessels are not allowed to discard legal sized cod while participating in the Haddock SAP North of CAI on a Category B (regular or reserve) DAS. If a vessel exceeds the possession limit while using a Category B DAS for these SAPs, it must "flip" to a Category A DAS, notifying NMFS

through VMS. Once a vessel "flips" to a Category A DAS, it must comply with all applicable regulations for vessels fishing on a Category A DAS (i.e. it is not required to use a haddock separator trawl, it must comply with Category A DAS landing limits, etc.).

(4) The number of Category B DAS that can be used on a trip cannot exceed the number of Category A DAS available to the vessel at the start of the trip.

Gear: All vessels participating in this SAP must use gear that has been demonstrated not to catch significant amounts of cod. At implementation of this framework, the only gear authorized for participation in this SAP is trawl gear using a haddock separator trawl as described in 50 CFR 648.85(a)(3)(iii)(A). The Regional Administrator (RA) may expand the list of gear allowed to participate in this SAP based on the results of an experimental fishery that demonstrates the gear can be fished without catching significant amounts of cod. For the purposes of this SAP, this means the gear must demonstrate that it performs similar to the performance of the haddock separator trawl. The RA will implement changes to the authorized gear by publishing a proposed rule describing the gear and providing an opportunity for public comment prior to a final rule.

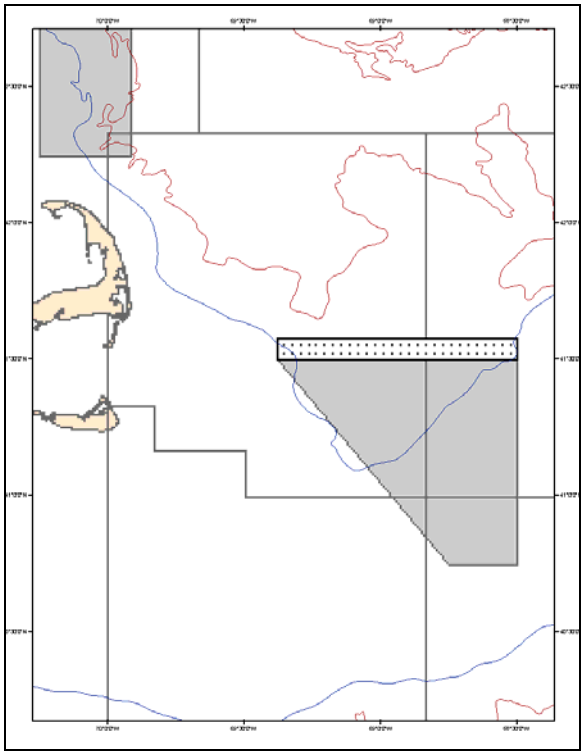


Figure 3 – Proposed haddock SAP area north of CAI (stippled area)

Observer Coverage:

(1) The target level of observer coverage will be sufficient to ensure the goals of the program are met.

(2) Vessels participating in the SAP must provide the observer program three days (72 hours before departure) advance notice of a CAI Haddock SAP trip.

Reporting Requirements:

(1) All vessels participating in the SAP must use a Vessel Monitoring System (VMS).
(2) Vessels must notify NMFS through VMS when beginning a trip into the SAP area. The vessel must identify the type of DAS being used on the trip (Category A, Category B (regular), or Category B (reserve)).
(3) Vessels participating in the SAP must provide daily reports of catch (kept and discarded) via VMS in accordance with instructions provided by the RA. These reports shall include the catch of haddock, yellowtail flounder, and stocks of concern by statistical area. Vessels must also provide a report when crossing the boundary into or out of the western U.S./Canada boundary.

Other Provisions:
(1) A vessel participating in this SAP cannot fish outside of the SAP area on the same trip, and cannot have any gear set outside of the SAP area while participating in the SAP.
(2) Vessels are allowed to fish in the area north of CAI while using a Category A DAS and while not participating in the SAP. These vessels must comply with all regulations for Category A DAS but need not comply with specific SAP requirements.

Rationale: This measure creates an additional opportunity to target Georges Bank haddock in order to achieve optimum yield for that stock and to partially mitigate the effort reductions of Amendment 13. This SAP is closer to shore, which will expand opportunities for smaller vessels that cannot fish in the CAII Haddock SAP adopted by FW 40A. The limit on haddock catch ensures that this SAP will not threaten haddock mortality objectives, while the incidental catch TACs do the same for stocks of concern. Vessels are not allowed to fish inside and outside this SAP on the same trip in order to facilitate enforcement and monitoring of the SAP. The daily reporting requirements facilitate monitoring of the catch so the TACs are not exceeded.

5.2.3.2 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

This SAP would allow hand-tended rod/reel commercial fishing to target haddock inside the WGOM closed area. Participants are most likely to be smaller vessels that typically fish with handlines, longlines, or gillnets in the Gulf of Maine. As described in sections 6.4.2.3 and 6.4.2.4, landings and revenues of regulated groundfish by hook and line, gillnet, and longline vessels have not increased since FY 1996. Landings of regulated groundfish by hook and line were lower in FY 2003 than any year since 1996. This SAP provides a limited, small-scale opportunity for these vessels to benefit from the rebuilding haddock resource in the GOM.

5.2.3.2.1 General Provisions

Participants:
Option 1: Vessels with limited access multispecies permits (including Handgear A permits)
Option 2: Vessels with limited access DAS permits.

Rationale: Vessels possessing a commercial open access permit are not allowed to participate in this SAP because the number of permits is not controlled in any way.

Location: The Western Gulf of Maine Closed Area (see Figure 4)

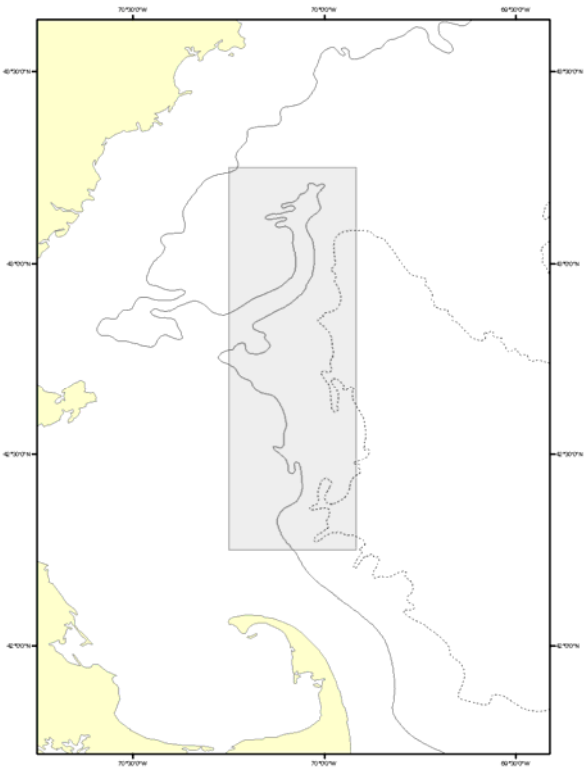


Figure 4 – WGOM Closed Area (shaded)

Haddock Catch Restrictions: This SAP is limited to 50 mt of haddock (kept and discarded). When the TAC is projected to be caught, participation in the SAP will be prohibited.

Incidental Catch Restrictions: This SAP is restricted to an incidental catch (cod cannot be retained) TAC for GOM cod of five percent of the GOM cod incidental catch TAC. All cod caught in this SAP, on any type of DAS, will count against the incidental catch TAC. Participation in the SAP will be prohibited on the date projected that the TAC will be caught. The current estimate of this TAC for FY 2005 is 6.3 mt, and for FY 2006 is 7.5 mt.

Landing/Possession Limits:

(1) Participants in this program are not allowed to retain any cod.
(2) Landing limits for haddock and other species will be as specified in existing regulations.

Gear: (1) Vessels can only use hand-tended rod/reel gear as defined in 50 CFR 648.2, with the exception that treble hooks cannot be used. (No mechanical jigging devices or "bandit" gear are allowed, and all reels must be manual).
(2) Full circle hooks must be used when using bait.

Rationale: This SAP is limited to selective rod and reel fishing. For vessels using bait, the full circle hook will help reduce discard mortality.

Reporting Requirements:

(1) All vessels participating in the SAP must be use an approved Vessel Monitoring System (VMS).
(2) Vessel operators must provide daily reports of catch (kept and discarded) of all regulated groundfish species, by statistical area, through VMS. These reports must be submitted in accordance with instructions issued by the RA.
(3) Vessel operators must notify NMFS through VMS when beginning a trip into the WGOM Closed Area Rod/Reel Haddock SAP.

Observer Coverage:
(1) Vessel operators must provide the observer program three days (seventy-two hours prior to sailing) advance notice of a WGOM Rod/Reel Haddock SAP Trip.
(2) Observer coverage will be sufficient to ensure the goals of the program are met.

Rationale: The observer program needs advance notice so that observers can be identified and meet the fishing vessels prior to departure.

Other Provisions: The Regional Administrator may close this access program if the catch of cod to haddock exceeds a ratio of 1:2, by weight. Closure of the program will be announced through notice action consistent with the Administrative Procedures Act (APA).

Rationale: This program facilitates the targeting of GOM haddock by commercial vessels. This restriction will reduce the likelihood that party/charter vessels will get a commercial hand gear permit, fish in the access program for part of the year, and then fish in the closed area targeting cod with a party/charter permit for the remainder of the year.

Duration: This SAP will expire two years after implementation of this action, unless extended by the Regional Administrator. Any extension will be announced through a notice action consistent with the Administrative Procedures Act. The Regional Administrator will allow this SAP to continue if all of the following conditions are met:

- The monitoring and enforcement provisions of the SAP prove sufficient to reliably document the catch of cod and haddock.
- In each of the two years that the SAP is conducted, the catch of cod does not exceed the cod TAC and the catch of haddock does not exceed the haddock TAC.
- The ratio of cod to haddock catch is less than 1:2, by weight.

5.2.3.2.2 Provisions for Limited Access DAS Permit Holders

(1) A vessel must elect to participate in this program for a minimum of seven days.
(2) A vessel may not fish for groundfish or monkfish in any other area, and no groundfish or monkfish gear can be set in any other area, during the period that a vessel has elected to participate in this program.
(3) **Season:** March and April

Rationale: The requirement to sign-in to the program for a minimum of seven days will facilitate enforcement and encourage vessels to remove all other gear while in the program. The prohibition on setting gear in other areas while in the program also facilitates enforcement and administration of the program, making it easier to track the catch of vessels participating in the SAP.

5.2.3.2.3 Provisions for Hand Gear Permit Holders

Season: March and April

Rationale: The season provides an opportunity for the smaller hand gear permit holders to access haddock as weather improves in the spring.

Other Provisions: Vessels may not fish in any other area while on a trip into the SAP area.

Rationale: This provision facilitates enforcement and makes it easier to track catches of the vessels participating in the program.

5.2.3.3 Closed Area II Yellowtail Flounder SAP (Measure C.3)

The season for the CAII Yellowtail Flounder SAP is revised to July 1 through December 31. Vessels participating in this SAP are limited to one trip per month. The yellowtail flounder landing limit for this SAP will be 10,000 pounds/trip unless adjusted by the Regional Administrator. Prior to June 1, the Regional Administrator, after consulting with the Council, will announce the number of trips authorized and the yellowtail flounder landing limit (not to exceed 30,000 pounds per trip). This announcement will be made as a notice action consistent with the Administrative Procedures Act.

When determining the number of trips and the appropriate trip limit, the Regional Administrator will consider the following factors:

- The available yellowtail flounder TAC under the US/CA Resource Sharing Understanding
- The potential catch of GB yellowtail flounder by all vessels (all gears) fishing outside of the SAP
- Recent discard estimates in all fisheries that catch yellowtail flounder
- Expected number of participants in the SAP

After consideration of these factors, the Regional Administrator will authorize the number of trips and appropriate trip limit that will provide for achieving but not exceeding the GB yellowtail flounder TAC and will result in a low risk of catching the GB yellowtail flounder TAC before the end of the fishing year.

The catch for this TAC should be based on the best estimate of the difference between the TAC and the catch that will be taken while fishing outside of the SAP on Category A DAS. Recent catches (landings and discards, all fisheries) have averaged about 3,750 mt. Based on this information, the suggested formula for determining the appropriate number of trips for FY 2005 is:

(TAC- 4,000 mt)/10,000 lbs.

This formula can be revised by the Regional Administrator if it is determined that the catch outside of the SAP will be different than the 4,000 mt assumed by the formula, or if the Regional Administrator adjusts the landing limit. Factors to consider in adjusting the landing limit include the amount of fish available to the SAP, the number of participants, and the risk that

All other provisions for this SAP remain the same.

Rationale: The CAII Yellowtail Flounder SAP, as adopted in Amendment 13, begins on June 1. This data conflicts with peak spawning months for yellowtail flounder on Georges Bank. In addition to the concerns over interfering with spawning fish, fish quality is poor and there is lower demand (and consequently lower prices) as a result. Changing the programs starting date by one month will increase the benefits of this program because higher quality fish will be landed at a better price. Limiting participating vessels to one trip per month will help to extend the season, as will reducing the landing limit to 10,000 pounds per trip.

The SAP is designed to help attain OY on the GB yellowtail flounder stock. As implemented in Amendment 13, the SAP was limited to a specific number of trips with no provisions for an adjustment if stock conditions change. This measure provides the Regional Administrator the ability to adjust the number of trips if the GB yellowtail flounder TAC changes, and provides guidance so that the catch on the SAP is unlikely to result in closure of the eastern US/CA area due to catching the GB yellowtail flounder TAC. This will make it unlikely that the SAP will interfere with the harvest of other species in this area (in particular GB haddock), since the eastern US/Canada area will close if the GB yellowtail flounder TAC is caught. The number of trips in the SAP can be adjusted so that it will be unlikely the catch of yellowtail flounder will result in closing the Eastern US/CA area.

5.2.4 Minimum Effective Effort Allocation (Measure D)

For any permit that was not allocated any Category A or B DAS under the provisions of Amendment 13, ten of the permit's Category C DAS will be re-categorized to ten Category B (reserve) DAS. If these DAS are carried over into a following fishing year, they remain Category B (reserve) DAS. These DAS can only be used in the following existing SAPs:

- CAI Hook Gear Haddock SAP
- WGOM Closed Area Rod/Reel Haddock SAP

Rationale: Under Amendment 13 provisions, roughly 350 vessels did not receive any Category A or B DAS. As a result, the future access of these vessels to the groundfish fishery is in doubt, and they cannot currently access the fishery. By providing a minimum of ten Category B (reserve) DAS to all vessels, these vessels are provided a limited opportunity to participate in some existing SAPs (albeit at a very low effort level) and have more hope of future participation as stocks rebuild. They can only participate in SAPs that do not have a DAS flip provision, since this provision requires that vessels have Category A DAS available.

5.2.5 GB Cod Hook Sector Revisions (Measure E)

To determine the share of GB cod allocated to the GB hook sector, member's GB cod landings during the qualification period will be used, regardless of the gear used that produced those landings. The sector's overall share remains capped at a maximum of twenty percent of the overall target TAC.

Any vessel is eligible to join the sector, regardless of type of gear used in the past. Fishermen in the sector, however, must use hook gear.

Rationale: When Amendment 13 implemented the GB Cod Hook Sector, it specified that vessel' entering the sector only bring their history of fish caught by hooks into the sector. The general rules for a sector adopted by Amendment 13, however, provide that the members of the sector bring all their catch history into the sector, regardless of how caught. This measure will make the allocation decisions for the GB cod hook sector consistent with those of any other sector that forms in the future. It will probably increase the allocation of cod to the sector.

5.2.6 Change to DAS Effective Effort Calculation (Measure F)

Option 1 (Measure F.1): This is the No Action alternative. If this option is selected, no changes are made to the DAS allocations or default measures implemented by Amendment 13. A permit's effective effort (baseline allocation) is based on the maximum number of DAS used in any fishing year between 1996 and 2001, limited by the permit's allocation in FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation.

Option 2 (Measure F.2): A permit's effective effort (baseline allocation) is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between 1996 and 2001, not limited by the permit's allocation in FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent of permit's effective effort will be defined as Category A DAS, while forty-five percent will be defined as Category B DAS. Half of the Category B DAS will be defined as Category B (regular) DAS, and half will be defined as Category B (reserve) DAS. In FY 2006, fifty percent of a permit's effective effort will be defined as Category A DAS, and fifty percent will be defined as Category B DAS. In FY 2009, forty percent of a permit's effective effort will be defined as Category A DAS, and sixty percent will be defined as Category B DAS.

When calculating the effective effort for a permit, an adjustment will be made for the years that a vessel fished in the large mesh permit category. If a vessel was in the large mesh category during a year in which 5,000 pounds of regulated groundfish were landed, it will not receive credit for more than its original allocation of DAS (that is, the allocation before receiving the bonus for fishing in the large mesh category).

Option 3 (Measure F.3): A permit's effective effort (baseline allocation) is based on the maximum number of DAS used in any fishing year between 1996 and 2001, not limited by the permit's allocation in FY 2001. A permit will not be credited for using DAS in excess of the FY 2001 allocation if the excess is the result of using carry-over DAS. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-six percent of permit's effective effort

will be defined as Category A DAS, while forty-four percent will be defined as Category B DAS. Half of the Category B DAS will be defined as Category B (regular) DAS, and half will be defined as Category B (reserve) DAS. In FY 2006, fifty-one percent of a permit's effective effort will be defined as Category A DAS, and forty-nine percent will be defined as Category B DAS. In FY 2009, forty-one percent of a permit's effective effort will be defined as Category A DAS, and fifty-nine percent will be defined as Category B DAS.

When calculating the effective effort for a permit, an adjustment will be made for the years that a vessel fished in the large mesh permit category. If a vessel was in the large mesh category during a year in which 5,000 pounds of regulated groundfish were landed, it will not receive credit for more than its original allocation of DAS (that is, the allocation before receiving the bonus for fishing in the large mesh category).

Rationale: Under Amendment 13, a permit's effective effort calculated with the same criteria (years, pounds landed) but was limited by the allocation in FY 2001. There has been some confusion whether Amendment 13 allocations were made consistent with Council decisions, so this measure is being considered to clarify the issue. Option 2 would allow effective effort to exceed a vessel's FY 2001 allocation, since some vessels used more DAS in a fishing year than they had allocated in FY 2001. Since this increases the number of DAS allocated, the split between Category A and B DAS must be changed in order to meet the mortality objectives of Amendment 13. Option 3 would not allow the use of carry-over DAS to influence a vessel's allocation. In both options, an adjustment will be made for vessels that fished in the large mesh permit category so that these vessels do not receive a "double-bonus" – an increase in the number of DAS used during the year, and an increase in the baseline that results from that use.

5.3 Alternative 2

The proposed action is based on this alternative, with minor modifications to several of the measures. This alternative is included in the document so the differences between the original form of the measures and the proposed action can be identified.

5.3.1 Summary

This alternative consists of the measures listed below. For the specific details of each measure, refer to Alternative 1 except where noted.

- Measure A.1: Changes to the DAS leasing and transfer conservation tax.
  - Option 1 (Measure A.1.a) – 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. No conservation tax for leased DAS.
  - Option 2 (Measure A.1.b) - 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 20 percent conservation tax for DAS transferred under the leasing program.
  - Option 3 (Measure A.1.c) - 10 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 10 percent conservation tax for DAS transferred under the leasing program.
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
  - Western Gulf of Maine Closed Area Rod/Reel SAP (Measure C.2)
    - Participants Option 1 – vessel with limited access multispecies permits (including Handgear A permits)
    - Participants Option 2: Vessel with limited access DAS permits
  - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure D: Minimum effective effort allocation
- Measure E: GB cod hook sector allocation
- Measure F: Change to DAS baseline calculation
  - Option 1 (Measure F.1) – No action
  - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
  - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as

Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

5.3.2 Incidental Catch TACs (Measure B)

In order to ensure that any catch (landings and discards) of stocks of concern taken while using a Category B (regular or reserve) DAS does not threaten the mortality objectives of Amendment 13, catches of those stocks taken on a Category B DAS are constrained by a "hard" incidental catch TAC adopted by FW 40A. These TACs are based on a percentage of the overall TAC for the stock of concern. The percentages used, and the incidental catch TACs that result for FY 2005 and 2006, are shown in Table 10.

The incidental catch TACs are allocated to programs developed to use Category B (regular or reserve) DAS where appropriate. The percentage of the TAC allocated to these programs can be adjusted through a management action such as a framework or amendment. Since this action proposes to adopt one additional SAP, the allocations made in FW 40A must be revised to account for this program. The allocations proposed for this action are shown as percentages of the incidental catch TAC in Table 11.

The GB cod incidental catch TAC is reduced by up to 10 percent in order to allow for the conduct of experiments. This TAC will be released to the Category B DAS programs on May 1 if no applications have been received to use this TAC. This creates a research set-aside of 9.7 mt in FY 2005 and 12.7 mt in FY 2006. Current estimates of the revised GB cod incidental catch TACs for FY 2005 and FY 2006 are shown in Table 12. Current estimates of the revised GOM cod incidental catch TACs for FY 2005 and 2006 are shown in Table 13.

Rationale: The rational is the same as for Alternative 1, with the exception that this alternative would not adopt the GB Haddock Fishery North of CAI SAP and so the GB cod TAC does not need to be adjusted for this SAP.

		Incidental Catch TAC	
	Percentage of Total Target TAC	**2005**	**2006**
GOM cod	Two	127	149
GB cod	Two (less ten percent research set aside)	87.3	114.3
CC/GOM yellowtail	Two	25	21
Plaice	Five	181	151
White Hake	Two	76	76
SNE/MA Yellowtail	Five	99	166
SNE/MA Winter Flounder	Five	178	222
Witch Flounder	Five	350	383

Table 10 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year

	Category B (regular) DAS Pilot Program	**CAI Hook Gear SAP**	**CAII Haddock SAP**	**WGOM Haddock SAP**	**GB Haddock North of CAI SAP**
GOM cod	95	NA	NA	5	NA
GB cod	50	16	34	NA	NA
CC/GOM yellowtail	100	NA	NA	NA	NA
Plaice	100	NA	NA	NA	NA
White Hake	100	NA	NA	NA	NA
SNE/MA Yellowtail	100	NA	NA	NA	NA
SNE/MA Winter Flounder	100	NA	NA	NA	NA
Witch Flounder	100	NA	NA	NA	NA

Table 11 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	39.5	43.6	57.2
CAI Hook Gear Haddock SAP	12.6	14	18.3
CAII Haddock SAP	27	29.7	38.9
GB Cod research set aside	0	9.7	12.7

Table 12 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	97	120.7	141.5
WGOM Rod/Reel Haddock SAP	0	6.3	7.5

Table 13 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006

5.4 Alternative 3

5.4.1 Summary

This alternative consists of the specific measures listed below. For the specific details of each measure, refer to Alternative 1 except where noted.

- Measure A.2: DAS transfer program modifications
  - Option 1 (Measure A.4.1) – Accepting non-groundfish permits
  - Option 2 (Measure A.4.2) – Refusing non-groundfish permits
  - Option 3 (Measure A.4.3) – Removal of proxy vessel
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
  - GB Haddock Fishery SAP North of CA I (Measure C.1)
  - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure F: Change to DAS baseline calculation
  - Option 1 (Measure F.1) – No action
  - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
  - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

5.4.2 Incidental Catch TACs (Measure B)

In order to ensure that any catch (landings and discards) of stocks of concern taken while using a Category B (regular or reserve) DAS does not threaten the mortality objectives of Amendment 13, catches of those stocks taken on a Category B DAS are constrained by a "hard" incidental catch TAC adopted by FW 40A. These TACs are based on a percentage of the overall TAC for the stock of concern. The percentages used, and the incidental catch TACs that result for FY 2005 and 2006, are shown in Table 14.

The incidental catch TACs are allocated to programs developed to use Category B (regular or reserve) DAS where appropriate. The percentage of the TAC allocated to these programs can be adjusted through a management action such as a framework or amendment. Since this action proposes to adopt one additional SAP (the GB Haddock Fishery North of CAI SAP), the allocations made in FW 40A must be

revised to account for this program. The allocations proposed for this action are shown as percentages of the incidental catch TAC in Table 15.

The GB cod incidental catch TAC is reduced by up to 10 percent in order to allow for the conduct of experiments. This TAC will be released to the Category B DAS programs on May 1 if no applications have been received to use this TAC. This creates a research set-aside of 9.7 mt in FY 2005 and 12.7 mt in FY 2006. Current estimates of the revised GB cod incidental catch TACs for FY 2005 and FY 2006 are shown in Table 16.

Rationale: The rationale is the same as for Alternative 1, with the exception that this alternative does not adopt the WGOM Closed Area Rod/Reel SAP.

		Incidental Catch TAC	
	Percentage of Total Target TAC	**2005**	**2006**
GOM cod	Two	127	149
GB cod	Two (less ten percent research set aside)	87.3	114.3
CC/GOM yellowtail	Two	25	21
Plaice	Five	181	151
White Hake	Two	76	76
SNE/MA Yellowtail	Five	99	166
SNE/MA Winter Flounder	Five	178	222
Witch Flounder	Five	350	383

Table 14 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year

	Category B (regular) DAS Pilot Program	**CAI Hook Gear SAP**	**CAII Haddock SAP**	**WGOM Haddock SAP**	**GB Haddock North of CAI SAP**
GOM cod	100	NA	NA	NA	NA
GB cod	45	13	34	NA	8
CC/GOM yellowtail	100	NA	NA	NA	NA
Plaice	100	NA	NA	NA	NA
White Hake	100	NA	NA	NA	NA
SNE/MA Yellowtail	100	NA	NA	NA	NA
SNE/MA Winter Flounder	100	NA	NA	NA	NA
Witch Flounder	100	NA	NA	NA	NA

Table 15 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	39.5	39.3	51.4
CAI Hook Gear Haddock SAP	12.6	11.3	14.9
CAII Haddock SAP	27	29.7	38.9
Haddock Fishery North of CAI SAP	0	7	9.1
GB Cod research set aside	0	9.7	12.7

Table 16 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	97	127	149

Table 17 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006

5.5 Alternative 4

5.5.1 Summary

This alternative consists of the specific measures listed below. For the specific details of each measure, refer to Alternative 1 except where noted.

- Measure A.1: Changes to the DAS leasing and transfer conservation tax.
  - Option 1 (Measure A.1.a) – 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. No conservation tax for leased DAS.
  - Option 2 (Measure A.1.b) - 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 20 percent conservation tax for DAS transferred under the leasing program.
  - Option 3 (Measure A.1.c) - 10 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 10 percent conservation tax for DAS transferred under the leasing program.
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
  - GB Haddock Fishery SAP North of CA I (Measure C.1)
  - Western Gulf of Maine Closed Area Rod/Reel SAP (Measure C.2)
    - Participants Option 1 – vessel with limited access multispecies permits (including Handgear A permits)
    - Participants Option 2: Vessel with limited access DAS permits
  - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure F: Change to DAS baseline calculation
  - Option 1 (Measure F.1) – No action
  - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
  - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

5.5.2 Incidental Catch TACs (Measure B)

This measure is identical to the measure in Alternative 1. The tables from that alternative are repeated below for clarity and reflect the adoption of two new SAPs and a research set-aside for GB cod.

Rationale: The rationale is the same as for Alternative 1.

		Incidental Catch TAC	
	Percentage of Total Target TAC	**2005**	**2006**
GOM cod	Two	127	149
GB cod	Two (less ten percent research set aside)	87.3	114.3
CC/GOM yellowtail	Two	25	21
Plaice	Five	181	151
White Hake	Two	76	76
SNE/MA Yellowtail	Five	99	166
SNE/MA Winter Flounder	Five	178	222
Witch Flounder	Five	350	383

Table 18 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year

	Category B (regular) DAS Pilot Program	**CAI Hook Gear SAP**	**CAII Haddock SAP**	**WGOM Haddock SAP**	**GB Haddock North of CAI SAP**
GOM cod	95	NA	NA	5	NA
GB cod	45	13	34	NA	8
CC/GOM yellowtail	100	NA	NA	NA	NA
Plaice	100	NA	NA	NA	NA
White Hake	100	NA	NA	NA	NA
SNE/MA Yellowtail	100	NA	NA	NA	NA
SNE/MA Winter Flounder	100	NA	NA	NA	NA
Witch Flounder	100	NA	NA	NA	NA

Table 19 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	39.5	39.3	51.4
CAI Hook Gear Haddock SAP	12.6	11.3	14.9
CAII Haddock SAP	27	29.7	38.9
Haddock Fishery North of CAI SAP	0	7	9.1
GB Cod research set aside	0	9.7	12.7

Table 20 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

	FY 2004	FY 2005	FY 2006
Category B (regular) DAS Pilot Program	97	120.7	141.5
WGOM Rod/Reel Haddock SAP	0	6.3	7.5

Table 21 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006

5.6 Independent Measures

Only those independent measures that differ from the proposed action are listed below.

5.6.1 Permit Baseline Characteristics Downgrade (Measure H)

Permit holders are allowed to make a one-time downgrade of the baseline characteristic of their permit (length, horsepower, gross and net registered tonnage). Only one downgrade is allowed, and all vessel characteristics must be changed to match the characteristics of the vessel that is currently using the permit. This new permit baseline will be used for all future decisions on vessel upgrades, DAS leases, DAS transfers, etc.

Under current regulations, the vessel using a permit can be replaced, but any increase in length, horsepower, gross and net tonnage is limited. Horsepower can only be changed once, and length, gross, and registered tonnage can only be changed once. The proposed measures does not change the replacement vessel restrictions – that is, if the permit was placed on an "upgraded" vessel, it cannot be used again on an upgraded vessel after the baseline characteristics are downgraded. Conversely, if the permit has never been placed on an upgraded vessel, the permit retains its eligibility for an upgrade.

This measure differs slightly from the proposed action, in that it would have applied the permit baseline downgrade to all situations associated with the permit, rather than just for the DAS leasing program.

Rationale: Exchanges of DAS under the DAS transfer and leasing programs are limited by a vessel's permit baseline characteristics. For vessels with "large" characteristics, this limits the number of candidate permits with which to conduct an exchange. In some cases, vessels are actually smaller than the permit baseline attached to the vessel. This measure would allow permit owners to make a one-time downgrade of their permit so that the permit baseline matches the characteristics of the vessel using the permit. All characteristics would have to be downgraded to the actual physical characteristics of the vessel, and this change cannot be reversed. This measure will facilitate use of the DAS transfer and leasing programs for those vessels and will reduce the amount of latent fishing capacity inherent in those permits. It is also likely to increase active fishing effort.

5.6.2 DAS Credit for Standing By Entangled Whales (Measure I)

Limited access groundfish vessels may be provided a DAS credit of up to twelve hours for standing by an entangled whale. The requirements for receiving this credit are as follows:

(1) The vessel must notify the U.S. Coast Guard of the entangled whale. The vessel must also be in contact with the Center for Coastal Studies, either directly or through the Coast Guard.
(2) Only one vessel at a time will receive credit for standing by the whale. It is permissible for a vessel to hand off the activity to a second vessel while waiting for the rescue team to arrive. Additional vessels could also receive credit for standing by the whale.
(3) Ideally, the vessel would remain on scene until the rescue team arrives, but this may not be possible in all circumstances. The stand-by vessel must be available to answer questions on the condition of the animal, possible species identification, severity of entanglement, gear information, etc.
(4) Credit will be granted for a verified report whether or not the rescue team arrives on scene or a rescue is attempted.
(5) This provision applies to all species of live whale, whether alive or dead.

This measure differs from the proposed action because it limits the DAS adjustment to a maximum of twelve hours and has different notification requirements.

Rationale: In 2003 there were thirty-four confirmed reports of large whale entanglements and only nine whales disentangled. Attempts were not made on eleven whales because they could not be relocated after the initial report. With the DAS reductions in Amendment 13, groundfish fishing vessels are reluctant to take the time to provide information on entangled whales because they lose valuable DAS time while standing-by. This measure will provide a limited DAS credit to vessels that report and stand-by entangled whales. The credit is given whether the whale is alive or dead since valuable information can be obtained form a carcass on the cause of death, condition of the whale, etc. – information that is especially important for northern right whales. (This measure differs from the proposed action because it limits the maximum credit that can be received to twelve hours).

5.6.3 Herring Vessel Interactions With Regulated Groundfish (Measure J)

Herring purse seine and mid-water (both single and paired trawls) are allowed to fish in all regulated mesh areas. Recently obtained information suggests that herring vessels catch regulated groundfish. This measure considers options that would help restrict interactions between herring fishing and regulated groundfish, or would help collect information on the nature of the problem. If one of these options is not approved, then herring vessels would continue to be allowed to fish in all groundfish mortality closed areas and no additional requirements would be imposed to collect additional information.

Option 1 (Measure G.1): Mid-water trawl vessels (including both single and paired mid-water trawl vessels) are not allowed to fish for herring in the following year round groundfish mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

Rationale: Several enforcement and observer reports have documented that mid-water trawl vessels catch and discard groundfish. This measure would restrict these vessels from the groundfish mortality closed areas in order to provide protection to groundfish in those areas.

Option 2 (Measure G.2): Vessels are not allowed to fish for herring using purse seines or mid-water trawl gear (including both single and paired mid-water trawl vessels) in the following groundfish year round mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

Rationale: Several enforcement and observer reports have documented that mid-water trawl vessels catch and discard groundfish. In addition, observer reports have documented that purse seine vessels can catch groundfish or other bottom dwelling species. This measure would restrict these vessels from the groundfish mortality closed areas in order to provide protection to groundfish in those areas.

Option 3 (Measure G.3): Herring purse seine vessels are not allowed to fish in the following groundfish year round mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

Rationale: Observer reports have documented that purse seine vessels can catch groundfish or other bottom dwelling species. This measure would restrict these vessels from the groundfish mortality closed areas in order to provide protection to groundfish in those areas.

Option 4 (Measure G.4): Herring fishing vessels with Category 1 permits must call NMFS and request an observer at least 72 hours in advance of any herring fishing trip in any area. If NMFS is unable to provide an observer and an observer waiver is granted, the vessel must notify NMFS enforcement of the time and place of landing prior to crossing the VMS demarcation line so that enforcement agents can attempt to observe the offload. This measure differs slightly from the proposed action in that the proposed action imposes the notification requirement only for vessels fishing in the GOM or GB regulated mesh areas. This measure was adopted as the proposed action.

Rationale: There is insufficient information available to estimate regulated groundfish discard rates in the herring fishery. This option will facilitate collection of additional information through increased observer coverage and witnessing of offloads by enforcement. It is recognized that enforcement agents will not be able to witness every offload due to resource limitations, but the notification requirement will make it possible for more offloads to be observed. In addition to these requirements, the Council will ask NMFS to have observers record information on footrope height above the bottom and document the reason for any tows not brought on board the vessel.

Option 5 (Measure G.5): No action.

5.6.4 Category B DAS Observer Requirement (Measure L)

Any vessel that cannot carry an observer cannot participate in any authorized SAP or the Category B (regular) DAS Pilot Program.

Rationale: Effective monitoring of the use of Category B DAS requires observer coverage. If vessels are unable to carry an observer, their catches while using Category B DAS could not be monitored. This measure will preclude vessels that are too small or have insufficient accommodations to carry observers from participating in the SAP.

5.7 Other Measures Not Adopted

Amendment 13 was submitted by the Council in December 2004. The Council immediately began preparation of a framework action (FW 40) in order to implement measures to target healthy stocks using Category B DAS. As this action progressed, the Council considered several suggested programs. Eventually the Council decided to submit two separate management actions – FW 40A and FW 40B. The measures listed below were discussed by the Council but not included in either action. They may be considered again by the Council in the future.

The Council rejected some of these measures because after preliminary review they were determined not to be reasonable. These measures are described as "considered but rejected." The Council has decided to defer consideration of other measures to a later action; these are described as "considered but delayed." A brief summary of these measures is provided below.

5.7.1 Measures Considered but Rejected

5.7.1.1 Directed Lobster Trawl Fishery SAP

The Council received a request to create a SAP for trawl vessels to target lobster offshore. The Council rejected this alternative because this is a lobster management issue and the Council does not manage lobster.

5.7.1.2 SNE/MA Winter Flounder SAP

The Council received a request to develop a SAP that would allow vessels to target winter flounder off western Long Island and New Jersey. The Council rejected this alternative because SNE/MA winter flounder is overfished and as such is not a suitable target for an SAP.

5.7.2 Measures Considered but Delayed

These measures were not included in FW 40B but may be considered for a future action. Any impacts – including cumulative impacts – will be analyzed in the action proposed these measures.

5.7.2.1 Large Mesh Skate and Monkfish Gillnet SAPs

In some cases, vessels targeting monkfish or skates using gillnets must use a groundfish DAS. These proposed SAPs would allow vessels using large mesh to meet this requirement using Category B DAS. The Council will consider these SAPs in a future action, noting that the Category B (regular) DAS pilot program, if approved, will allow this activity. In addition, it may be more appropriate to have these fisheries defined as exempted fisheries so they are not subject to groundfish regulations.

5.7.2.2 SNE/MA Scup/Black Sea Bass/Winter Flounder SAP

This SAP would allow vessels fishing for scup, black sea bass, and fluke to retain some winter flounder if they use groundfish mesh and a Category B DAS. This SAP would apply to the area between 72-30W and 70W longitude. The Council will consider this SAP in a future action.

5.7.2.3 WGOM Haddock Gillnet SAP

The Council considered allowing vessels using gillnet gear to fish with 6-inch mesh in the area during certain time periods in order to target GOM haddock. The Council did not submit this SAP

because there is a possibility that vessels using this gear may also catch cod. The Council recommended that an experimental fishery be conducted to determine if this SAP is feasible. The Council may consider this SAP in the future.

5.7.2.4 Shrimp Trawl Access to the WGOM Habitat Closed Area

Amendment 13 restricted mobile bottom tending gear from certain areas to minimize, to the extent practicable, the adverse effects of fishing on EFH. One of these areas includes most of the WGOM closed area. The Council will consider allowing shrimp trawls into all or part of this area in a future action.

6.0 AFFECTED ENVIRONMENT

This section provides an overview of the environment that may be affected by the proposed action. While most of the information applies to the northeast multispecies fishery, some information is provided for Atlantic herring since this action considered measures that could affect that fishery.

6.1 Physical Environment

Amendment 13 included a thorough description of the physical environment of the Northeast multispecies fishery, including oceanographic and physical habitat conditions in the Gulf of Maine – Georges Bank region and the area south of New England. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a). The Northeast Shelf Ecosystem (Figure 5) has been described as including the area from the Gulf of Maine south to North Carolina, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The continental slope of this region includes the area east of the shelf, out to a depth of 2000 m. A number of distinct sub-systems comprise the region, including the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another subsystem, Southern New England, is described; however, Amendment 13 incorporated the distinctive features of this region into the descriptions of Georges Bank and the Mid-Atlantic Bight. The following summary highlights the major elements of the physical environment discussed in Amendment 13.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. Highly productive, well-mixed waters and strong currents characterize it. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley and in areas of glacially rafted hard bottom.

The broad-scale hydrography of the Gulf of Maine – Georges Bank region is strongly influenced by variation in the major water mass fluxes into the Gulf of Maine. The two key sources of inflows to the Gulf of Maine are Scotian Shelf water, which is relatively cool and fresh, and slope water, which is relatively warm and more saline. The volume ratio of Scotian Shelf water to slope water was roughly 1:2 during the 1980s, while during the 1990s, the volume ratio has been roughly 2:1 (Pers. Comm. Dr. David Mountain, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543). As a result of these broad-scale changes in inputs, water salinity has been lower in the Gulf of Maine during the 1990s.

Changes in the relative salinity of the Gulf of Maine have been indexed by salinity anomalies on the northwest flank of Georges Bank during 1975-2001. The observed salinity anomaly index shows cyclic variation on a 3-5 year time scale. During the 1990s, the salinity anomaly index has been low. In particular, salinity was very low during the 1996-1999 period. Since 1999, the salinity index has returned to normal levels. Based on some recent research, it appears that when salinity is low during autumn, chlorophyll levels in the subsequent spring tend to be higher than average, indicating higher primary production in the Gulf of Maine. Whether this higher primary production funnels upward through the food web to improve growth of commercially exploited fishes is not known, however.

Physical Environment

During 1998, there was an unusual influx of Labrador slope water (LSW) into the Gulf of Maine (Pers. Comm. Dr. David Mountain, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543). The event began in January and was detectable through the autumn of 1998. Labrador slope water is cooler and fresher than the "normal" water mass of slope water that flows into the Gulf. Thus, the influx of LSW reduced water temperatures, on average, in 1998. This event was also notable because it was the first time since the 1960s that a LSW mass was observed in the Gulf of Maine. The unusual influx of LSW likely corresponds to a delayed response of local ocean conditions to the dramatic change in the North Atlantic Oscillation Index, a broad-scale measure of winter atmospheric pressure, during 1995-1996.

Interestingly, recruitment of several groundfish stocks in the Gulf of Maine was above recent average levels in 1998. In particular, the 1998 year classes of white hake, American plaice, witch flounder, and Gulf of Maine cod were larger than might be expected given recent low levels of recruitment. In addition, the 1998 and 1999 year classes of Georges Bank haddock were large in comparison to recent levels. Overall, it appears that the LSW event of 1998 may have had a positive effect on larval survival of several groundfish stocks, as measured by recruitment estimates taken from stock assessments.

While groundfish fishing occurs throughout the range of the resource, some of the measures in this action will control fishing in defined areas. The WGOM Closed Area Rod/Reel Haddock SAP will only take place in the WGOM Closed Area. Figure 8 describes the sediment types in the GOM, including those in the vicinity of this SAP.

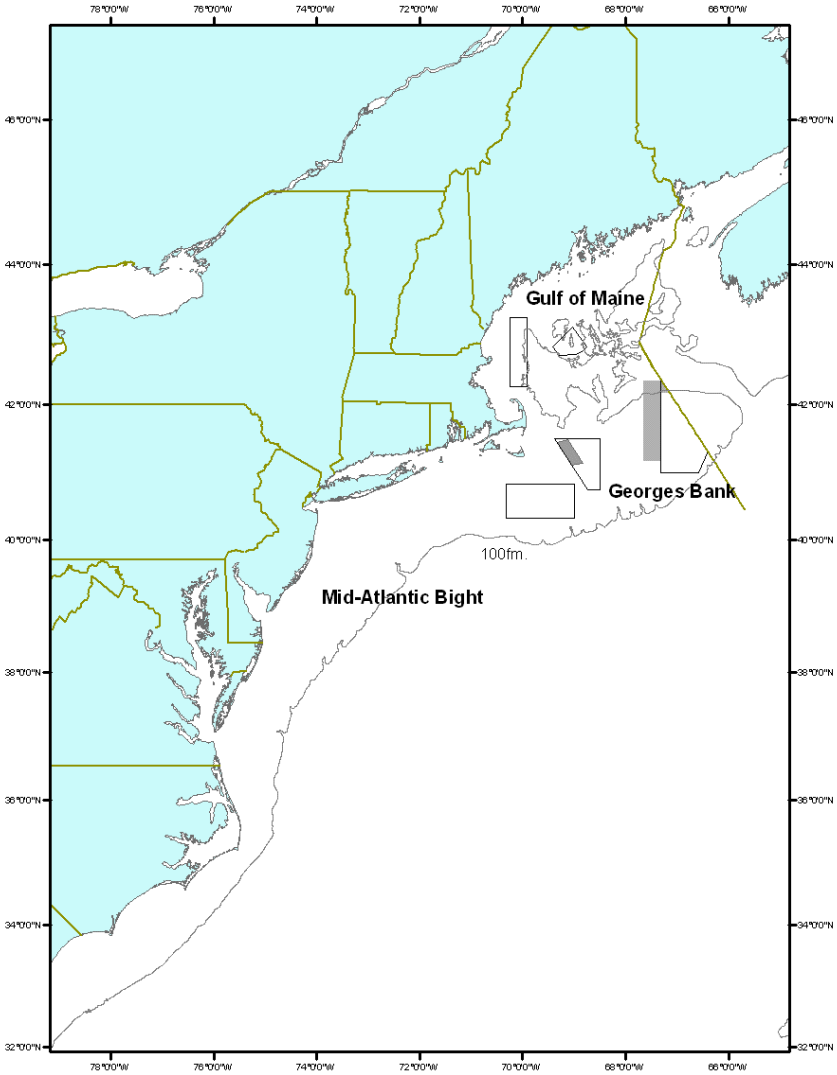


Figure 5 – U.S. Northeast Shelf Ecosystem, showing multispecies year round mortality closed areas and FW 40A SAP areas (shaded)

6.2 Biological Environment

The biological environment for the Northeast multispecies fishery is described in section 9.2 of Amendment 13. The management unit for the fishery is described in Amendment 7 and 9. No changes are proposed. Life history and habitat characteristics of the stocks managed by this FMP can be found in the Essential Fish Habitat source documents (series) published as NOAA Technical Memorandums and available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/. This section described stock status for the regulated groundfish stocks, monkfish, and skates, the species most likely to be affected by the proposed management measures

6.2.1 Groundfish Stock Status

Groundfish stock status was formally assessed at the Groundfish Assessment Review Meeting (GARM, NEFSC 2002a) in 2002. Since then, projection analyses were conducted during October 2003 (NEFSC, unpublished data) to quantify fishing mortality rates and stock biomasses in 2002. These projections were based on observed catches during 2002 along with any relevant survey data required for index-based stock assessments. This updated status information was provided to the NEFMC in 2003 and is summarized in Table 22 and Figure 6. It represents the most recent evaluation of the status of groundfish stocks but this updated status information was not formally vetted through a SARC or other independent scientific review process. Assessments of all regulated groundfish stocks will be updated in 2005.

GB yellowtail flounder was assessed in 2003 and 2004 by the Trans-boundary Resource Assessment Committee (TRAC). The results of these assessments were less optimistic than the information provided by the NEFSC in October, 2003, and suggest that stock biomass is lower and fishing mortality is higher than previously reported. The TRAC noted considerable uncertainty over the assessment and is planning a benchmark assessment in 2005 in order to provide a more definitive evaluation of stock status.

Based on the 2003 update, fishing mortality on eleven groundfish stocks was estimated to have decreased from 2001 to 2002. These stocks were: Gulf of Maine cod, Georges Bank haddock, American plaice, witch flounder, Pollock, Cape Cod/ Gulf of Maine and Southern New England/Mid-Atlantic yellowtail, white hake, southern windowpane flounder, and Gulf of Maine and Southern New England/Mid-Atlantic winter flounder. Similarly, the 2003 update showed that fishing mortality had increased on only two stocks: Georges Bank cod and yellowtail. Of these, the Georges Bank cod stock assessment has exhibited a retrospective pattern that tends to underestimate fishing mortality (F) in the last year of the assessment. Thus, the increasing estimate of the F on cod might be expected even if there were no actual change in fishing mortality. The remaining six stocks showed no change in F from 2001 to 2002. Of these, Atlantic halibut does not have a proxy for fishing mortality status due to a lack of data. Overall, groundfish fishing mortality rates were projected to have decreased from 2001 to 2002.

Fishing mortality rates in 2002 were projected to exceed F_{MSY} for a total of eight stocks on the basis of the 2003 update. These stocks were (% reduction in F needed to achieve F_{MSY} threshold): Gulf of Maine cod (30%), Georges Bank cod (58%), American plaice (30%), witch flounder (44%), Cape Cod/Gulf of Maine yellowtail (75%), Southern New England/Mid-Atlantic yellowtail (69%), white hake (40%), and Southern New England/Mid-Atlantic winter flounder (27%). Projected 2002 fishing mortality rates on the remaining 11 stocks were at or below the F_{MSY} threshold, with the exception of Atlantic halibut where no estimate of F was available. Overall, overfishing was not occurring for the majority of groundfish stocks in 2002.

Groundfish stock biomasses were projected to be below the ½ B_{MSY} threshold for a total of eleven stocks in 2002 on the basis of the 2003 update. These stocks were (% increase in stock biomass needed to achieve B_{MSY} target): Gulf of Maine cod (247%), Georges Bank cod (716%), Gulf of Maine haddock (116%), Georges Bank haddock (151%), Cape Cod/Gulf of Maine yellowtail (344%), Southern New England/Mid-Atlantic yellowtail (4413%), white hake (128%), ocean pout (115%), southern windowpane flounder (300%), Southern New England/Mid-Atlantic winter flounder (404%) and Atlantic halibut (1977%). The remaining eight groundfish stocks were projected to be at or above the ½ B_{MSY} threshold in 2002. Overall, the majority of groundfish stocks were projected to have been overfished in 2002.

Analyses for Amendment 13 included projections of future catch and stock size for stocks assessed using age-based methods given assumed fishing mortality rates. While projections are subject to uncertainty, the results showed that if fishing mortality in FY 2003 was the same as fishing mortality in FY 2002, the following six stocks would increase in size in 2003: plaice, GB haddock, GB yellowtail flounder, SNE/MA yellowtail flounder, SNE/MA winter flounder, and witch flounder. The following three stocks were expected to decline in size in FY 2003: GOM cod, GB cod and CC/GOM yellowtail flounder.

Given the information currently available, stock biomasses and fishing mortality rates for FY 2003 cannot be determined with certainty. As described in the preceding paragraphs, however, it is likely that fishing mortality has declined for most groundfish stocks (with the exception of GB cod and white hake) and, with the exception of GB cod, GOM cod, and CC/GOM yellowtail flounder, it is not likely that stock biomass declined for regulated groundfish stocks.

There has been no direct assessment of groundfish resource status since the Groundfish Assessment Review Meeting of 2002 (NEFSC 2002a). As a result, no estimates of current fishing mortality or biomass are currently available. However, recent survey data can provide an indication of the likely trends in groundfish biomass for each of the nineteen stocks in the multispecies FMP. Recent survey indices are provided in Table 23 and charted in Figure 7.

Relative changes in groundfish biomass from 2001 to 2003 were evaluated using updated NEFSC autumn and spring survey data. The 3-year average of the autumn NEFSC bottom trawl survey weight per tow in 2001 ($B_{1999\text{-}2001}$) was compared to the average of the 2002 and 2003 values ($B_{2002\text{-}2003}$) to measure the relative change in biomass for 18 stocks while the spring survey index was used for ocean pout. Percent changes of less than <20% were considered to be within the range of sampling variability associated with annual survey observations. This led to three categories for changes in relative stock biomass: substantial increase, moderate change, and substantial decrease.

Eight out of nineteen stocks (42%) showed a substantial increase in relative biomass from 2001 (Table 23). Of these, Georges Bank (+209%) and Gulf of Maine cod (+197%) showed the largest increases in relative biomass. The Georges Bank cod $B_{2002\text{-}2003}$ index, however, was the average of two disparate values (11.3 and 2.1 kg/tow). The recent decadal pattern for this stock suggests that the 11.3 value may be an outlier. Thus, the apparent increase in Georges Bank cod should be cautiously interpreted. Gulf of Maine cod, however, has had an overall increasing pattern in survey biomass values since 1998. Redfish also showed a substantial increase (+108%), more than doubling since 2001. The remaining five stocks showed increases of roughly 50% or less: White hake (+51%), Georges Bank haddock (+30%), Southern New England Mid-Atlantic yellowtail (+43%), Southern New England Mid-Atlantic winter flounder (+36%), and pollock (+27%).

Seven of nineteen stocks (37%) showed moderate change in relative biomass from 2001. Of these, five showed a moderate increase: Northern (+4%) and Southern (+13) windowpane flounder,

Atlantic halibut (+9%), and Georges Bank (+17%) and Gulf of Maine (+9%) winter flounder. The remaining two stocks showed a moderate decrease: American plaice (-15%) and ocean pout (-3%).

Five of the nineteen stocks (26%) showed a substantial decrease in relative biomass from 2001. Relative biomasses of Georges Bank (-54%) and Cape Cod Gulf of Maine (-45%) yellowtail stocks declined by roughly one-half since 2001. Similarly, Gulf of Maine haddock also declined by roughly one-half (-51%). Witch flounder declined by roughly quarter (-25%).

Overall, updated survey indices suggested that relative biomasses of over two-thirds of the groundfish stocks increased moderately or substantially since 2001. For the stocks that appeared to decrease, Georges Bank yellowtail and Gulf of Maine haddock are notable since they may be subject to new or ongoing special access programs.

	Biomass		Fishing Mortality	
Stock	**2001**	**2002 (Projected)**	**2001**	**2002 (Projected)**
GOM Cod	22,000 mt	23,850	0.47	0.33
GB Cod	29,170 mt	26,560	0.38	0.43
GB Haddock	74,400 mt	99,570	0.22	0.20
GOM Haddock(1)	10.31	10.28	0.12	0.12
GB Yellowtail Flounder	39,000 mt	47,100	0.13	0.15
Cape Cod/GOM Yellowtail Flounder	3,200 mt	2,840	0.75	0.68
SNE/MA yellowtail flounder	1,900 mt	1,540	0.91	0.85
American Plaice	13,822 mt	15,570	0.43	0.27
Witch Flounder(3)	12,300 mt	18,300	0.76	0.41
GOM Winter Flounder	5.37	7,690	0.14	0.10
GB Winter Flounder(2)	9,805	9,805	0.25	0.25
SNE/MA Winter Flounder	7,600 mt	5,970	0.51	0.44
Acadian Redfish	119,600 mt (2000)	119,600	0.01	0.01
White Hake(1)	2.35	3.37	1.36	0.91
Pollock(1)	1.60	1.74	3.55	3.30
Windowpane Flounder (North)(1)	0.79	0.85	0.1	0.09
Windowpane Flounder (South)(1)	0.21	0.23	0.69	0.50
Ocean Pout(1)	2.46	2.28	0.007	0.01
Atlantic Halibut	0.2		Unknown	Unknown

Table 22 – Stock biomass and fishing mortality (2001). Units are SSB and fully-recruited fishing mortality unless noted. Sources: 2001 estimates based on GARM 2002, SAW 35, and SAW 37; 2002 estimates from NEFSC (unpublished data) and SAW 37.

(1) Biomass based on fall survey index, mortality based on relative exploitation rate (multi-year average)
(2) Total biomass and biomass weighted fishing mortality
(3) Witch flounder assessed in SAW 37.

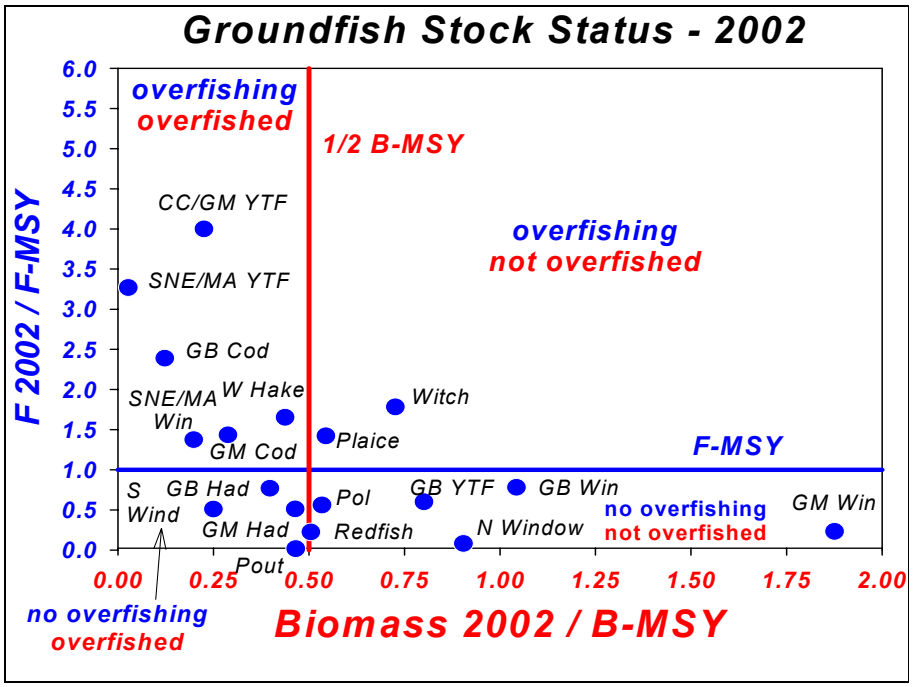


Figure 6 - Groundfish stock status, 2002 (NEFSC, see Table 22 for sources)

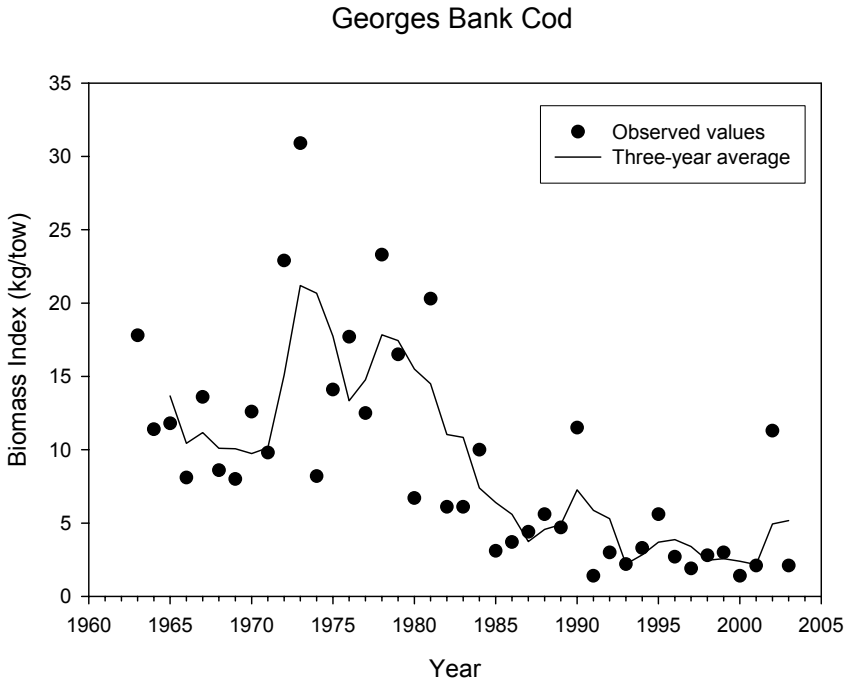
Year	GB Cod	3-yr Average GB Cod	GB Haddock	3-yr Average GB Haddock	GB Yellowtail	3-yr Average GB Yellowtail	SNEMA Yellowtail	3-yr Average SNEMA Yellowtail	CCGM Yellowtail	3-yr Average CCGM Yellowtail	GM Cod	3-yr Average GM Cod	Witch	3-yr Average Witch	American plaice	3-yr Average American plaice	GB Winter flounder	3-yr Average GB Winter flounder	SNEMA Winter flounder	3-yr Average SNEMA Winter flounder
1963	17.8		79.8		12.8		14.0				17.9		3.5		5.9		1.8		3.3	
1964	11.4		96.8		13.6		14.0				22.8		2.0		2.8		1.8		4.9	
1965	11.8	13.7	72.8	83.1	9.1	11.8	10.2	12.7			12.0	17.6	2.3	2.6	3.8	4.2	2.1	1.9	4.4	4.2
1966	8.1	10.4	29.9	66.5	4.0	8.9	9.0	11.1			12.9	15.9	4.6	2.9	4.9	3.8	5.7	3.2	3.3	4.2
1967	13.6	11.2	25.5	42.7	7.6	6.9	14.0	11.1			9.2	11.4	2.0	3.0	2.7	3.8	2.1	3.3	2.7	3.5
1968	8.6	10.1	15.4	23.6	10.5	7.4	13.0	12.0			19.4	13.8	3.5	3.4	2.9	3.5	1.1	2.9	2.2	2.7
1969	8.0	10.1	8.4	16.4	9.3	9.1	14.5	13.8			15.4	14.7	4.4	3.3	2.4	2.7	2.4	1.8	1.9	2.3
1970	12.6	9.7	13.5	12.4	5.0	8.3	16.2	14.6			16.4	17.1	3.7	3.9	2.0	2.4	6.5	3.3	2.4	2.2
1971	9.8	10.1	5.6	9.2	6.4	6.9	9.0	13.2			16.5	16.1	3.0	3.7	2.0	2.1	1.3	3.4	1.2	1.8
1972	22.9	15.1	8.5	9.2	6.3	5.9	31.5	18.9			13.0	15.3	2.4	3.0	1.6	1.9	1.6	3.1	3.1	2.2
1973	30.9	21.2	9.8	7.9	6.6	6.4	3.1	14.5			8.7	12.7	2.1	2.5	1.9	1.8	1.2	1.3	0.8	1.7
1974	8.2	20.7	4.0	7.4	3.7	5.6	1.5	12.1			9.0	10.2	1.6	2.0	1.4	1.7	1.5	1.4	0.8	1.6
1975	14.1	17.7	15.1	9.6	2.4	4.2	0.6	1.8			8.6	8.8	1.0	1.6	2.4	1.9	2.1	1.6	0.7	0.8
1976	17.7	13.3	35.8	18.3	1.5	2.5	2.0	1.4			6.7	8.1	0.9	1.2	3.0	2.3	3.9	2.5	1.3	0.9
1977	12.5	14.8	27.5	26.1	2.8	2.2	1.1	1.2	7.5		10.2	8.5	3.4	1.8	3.5	3.0	4.0	3.3	1.7	1.2
1978	23.3	17.8	18.1	27.1	2.4	2.2	2.0	1.7	2.0		12.9	9.9	2.9	2.4	4.7	3.7	3.1	3.7	1.4	1.5
1979	16.5	17.4	32.0	25.9	1.5	2.2	1.8	1.6	2.6	4.1	17.5	13.5	1.6	2.6	4.0	4.1	3.8	3.6	2.6	1.9
1980	6.7	15.5	22.0	24.0	6.7	3.5	1.4	1.7	6.6	3.7	14.2	14.9	2.0	2.2	5.1	4.6	1.9	2.9	3.2	2.4
1981	20.3	14.5	14.0	22.7	2.6	3.6	4.0	2.4	1.9	3.7	8.1	13.3	2.2	2.0	5.6	4.9	2.4	2.7	3.1	3.0
1982	6.1	11.0	7.3	14.4	2.3	3.9	5.7	3.7	2.1	3.5	16.1	12.8	0.8	1.7	2.5	4.4	2.7	2.3	1.7	2.7
1983	6.1	10.8	5.8	9.0	2.1	2.3	4.5	4.7	0.3	1.4	8.8	11.0	2.1	1.7	3.5	3.9	2.4	2.5	2.7	2.5
1984	10.0	7.4	4.5	5.9	0.6	1.7	1.0	3.7	1.4	1.2	8.8	11.2	2.3	1.8	2.0	2.7	2.5	2.5	0.9	1.8
1985	3.1	6.4	3.9	4.7	0.7	1.1	0.3	1.9	1.6	1.1	8.5	8.7	1.6	2.0	2.0	2.5	1.1	2.0	1.0	1.5
1986	3.7	5.6	5.1	4.5	0.8	0.7	0.8	0.7	1.0	1.3	5.1	7.5	1.1	1.7	1.6	1.9	2.2	1.9	0.5	0.8
1987	4.4	3.7	2.6	3.8	0.5	0.7	0.4	0.5	0.6	1.0	3.4	5.7	0.4	1.0	1.1	1.6	0.9	1.4	0.4	0.6
1988	5.6	4.6	5.6	4.4	0.2	0.5	0.5	0.6	1.1	0.9	6.6	5.0	0.6	0.7	1.5	1.4	1.3	1.4	0.5	0.5
1989	4.7	4.9	4.7	4.3	1.0	0.6	2.4	1.1	2.2	1.3	4.6	4.9	0.4	0.4	1.2	1.2	1.1	1.1	0.3	0.4
1990	11.5	7.3	2.6	4.3	0.7	0.6	1.3	1.4	2.3	1.9	4.9	5.4	0.4	0.5	2.9	1.8	0.4	0.9	0.5	0.5
1991	1.4	5.9	0.9	2.8	0.7	0.8	0.8	1.5	1.2	1.9	2.8	4.1	0.5	0.4	1.6	1.9	0.1	0.5	0.7	0.5
1992	3.0	5.3	3.2	2.2	0.6	0.7	0.1	0.7	1.9	1.8	2.4	3.4	0.2	0.4	1.8	2.1	0.4	0.3	0.8	0.7
1993	2.2	2.2	4.3	2.8	0.5	0.6	0.1	0.3	1.1	1.4	1.0	2.1	0.5	0.4	2.4	1.9	0.7	0.4	0.4	0.6
1994	3.3	2.8	2.9	3.5	0.9	0.7	0.3	0.2	2.7	1.9	2.7	2.0	0.4	0.4	2.7	2.3	0.6	0.5	1.5	0.9
1995	5.6	3.7	10.7	6.0	0.4	0.6	0.3	0.2	0.8	1.5	3.7	2.5	0.6	0.5	2.6	2.5	1.3	0.9	0.6	0.8
1996	2.7	3.9	4.1	5.9	1.3	0.9	0.2	0.3	2.6	2.0	2.4	2.9	1.0	0.7	2.2	2.5	1.8	1.2	1.1	1.1
1997	1.9	3.4	6.5	7.1	3.8	1.8	0.9	0.5	2.3	1.9	1.9	2.7	0.8	0.8	1.9	2.3	1.5	1.5	2.6	1.4
1998	2.8	2.5	5.8	5.5	4.3	3.1	0.7	0.6	1.6	2.2	1.5	1.9	0.5	0.8	2.2	2.1	1.6	1.6	2.2	2.0
1999	3.0	2.6	33.1	15.1	8.0	5.4	0.5	0.7	6.0	3.3	3.5	2.3	0.9	0.7	2.6	2.2	1.8	1.6	1.5	2.1
2000	1.4	2.4	15.4	18.1	5.8	6.1	0.7	0.6	3.5	3.7	4.7	3.2	1.1	0.8	2.8	2.5	2.7	2.0	2.1	2.0
2001	2.1	2.2	20.0	22.8	11.6	8.5	0.4	0.5	1.9	3.8	7.3	5.2	1.7	1.2	2.6	2.7	2.5	2.3	2.0	1.9
2002	11.3	4.9	36.3	23.9	3.8	7.1	1.1	0.7	0.7	2.0	24.7	12.2	1.1	1.3	2.2	2.6	3.2	2.8	3.6	2.6
2003	2.1	5.2	23.0	26.4	4.0	6.5	0.4	0.6	3.4	2.0	6.0	12.7	0.8	1.2	2.3	2.4	2.2	2.6	1.6	2.4
Avg 2002-2003	6.700		29.673		3.900		0.764		2.076		15.326		0.926		2.255		2.695		2.603	
% change 2001	219%		48%		-66%		82%		10%		110%		-46%		-14%		7%		28%	
% change 2001 (3-yr)	**209%**		**30%**		**-54%**		**43%**		**-45%**		**197%**		**-25%**		**-15%**		**17%**		**36%**	

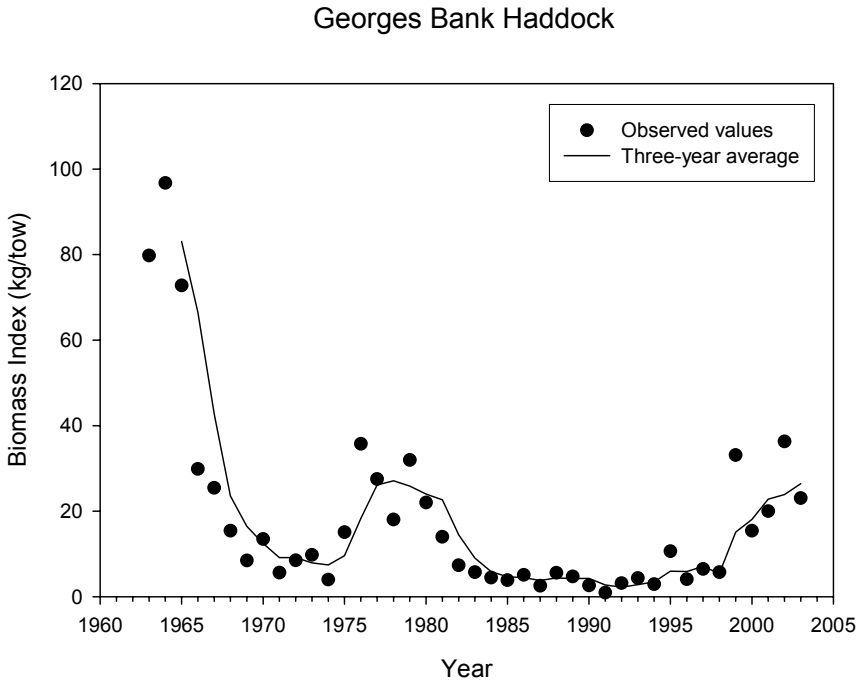
Table 23 - NEFSC survey biomass indices (kg/tow), 1963-2003

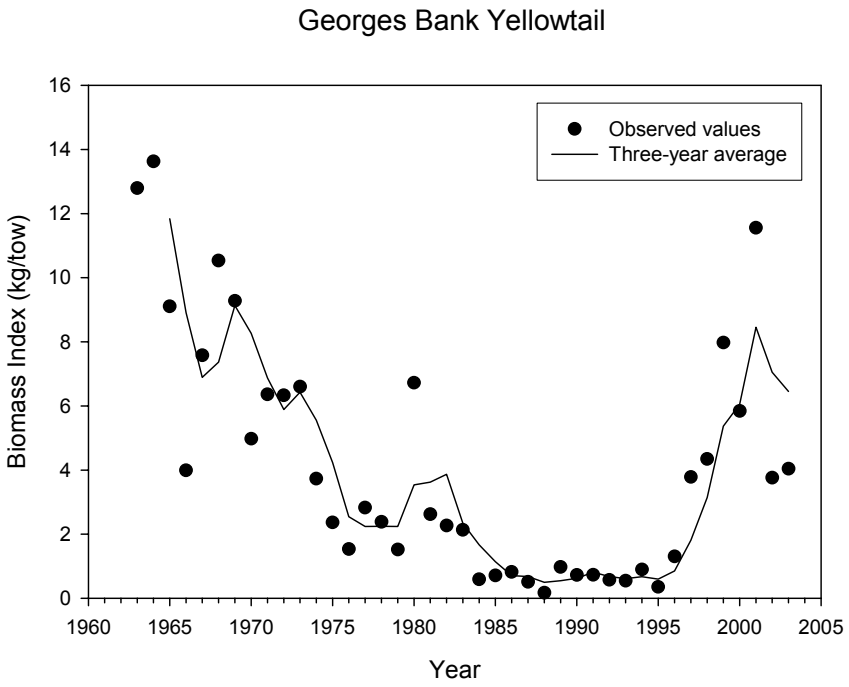
Year	White Hake (>60 cm)	3-yr Average White Hake (>60 cm)	Pollock	3-yr Average Pollock	Redfish	3-yr Average Redfish	Ocean pout	3-yr Average Ocean pout	N Windowpane	3-yr Average N Window-pane	S Windowpane	3-yr Average S Window-pane	GM Haddock	3-yr Average GM Haddock	Halibut	3-yr Average Halibut	GM Winter flounder	3-yr Average GM Winter flounder
1963	3.9		5.0		24.1				0.2		2.0		50.7		0.1			
1964	3.3		2.4		54.6				0.1		0.9		18.8		0.1			
1965	4.6	3.9	2.1	3.2	13.1	30.6			0.2	0.2	0.8	1.2	17.6	29.1	0.0	0.1		
1966	4.0	4.0	1.6	2.1	29.1	32.3			0.5	0.3	1.1	0.9	13.9	16.8	0.0	0.0		
1967	1.8	3.5	1.2	1.6	24.3	22.2			0.5	0.4	0.8	0.9	16.9	16.1	0.0	0.0		
1968	2.2	2.7	2.3	1.7	40.4	31.3	5.4		0.3	0.4	0.9	0.9	15.5	15.4	0.0	0.0		
1969	8.4	4.1	3.0	2.2	23.5	29.4	6.2		0.6	0.5	0.4	0.7	12.9	15.1	0.5	0.2		
1970	7.8	6.1	2.0	2.4	32.9	32.3	5.2	5.6	0.2	0.4	0.3	0.5	7.4	11.9	0.0	0.2		
1971	8.0	8.0	1.9	2.3	23.4	26.6	2.2	4.5	0.2	0.3	0.4	0.4	8.1	9.4	0.1	0.2		
1972	7.0	7.6	3.1	2.3	24.6	27.0	4.5	3.9	0.6	0.3	0.6	0.4	3.0	6.2	0.0	0.0		
1973	8.2	7.8	4.0	3.0	17.0	21.7	3.4	3.3	1.5	0.8	0.6	0.5	8.6	6.6	0.1	0.1		
1974	8.2	7.8	1.5	2.9	24.2	21.9	1.5	3.1	0.8	1.0	0.3	0.5	3.3	5.0	0.0	0.1		
1975	4.5	7.0	1.5	2.4	39.9	27.0	1.3	2.0	0.4	0.9	0.1	0.3	8.6	6.8	0.1	0.1		
1976	6.8	6.5	7.3	3.4	15.3	26.5	1.4	1.4	1.2	0.8	0.4	0.3	8.0	6.7	0.4	0.2		
1977	9.1	6.8	5.3	4.7	17.3	24.2	3.6	2.1	1.6	1.0	0.5	0.3	8.8	8.5	0.1	0.2		
1978	8.5	8.1	3.6	5.4	20.7	17.8	3.4	2.8	1.2	1.3	0.5	0.5	20.9	12.6	0.3	0.2		
1979	7.0	8.2	4.7	4.5	16.0	18.0	1.5	2.8	0.7	1.1	0.8	0.6	13.7	14.5	0.0	0.1	2.6	
1980	11.6	9.0	3.3	3.9	12.6	16.4	5.7	3.5	0.6	0.8	0.3	0.5	9.8	14.8	0.0	0.1	6.6	
1981	8.4	9.0	1.6	3.2	12.2	13.6	7.6	4.9	0.8	0.7	0.5	0.5	9.3	11.0	0.3	0.1	3.0	4.1
1982	7.2	9.1	1.6	2.2	3.4	9.4	4.7	6.0	0.5	0.6	0.9	0.6	4.2	7.8	0.1	0.1	1.9	3.8
1983	6.1	7.2	1.4	1.5	4.1	6.6	4.2	5.5	0.6	0.6	0.4	0.6	5.2	6.2	0.0	0.1	3.5	2.8
1984	5.1	6.1	0.7	1.2	3.9	3.8	5.5	4.8	2.1	1.1	0.3	0.5	3.9	4.4	0.1	0.1	3.1	2.8
1985	5.5	5.5	2.0	1.4	5.7	4.6	6.5	5.4	0.9	1.2	0.6	0.4	6.1	5.1	0.1	0.1	2.3	3.0
1986	4.4	5.0	1.2	1.3	8.0	5.9	6.3	6.1	1.1	1.4	0.6	0.5	1.4	3.8	0.3	0.2	0.9	2.1
1987	4.6	4.8	1.2	1.5	5.5	6.4	2.7	5.2	0.7	0.9	0.4	0.5	2.6	3.4	0.0	0.2	0.5	1.2
1988	5.4	4.8	1.8	1.4	6.3	6.6	3.2	4.1	0.7	0.8	0.4	0.5	1.5	1.8	0.0	0.1	1.0	0.8
1989	3.8	4.6	0.6	1.2	6.8	6.2	2.8	2.9	0.4	0.6	0.1	0.3	0.6	1.6	0.1	0.0	2.0	1.2
1990	3.8	4.3	1.1	1.1	12.2	8.4	5.1	3.7	1.1	0.7	0.2	0.2	0.4	0.8	0.1	0.0	1.2	1.4
1991	4.8	4.2	0.6	0.8	8.4	9.1	3.8	3.9	0.2	0.6	0.4	0.2	0.1	0.4	0.2	0.1	1.5	1.6
1992	4.1	4.3	0.9	0.9	8.1	9.6	2.3	3.7	0.4	0.6	0.2	0.3	0.1	0.2	0.2	0.2	3.1	1.9
1993	4.9	4.6	0.5	0.7	11.2	9.2	3.1	3.0	0.6	0.4	0.0	0.2	0.5	0.2	0.0	0.2	1.9	2.1
1994	2.5	3.8	0.4	0.6	5.9	8.4	2.3	2.6	0.3	0.4	0.2	0.1	0.2	0.3	0.0	0.1	1.3	2.1
1995	3.0	3.4	0.7	0.5	4.7	7.3	1.9	2.4	0.8	0.6	0.2	0.2	1.1	0.6	0.1	0.0	1.4	1.5
1996	3.3	2.9	0.7	0.6	30.6	13.7	2.1	2.1	0.5	0.5	0.3	0.2	3.5	1.6	0.1	0.0	3.1	2.0
1997	2.6	3.0	1.0	0.8	18.9	18.1	1.6	1.9	0.4	0.6	0.1	0.2	2.4	2.4	0.2	0.1	2.9	2.5
1998	1.6	2.5	0.8	0.8	31.7	27.1	1.7	1.8	1.7	0.9	0.2	0.2	2.9	3.0	0.1	0.1	1.0	2.4
1999	1.3	1.8	1.5	1.1	22.9	24.5	2.6	2.0	0.7	0.9	0.1	0.1	4.9	3.4	0.0	0.1	3.3	2.4
2000	2.9	1.9	0.8	1.0	26.2	26.9	2.0	2.1	0.7	1.0	0.2	0.2	14.0	7.3	0.0	0.0	5.1	3.1
2001	2.9	2.4	2.4	1.6	28.2	25.8	2.8	2.5	0.9	0.8	0.3	0.2	12.0	10.3	0.0	0.0	3.1	3.8
2002	4.3	3.4	1.9	1.7	41.9	32.1	2.0	2.3	0.9	0.8	0.2	0.2	4.8	10.3	0.0	0.0	4.0	4.1
2003	2.8	3.3	2.2	2.2	65.5	45.2	2.8	2.5	0.8	0.9	0.3	0.3	5.4	7.4	0.0	0.0	4.3	3.8
Avg 2002-2003	3.564		2.026		53.683		2.392		0.829		0.237		5.100		0.027		4.161	
% change 2001	23%		-17%		90%		-15%		-10%		-30%		-57%		-28%		33%	
% change 2001 (3-yr)	**51%**		**27%**		**108%**		**-3%**		**4%**		**13%**		**-51%**		**9%**		**9%**	

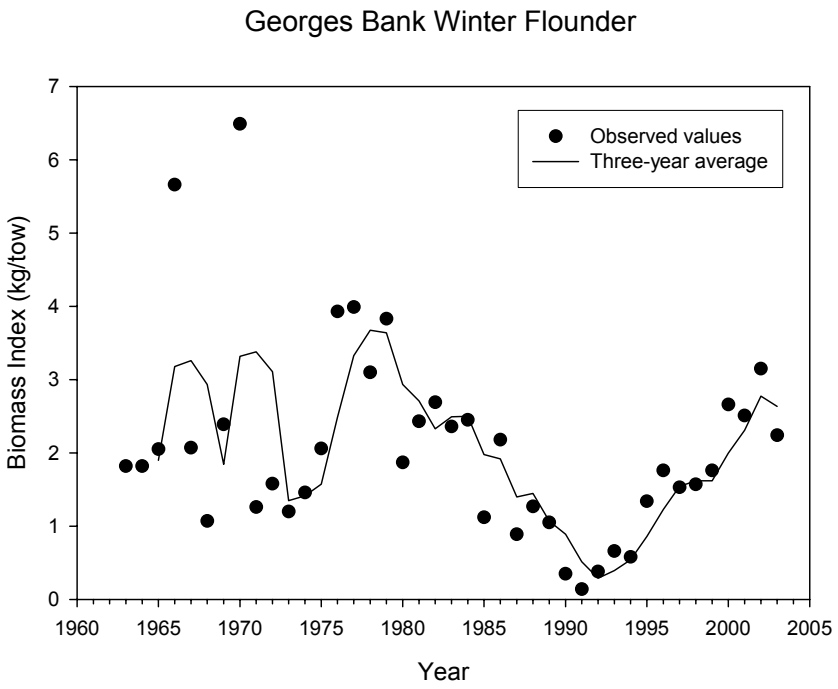
Table 23 - NEFSC survey biomass indices (kg/tow), 1963-2003 (cont.)

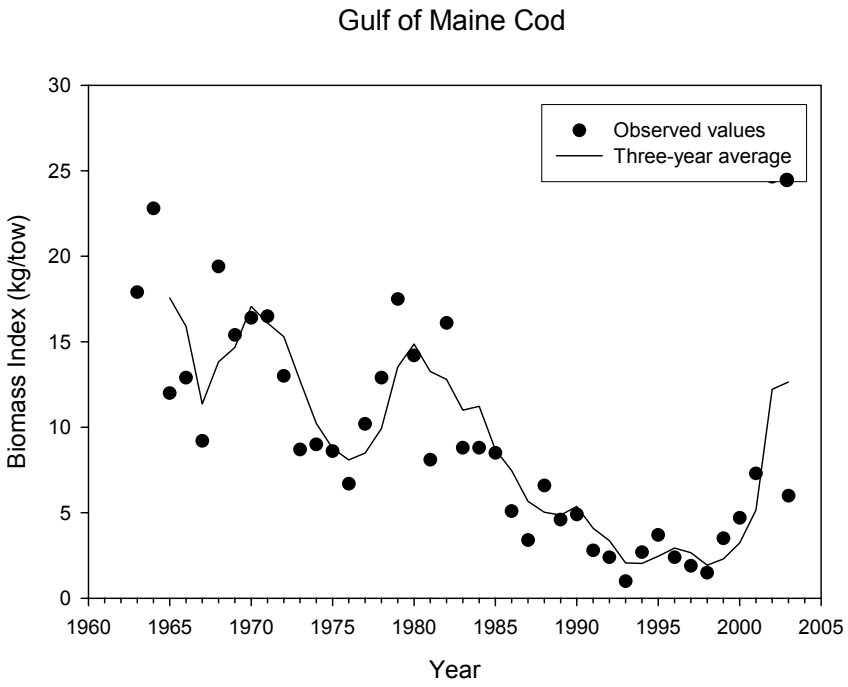
Figure 7 – Autumn trawl survey indices for regulated groundfish

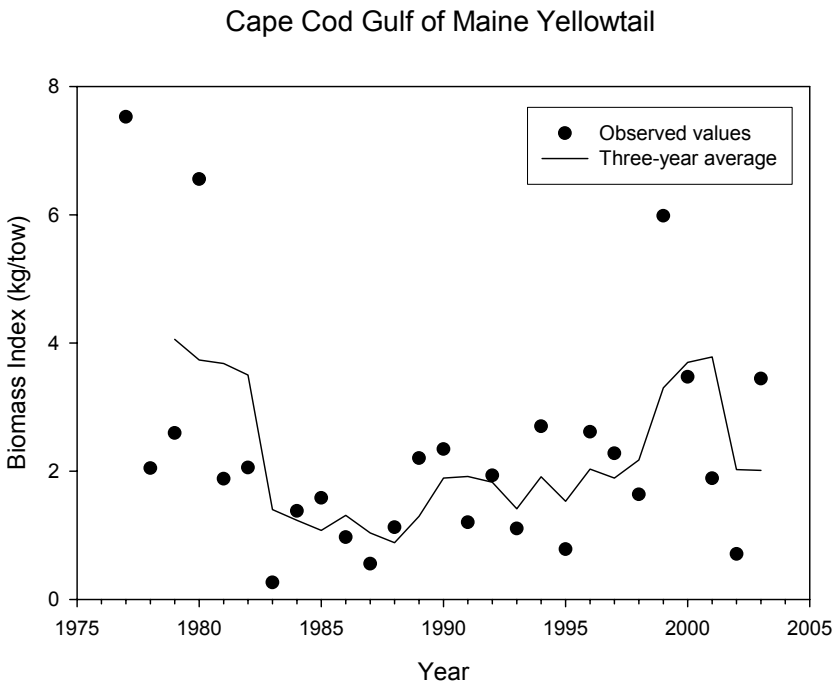


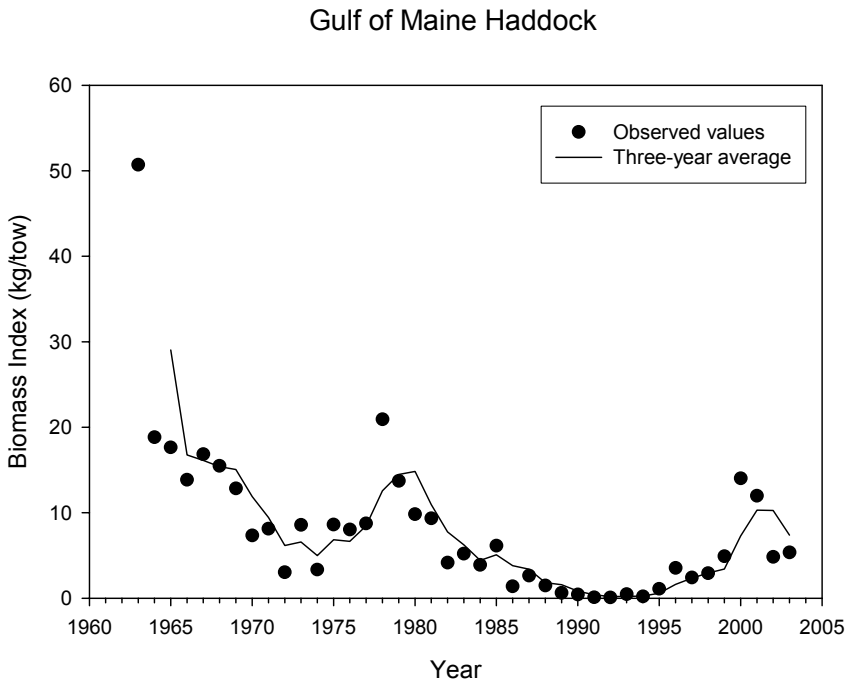


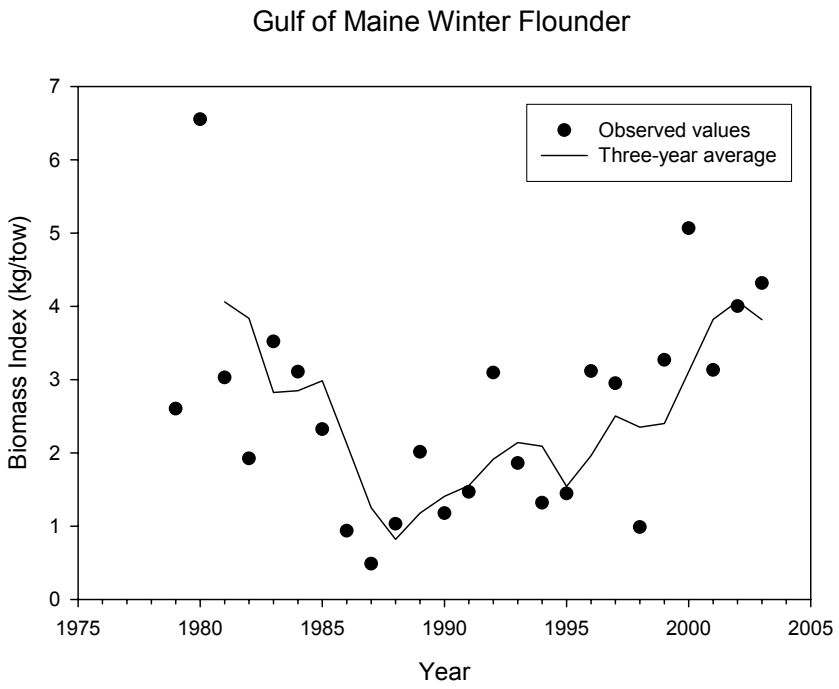

Georges Bank Yellowtail
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
2
4
6
8
10
12
14
16
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

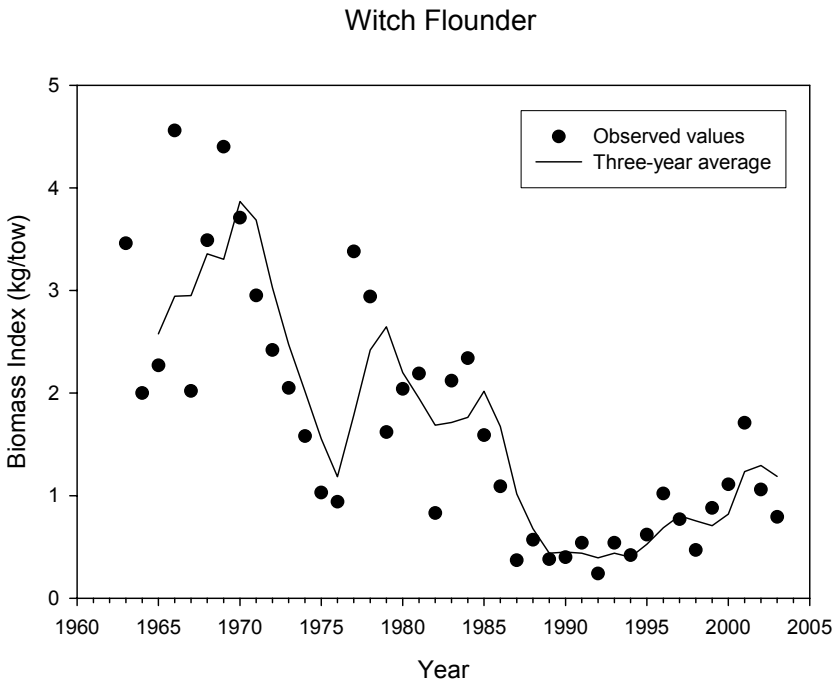

Georges Bank Winter Flounder
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
6
7
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

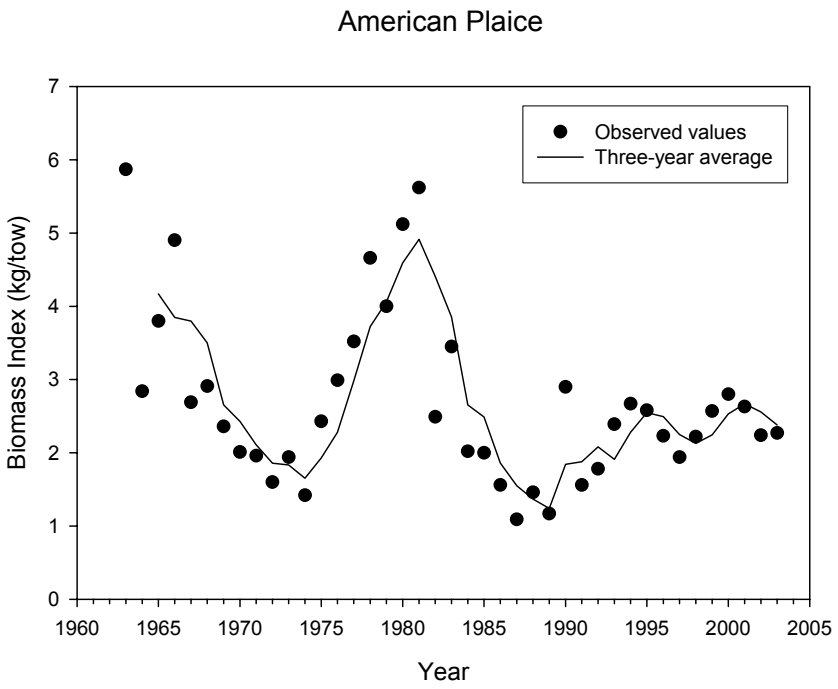

Gulf of Maine Cod
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
5
10
15
20
25
30
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

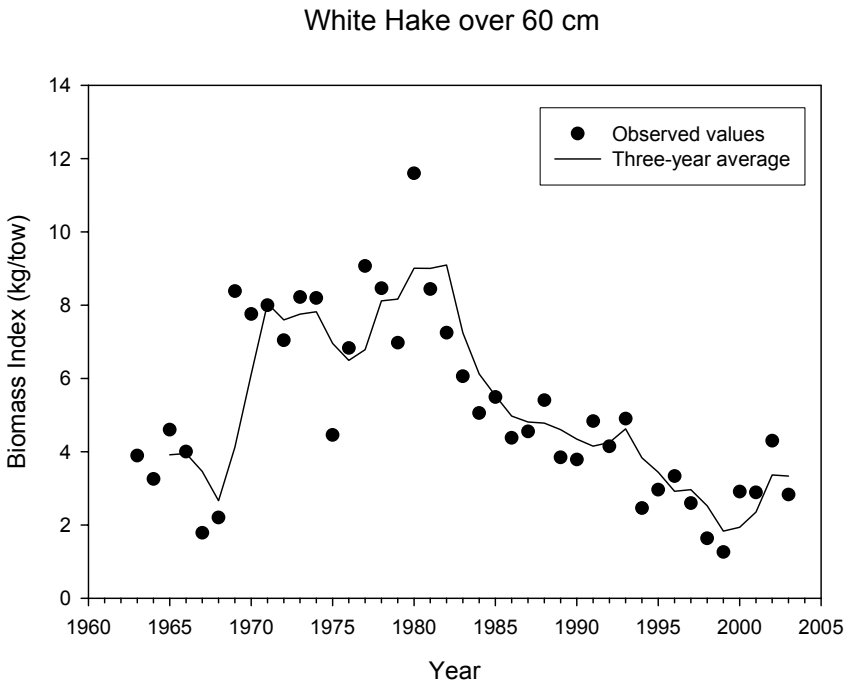

Cape Cod Gulf of Maine Yellowtail
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
2
4
6
8
1975
1980
1985
1990
1995
2000
2005

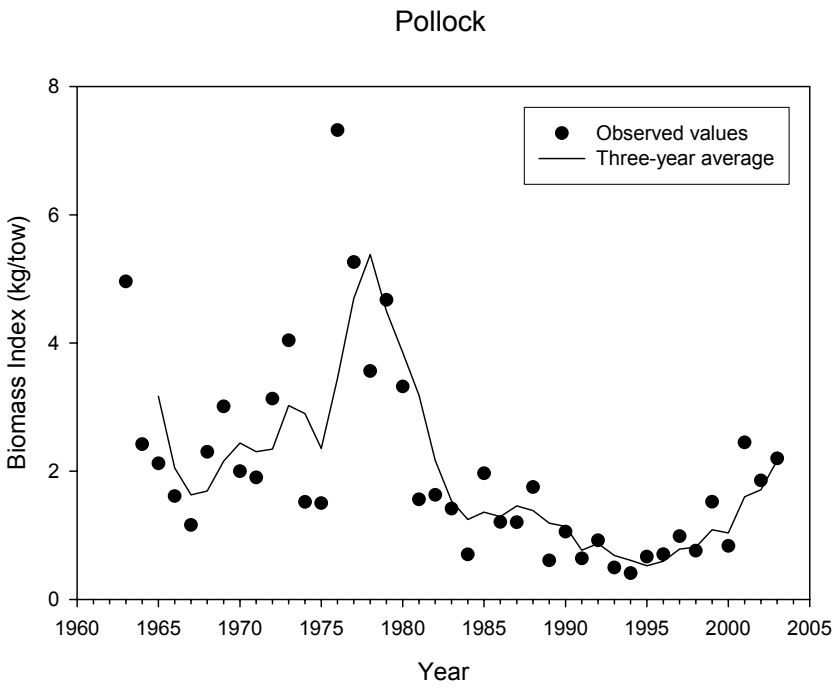

Gulf of Maine Haddock
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
10
20
30
40
50
60
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

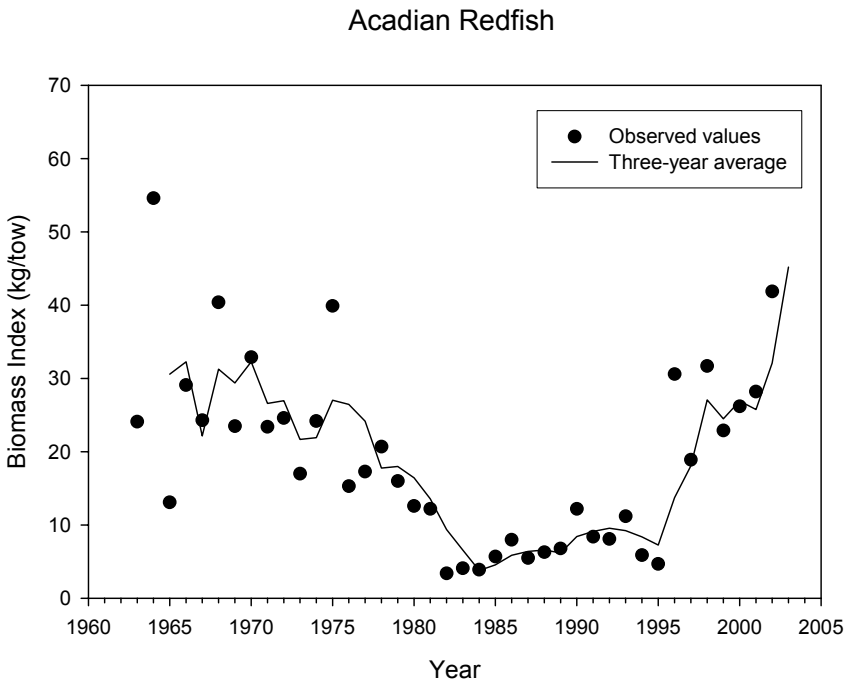

Gulf of Maine Winter Flounder
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
6
7
1975
1980
1985
1990
1995
2000
2005

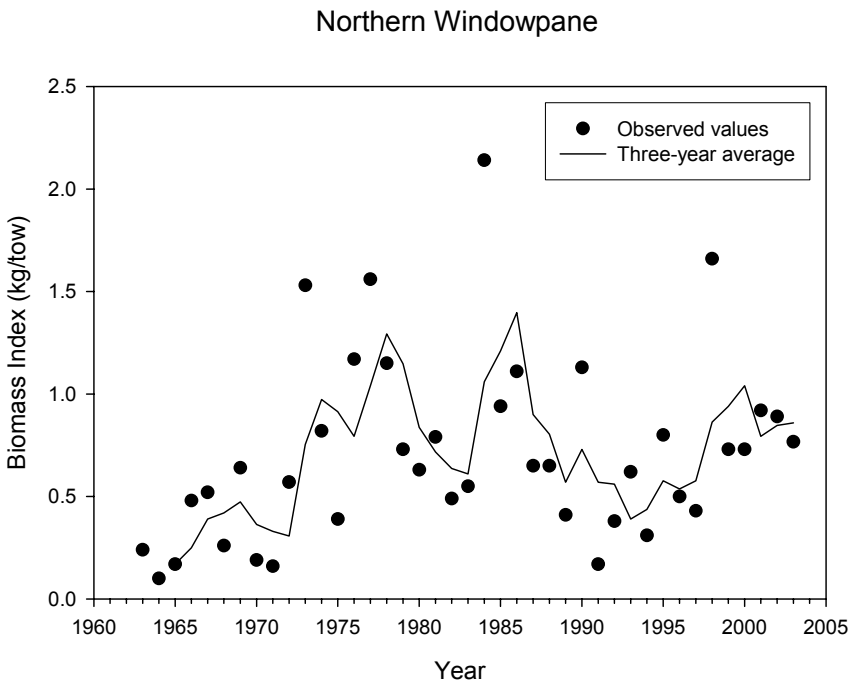

Witch Flounder
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

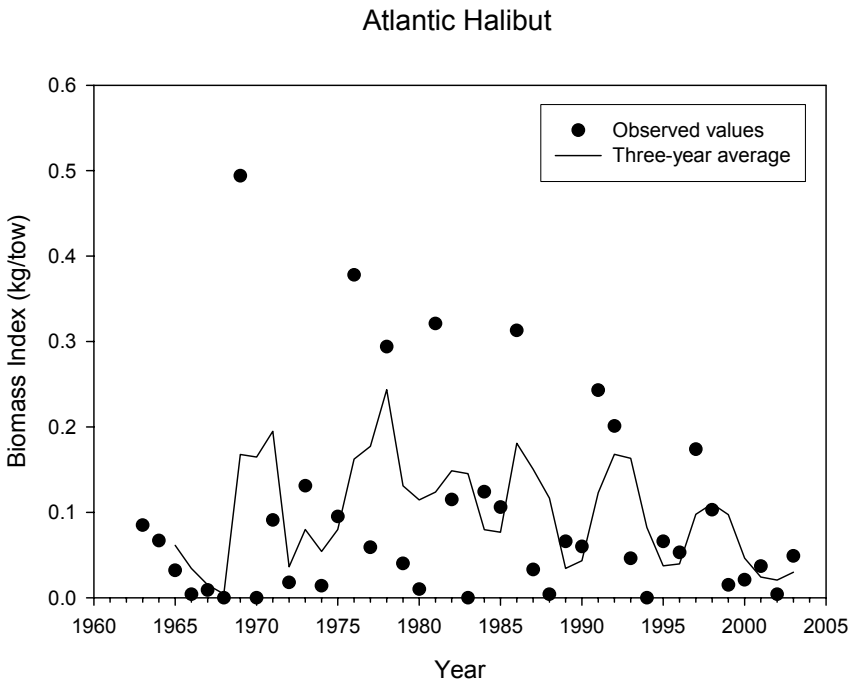

American Plaice
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
6
7
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

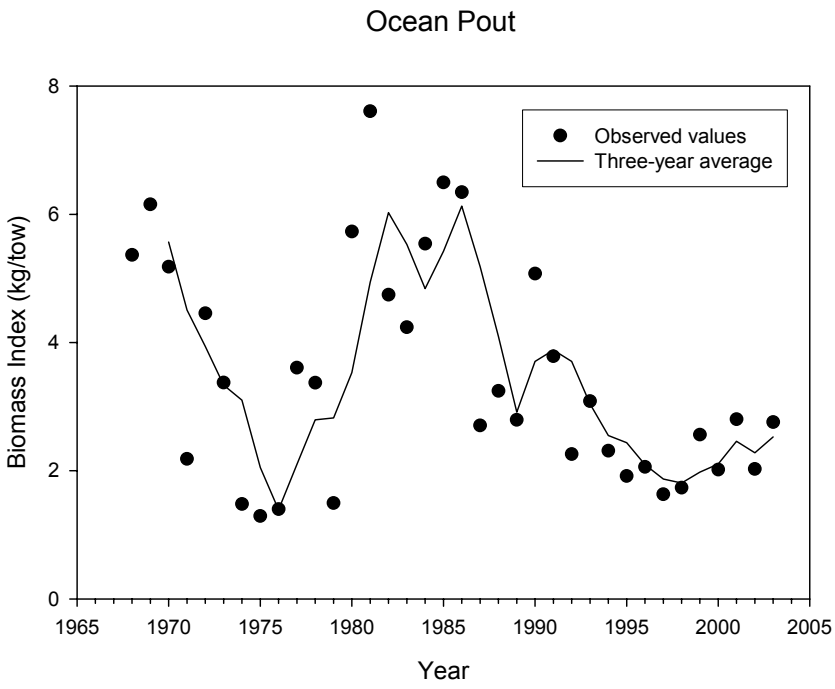

White Hake over 60 cm
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
2
4
6
8
10
12
14
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

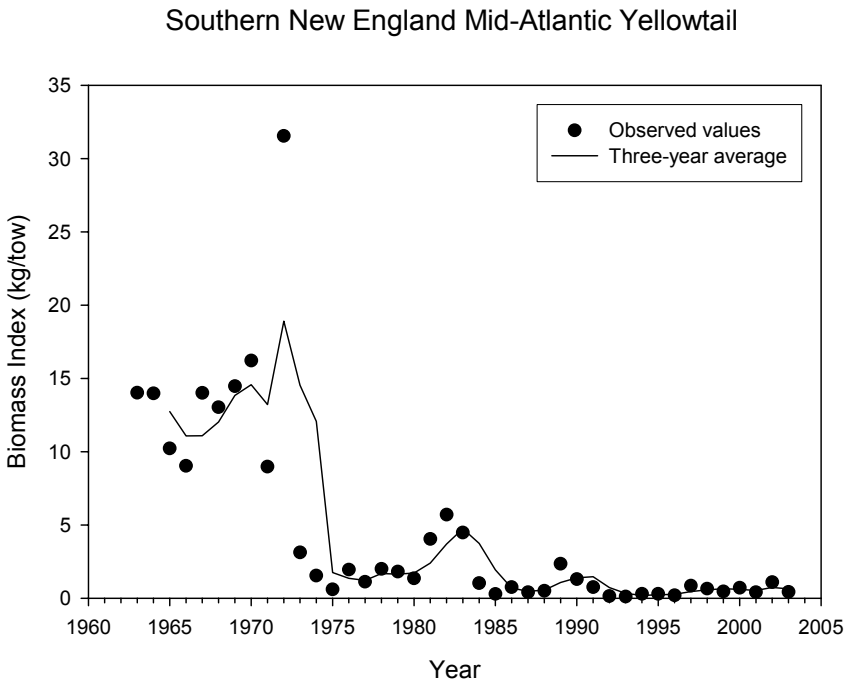

Pollock
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
2
4
6
8
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005


Acadian Redfish
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
10
20
30
40
50
60
70
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005


Northern Windowpane
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0.0
0.5
1.0
1.5
2.0
2.5
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005


Atlantic Halibut
Observed values
Three-year average
Biomass Index (kg/tow)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year


Ocean Pout
Observed values
Three-year average
Biomass Index (kg/tow)
0
2
4
6
8
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year


Southern New England Mid-Atlantic Yellowtail
Observed values
Three-year average
Biomass Index (kg/tow)
Year
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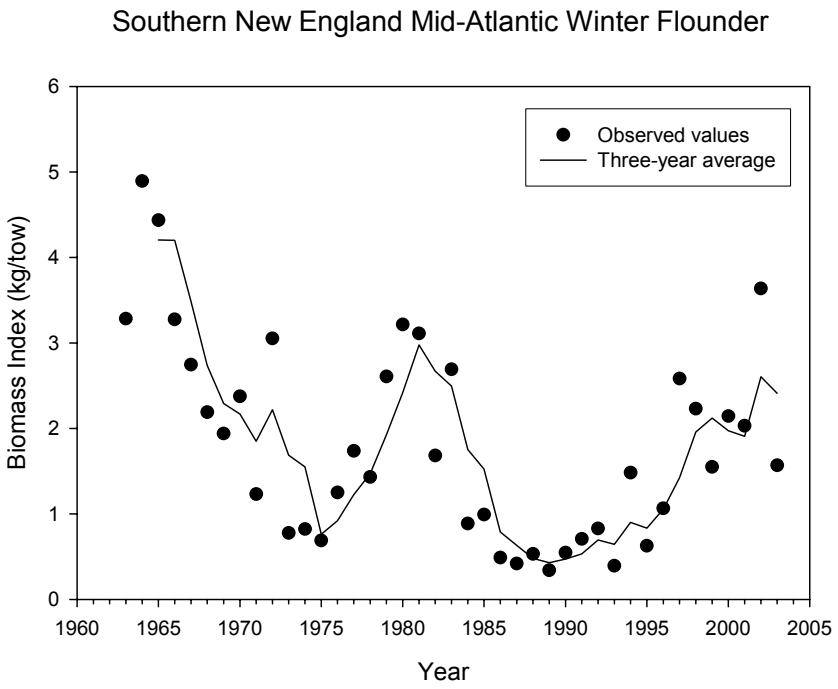
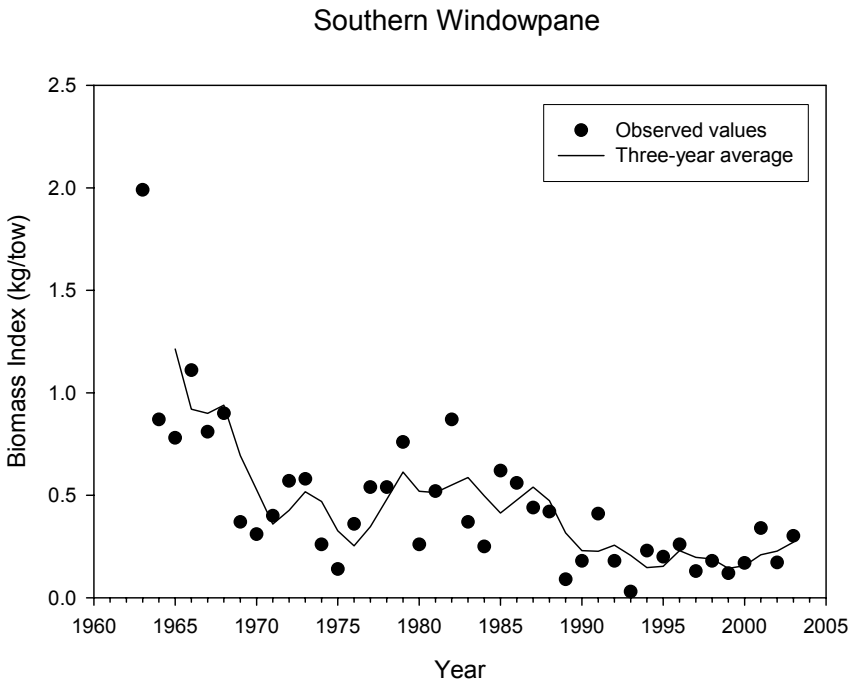
5
10
15
20
25
30
35
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005


Southern New England Mid-Atlantic Winter Flounder
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
6
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005


Southern Windowpane
Observed values
Three-year average
Biomass Index (kg/tow)
2.5
2.0
1.5
1.0
0.5
0.0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year

6.2.2 Habitat

6.2.3 Habitat Associations and Functions

Amendment 13 provided a detailed description of the habitat associations and functions for the multispecies fishery, throughout its range. While the new SAP considered by this action takes place in the Gulf of Maine, other measures affect groundfish fishing in all areas and so key elements of the Amendment 13 discussion are repeated below.

6.2.3.1 Gulf of Maine

The Gulf of Maine's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. The greatest number of invertebrates in this region are classified as mollusks, followed by annelids, crustaceans, echinoderms and other (Theroux and Wigley 1998). By weight, the order of taxa changes to echinoderms, mollusks, other, annelids and crustaceans. Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven types of bottom assemblages. These assemblages are identified in Table 24 and their distribution is depicted in Figure 8. This classification system considers benthic assemblage, substrate type and water properties. Several authors have examined the species assemblages and related them to habitat areas or physical characteristics. For example, Overholtz & Tyler (1985) identified five assemblages for this region (Table 25).

Benthic Assemblage	Benthic Community Description
1	Comprises all sandy offshore banks, most prominently Jeffreys Ledge, Fippennies Ledge, and Platts Bank; depth on top of banks about 70 m; substrate usually coarse sand with some gravel; fauna characteristically sand dwellers with an abundant interstitial component.
2	Comprises the rocky offshore ledges, such as Cashes Ledge, Sigsbee Ridge and Three Dory Ridge; substrate either rock ridge outcrop or very large boulders, often with a covering of very fine sediment; fauna predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers; overlying water usually cold Gulf of Maine Intermediate Water.
3	Probably extends all along the coast of the Gulf of Maine in water depths less than 60 m; bottom waters warm in summer and cold in winter; fauna rich and diverse, primarily polychaetes and crustaceans; probably consists of several (sub-) assemblages due to heterogeneity of substrate and water conditions near shore and at mouths of bays.
4	Extends over the soft bottom at depths of 60 to 140 m, well within the cold Gulf of Maine Intermediate Water; bottom sediments primarily fine muds; fauna dominated by polychaetes, shrimp, and cerianthid anemones.
5	A mixed assemblage comprising elements from the cold water fauna as well as a few deeper water species with broader temperature tolerances; overlying water often a mixture of Intermediate Water and Bottom Water, but generally colder than 7° C most of the year; fauna sparse, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthid also present.
6	Comprises the fauna of the deep basins; bottom sediments generally very fine muds, but may have a gravel component in the offshore morainal regions; overlying water usually 7 to 8° C, with little variation; fauna shows some bathyal affinities but densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipod.
7	The true upper slope fauna that extends into the Northeast Channel; water temperatures are always above 8° and salinities are at least 35 ppt; sediments may be either fine muds or a mixture of mud and gravel.

Table 24 - Gulf of Maine benthic assemblages as identified by Watling (1998).

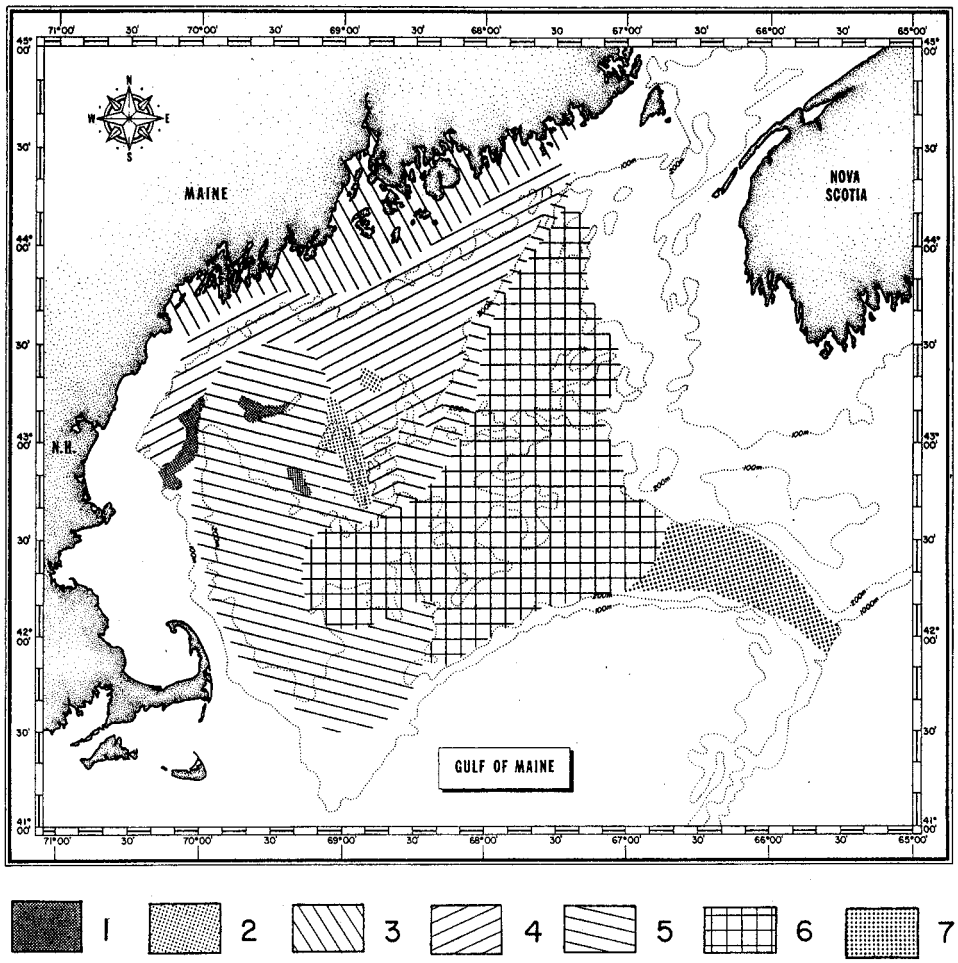


Figure 8 - Distribution of the seven major benthic assemblages in the Gulf of Maine as determined from both soft bottom quantitative sampling and qualitative hard bottom sampling.

The assemblages are characterized as follows: 1. Sandy offshore banks; 2. Rocky offshore ledges; 3. Shallow (<50 m) temperate bottoms with mixed substrate; 4. Boreal muddy bottom, overlain by Maine Intermediate Water, 50 – 160 m (approx.); 5. Cold deep water, species with broad tolerances, muddy bottom; 6. Deep basin warm water, muddy bottom; 7. Upper slope water, mixed sediment. Source: Watling 1998.

Overholtz & Tyler (1984)		Gabriel (1992)	
Assemblage	**Species**	**Species**	**Assemblage**
Slope & Canyon	offshore hake blackbelly rosefish Gulf stream flounder fourspot flounder monkfish, whiting white hake, red hake	offshore hake blackbelly rosefish Gulf stream flounder fawn cusk-eel, longfin hake, armored sea robin	**Deepwater**
Intermediate	whiting red hake monkfish Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	whiting red hake monkfish short-finned squid, spiny dogfish, cusk	**Combination of Deepwater Gulf of Maine/Georges Bank & Gulf of Maine-Georges Bank Transition**
Shallow	Atlantic cod haddock pollock whiting white hake red hake monkfish ocean pout yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin summer flounder sea raven, sand lance	Atlantic cod haddock pollock yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin	**Gulf of Maine-Georges Bank Transition Zone** **Shallow Water Georges Bank-Southern New England**
Gulf of Maine-Deep	white hake American plaice witch flounder thorny skate whiting, 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**

Table 25 - Comparison of demersal fish assemblages of Georges Bank and Gulf of Maine identified by Overholtz and Tyler (1985) and Gabriel (1992).

Gabriel analyzed a greater number of species and did not overlap assemblages.

6.2.3.2 Georges Bank

The interaction of several environmental factors including availability and type of sediment, current speed and direction, and bottom topography have been found to combine to form seven sedimentary provinces on eastern Georges Bank (Valentine et al. 1993), which are outlined in Table 26 and depicted in Figure 9.

Theroux and Grosslein (1987) identified four macrobenthic invertebrate assemblages that corresponded with previous work in the geographic area. They noted that it is impossible to define distinct boundaries between assemblages because of the considerable intergrading that occurs between adjacent assemblages; however, the assemblages are distinguishable. Their assemblages are associated with those identified by Valentine et al. (1993) in Table 26.

The Western Basin assemblage (Theroux and Grosslein 1987) is found in the upper Great South Channel region at the northwestern corner of the bank, in comparatively deep water (150-200 m) with relatively slow currents and fine bottom sediments of silt, clay and muddy sand. This is the general area of the CAI Hook Gear Haddock SAP. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers. Representative organisms include bivalves (*Thyasira flexuosa, Nucula tenuis, Musculus discors*), annelids (*Nephtys incisa, Paramphinome pulchella, Onuphis opalina, Sternaspis scutata*), the brittle star (*Ophiura sarsi*), the amphipod *Haploops tubicola*, and red crab (*Geryon quedens*). Valentine et al. 1993 did not identify a comparable assemblage; however, this assemblage is geographically located adjacent to Assemblage 5 as described by Watling (1998) (Table 24**,** Figure 8).

The Northeast Peak assemblage is found along the Northern Edge and Northeast Peak, which varies in depth and current strength and includes coarse sediments, mainly gravel and coarse sand with interspersed boulders, cobbles and pebbles. This is the general area of part of the CAII Haddock SAP, though the assemblage also extends to the east into Canadian waters. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittlestars, crustaceans and polychaetes), with a characteristic absence of burrowing forms. Representative organisms include amphipods (*Acanthonotozoma serratum, Tiron spiniferum*), the isopod *Rocinela americana*, the barnacle *Balanus hameri*, annelids (*Harmothoe imbricata, Eunice pennata, Nothria conchylega,* and *Glycera capitata*), sea scallops (*Placopecten magellanicus*), brittlestars (*Ophiacantha bidentata, Ophiopholis aculeata*), and soft corals (*Primnoa resedaeformis*, *Paragorgia arborea*).

The Central Georges assemblage occupies the greatest area, including the central and northern portions of the bank in depths less than 100 m. This area is included in both the CAII Haddock SAP (the portion of the SAP area west of CAII) and the Western U.S./Canada area. Medium grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large in size with burrowing or motile habits. Sand dollars (*Echinarachnius parma*) are most characteristic of this assemblage. Other representative species include mysids (*Neomysis americana*, *Mysidopsis bigelowi*), the isopod *Chiridotea tuftsi*, the cumacean *Leptocuma minor*, the amphipod *Protohaustorius wigleyi*, annelids (*Sthenelais limicola, Goniadella gracilis, Scalibregma inflatum*), gastropods (*Lunatia heros*, *Nassarius trivittatus*), the starfish *Asterias vulgaris*, the shrimp *Crangon septemspinosa* and the crab *Cancer irroratus*.

The Southern Georges assemblage is found on the southern and southwestern flanks at depths from 80 m 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 genus *Astropecten*. Representative organisms include amphipods (*Ampelisca compressa, Erichthonius rubricornis, Synchelidium americanum*), the cumacean *Diastylis quadrispinosa,* annelids

(*Aglaophamus circinata, Nephtys squamosa, Apistobranchus tullbergi*), crabs (*Euprognatha rastellifera, Catapagurus sharreri*) and the shrimp *Munida iris*.

Along with high levels of primary productivity, Georges Bank has been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel identified six assemblages, which are compared with the results of Overholtz & Tyler (1985) in Table 25. Mahon et al. (1998) found similar results.

Sedimentary Province	Depth (m)	Description	Benthic Assemblage
Northern Edge / Northeast Peak (1)	40-200	Dominated by gravel with portions of sand, common boulder areas, and tightly packed pebbles. Representative epifauna (bryozoa, hydrozoa, *anemones,*and *calcareous* worm tubes) are abundant in areas of boulders. *Strong tidal and storm currents.*	Northeast Peak
Northern Slope & Northeast Channel (2)	200-240	Variable sediment type (gravel, gravel-sand, and sand) scattered bedforms. This is a transition zone between the northern edge and southern slope. *Strong tidal and storm currents.*	Northeast Peak
North / Central Shelf (3)	60-120	Highly variable sediment type (ranging from gravel to sand) with rippled sand, large bedforms, and patchy gravel lag deposits. *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Central & Southwestern Shelf - *shoal ridges* (4)	10-80	Dominated by sand (fine and medium grain) with large sand ridges, dunes, waves, and ripples. Small bedforms in southern part. *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Central & Southwestern Shelf - *shoal troughs* (5)	40-60	Gravel (including gravel lag) and gravel-sand between large sand ridges. Patch large bedforms. Strong currents. (Few samples – submersible observation noted presence of gravel lag, rippled gravel-sand, and large bedforms.) *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Southeastern Shelf (6)	80-200	Rippled gravel-sand (medium and fine-grained sand) with patchy large bedforms and gravel lag. Weaker currents; *ripples are formed by intermittent storm currents. Representative epifauna include sponges attached to shell fragments and amphipods.*	Southern Georges
Southeastern Slope (7)	400-2000	Dominated by silt and clay with portions of sand (medium and fine) with rippled sand on shallow slope and smooth silt-sand deeper.	none

Table 26 - Sedimentary provinces of Georges Bank, as defined by Valentine *et al.* (1993) and Valentine and Lough (1991) with additional comments by Valentine (personal communication) and Benthic Assemblages assigned from Theroux and Grosslein (1987).

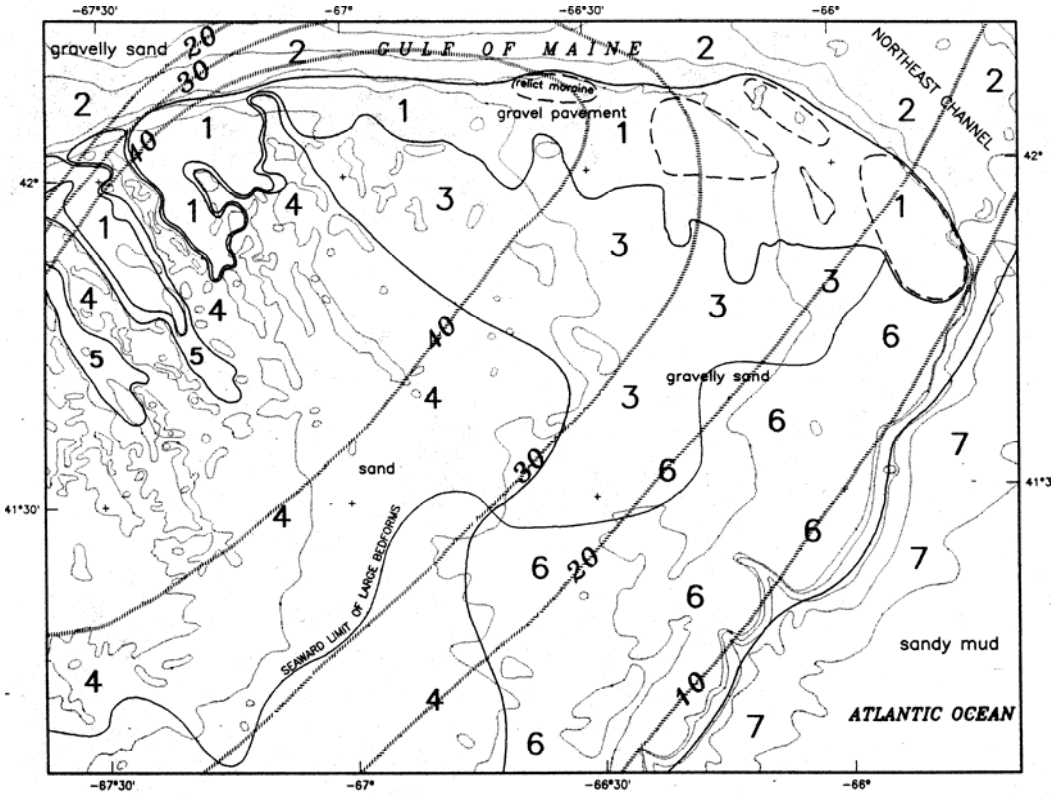


Figure 9 - Sedimentary provinces of eastern Georges Bank based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/sec).

Relict moraines (bouldery sea floor) are enclosed by dashed lines. Source: Valentine and Lough (1991).

6.2.3.3 Southern New England/Mid-Atlantic Bight

Three broad faunal zones related to water depth and sediment type were identified for the Mid-Atlantic by Pratt (1973). The "sand fauna" zone was defined for sandy sediments (1% or less silt) which are at least occasionally disturbed by waves, from shore out to 50 m. The "silty sand fauna" zone occurred immediately offshore from the sand fauna zone, in stable sands containing at least a few percent silt and slightly more (2%) organic material. Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley, and support the "silt-clay fauna."

Demersal fish assemblages were described at a broad geographic scale for the continental shelf and slope from Cape Chidley, Labrador to Cape Hatteras, North Carolina (Mahon *et al.* 1998) and from Nova Scotia to Cape Hatteras (Gabriel 1992). Factors influencing species distribution included latitude and depth.

Results of these studies were similar to an earlier study confined to the Mid-Atlantic Bight continental shelf (Colvocoresses and Musick 1983). In this study, there were clear variations in species abundances, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. This is especially true for five strongly recurring species associations that varied slightly by season (Table 27). The boundaries between fish assemblages generally followed isotherms and isobaths. The assemblages were largely similar between the spring and fall collections, with the most notable change being a northward and shoreward shift in the temperate group in the spring.

Season	Species Assemblage				
	Boreal	**Warm temperate**	**Inner shelf**	**Outer shelf**	**Slope**
Spring	Atlantic cod little skate sea raven monkfish winter flounder longhorn sculpin ocean pout whiting red hake white hake spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin	windowpane	fourspot flounder	shortnose greeneye offshore hake blackbelly rosefish white hake
Fall	white hake whiting red hake monkfish longhorn sculpin winter flounder yellowtail flounder witch flounder little skate spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin smooth dogfish	windowpane	fourspot flounder fawn cusk eel gulf stream flounder	shortnose greeneye offshore hake blackbelly rosefish white hake witch flounder

Table 27 - Major Recurrent Demersal Finfish Assemblages of the Mid-Atlantic Bight During Spring and Fall as Determined by Colvocoresses and Musik (1983).

6.2.4 Gear Effects

A number of authors have reviewed, to varying extents, existing scientific literature on the effects of fishing on habitat (e.g., Auster et al. 1996, Cappo et al. 1998, Collie 1998, Jennings and Kaiser 1998, Rogers et al. 1998, Auster and Langton 1999, Hall 1999, Collie et al. 2000, Lindeboom and de Groot 2000, Barnette 2001, National Research Council 2002). The following summary of the conclusions reached by these authors is extracted from a recent NOAA report (Johnson 2002). This discussion will focus on the gears likely to be used in the Category B (regular) DAS Pilot Program, the CAI Hook Gear Haddock SAP, and the CAII Haddock SAP: otter trawls, longlines, and gillnets. Most of the discussion relates to mobile gear (otter trawls) since that gear is believed to have more impacts on habitat than fixed gear.

A number of review papers have focused specifically on the physical effects of bottom trawls. In Europe, an ICES working committee (ICES 1973) concluded that otter trawls, beam trawls and dredges all have similar effects on the seabed, but the magnitude of disturbance increases from shrimp to beam trawls with tickler and stone guards, to Rapido trawls, to mollusk (e.g., scallop) dredges. Kaiser et al. (1996) and Collie et al. (2000) state that, because beam trawls are used almost exclusively in areas that are adapted to frequent wave/tidal action, they are less likely to adversely affect bottom habitats. As mentioned elsewhere in the Amendment 13 FSEIS, scallop dredges used in Europe and Australia are designed differently than the sweep dredge used in the Northeast region of the U.S. Specifically, they have a row of teeth that penetrate several inches into the bottom and therefore have a greater impact on benthic habitats than the sweep dredge. Beam trawls and Rapido trawls are not used in the U.S. groundfish fishery.

Auster et al. (1996) conducted three studies of mobile fishing gear in the Gulf of Maine and concluded that mobile fishing gear alters the seafloor and reduces habitat complexity, sedimentary structures, and emergent epifauna. Collie (1998) reviewed studies from New England and concluded that hard bottom benthic habitats (e.g., boulders and gravel pavement) experience significant impacts of mobile bottom-tending fishing gear, while mobile sand habitats are less vulnerable. Jennings and Kaiser (1998) concluded that fishing activities lead to changes in the structure of marine habitats and influence the diversity, composition, biomass, and productivity of the associated biota. They further concluded that these effects vary according to gears used, habitats fished, and the magnitude of natural disturbance, but tend to increase with depth and the stability of the substrate. Auster and Langton (1999) reviewed 22 studies from a wide geographic range and concluded that mobile fishing gear reduces habitat complexity by: (1) directly removing epifauna or damaging epifauna leading to mortality, (2) smoothing sedimentary bedforms and reducing bottom roughness, and (3) removing taxa which produce structure (i.e., taxa which produce burrows and pits). They also concluded that for fixed gear, the area impacted per unit effort is smaller than for mobile gear, but the types of damage to emergent benthos appear to be similar (but not necessarily equivalent per unit effort).

Collie et al. (2000) analyzed 39 published studies to compile and evaluate current findings regarding fishing gear effects on different types of benthic habitat. They found: (1) 89% of the studies were undertaken at depths less than 60 m; (2) otter trawl gear is the most frequently studied; (3) most studies have been done in Northern Europe and Eastern North America. The authors reached several conclusions regarding the effects of fishing: (1) intertidal dredging and scallop dredging have the greatest initial effects on benthic biota, followed by otter trawling and then beam trawling (although beam trawling studies were conducted in dynamic sandy areas, where effects might be less apparent); (2) fauna in stable gravel, mud and biogenic habitats are more adversely affected than those in less consolidated coarse sediments; (3) recovery appears most rapid in less physically stable habitats (inhabited generally

by more opportunistic species); (4) we may accurately predict recovery rates for small-bodied taxa, but communities often contain one or two long-lived, vulnerable species; (5) large-bodied organisms are more prevalent before trawling; and (6) the mean initial response to fishing impacts is negative (55% reduction of individual taxa). Based on these findings, the authors suggested that the scientific community abandon short-term small-scale experiments and undertake larger scale experiments that mimic the timing and frequency of disturbance typical of commercial fishing activities.

A working committee of the International Council for the Exploration of the Seas (ICES) issued, in November 2000, a report on the "Effects of Different Types of Fisheries on North Sea and Irish Sea Benthic Ecosystems." This report (ICES 2001) was a summary of findings based on a comprehensive report of the same title edited by Lindeboom and de Groot (1998). Direct habitat effects of fishing have also been summarized by Johnson (2002) in four categories: alteration of physical structure, sediment suspension, chemical modifications, and benthic community changes. Refer to Amendment 13 for a complete discussion and evaluation of summary provided by Johnson (2002).

The most recent and comprehensive summary of gear effects on benthic marine habitats was prepared by the National Research Council. This report, entitled "Effects of Trawling and Dredging on Seafloor Habitat" (NRC 2002) reiterated four general conclusions regarding the types of habitat modifications caused by trawls and dredges.

1. Trawling and dredging reduce habitat complexity.
2. Repeated trawling and dredging result in discernable changes in benthic communities.
3. Bottom trawling reduces the productivity of benthic habitats.
4. Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

The NRC report also summarized the indirect effects of mobile gear fishing on marine ecosystems. It did not consider the effects of all gear types, only the two (trawls and dredges) that are considered to most affect benthic habitats. It also provided detailed information from only a few individual studies.

An additional source of information used to evaluate gear effects on habitat is the report of a gear effects workshop sponsored by the New England and Mid-Atlantic Fishery Management Councils in October 2001 (NREFHSC 2002). This report includes conclusions reached by a panel of experts on the effect of different gears on benthic habitat types in the Northeast U.S. and is summarized in Table 28 below. The results of the workshop have been considered in the next section, which includes a review of the relevant fishing gear effects literature.

Results of a comprehensive review of available gear effect publications on bottom otter trawls that were relevant to the NE region of the U.S. are summarized here. Refer to Amendment 13 for the full gear effects evaluation and list of authors. Positive and negative effects of otter trawls reported in these publications are listed by substrate type in Table 29 to Table 30 below along with recovery times (when known). Without more information on recovery times, it is difficult to be certain which of the negative effects listed in these tables last for, say, more than a month or two. In fact, it is difficult to conclude in some cases (e.g., furrows produced by trawl doors) whether the habitat effect is positive, negative, or neutral. Despite these shortcomings in the information, the scientific literature for the NE region does provide some detailed results that confirm the previous determinations of potential adverse impacts of trawls and dredges that were based on the ICES (2001), NRC (2002), and Morgan and Chuenpagdee (2003) reports.

TYPE OF IMPACT	DEGREE OF IMPACT	DURATION	TYPE OF EVIDENCE	COMMENTS
MUD				
Removal of Major Physical Features	XXX (H) N/A (L)	Permanent	PJ	(H) in Mud referrs to clay (i.e., tilefish burrows) in all cases
Impacts to Biological Structure	Unknown (H) XX* (L)	Months - Yrs	PJ	(L) opinions ranged from X-XXX
Impacts to Physical Structure	XXX* (H) XX* (L)	Months - Yrs	PR, GL, PJ	(L) opinions ranged from XX-XXX and unknown
Changes in Benthic Prey	Unknown			
SAND				
Removal of Major Physical Features	N/A	N/A	N/A	
Impacts to Biological Structure	XX* (H, L)	Months - Years	PR, GL, PJ	(H) opinion ranged from X-XXX (L) opinion ranged from XX-XXX
Impacts to Physical Structure	X* (H) XX* (L)	Days - Months	PR, GL, PJ	(H, L) opinion ranged from X-XXX
Changes in Benthic Prey	XX* (H, L)	Months - Years	PR, PJ, GL	(H) opinions were XX or unknown (L) ranged from X-XXX and unknown
GRAVEL				
Removal of Major Physical Features	XXX (H, L)	Permanent	PR, GL,PJ	
Impacts to Biological Structure	XXX (H, L)	Months - Years	PR, GL, PJ	
Impacts to Physical Structure	XXX (H, L)	Months - Years	PR, GL, PJ	Rocks altered or relocated
Changes in Benthic Prey	Unknown			

KEY: X = Effect can be present, but is rarely large; XX = Effect is present and moderate; XXX = Effect is often present and can be large; N/A = Effect is not present or not applicable; Unknown = effects are not currently known; (H) = High energy environment; (L) = Low energy environment; PR = Peer reviewed literature; GL = Grey literature; PJ = Professional judgment. For definitions of Substrate Type and Type of Impact see Appendix D.

NOTE: Ongoing Canadian experiments will be able to provide additional information in the near future.

* **This does not represent a consensus among the panel**

Table 28 - Impacts of Otter Trawls on Benthic Habitat

Physical Effects	Recovery
Doors produce furrows/berms	2-18 months
Repeated tows increase bottom roughness	
Re-suspension/dispersal of fine sediments	
Rollers compress sediments	
Smoothing of surface features	
Biological Effects	
Reduced infaunal abundance	Within 3 ½ months (1 of 2 studies)
Reduced number of infaunal species	Within 3 ½ months
Reduced abundance of polychaete/bivalve species	Within 3 ½ months (1 of 2 studies)
Increased food value of sediments	
Increased chlorophyll production of surface sediments	
Removal/damage of epifauna	
Reduced abundance of brittlestars	
Increased number of infaunal species	
Increased abundance of polychaetes	
Decreased abundance of bivalves	
Altered community structure	18 months

Table 29 – Effects and Recovery Times of Bottom Otter Trawls on Mud Substrate in the Northeast Region as Noted By Authors of Eight Gear Effect Studies.

Physical Effects	Recovery
Doors produce furrows/berms	Few days – a year
Smoothing of surface features	Within a year
Re-suspension/dispersal of fine sediments	No lasting effects
Biological Effects	
Mortality of large sedentary and/or immobile epifaunal species	
Reduced density of attached macrobenthos	
Removal/damage of epifauna	
Reduced abundance of polychaetes	
Reduced abundance/biomass of epibenthic organisms	
Reduced biomass/average size of many epibenthic species	
Epifauna (sponges/anemones) less abundant in closed areas	

Table 30 - Effects and Recovery Times of Bottom Otter Trawls on Sand Substrate in the Northeast Region as Noted By Authors of Twelve Gear Effect Studies.

Physical Effects	Recovery
Displaced boulders	
Removal of mud covering boulders and rocks	
Groundgear leave furrows	
Biological Effects	
Reduced abundance of attached organisms (sponges, anemones, soft corals)	
Damaged sponges, soft corals, brittle stars	12 months

Table 31 – Effects and Recovery Times of Bottom Otter Trawls on Gravel and Rock Substrate in the Northeast Region as Noted By Authors of Three Gear Effect Studies.

6.3 Endangered and Other Protected Species

As discussed in Amendment 13 to the Northeast Multispecies FMP (NEFMC 2003), the following protected species are found in the environment utilized by the fisheries regulated by the amendment. A number of them are listed under the Endangered Species Act of 1973 (ESA) as endangered or threatened, while others are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA). Two right whale critical habitat designations are located in the area of the multispecies fishery. While a list of the species is included in this document, the information provided here is summary of the full descriptions provided in the Amendment 13 Final Supplemental Environmental Impact Statement. Barndoor skate, a candidate species for listing under the ESA, is discussed in the Skate Baseline Review included in this document.

Cetaceans	
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella* spp.)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected
Seals	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandica*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Birds	
Roseate tern (*Sterna dougallii dougallii*)	Endangered
Piping plover (*Charadrius melodus*)	Endangered

Critical Habitat Designations
Right whale Cape Cod Bay
Great South Channel

Although all of the species listed above may be found in the general geographical area covered by the Multispecies FMP, not all are affected by the fishery. Some species may inhabit areas other than those in which the fishery is prosecuted, prefer a different depth or temperature zone, or may migrate through the area at times when the fishery is not in operation. In addition, certain protected species may not be vulnerable to capture or entanglement with the gear used in the fishery. Therefore, protected species are divided into two groups. The first contains those species not likely to be affected by Amendment 13 or measures included in this framework, while the second group is the subject of a more detailed assessment because of potential or documented interactions with protected species.

6.3.1 Protected Species Not Likely to be Affected by the Multispecies FMP

Following a review of the current information available on the distribution and habitat needs of the endangered, threatened, and otherwise protected species listed above in relation to the action being considered, the Council considers that multispecies fishing operations and the measures proposed in Framework 40A to the Northeast Multispecies FMP are unlikely to affect the shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, roseate tern, piping plover and the hawksbill sea turtle, all of which are species listed under the ESA. As discussed in Amendment 13, there is little habitat and distribution overlap between these species and the multispecies fishery making the likelihood of encounters rare events.

No evidence to date suggests that operation of the fishery adversely affects the value of critical habitat designated to protect right whales. Right whale critical habitat, therefore, is not discussed further in this document.

6.3.2 Protected Species Potentially Affected by the Multispecies FMP

The status information below is a summary of that provided in the Amendment 13 documents and describes the threatened and endangered species that are potentially affected by the proposed action as well as those accorded protection by the Marine Mammal Protection Act. All have previously been discussed in more detail in the Amendment 13 Final Environmental Impact Statement. That information is incorporated herein by reference

North Atlantic Right Whale
The North Atlantic right whale population, which numbers less than 300 animals ranges from wintering and calving grounds in the southeastern U.S. to summer feeding grounds in New England, the northern Bay of Fundy and the Scotian Shelf. New England waters are a primary feeding ground.

Right whales feed on zooplankton throughout the water column, and may feed near the bottom in shallow waters. In the Gulf of Maine, they have been observed feeding primarily on copepods, by skimming at or below the water's surface with open mouths (NMFS 1991; Kenney et al. 1986; Murison and Gaskin 1989; and Mayo and Marx 1990). Research suggests that right whales must locate and exploit extremely dense patches of zooplankton to feed efficiently (Waring et al. 2003).

At least some portion of the right whale population is present in New England waters throughout most months of the year. They are most abundant in Cape Cod Bay between February and April (Hamilton and Mayo 1990; Schevill et al. 1986; Watkins and Schevill 1982) and in the Great South Channel in May and June (Kenney et al. 1986; Payne et al. 1990) where they have been observed feeding predominantly on copepods, largely of the genera *Calanus* and *Pseudocalanus* (Waring et al. 2003). Right whales also frequent Stellwagen Bank and Jeffrey's Ledge, as well as Canadian waters including the Bay of Fundy and Browns and Baccaro Banks, in the spring and summer months. Mid-Atlantic waters are used as a migratory pathway from the spring and summer feeding/nursery areas to the winter calving grounds off the coast of Georgia and Florida.

Sources of mortality include ship strikes and entanglement in fixed fishing gear. Considered to be the most endangered whale in the world, the current death rate far exceeds the birth rate in the western North Atlantic population. An increasing calving interval, the relatively large number of female right whales killed and human-related mortality make the probability of right whale extinction in the next 191 years very high (Caswell et al. 1999).

Humpback Whale

Humpback whales calve and mate in the West Indies and migrate to feeding areas in the northwestern Atlantic during the summer months. Six separate feeding areas are utilized in northern waters (Waring et al. 2002). Only one of these feeding areas, the Gulf of Maine, lies within U.S. waters contained within the management unit of the FMP (Northeast Region). Most of the humpbacks that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod Bays. Sightings are most frequent from mid-March through November between 41º N and 43º N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge (CeTAP 1982), and peak in May and August. However, small numbers of individuals may be present in this area year-round. They feed on a number of species of small schooling fishes, particularly sand lance and Atlantic herring, by filtering large amounts of water through their baleen to capture prey (Wynne and Schwartz 1999).

Humpback whales use the mid-Atlantic as a migratory pathway. However, observations of juvenile humpbacks since 1989 in the mid-Atlantic have been increasing during the winter months, peaking January through March (Swingle et al. 1993). Biologists theorize that non-reproductive animals may be establishing a winter-feeding range in the mid-Atlantic since they are not participating in reproductive behavior in the Caribbean. The whales using this mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding stocks in the mid-Atlantic region.

New information has become available on the status and trends of the humpback whale population in the North Atlantic that indicates the population is increasing. However, it has not yet been determined whether this increase is uniform across all six feeding stocks (Waring et al. 2003). For example, although the overall rate of increase has been estimated at 9.0% (CV=0.25) by Katona and Beard (1990), Barlow and Clapham (1997) reported a 6.5% rate through 1991 for the Gulf of Maine feeding group.

A variety of methods have been used to estimate the North Atlantic humpback whale population. However, the photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project gave a North Atlantic basin-wide estimate of 11,570 (CV= 0.069) is regarded as the best available estimate for that population, although caveat are associated with this estimate (Waring et al. 2003).

The major known sources of anthropogenic mortality and injury of humpback whales include entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies, and ship strikes. Based on photographs of the caudal peduncle of humpback whales, Robbins and Mattila (1999) estimated that between 48% and 78% of animals in the Gulf of Maine exhibit scarring caused by entanglement.

Fin Whale

Fin whales inhabit a wide range of latitudes between 20-75° N and 20-75° S (Perry et al. 1999). Fin whales spend the summer feeding in the relatively high latitudes of both hemispheres, particularly along the cold eastern boundary currents in the North Atlantic and North Pacific Oceans and in Antarctic waters (IWC 1992). Most migrate seasonally from relatively high-latitude Arctic and Antarctic feeding areas in the summer to relatively low-latitude breeding and calving areas in the winter (Perry et al. 1999).

In the North Atlantic today, fin whales are widespread and occur from the Gulf of Mexico and Mediterranean Sea northward to the edges of the arctic pack ice (NMFS 1998b). A number of researchers have suggested the existence of fin whale subpopulations in the North Atlantic. Mizroch et al. (1984) suggested that local depletions resulting from commercial over harvesting supported the existence of North Atlantic fin whale subpopulations. Others have used genetic information to support the existence of multiple subpopulations of fin whales in the North Atlantic and Mediterranean (Bérubé et al. 1998). Although the IWC's Scientific Committee proposed seven stocks for North Atlantic fin whales, it is uncertain whether these stock boundaries define biologically isolated units (Waring et al. 2003). NMFS has designated one stock of fin whale for U.S. waters of the North Atlantic (Waring et al. 2003) where the species is commonly found from Cape Hatteras northward.

Various estimates have been provided to describe the current status of fin whales in western North Atlantic waters. The latest published SAR (Waring et al. 2003) gives a best estimate of abundance for fin whales of 2,814 (CV = 0.21). However, this is considered an underestimate, as too little is known about population structure, and the estimate is derived from surveys over a limited portion of the western North Atlantic. There is also not enough information to estimate population trends.

The major known sources of anthropogenic mortality and injury of fin whales include ship strikes and entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies. However, many of the reports of mortality cannot be attributed to a particular source. Of 18 fin whale mortality records collected between 1991 and 1995, four were associated with vessel interactions, although the true cause of mortality was not known. Although several fin whales have been observed entangled in fishing gear, with some being disentangled, no mortalities have been attributed to gear entanglement.

In general, known mortalities of fin whales are less than those recorded for right and humpback whales. This may be due in part to the more offshore distribution of fin whales where they are either less likely to encounter entangling gear, or are less likely to be noticed when gear entanglements or vessel strikes do occur.

The overall distribution of fin whales may be based on prey availability. This species preys opportunistically on both zooplankton and fish (Watkins et al. 1984). The predominant prey of fin whales varies greatly in different geographical areas depending on what is locally available. In the western North Atlantic fin whales feed on a variety of small schooling fish (i.e., herring, capelin, sand lance) as well as squid and planktonic crustaceans (Wynne and Schwartz 1999). As with humpback whales, fin whales feed by filtering large volumes of water for their prey through their baleen plates. Photo identification studies in western North Atlantic feeding areas, particularly in Massachusetts Bay, have shown a high rate of annual return by fin whales, both within years and between years (Seipt et al. 1990).

Sei Whale

Sei whales are a widespread species in the world's temperate, subpolar and subtropical and even tropical marine waters. However, they appear to be more restricted to temperate waters than other balaenopterids (Perry et al. 1999). Mitchell and Chapman (1977) suggested that the sei whale population in the western North Atlantic consists of two stocks, a Nova Scotian Shelf stock and a Labrador Sea stock. The Nova Scotian Shelf stock includes the continental shelf waters of the Northeast Region, and extends northeastward to south of Newfoundland. The IWC boundaries for this stock are from the U.S. east coast to Cape Breton, Nova Scotia and east to 42°W longitude (Waring et al. 2003). This is the only sei whale stock within the management unit of this FMP.

Sei whales occur in deep water throughout their range, typically over the continental slope or in basins situated between banks (NMFS 1998a). In the northwest Atlantic, the whales travel along the eastern Canadian coast in autumn on their way to and from the Gulf of Maine and Georges Bank where they occur in winter and spring. Within the Northeast Region, the sei whale is most common on Georges Bank and into the Gulf of Maine/Bay of Fundy region during spring and summer. Individuals may range as far south as North Carolina. It is important to note that sei whales are known for inhabiting an area for weeks at a time then disappearing for year or even decades. This has been observed all over the world, including in the southwestern Gulf of Maine in 1986, but the basis for this phenomenon is not clear.

Although sei whales may prey upon small schooling fish and squid in the Northeast Region, available information suggests that calanoid zooplankton are the primary prey of this species. There are occasional influxes of sei whales further into Gulf of Maine waters, presumably in conjunction with years of high copepod abundance inshore.

There are insufficient data to determine trends of the sei whale population. Because there are no abundance estimates within the last 10 years, a minimum population estimate cannot be determined for management purposes (Waring et al. 2003). Abundance surveys are problematic because this species is difficult to distinguish from the fin whale and too little is known of the sei whale's distribution, population structure and patterns of movement.

No instances of injury or mortality of sei whales due to entanglements in fishing gear have been recorded in U.S. waters, possibly because sei whales typically inhabit waters further offshore than most commercial fishing operations, or perhaps entanglements do occur but are less likely to be observed. However, due to the overlap of this species observed range with the multispecies fishery areas that use sink gillnet gear, the potential for entanglement does exist. As noted in Waring, et al. (2003), sei whale movements into inshore areas have occurred historically. Similar impacts noted above for other baleen whales may also occur. Due to the deep-water distribution of this species, interactions that do occur are less likely to be observed or reported than those involving right, humpback, and fin whales that often frequent areas within the continental shelf.

Blue Whale

Like the fin whale, blue whales occur worldwide and are believed to follow a similar migration pattern from northern summering grounds to more southern wintering areas (Perry et al. 1999). Of the three subspecies have been identified, only *B. musculus* occurs in the northern hemisphere. Blue whales range in the North Atlantic from the subtropics to Baffin Bay and the Greenland Sea

NMFS recognizes a minimum population estimate of 308 blue whales within the Northeast Region (Waring et al. 2003). Blue whales are only occasional visitors to east coast U.S. waters. They are more commonly found in Canadian waters, particularly the Gulf of St. Lawrence where they are present for most of the year, and in other areas of the North Atlantic. It is assumed that blue whale distribution is

governed largely by food requirements which, at least in the Gulf of St. Lawrence, appear to include predominantly copepod species (NMFS 1998b).

Entanglements in fishing gear such as the sink gillnet gear used in the multispecies fishery and ship strikes are believed to be the major sources of anthropogenic mortality and injury of blue whales. However, confirmed deaths or serious injuries are few. NOAA Fisheries 2003 Biological Opinion for the monkfish fishery references an incident in 1987, when, concurrent with an unusual influx of blue whales into the Gulf of Maine, one report was received from a whale watch boat that spotted a blue whale in the southern Gulf of Maine entangled in gear described as probable lobster pot gear. A second animal found in the Gulf of St. Lawrence apparently died from the effects of an entanglement.

Sperm Whale

Sperm whales inhabit all ocean basins, from equatorial waters to the polar regions (Perry et al. 1999). In the western North Atlantic they range from Greenland to the Gulf of Mexico and the Caribbean. The sperm whales that occur in the western North Atlantic are believed to represent only a portion of the total stock (Blaylock et al. 1995). Total numbers of sperm whales off the USA or Canadian Atlantic coast are unknown, although eight estimates from selected regions of the habitat do exist for select time periods. The best estimate of abundance for the North Atlantic stock of sperm whales is 4,702 (CV=0.36) (Waring et al. 2003).

Sperm whales generally occur in waters greater than 180 meters in depth with a preference for continental margins, seamounts, and areas of upwelling, where food is abundant (Leatherwood and Reeves 1983). Sperm whales in both hemispheres migrate to higher latitudes in the summer for feeding and return to lower latitude waters in the winter where mating and calving occur. Mature males typically range to higher latitudes than mature females and immature animals but return to the lower latitudes in the winter to breed (Perry et al. 1999). Waring et al. (1993) suggest sperm whale distribution is closely correlated with the Gulf Stream edge with a migration to higher latitudes during summer months where they are concentrated east and northeast of Cape Hatteras. 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. 2003).

Sperm whales, especially mature males in higher latitude waters, have been observed to take significant quantities of large demersal and deep water sharks, multispecies, and bony fishes.

Few instances of injury or mortality of sperm whales due to human impacts have been recorded in U.S. waters. Because of their generally more offshore distribution and their benthic feeding habits, sperm whales are less subject to entanglement than are right or humpback whales. However, the multispecies fishery is conducted near the shelf edge and utilizes fixed sink gillnet gear that may pose a threat to sperm whales. Documented takes primarily involve offshore fisheries such as the offshore lobster pot fishery and pelagic driftnet and pelagic longline fisheries. Ships also strike sperm whales. Due to the offshore distribution of this species, interactions (both ship strikes and entanglements) that do occur are less likely to be reported than those involving right, humpback, and fin whales that more often occur in nearshore areas.

Leatherback Sea Turtle

The leatherback sea turtle is the largest living turtle and ranges farther than any other sea turtle species, exhibiting broad thermal tolerances that allow it to forage into the colder Northeast Region waters (NMFS and USFWS, 1995). Evidence from tag returns and strandings in the western North Atlantic suggests that adults engage in routine migrations between boreal, temperate and tropical waters (NMFS and USFWS, 1992). In the U.S., leatherback turtles are found throughout the western North Atlantic during the warmer months along the continental shelf, and near the Gulf Stream edge. A 1979

aerial survey of the outer Continental Shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia showed leatherbacks to be present throughout the area with the most numerous sightings made from the Gulf of Maine south to Long Island (CeTAP 1982). Shoop and Kenney (1992) also observed concentrations of leatherbacks during the summer off the south shore of Long Island and New Jersey. Leatherbacks in these waters are thought to be following their preferred jellyfish prey.

Leatherbacks are predominantly a pelagic species and feed on jellyfish and other soft-body prey. Time-depth-recorder data collected by Eckert et al. (1996) indicate that leatherbacks are night feeders and are deep divers, with recorded dives to depths in excess of 1,000 meters. However, leatherbacks may feed in shallow waters if there is an abundance of jellyfish near shore. For example, leatherbacks occur annually in shallow bays such as Cape Cod and Narragansett Bays during the fall.

Recent information suggests that western North Atlantic populations declined from 18,800 nesting females in 1996 (Spotila et al. 1996) to 15,000 nesting females by 2000.

Anthropogenic impacts to the leatherback population include fishery interactions as well as exploitation of the eggs (Ross 1979). Eckert (1996) and Spotila et al. (1996) record that adult mortality has also increased significantly, particularly as a result of driftnet and longline fisheries.

Numerous fisheries that occur in both U.S. state and federal waters are known to negatively impact juvenile and adult leatherback sea turtles. These include incidental take in several commercial and recreational fisheries. Fisheries known or suspected to incidentally capture leatherbacks include those deploying bottom trawls, off-bottom trawls, purse seines, hook and line, gill nets, drift nets, traps, haul seines, pound nets, beach seines, and surface longlines (NMFS and USFWS 1992).

Leatherbacks are also susceptible to entanglement in lobster and crab pot gear. The probable reasons may be attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface; attraction to the buoys which could appear as prey; or the gear configuration which may be more likely to wrap around flippers. The total number of leatherbacks reported entangled from New York through Maine from all sources for the years 1980 - 2000 is 119. Entanglements are also common in Canadian waters where Goff and Lien (1988) reported that 14 of 20 leatherbacks encountered off the coast of Newfoundland/Labrador were entangled in fishing gear including salmon net, herring net, gillnet, trawl line and crab pot line. Prescott (1988) reviewed stranding data for Cape Cod Bay and concluded that for those turtles where cause of death could be determined (the minority), entanglement in fishing gear is the leading cause of death followed by capture by dragger, cold stunning, or collision with boats.

Kemp's Ridley Sea Turtle

The Kemp's ridley is the most endangered of the world's sea turtle species. Of the world's seven extant species of sea turtles, the Kemp's ridley has declined to the lowest population level. The Turtle Expert Working Group (TEWG) (1998; 2000), however, indicated that the Kemp's ridley population appears to be in the early stage of exponential expansion. Nesting data, estimated number of adults, and percentage of first time nesters have all increased from lows experienced in the 1970s and 1980s. From 1985 to 1999, the number of nests observed at Rancho Nuevo and nearby beaches has increased at a mean rate of 11.3% per year, allowing cautious optimism that the population is on its way to recovery.

Juvenile Kemp's ridleys use northeastern and Mid-Atlantic coastal waters of the U.S. Atlantic coastline as primary developmental habitat during summer months, with shallow coastal embayments serving as important foraging grounds. Next to loggerheads, they are the second most abundant sea turtle in Virginia and Maryland waters, arriving in these areas during May and June (Keinath et al., 1987; Musick and Limpus, 1997). Studies have found that post-pelagic ridleys feed primarily on a variety of species of crabs. Mollusks, shrimp, and fish are consumed less frequently (Bjorndal, 1997).

With the onset of winter and the decline of water temperatures, ridleys migrate to more southerly waters from September to November (Keinath et al., 1987; Musick and Limpus, 1997). Turtles that do not head south soon enough face the risks of cold stunning in northern waters. Cold stunning can be a significant natural cause of mortality for sea turtles in Cape Cod Bay and Long Island Sound. Cold-stunned turtles have also been found on beaches in New York and New Jersey. Such events can represent a significant cause of natural mortality, in spite of the fact that many cold-stun turtles can survive if found early enough.

Like other turtle species, the severe decline in the Kemp's ridley population appears to have been heavily influenced by a combination of exploitation of eggs and impacts from fishery interactions. Currently, anthropogenic impacts to the Kemp's ridley population are similar to those discussed above for other sea turtle species. Takes of Kemp's ridley turtles have been recorded by sea sampling coverage in the Northeast otter trawl fishery, pelagic longline fishery, and southeast shrimp and summer flounder bottom trawl fisheries.

Green Sea Turtle

Green turtles are distributed circumglobally. In the western Atlantic they range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean, but are considered rare north of Cape Hatteras (Wynne and Schwartz, 1999). Recent population estimates for the western Atlantic area are not available. Green turtles appear to prefer marine grasses and algae in shallow bays, lagoons and reefs (Rebel 1974) but also consume jellyfish, salps, and sponges.

As is the case for loggerhead and Kemp's ridley sea turtles, green sea turtles use mid-Atlantic and northern areas of the western Atlantic coast as important summer developmental habitat. Green turtles are found in estuarine and coastal waters as far north as Long Island Sound, Chesapeake Bay, and North Carolina sounds (Musick and Limpus 1997). Like loggerheads and Kemp's ridleys, green sea turtles that use northern waters during the summer must return to warmer waters when water temperatures drop, or face the risk of cold stunning. Cold stunning of green turtles may occur in southern areas as well (*i.e.*, Indian River, Florida), as these natural mortality events are dependent on water temperatures and not solely geographical location.

Anthropogenic impacts to the green sea turtle population are similar to those discussed above for other sea turtles species. As with the other species, fishery mortality accounts for a large proportion of annual human-caused mortality outside the nesting beaches, while other activities like dredging, pollution, and habitat destruction account for an unknown level of other mortality. Sea sampling coverage in the pelagic driftnet, pelagic longline, southeast shrimp trawl, and summer flounder bottom trawl fisheries has recorded takes of green turtles.

Loggerhead Sea Turtle

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans in a wide range of habitats. These include open ocean, continental shelves, bays, lagoons, and estuaries (NMFS and USFWS 1995). Loggerhead sea turtles are primarily benthic feeders, opportunistically foraging on crustaceans and mollusks (Wynne and Schwartz 1999). Under certain conditions they may also scavenge fish (NMFS and USFWS 1991).

The threatened loggerhead sea turtle is the most abundant of the sea turtles listed as threatened or endangered in the U.S. waters. However, the status of the northern loggerhead subpopulation is of particular concern. There are only an estimated 3,800 nesting females in the northern loggerhead subpopulation, and the status of this northern population based on number of loggerhead nests, has been classified declining or stable (TEWG 2000). Another factor that may add to the vulnerability of the

northern subpopulation is that genetics data show that the northern subpopulation produces predominantly males (65%). In contrast, the much larger south Florida subpopulation produces predominantly females (80%) (NMFS SEFSC 2001).

The activity of the loggerhead is limited by temperature. Loggerheads commonly occur throughout the inner continental shelf from Florida through Cape Cod, Massachusetts. Loggerheads may also occur as far north as Nova Scotia when oceanographic and prey conditions are favorable. Surveys conducted offshore as well as sea turtle stranding data collected during November and December off North Carolina suggest that sea turtles emigrating from northern waters in fall and winter months may concentrate in nearshore and southerly areas influenced by warmer Gulf Stream waters (Epperly et al. 1995). This is supported by the collected work of Morreale and Standora (1998) who tracked 12 loggerheads and 3 Kemp's ridleys by satellite. All of the turtles followed similar spatial and temporal corridors, migrating south from Long Island Sound, New York, during October through December. The turtles traveled within a narrow band along the continental shelf and became sedentary for one or two months south of Cape Hatteras.

Loggerhead sea turtles do not usually appear on the most northern summer foraging grounds in the Gulf of Maine until June, but are found in Virginia as early as April. They remain in the mid-Atlantic and northeast areas until as late as November and December in some cases, but the majority leaves the Gulf of Maine by mid-September. Aerial surveys of loggerhead turtles north of Cape Hatteras indicate that they are most common in waters from 22 to 49 meters deep, although they range from the beach to waters beyond the continental shelf (Shoop and Kenney 1992).

Loggerhead sea turtles originating from the western Atlantic nesting aggregations are believed to lead a pelagic existence in the North Atlantic gyre for as long as 7-12 years before settling into benthic environments. In the waters off the coastal U.S., they are exposed to a suite of fisheries in federal and State waters including trawl, sacallop dredge, purse seine, hook and line, gillnet, pound net, longline, and trap fisheries. Loggerhead sea turtles are captured in fixed pound net gear in the Long Island Sound, in pound net gear and trawls in summer flounder and other finfish fisheries in the Mid-Atlantic and Chesapeake Bay, in gillnet fisheries in the Mid-Atlantic and elsewhere, and in multispecies, monkfish, spiny dogfish, and northeast sink gillnet fisheries.

Minke Whale

Minke whales have a cosmopolitan distribution in polar, temperate, and tropical waters. The Canadian east coast population is one of four populations recognized in the North Atlantic. Minke whales off the eastern coast of the U.S. are considered to be part of the population that extends from Davis Strait off Newfoundland to the Gulf of Mexico. The species is common and widely distributed along the U.S. continental shelf. They show a certain seasonal distribution with spring and summer peak numbers, falling off in the fall to very low winter numbers. Like all baleen whales, the minke whale generally occupies the continental shelf proper.

Minke whales are known to be taken in sink gillnet gear that is also used to catch multispecies finfish. Takes have also been documented in trawl fisheries. Waring et al. (2003) has described the estimated total take of minkes in all fisheries to be below the PBR established for that species.

Harbor Porpoise

Harbor porpoise are found primarily in the Gulf of Maine in the summer months. However, they migrate seasonally through regions where multispecies finfish are caught. For example, they move through the southern New England area where the multispecies fishery occurs in the spring (March and April). Harbor porpoise also move through the Massachusetts Bay and Jeffrey's Ledge region in the spring (April and May) and the fall (October November).

Harbor porpoise are taken in sink gillnet gear. The historic level of serious injury and mortality of this species in this gear was known to be high relative to the estimated population level. The Harbor Porpoise Take Reduction Plan (HPTRP) was implemented in 1998 to reduce takes in the Northeast and Mid-Atlantic gillnet fisheries through a series of time/area closures and required use of acoustical deterrents that have reduced the take to acceptable levels.

NMFS recently reported (67 FR 51234 dated August 7, 2002) that the estimated incidental take of harbor porpoise in U.S. waters for 2001 was 80 animals. The minimum population estimate for 1999 was established at 74,695, and the potential biological removal (PBR) for the harbor porpoise is now set at 747. Although the current mortality estimate is below the latest PBR level, the stock is still considered a strategic stock requiring continued measures to reduce human-caused mortality from commercial fishing. This is due to the fact that there are insufficient data to determine population trends for this species.

Atlantic White-Sided Dolphin

White-sided dolphins are found in the temperate and sub-polar waters of the North Atlantic, primarily on the continental shelf waters out to the 100-meter depth contour. The species is distributed from central western Greenland to North Carolina, with the Gulf of Maine stock commonly found from Hudson Canyon to Georges Bank and into the Gulf of Maine to the Bay of Fundy. A minimum population estimate for the white-sided dolphin 37,904 has been derived for U.S. waters (Waring et al. 2003) from several survey estimates.

White-sided dolphins have been observed taken in sink gillnets, pelagic drift gillnets, and several mid-water and bottom trawl fisheries. Waring et al. (2002) described the estimated total take of white-sided dolphins in all fisheries (including those that catch multispecies) to be below the PBR established for that species.

Risso's Dolphin

Risso's dolphins are distributed along the continental shelf edge of North America from Cape Hatteras to Georges Bank. A minimum population estimate of 29,110 was derived from limited survey estimates in northern U.S. waters. Observers have documented takes in the pelagic drift gillnet, pelagic longline, and mid-water trawl fisheries as well as the Northeast multispecies sink gillnet fishery. Entanglements are likely rare based on their preference for pelagic prey species (squid and schooling fishes) and because their general distribution makes encounters with groundfish gear unlikely.

Pantropical Spotted Dolphins

The two species of spotted dolphin in the Western North Atlantic, *Stenella frontalis* and *S. attenuata,* are difficult to differentiate at sea resulting in combined abundance estimates prior to 1998. The best estimate of abundance currently available is 13,117. Data is insufficient to determine population trends for this species. Sightings from 1990-1998 occurred almost exclusively on the continental shelf edge and slope areas west of Georges Bank (Waring et al. 2003). NOAA's *2004 MMPA List of Fisheries* lists this species as taken in Northeast sink gillnets. Despite some level of interactions, the pelagic prey species of these animals and their habitat preferences make it likely that takes in this fishery occur at low levels.

Coastal Bottlenose Dolphins

The coastal form of the bottlenose dolphin occurs in the shallow, relatively warm waters along the U.S. Atlantic coast from New Jersey to Florida and the Gulf of Mexico. They rarely range beyond the 25-meter depth contour north of Cape Hatteras. Although they are taken in coastal sink gillnet operations (bluefish, croaker, spiny and smooth dogfish, kingfish, Spanish mackerel, spot, striped bass and weakfish)

these fisheries occur in the more shallow range of the coastal bottlenose dolphin. A complete list of fishery interactions is provided in Waring et al. (2003) and infers that anchored set gillnets and drift gillnets used in the groundfish fishery may take this species.

Although one or more of the management units of this stock may not be depleted, at this writing all units retain the depleted designation. The stock is considered strategic under the MMPA because fishery-related mortality and serious injury exceed PBR. Because encounters generally occur inshore of the groundfish fishery, its continued operation is not likely to affect the status of this stock.

Pelagic Delphinids (Pilot whales, offshore bottlenose and common dolphins)

The pelagic delphinid complex is made up of small odontocete species that are broadly distributed along the continental shelf edge where depths range from 200 - 400 meters. They are commonly found in large schools feeding on schools of fish. The minimum population estimates for each species number in the tens of thousands. They are known to be taken in pelagic and sink gillnets gear as well as mid-water and bottom trawl gear. Takes have occurred in the bottom trawl fishery and gillnet fisheries, although their pelagic prey species suggest they do not forage near the bottom. Interactions therefore are likely to be infrequent.

Harbor seal

Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine, and occur seasonally along the southern New England and New York coasts from September through late-May. However, breeding and pupping normally occur only in waters north of the New Hampshire/Maine border. Since passage of the MMPA in 1972, the number of seals found along the New England coast has increased nearly five-fold with the number of pups seen along the Maine coast increasing at an annual rate of 12.9 percent during the 1981-1997 period (Gilbert and Guldager 1998). The minimum population estimate for the harbor seal is 30,990 based on uncorrected total counts along the Maine coast in 1997 (Waring et al. 2003).

Harbor seals are taken in sink gillnet gear used in the groundfish fishery. Waring et al. (2003) has described the estimated total take of harbor seals in all fisheries (972) to be below the PBR of 5,493 established for that species.

Gray seal

The gray seal is found on both sides of the North Atlantic, with the western North Atlantic population occurring from New England to Labrador. There are two breeding concentrations in eastern Canada; one at Sable Island and one that breeds on the pack ice in the Gulf of St. Lawrence. There are several small breeding colonies on isolated islands along the coast of Maine and on outer Cape Cod and Nantucket Island in Massachusetts (Waring et al. 2003). The population estimates for the Sable Island and Gulf of St Lawrence breeding groups was 143,000 in 1993. The gray seal population in Massachusetts has increased from 2,010 in 1994 to 5,611 in 1999, although it is not clear how much of this increase may be due to animals emigrating from northern areas. Approximately 150 gray seals have been observed on isolated islands off Maine.

Gray seals are taken in sink gillnet gear. Waring et al. (2002) has described the estimated total take of gray seals from 1959 to 1999 in all fisheries to be between 50 and 155 animals which is well below the PBR of 8,850 established for that species.

Harp seal

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans, and has been increasing off the East Coast of the United States from Maine to New Jersey. Harp seals are usually found off the U.S. from January to May when the western stock of harp seals is at their most southern

point of migration (Waring et al. 2003). This species congregates on the edge of the pack ice in February through April when breeding and pupping takes place. The harp seal is highly migratory, moving north and south with the edge of the pack ice. Non-breeding juveniles will migrate the farthest south in the winter, but the entire population moves north toward the Artic in the summer. The minimum population estimate for the western North Atlantic is 5.2 million seals.

A large number of harp seals are killed in Canada, Greenland and the Artic. The Canadian kill is controlled by DFO who set the allowed kill at 275,000 in 1997. Mortality in Greenland and the Artic may exceed 100,000 (Waring et al. 2003). Harp seals are also taken in sink gillnet gear used to catch multispecies. Waring et al. (2003) has described the estimated total take of harp seals from 1959 to 1999 in all fisheries to range between 78 and 694 animals depending on the location of the pack ice edge which drives the seals farther south into the range of the sink gillnet fishery. Even with the highest takes observed, the take is well below the PBR of 156,000 established for that species.

6.3.3 Actions to Minimize Interactions with Protected Species

Many of the factors that serve to mitigate the impacts of the multispecies fishery on protected species are currently being implemented in the Northeast Region under either the Atlantic Large Whale Take Reduction Plan (ALWTRP) or the Harbor Porpoise Take Reduction Plan (HPTRP). In addition, the Multispecies FMP has undergone repeated consultations pursuant to Section 7 of the Endangered Species Act (ESA), with the most recent Biological Opinion dated June 14, 2001. The conclusion in that Opinion states that the multispecies fishery is likely to jeopardize the continued existence of the North Atlantic right whale, and required NMFS to implement a set of Reasonable and Prudent Alternatives (RPAs) to remedy the jeopardy finding. As described below, the regulatory measures of the ALWTRP and the HPTRP have been implemented in direct response to the impacts of fishing operations taking place under the Multispecies FMP (and others) and must be adhered to by any vessel fishing for multispecies.

6.3.3.1 Harbor Porpoise Take Reduction Plan

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

6.3.3.2 Atlantic Large Whale Take Reduction Plan

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

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

Management system (SAM) of additional gear modifications to protect known seasonal concentrations of right whales in the southern Gulf of Maine and Georges Bank.

The most recent change to the ALWTRP, which became effective on September 25, 2003, allows lobster trap and anchored gillnet gear in a DAM zone once a closure is triggered, but specifies additional gear modifications designed to reduce the risk of entanglements of northern right whales.

6.3.3.3 NMFS Rule to Conserve Sea Turtles

NMFS published a final rule (67 *FR* 71895, December 3, 2002), effective January 2, 2003, that enacted a series of seasonal closures to the use of large mesh gillnets in the EEZ off the coast of Virginia and North Carolina. The purpose of the closures is to reduce the impact of the monkfish fishery on endangered and threatened species of sea turtles. This final rule followed several temporary actions taken by NMFS since 2000 in response to sea turtle strandings.

Federal waters between Oregon Inlet and the North Carolina/South Carolina border are closed year round, while three other areas to the north (up to Chincoteague, VA) are closed from March 16, April 1, and April 16, respectively, to January 14 each year.

6.4 Human Environment

6.4.1 Overview

The Affected Human Environment for the Northeast Multispecies fishery was described in detail in section 9.4 of Amendment 13. That discussion described the Northeast Multispecies fishery from FY 1994 and the implementation of Amendment 5 through the present. In most instances, data was only available to describe the fishery through FY 2001, though some preliminary information was included for part of FY 2002. The information provided in that discussion is useful for understanding the response of the fishery to past management actions and in predicting how the fishery may respond to the management actions implemented by Amendment 13. That discussion also helps meet the M-S Act requirement to take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of those communities, and, consistent with the conservation requirements of the M-S Act, to the extent practicable, minimize the adverse economic impacts on such communities. Section 9.4 of Amendment 13 also helps fill a NEPA requirement to consider the interactions of the natural and human environments and the impacts on both systems of any changes due to governmental actions or policies.

Substantial changes took place in the fishery between FY 2001 and FY 2002. In FY 2002 and 2003, the fishery was managed under provisions implemented as a result of a lawsuit (*Conservation Law Foundation et al v. Donald Evans*) that imposed additional restrictions that were not in place in FY 2001: reductions in effort, additional closed areas, changes in gear, mesh size, etc. The impacts of these additional restrictions could not be fully described in Amendment 13 because the data were not available when the document was prepared. These impacts may provide some indication of the effectiveness of the Amendment 13 regulations, since Amendment 13 is believed to be more restrictive than the measures in place in FY 2002 and 2003. FW 40A (NEFMC 2004) was submitted by the Council in July, 2004. The Affected Environment section of FW 40A included updated information on the fishery in FY 2002. Data was not available for FY 2003 when that document was prepared.

Because the proposed action is being submitted only eight months after the implementation of Amendment 13 and shortly after implementation of FW 40A, there is little additional information with which to update the human environment discussion of Amendment 13 and FW 40A. In particular, it is too early to evaluate, in any detail, the changes to the human environment resulting from either action. In addition, this proposed action focuses entirely on measures that apply to the commercial harvesting sector, so there is little utility in including an update of the recreational harvesting sector (and, in any case, no new information to do so). This section of the document provides a brief summary of the information in Amendment 13, updated where possible with additional data for FY 2003.

This action also considered measures that would impact the herring fishery. Section 6.4.6 provides a brief overview of that fishery.

6.4.2 Commercial Harvesting Sector

The multispecies fishery in the Northeastern United States consists of a commercial and recreational harvesting sector. The commercial sector consists of a wide range of vessels of different sizes and using different gear types. These vessels are homeported in several coastal states, with most vessels

claiming homeports in Maine, New Hampshire, Massachusetts, and Rhode Island. Gears that are typically used to prosecute the fishery include otter trawls, sink gillnets, bottom longlines, and hook gear. Detailed descriptions of these gears, and their impacts on EFH, are provided in section 9.2.3 of Amendment 13.

Since the implementation of Amendment 5 in 1994, all vessels that land regulated groundfish for commercial sale have been required to have a permit. Permits are issued in different categories, depending on the activity and history of the vessel. There have been several changes in the defined permit categories, as Amendment 5, Amendment 7, and Amendment 13 all changed the category definitions. For this reason, when examining fishing activity based on permit category, care must be taken to make comparisons to similar permits. Moratorium - commonly called limited access - permits were granted to vessels based on fishing history during a defined period. Limited access permit holders land most regulated groundfish. No new limited access DAS permits have been granted since 1996, but the ownership of vessels issued permits has changed. Most limited access permits are restricted in the number of DAS that can be fished. In addition, there are open access permit categories that could be requested at any time, with the limitation that a vessel could not have a limited access and open access permit at the same time. Many groundfish vessels have permits, and participate in, other fisheries. Indeed, for some vessels groundfish revenues are only a small part of total fishing revenues.

Amendment 13 provided a comprehensive review of the commercial groundfish-harvesting sector from FY 1994 through FY 2001. Landings and revenues for vessels with groundfish permits were reported for each fishing year, aggregated by permit category, vessel length, homeport state, and gear type. In addition, since one of the primary effort controls used in the fishery is limits on the DAS fished, similar categories were used to describe the allocation and use of DAS by limited access vessels. FW 40 updated that information for FY 2002. This section will provide a brief overview of that information, updated with data for FY 2003. The addition of FY 2003 not only shows how regulations implemented under *CLF et al. v. Evans* affected the industry, but can also be used to gain a further sense of how the effort reductions adopted by Amendment 13 will affect different sectors.

6.4.2.1 Recent DAS Use and DAS Allocations

FY 2002 DAS use by limited access vessels was summarized in Amendment 13; this information is repeated below (Table 32). The number of DAS used in FY 2002 reflected a 36.6 percent decline from the DAS used in FY 2001. In terms of the homeport state claimed on permit applications, vessels homeported in New Hampshire used 44 percent fewer DAS in FY 2002 than in FY 2001, followed by Massachusetts (-38 percent), Maine (-37 percent), New York (-35 percent), New Jersey (-22 percent, incorrectly reported as -44 percent in FW 40A) and Rhode Island (-21 percent).

FY 2003 DAS use by limited access vessels is summarized below (Table 33). The number of DAS used in FY 2003 reflects a 35.2 percent decline from the DAS used in FY 2001 and a 1.5 percent increase from the DAS used in FY 2002. This suggests that DAS use limited by the FW 33 court order was consistent in both years even though there were some differences in the management measures in place in FY 2002 and FY 2003. Most notably, DAS use in FY 2002 was constrained in the early months of the fishing year to a percentage of each permit's allocation, but this restriction was not in place in FY 2003. In terms of the homeport state claimed on permit applications, vessels homeported in New Hampshire used 41.2 percent fewer DAS in FY 2003 than in FY 2001, followed by New York (-40.6 percent), Massachusetts (-38.8 percent), Connecticut (-38.2 percent), Maine (-26.6 percent), New Jersey (-15.1 percent) and Rhode Island (-14.0 percent). From FY 2002 to FY 2003, vessels homeported in Maine increased DAS use by 14 percent, followed by New Jersey (+9 percent), Connecticut and Rhode Island (+7 percent), and New Hampshire (+4 percent). New York (-10 percent) and Massachusetts (-2 percent) vessels used fewer DAS in FY 2003 than in FY 2002.

When DAS use is examined in terms of vessel length, vessels less than 30 feet in length used 66.1 percent fewer DAS in FY 2003 than in FY 2001. Vessels between 30 and 50 feet in length used 43.4 percent fewer DAS, followed by vessels between 50 and 75 feet in length (-29.7 percent) and vessels over 75 feet in length (-18.9 percent). The three larger length classes increased DAS use by 1.4 to 1.8 percent between FY 2002 and FY 2003, while the smallest vessels used five percent fewer DAS.

Based on these data, the total number of DAS used in FY 2003 was very similar to the number used in FY 2002, though there were some changes in the distribution of DAS use by homeport state and vessel length.

Amendment 13 changed DAS allocations. As described in other sections of this document, Amendment 13 implemented new Categories for DAS and assigned DAS based on vessel history during the period FY 1996 through FY 2001. As a result, the distribution of DAS is different than that observed in FY 2002. The FY 2004 initial allocations are show in Table 34. This table does not reflect the number of FY 2004 DAS that result from the Amendment 13 provision that any carry-over DAS from FY 2003 (that is, DAS not used in FY 2003, not to exceed ten DAS) can be "carried-over" as Category B (regular) DAS in FY 2004. The distribution of these DAS could change as a result of two programs adopted in Amendment 13 that allow the limited movement of DAS from one vessel to another. One program allows leasing of DAS for a one-year period, while a second program allows the permanent transfer of DAS.

At least 339 vessels with a limited access permit do not have any DAS allocated under Amendment 13 (more recent information indicates there are 404 permits that were not allocated DAS). The total allocated DAS that can be used to target any stock declined by 40 percent to 42,989 DAS. An additional 28,660 DAS are available to target healthy stocks. The overall totals of DAS available are similar for FY 2003 and FY 2004 years, but the distribution of those DAS is different. Vessels homeported in Maine have 20 percent more allocated DAS in FY 2004 (Category A and B DAS combined) than in FY 2003. Vessels homeported in New Hampshire and Massachusetts each have 4 percent more DAS available. Vessels from all other states have fewer DAS available, ranging from Rhode Island (-7 percent) to New York (-29 percent). Vessels may not be able to use Category B DAS, however, for a variety of reasons (e.g. lack of access to SAPs, closure of the Category B (regular) DAS fishery). Considering only Category A DAS that can be used to target any stock, Maine has 28 percent fewer DAS than in FY 2003, while New Hampshire and Massachusetts have 38 percent fewer, followed by Rhode Island (-44 percent), Connecticut (-45 percent), New York (-57 percent), and New Jersey (-54 percent).

With respect to vessel length, all classes have fewer Category A DAS allocated in FY 2004 than DAS allocated in FY 2003. The class that lost the least DAS is the over 75-foot class (-27 percent), while the other classes followed in order of decreasing size (-36 percent, -45 percent, and –49 percent). In terms of combined Category A and B DAS, the two largest classes have more DAS allocated in FY 2004 than in FY 2003 (over 75 ft: +21 percent, 50-75 ft.: + 6 percent), while the two smaller length classes have less combined DAS available than in FY 2003 (under 30 ft.: -15 percent, 30 to 50 ft.: -9 percent).

When submitting a permit application, vessels declare a primary fishing gear. While this declaration does not limit vessels to using that gear, it can be used to summarize DAS allocations by gear type. Based on this declaration, bottom trawls (-12 percent) and gillnets (-38 percent) have fewer Category A DAS in FY 2004 than DAS allocated in FY 2003. Bottom longlines, however, have 72 percent more Category A DAS. For combined Category A and B DAS, the major groundfish gears all have more DAS available than in FY 2003 (bottom trawl: +46 percent, gillnet: + 2 percent, and bottom longline: +188 percent).

Categories		Total Number of Permitted Vessels with Allocated DAS (1)	Total Days-at-Sea Allocated (2)	Number of Permitted Vessels that Called In (3)	DAS Allocated to Vessels that Called In (4)	Total DAS Used by Vessels that Called In (5)	% of total allocated DAS Used by Vessels that called in ((5)/(2)*100)	% of allocated DAS (to vessels that called in) Used by Vessels that Called In ((5)/(4)*100)
Permit Category	Individual	138	13,884	131	13,624	12,329	89	90
	Fleet	1,036	47,977	732	40,897	24,695	51	60
	Combination	46	1,637	16	962	663	40	69
	Hook Gear	120	3,607	61	2,389	875	24	37
	Large Mesh	57	4,113	51	3,938	2,849	69	72
	Total	**1,397**	**71,218**	991	61,812	41,410	58	67
Length	1 - 29 feet	91	2,518	43	1,497	526	21	35
	30 - 49 feet	750	33,731	524	28,540	16,736	50	59
	50 - 74 feet	391	24,068	303	21,910	15,956	66	73
	75+ feet	165	10,901	121	9,864	8,192	75	83
	unknown	0	0	0	0	0	-	-
	Total	**1,397**	**71,218**	**991**	**61,812**	**41,410**	**58**	**67**
Gear	Bottom Trawl	513	35,043	482	34,349	25,596	73	75
	Midwater Trawl	2	133	1	105	97	73	93
	Shrimp Trawl	32	1,774	24	1,645	1,109	63	67
	Bottom Longline	24	1,406	23	1,388	768	55	55
	Hook & Line	125	3,758	73	2,798	1,161	31	41
	Sink Gillnet	185	12,571	183	12,535	9,310	74	74
	Scallop Dredge	62	2,054	24	1,170	596	29	51
	Lobster Trap	0	0	0	0	0	0	-
	Other	454	14,479	181	7,822	2,773	19	35
	Total	**1,397**	**71,218**	**991**	**61,812**	**41,410**	**58**	**67**
Homeport State	Maine	178	9,598	118	8,136	5,943	62	73
	New Hampshire	73	4,293	56	3,844	2,576	60	67
	Massachusetts	751	40,577	566	36,275	24,525	60	68
	Rhode Island	107	5,848	83	5,187	3,739	64	72
	Connecticut	17	871	12	732	370	42	50
	New York	135	5,095	91	4,161	2,112	41	51
	New Jersey	79	2,866	41	2,013	1,108	39	55
	Other	57	2,069	24	1,465	1,037	50	71
	Total	**1,397**	**71,218**	**991**	**61,812**	**41,410**	**58**	**67**

Table 32 – FY 2002 DAS use by various categories of multispecies vessels

Categories		Total Number of Permitted Vessels with Allocated DAS (1)	Total Days-at-Sea Allocated (2)	Number of Permitted Vessels that Called In (3)	DAS Allocated to Vessels that Called In (4)	Total DAS Used by Vessels that Called In (5)	% of total allocated DAS Used by Vessels that called in ((5)/(2)*100)	% of allocated DAS (to vessels that called in) Used by Vessels that Called In ((5)/(4)*100)
Permit Category	Individual	139	14,247	132	13,908	12,994	91	93
	Fleet	1,047	48,468	683	39,192	25,492	53	65
	Combination	47	1,651	15	928	727	44	78
	Hook Gear	115	3,466	54	2,127	760	22	36
	Large Mesh	56	3,511	47	3,178	2,374	68	75
	Total	**1,404**	**71,344**	**931**	**59,334**	**42,347**	**59**	**71**
Length	1 - 29 feet	102	3,115	41	1,419	500	16	35
	30 - 49 feet	762	33,928	492	27,424	17,176	51	63
	50 - 74 feet	382	23,442	288	20,742	16,267	69	78
	75+ feet	158	10,859	110	9,750	8,403	77	86
	unknown	0	0	0	0	0	0	0
	Total	**1,404**	**71,344**	**931**	**59,334**	**42,347**	**59**	**71**
Gear	Bottom Trawl	793	45,954	574	39,904	29,909	65	75
	Midwater Trawl	5	254	3	179	118	46	66
	Other Trawl	10	524	7	449	322	61	72
	Longlines	170	5,759	75	3,647	1,553	27	43
	Hand line	124	3,484	57	2,047	769	22	38
	Gillnet	285	14,692	207	12,621	9,400	64	74
	Pots and Traps	12	354	3	163	71	20	43
	Other	5	324	5	324	206	64	64
	Total	**1,404**	**71,344**	**931**	**59,334**	**42,347**	**59**	**71**
Homeport State	Maine	187	10,394	119	8,680	6,898	66	79
	New Hampshire	68	4,220	53	3,714	2,733	65	74
	Massachusetts	752	40,347	522	34,465	24,226	60	70
	Rhode Island	115	5,975	84	5,264	4,044	68	77
	Connecticut	17	848	13	716	400	47	56
	New York	129	4,713	76	3,406	1,928	41	57
	New Jersey	85	2,965	46	1,949	1,213	41	62
	Other	51	1,882	18	1,141	905	48	79
	Total	**1,404**	**71,344**	**931**	**59,334**	**42,347**	**59**	**71**

Table 33 – FY 2003 DAS use by various categories of multispecies vessels

By Permit Category	Number of Permits		DAS Allocated		
	Without DAS Allocations	With DAS Allocations	Total DAS	Category A DAS	Category B DAS
Individual	253	801	64,446	38,667	25,778
Combination	15	31	1,864	1,119	746
Hook Gear	55	45	2,114	1,269	846
Large Mesh	16	38	3,225	1,935	1,290
Total	**339**	**915**	**71,649**	42,989	28,660
Length Category					
1 - 29 Feet	41	40	2,139	1,283	856
30 - 49 Feet	211	454	30,812	18,487	12,325
50 - 74 Feet	55	297	25,461	15,277	10,184
75+ Feet	32	124	13,237	7,942	5,295
Total	**339**	**915**	**71,649**	42,989	28,660
Homeport State					
ME	40	125	11,507	6,904	4,603
NH	13	55	4,464	2,678	1,786
MA	160	507	42,015	25,209	16,806
RI	30	75	5,452	3,271	2,181
CT	1	14	786	472	314
NY	40	72	3,596	2,157	1,438
NJ	32	44	2,211	1,327	884
Other	23	23	1,618	971	647
Total	**339**	**915**	**71,649**	42,989	28,660
Primary Gear Type					
Bottom Trawl	109	612	51,013	30,608	20,405
Midwater Trawl	1	5	357	214	143
Other Trawl	4	7	572	343	229
Hand Line	70	48	2,235	1,341	894
Longlines	74	69	4,044	2,426	1,618
Gillnet	73	166	12,863	7,718	5,145
Pots and Traps	8	1	65	39	26
Other	0	7	500	300	200
Total	**339**	**915**	**71,649**	42,989	28,660

Table 34 – FY 2004 DAS allocations by various categories

Sources: NMFS Permit Database and DAS Database
Caveats and Assumptions: This table includes current 2004 permit holders. 2003 permit holders have until April 2005 to obtain a 2004 permit. The data are current as of 17 June 2004 and due to DAS transfers or leasing the numbers may change. CPH permits and carry-over DAS not included.

6.4.2.2 Landings and Revenues by Permit Category

Amendment 7, adopted in 1996, implemented several different limited and open access permit categories in the multispecies fishery that were in effect in FY 2002. The limited access permit categories were:

- Individual
- Fleet
- Small vessel exemption
- Hook gear
- Combination vessel
- Large mesh individual DAS
- Large mesh fleet DAS

The open access categories were:

- Handgear permit
- Scallop multispecies possession limit permit
- Non-regulated multispecies permit
- Charter/party (vessels cannot sell their catch and this is not considered a commercial permit)

Table 35 through Table 51 summarizes landings and revenues by permit category. These data do not include state aggregated landings, consistent with the information in Amendment 13 and FW 40A, since that data cannot be summarized by permits, length, etc. In FY 2002, the number of vessels that were permitted in the multispecies fishery and landed groundfish declined to 1,152 vessels. This was the lowest level since FY 1997 and represents a twelve percent decline from the number of vessels that landed groundfish in FY 2001. The decline was most pronounced in the hook gear (-31 percent) and combined (-29 percent) permit categories, while fleet permits showed a 9 percent decline. Total landings by these permitted vessels declined 22 percent from FY 2001, while groundfish landings declined by a similar amount (-18.9 percent). While all categories had reduced groundfish landings in FY 2002, the hook gear category had the greatest decline in groundfish landings from FY 2001 to FY 2002 (-53 percent). The two categories with the largest groundfish landings – individual and fleet DAS vessels – had similar reductions in groundfish landings. While both total and groundfish landings declined, total revenues increased due primarily to a 21 million dollar increase in revenues for all open access permits. This increase is probably the result of increased scallop landings for vessels with scallop multispecies possession limit permits. Groundfish revenues declined by 1.3 percent but remained at the second highest level seen since FY 1996. Changes in groundfish revenues were not consistent across all permit categories, as the fleet permit category showed a small increase in groundfish revenues while all other categories declined.

Preliminary landings and revenue data is now available for FY 2003. It is possible that these data are not complete due to late reporting by dealers, so the information should be viewed with caution. The number of vessels with groundfish permits that landed regulated groundfish declined again in FY 2003 to 1,089, a 17.2 percent decline from the number of vessels that landed groundfish in FY 2001 before implementation of the FW 33 court order. The decline was the most pronounced in the Large Mesh Fleet DAS permit category (-43.5 percent), followed by the Combination (-21.7 percent) and hook gear (-9.3 percent) permit categories. Total landings increased by 16 percent from FY 2002 while groundfish landings declined by 3.5 percent. Groundfish landings by open access (-62.1 percent), large mesh fleet DAS (-44.5 percent) and individual DAS (-7.3 percent) permit holders declined, while all other permit categories increased groundfish landings from FY 2002 to FY 2003. Total revenues increased by 11.8

percent, primarily due to a 48.5 million dollar increase for open access permit holders. Groundfish revenues did not follow the same trend, declining by 17.5 percent from FY 2002 to FY 2003. Groundfish revenues (in constant 1999 dollars) were lower than during any other fishing year since 1996. Only the hook gear category showed a slight increase in groundfish revenues from FY 2002 to FY 2003.

Permit Category	1996	1997	1998	1999	2000	2001	2002	2003
Individual	143	140	129	130	129	131	129	127
Fleet DAS	829	814	767	740	745	730	664	642
Small Vessel Exemption	3	4	3	5	5	3	1	1
Hook Gear	70	75	83	84	76	78	54	49
Combination Vessel	36	34	34	35	38	32	23	18
Large Mesh, Individual DAS	0	1	1	1	2	2	3	4
Large Mesh, Fleet DAS	9	9	14	14	21	49	46	26
Open Access Combined	192	209	243	254	278	283	228	217
Unknown Category	72	3	5	2	2	6	4	5
Total	**1,354**	**1,289**	**1,279**	**1,265**	**1,296**	**1,314**	**1,152**	**1,089**

Table 35 – Multispecies permit holders landing regulated groundfish, by permit category

Permit Category	1996	1997	1998	1999	2000	2001	2002	2003
Individual	66,710	58,315	56,199	51,206	56,432	67,218	59,649	54,581
Fleet DAS	273,218	307,318	273,248	233,946	228,439	229,936	186,142	174,204
Small vessel exemption	14	30	21	15	37	Conf	Conf.	Conf
Hook gear	3,611	3,626	5,113	4,354	7,278	2,932	1,705	2,371
Combination vessel	16,212	27,741	26,118	17,349	11,247	12,839	13,868	17,248
Large mesh, individual DAS	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	968	867
Large mesh, fleet DAS	678	2,015	3,233	2,202	3,206	8,168	8,078	7,358
Open Access Combined	75,481	128,853	157,901	158,572	179,002	228,601	155,966	239,279
Unknown Category	17,616	318	496	286	25	65	143	46
Total	**453,540**	**528,216**	**522,329**	**467,929**	**485,665**	**549,770**	**426,519**	**495,954**

Table 36 – Total landings (all species, 1,000's of pounds) by multispecies permit holders, by permit category

Permit Category	1996	1997	1998	1999	2000	2001	2002	2003
Individual	33,856	35,450	33,209	34,618	40,498	50,426	40,596	37,647
Fleet DAS	36,223	33,813	34,306	33,110	44,309	45,328	37,422	38,508
Small vessel exemption	1	1	6	6	23	1	Conf.	Conf
Hook gear	703	1,015	987	810	897	1,093	514	608
Combination vessel	1,082	1,113	1,965	1,920	2,966	3,682	2,719	2,839
Large mesh, individual DAS	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	561	588
Large mesh, fleet DAS	37	499	553	558	721	2,272	1,702	776
Open Access Combined	248	842	574	481	869	909	569	216
Unknown Category	235	0	47	12	5	7	12	14
Total	**72,384**	**72,734**	**71,647**	**71,515**	**90,287**	**103,718**	**84,095**	**81,196**

Table 37 – Regulated groundfish landings (1,000's of pounds) by multispecies permit holders

Permit Category	1996	1997	1998	1999	2000	2001	2002	2003
Individual	$62,066	$58,364	$58,035	$64,710	$63,541	$63,285	$61,407	$57,135
Fleet DAS	$141,636	$144,590	$134,597	$142,158	$133,165	$122,002	$117,870	$122,558
Small vessel exemption	$31	$39	$28	$32	$46	$14	Conf.	Conf.
Hook gear	$3,429	$4,120	$4,469	$4,422	$3,476	$3,075	$2,759	$3,188
Combination vessel	$20,172	$18,676	$17,700	$25,701	$32,644	$27,967	$32,423	$35,457
Large mesh, individual DAS	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	$1,041	$727
Large mesh, fleet DAS	$615	$1,654	$2,532	$3,048	$4,383	$9,387	$8,994	$7,283
Open Access Combined	$95,171	$100,113	$101,008	$142,534	$168,061	$162,605	$180,409	$228,806
Unknown Category	$16,368	$126	$347	$111	$42	$52	$120	$65
Total	**$339,489**	**$327,682**	**$318,715**	**$382,716**	**$405,359**	**$388,388**	**$407,025**	**$455,219**

Table 38 – Total revenues (1,000's of 1999 dollars) by multispecies permit holders

Permit Category	1996	1997	1998	1999	2000	2001	2002	2003
Individual	$40,185	$40,549	$41,272	$43,541	$43,360	$47,575	$45,120	$35,696
Fleet DAS	$39,577	$37,535	$40,904	$39,138	$45,414	$43,448	$43,575	$39,987
Small vessel exemption	$1	$1	$8	$8	$26	$1	Conf.	Conf.
Hook gear	$821	$1,228	$1,333	$1,105	$1,195	$1,259	$739	$798
Combination vessel	$1,321	$1,367	$2,628	$2,542	$3,269	$3,661	$3,168	$2,959
Large mesh, individual DAS	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	$486	$392
Large mesh, fleet DAS	$42	$549	$696	$683	$783	$2,365	$2,197	$839
Open Access Combined	$225	$1,016	$724	$580	$842	$946	$693	$256
Unknown Category	$272	$1	$48	$15	$4	$9	$18	$14
Total	**$82,444**	**$82,244**	**$87,612**	**$87,612**	**$94,894**	**$99,263**	**$97,998**	**$80,941**

Table 39 – Groundfish revenues (1,000's of 1999 dollars) by multispecies permit holders

6.4.2.3 Landings and Revenues by Vessel Length

Amendment 13 also summarized landings and revenues by vessel length. While length is an imperfect measure of fishing power, it is a readily understandable parameter. These summaries indicate whether the management measures affected large and small vessel fishermen in similar fashion. Rounding errors cause minor differences in the totals compared to other sections. The decline in total landings from FY 2001 to FY 2002 was the least for the 50 to 75 foot length class (-11.5 percent) and greatest for the smallest (0 to 30 ft. length class, -32.5 percent) and largest (over 75 ft., - 29 percent) classes. Groundfish landings did not follow the same pattern. While the smallest length class had the largest decline in regulated groundfish landings (-52.2 percent), the largest length class had only an 11.3 percent decline. The changes in revenues show even more pronounced difference. Once again, the smallest length class had the greatest decline in both total (-22 percent) and groundfish (-38.7 percent) revenues. Conversely, the two largest length classes saw increases in total revenues – this may be due to increases in scallop revenues by vessels with a scallop multispecies possession limit permit. The largest length class, however, also saw a 3.5 percent increase in regulated groundfish revenues while the two mid-sized length classes saw declines of 8.4 percent and 6.4 percent from FY 2001 to FY 2002.

In FY 2003, total landings continued to decline for vessels less than thirty feet in length and vessels fifty to seventy-five feet in length. The greatest increase was for vessels seventy-five feet in length or greater (+28.4 percent). Vessels thirty to fifty feet in length increased their landings of groundfish (+3 percent) while groundfish landings declined for other size classes. Total revenues increased for the largest vessels but declined for all others. Regulated groundfish revenues declined for all length classes, with the greatest loss for the smallest vessels (-20.2 percent), followed by vessels seventy-five feet and greater (-18.4 percent), fifty to seventy-five feet (-15.9 percent) and thirty to fifty feet (-11.1 percent).

Vessel Length Class (feet)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
less than 30	1,215	1,545	2,008	1,632	1,307	1,273	1,899	1,574	1,063	830
30 to less than 50	67,685	79,454	73,826	67,836	66,529	59,470	55,828	54,959	46,455	48,972
50 to less than 75	127,918	138,312	141,872	161,520	134,022	134,653	142,791	152,814	136,766	134,935
75 or greater	221,253	219,185	235,835	297,800	320,824	272,535	285,784	341,216	242,232	311,217
Total	**418,071**	**438,497**	**453,540**	**528,788**	**522,683**	**467,931**	**486,302**	**550,562**	**426,516**	**495,954**

Table 40 – Total landings (1,000's of pounds) by vessels with multispecies permits, by length

Vessel Length Class (ft)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
less than 30	490	540	521	601	644	491	625	836	400	354
30 to less than 50	19,483	17,800	18,014	19,007	18,115	16,572	21,538	24,650	18,102	18,649
50 to less than 75	28,892	26,345	30,384	29,430	29,718	30,443	37,942	43,645	34,367	32,885
75 or greater	26,469	23,094	23,466	23,697	23,171	24,011	30,670	35,194	31,225	29,307
Total	**75,334**	**67,779**	**72,384**	**72,734**	**71,649**	**71,517**	**90,775**	**104,325**	**84,094**	**81,195**

Table 41 – Regulated groundfish landings (1,000's of pounds) by vessels with multispecies permits, by length

Vessel Length Class (ft)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
less than 30	$2,279	$3,080	$2,276	$1,931	$1,823	$2,005	$1,542	$1,498	$1,172	$1,221
30 to less than 50	$59,364	$63,978	$55,816	$53,883	$53,789	$61,621	$58,014	$59,303	$53,895	$51,854
50 to less than 75	$117,354	$110,010	$111,182	$109,945	$104,324	$122,709	$128,030	$123,429	$127,236	$125,669
75 or greater	$182,481	$171,561	$170,215	$162,079	$158,934	$196,383	$218,410	$204,889	$222,721	$235,981
Total	**$361,479**	**$348,628**	**$339,489**	**$327,839**	**$318,870**	**$382,718**	**$405,996**	**$389,118**	**$407,026**	**$414,725**

Table 42 – Total revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by length

Vessel Length Class (ft.)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
less than 30	$679	$663	$557	$682	$884	$689	$789	$941	$577	$461
30 to less than 50	$23,518	$20,801	$18,593	$20,659	$21,311	$19,733	$22,673	$24,154	$22,144	$19,695
50 to less than 75	$36,681	$34,042	$35,512	$33,855	$36,176	$36,645	$38,787	$40,563	$37,973	$31,957
75 or greater	$33,146	$29,997	$27,781	$27,048	$29,244	$30,547	$33,057	$34,082	$35,301	$28,827
Total	**$94,025**	**$85,503**	**$82,444**	**$82,244**	**$87,614**	**$87,615**	**$95,306**	**$99,740**	**$97,997**	**$80,940**

Table 43 – Regulated groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by length

6.4.2.4 Landings and Revenues by Gear

Landings and revenues can also be summarized by gear. Amendment 13 reported this information for both day and trip gillnet vessels, but that information was not available for this document. Bottom trawls, sink gillnets, and bottom longlines – the primary gears used to catch groundfish – all saw a decline in total landings from FY 2001 to FY 2002. Bottom trawls experienced a negligible decline in total revenue, however, while bottom longline total revenues declined 27.3 percent and sink gillnet total revenues declined 13.4 percent. Bottom trawls experienced a 16 percent decline in groundfish landings, while bottom longlines experienced a 64 percent decline and sink gillnets saw a 53 percent decline in regulated groundfish landings. Changes in groundfish revenues, however, show a different pattern. Bottom trawl revenues from groundfish declined by 1 percent, sink gillnet revenues from regulated groundfish were essentially unchanged, and bottom longline revenues from regulated groundfish declined by 55.2 percent.

The changes seen in FY 2002 did not persist into FY 2003. Sink gillnet (+24.6 percent) and hook and line (+15.8 percent) total landings increased, while longline (-8.4 percent) and trawl (-5.9 percent) total landings declined. Sink gillnet (+14.7 percent) and longline (+14.8 percent) groundfish landings increased while trawl (-5.9 percent) and hook and line (-26.3 percent) declined. Regulated groundfish revenues declined for each of the four primary groundfish gears: trawl (-16.8 percent), longline (-5.6 percent), hook and line (-27.2 percent) and sink gillnet (-7.1 percent).

Gear Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bottom trawl*	237,964	228,269	214,830	227,433	242,471	206,073	201,259	198,586	182,732	172,046
Bottom longline*	8,965	8,905	7,869	8,970	8,559	6,921	7,083	7,105	4,672	4,279
Hook and line*	979	1,404	1,461	2,200	2,018	1,614	1,861	2,032	1,219	1,412
Sink gillnet, total*	41,991	53,056	49,983	43,990	46,003	37,854	30,462	35,165	29,323	36,563
Day Gillnet	N/A	N/A	N/A	24,417	25,906	17,903	13,081	18,391		
Trip Gillnet	N/A	N/A	N/A	7,303	5,529	6,168	6,941	8,685		
Midwater trawl	23,801	26,303	69,968	97,707	130,570	106,402	128,995	191,789	106,487	178,511
Shrimp trawl	12,438	15,888	15,440	9,491	3,893	6,210	3,665	1,384	3,105	1,881
Scallop dredge	16,671	15,482	16,460	14,185	13,993	21,482	30,557	41,879	44,426	51,332
Lobster trap	5,532	6,065	6,449	6,229	5,905	7,290	5,391	4,433	4,806	4,535
All other	69,730	83,125	71,079	118,584	69,271	74,085	77,029	68,189	49,747	45,395
Total	**418,071**	**438,497**	**453,540**	**528,788**	**522,683**	**467,931**	**486,302**	**550,562**	**426,517**	**495,954**

Table 44 – Total landings (all species, 1,000's of pounds) by vessels with multispecies permits, by gear

Gear Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	203
Bottom trawl*	54,237	48,837	54,518	54,232	55,224	56,048	73,622	85,422	71,516	67,347
Bottom longline*	5,337	4,120	2,870	3,912	4,068	2,706	2,192	2,767	982	1,128
Hook and line*	121	603	711	893	1,079	793	1,420	1,663	770	568
Sink gillnet, total*	15,172	13,643	13,829	13,280	10,962	11,555	12,653	13,769	10,475	12,016
Day Gillnet	N/A	N/A	N/A	7,278	4,783	5,122	5,123	6,884		
Trip Gillnet	N/A	N/A	N/A	3,768	3,714	3,694	4,984	5,171		
Midwater trawl	0	0	0	0	0	1	0	0	0	0
Shrimp trawl	23	35	32	41	1	1	24	2	1	4
Scallop dredge	245	206	176	177	162	165	216	309	147	11
Lobster trap	29	39	26	19	15	27	72	10	18	7
All other	171	295	221	179	137	220	576	382	185	114
Total	**75,334**	**67,779**	**72,384**	**72,734**	**71,649**	**71,517**	**90,775**	**104,325**	**84,094**	**81,195**

Table 45 – Regulated groundfish landings (1,000's of pounds) by vessels with multispecies permits, by gear

Gear Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bottom trawl*	$176,972	$168,294	$159,429	$165,551	$167,224	$175,251	$172,571	$162,534	$162,499	$146,012
Bottom longline*	$10,929	$9,050	$7,403	$8,657	$9,201	$6,700	$5,893	$6,583	$4,786	$4,072
Hook and line*	$9,082	$10,228	$7,083	$5,848	$5,059	$5,534	$2,605	$2,467	$1,791	$3,458
Sink gillnet, total*	$26,234	$28,718	$25,881	$23,812	$26,016	$33,820	$30,293	$34,363	$29,761	$28,089
Day Gillnet	N/A	N/A	N/A	$12,429	$12,632	$14,146	$13,536	$18,561		
Trip Gillnet	N/A	N/A	N/A	$5,175	$4,736	$6,814	$7,041	$8,451		
Midwater trawl	$2,547	$4,120	$4,192	$5,488	$7,354	$6,619	$7,496	$11,874	$7,230	$12,459
Shrimp trawl	$11,839	$12,352	$12,069	$10,795	$5,110	$9,063	$7,499	$2,999	$4,215	$1,402
Scallop dredge	$74,222	$70,375	$83,342	$71,085	$65,194	$105,746	$141,604	$141,651	$168,495	$193,062
Lobster trap	$15,662	$16,309	$17,220	$16,223	$16,004	$21,747	$15,340	$11,717	$12,035	$12,044
All other	$33,992	$29,182	$22,869	$20,380	$17,710	$18,239	$22,696	$14,930	$14,211	$14,127
Total	**$361,479**	**$348,628**	**$339,489**	**$327,839**	**$318,870**	**$382,718**	**$405,996**	**$389,118**	**$407,025**	**$414,725**

Table 46 – Total revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by gear

Gear Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bottom trawl*	$69,496	$64,315	$64,621	$63,322	$69,001	$69,348	$77,463	$81,747	$80,958	$67,398
Bottom longline*	$6,593	$4,873	$3,343	$4,724	$5,389	$3,758	$2,912	$3,238	$1,451	$1,370
Hook and line*	$148	$782	$807	$1,045	$1,456	$1,193	$1,835	$1,922	$1,109	$808
Sink gillnet, total*	$17,233	$14,834	$13,156	$12,648	$11,383	$12,829	$12,272	$12,308	$12,074	$11,226
Day Gillnet	N/A	N/A	N/A	$7,463	$5,215	$5,893	$5,207	$6,621	N/A	N/A
Trip Gillnet	N/A	N/A	N/A	$2,975	$3,564	$3,987	$4,575	$4,251	N/A	N/A
Midwater trawl	$0	$0	$0	$0	$0	$1	$0	$0	$0	$0
Shrimp trawl	$30	$36	$38	$41	$1	$2	$9	$3	$1	$7
Scallop dredge	$269	$222	$185	$201	$194	$182	$168	$248	$142	$12
Lobster trap	$32	$42	$25	$21	$15	$38	$67	$10	$18	$9
All other	$223	$400	$269	$242	$176	$265	$580	$264	$242	$111
Total	**$94,025**	**$85,503**	**$82,444**	**$82,244**	**$87,614**	**$87,615**	**$95,306**	**$99,740**	**$97,997**	**$81,481**

Table 47 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by gear

6.4.2.5 Landings and Revenues by Homeport State

Federal permit holders indicate their homeport state when applying for a permit. While a vessel is not obligated to land in its claimed homeport, summarizing landings and revenues by this information indicates whether regulations have different effects on different communities. Permit applicants also indicate their principal port state when applying for a permit, and there is some information that indicates principal port state may be a more reliable indicator of where landings actually occur. Nevertheless, in order to be consistent with the information in Amendment 13, this document reports information by homeport state. There are minor differences between these tables an earlier revenue and landings summaries for FY 2003 due to rounding errors.

Maine, Massachusetts, Rhode Island, and New Jersey showed large declines in total landings by vessels with multispecies permits between FY 2001 and FY 2002. With respect to groundfish landings, only vessels listing Rhode Island as a homeport showed an increased in groundfish landings (+3 percent), while all other states reported a declined. Vessels listing Virginia homeports reported a decline of 83 percent, Connecticut vessels showed a decline of 43 percent, and New Hampshire (-33 percent) and New Jersey (-34 percent) had similar reductions. Groundfish landings by Maine vessels declined 25 percent, while landings by Massachusetts vessels declined 18 percent.

Between FY 2001 and FY 2002, total revenues for vessels with multispecies permits increased for vessels claiming Massachusetts, Connecticut, New Jersey, Virginia, and Florida as the homeport state. With the exception of Connecticut, these states all have substantial scallop activity, and the increase in total revenues may reflect increased scallop landings. All other homeport states saw a decline in total revenues. In terms of groundfish revenues, vessels claiming Rhode Island (+21.5 percent) and New York (7.7 percent) reported an increase in groundfish revenues. All other homeport states saw a decline in groundfish revenues. Connecticut groundfish revenues declined 31 percent even as total revenues increased, reflecting a shift away from groundfish. Groundfish revenues declined for vessels homeported in New Hampshire (-20.2 percent), New Jersey (-17 percent), Maine (-12.7 percent), and Massachusetts (-1.6 percent) all declined.

Total landings increased from FY 2002 to FY 2003 for vessels with homeports of Maine (+11.5 percent), New Hampshire (+3 percent), Massachusetts (+45.8 percent), and New Jersey (+6 percent). Total landings declined for vessels from Connecticut (-33.2 percent), New York (-13.1 percent), North Carolina (-1.3 percent), and Rhode Island (-0.4 percent). Regulated groundfish landings increased for vessels from New Jersey (+18.5 percent), Maine (+6.6 percent), New Hampshire (+2.5 percent), and Rhode Island (+0.6 percent). Groundfish landings declined for vessels from Connecticut (-69.3 percent), Massachusetts (-8.1 percent), and New York (-6.1 percent). Total revenues increased for vessels from New Jersey (+16 percent) and Massachusetts (+1 percent), but declined for vessels from Connecticut (-27.6 percent), New Hampshire (-17.8 percent), New York (-12.7 percent), Maine (-7.8 percent), and Rhode Island (-0.3 percent. Groundfish revenues increased for vessels from New Jersey (+23.5 percent) and declined for vessels from Massachusetts and New York (-18.6 percent), Rhode Island (-13.3 percent), New Hampshire (-12.2 percent) and Maine (-9.3 percent).

State	1996	1997	1998	1999	2000	2001	2002	2003
ME	57,735	116,809	80,185	97,244	92,655	106,347	72,683	81,089
NH	10,005	8,479	9,134	6,720	16,532	25,893	24,781	25,572
MA	152,568	154,493	146,750	124,629	131,754	173,959	130,878	190,757
RI	99,630	103,482	115,016	100,941	93,407	86,590	58,125	57,906
CT	169	343	1,834	294	3,227	2,601	2,164	1,447
NY	23,291	30,003	31,725	27,965	29,761	26,073	25,492	22,157
NJ	79,842	85,836	107,158	81,878	87,857	94,971	74,537	79,062
DE	6,759	2,011	1,968	1,865	1,453	1,238	886	973
MD	1,310	2,366	2,085	1,741	1,469	1,338	1,146	882
VA	7,655	7,491	9,840	8,587	10,600	11,409	11,329	11,245
NC	10,727	13,548	16,427	15,639	16,132	18,972	23,237	22,936
FL	2,325	1,076	443	233	267	509	532	595
Other	1,523	2,852	118	193	706	661	727	1,281
Total	**453,540**	**528,788**	**522,682**	**467,931**	**485,819**	**550,562**	**426,517**	**495,902**

Table 48 – Total landings (all species, 1,000's of pounds) by vessels with multispecies permits, by homeport state

State	1996	1997	1998	1999	2000	2001	2002	2003
ME	15,284	14,180	13,306	13,188	18,047	21,139	15,934	16,998
NH	4,279	4,080	4,267	3,232	4,535	5,029	3,351	3,435
MA	46,313	46,983	42,312	42,767	50,724	61,687	50,317	46,282
RI	2,972	4,213	6,142	6,090	8,486	8,666	8,941	8,999
CT	37	3	141	174	820	758	403	124
NY	1,323	1,369	2,445	2,916	4,096	3,069	2,870	2,697
NJ	925	346	952	1,375	1,844	1,095	723	857
DE	835	882	831	952	988	796	510	521
MD	1	0	1	0	4	2	2	<1
VA	212	119	398	407	431	829	143	270
NC	15	321	732	360	798	1,254	898	1,011
FL	140	238	121	53	2	0	1	250
Other	47	0	0	0	0	0	0	0
Total	**72,384**	**72,734**	**71,648**	**71,517**	**90,775**	**104,325**	**84,093**	**81,444**

Table 49 – Regulated groundfish landings (all species, 1,000's of pounds) by vessels with multispecies permits, by state

State	1996	1997	1998	1999	2000	2001	2002	2003
ME	$38,342	$35,027	$29,539	$35,420	$37,032	$35,227	$32,369	$29,870
NH	$7,832	$6,977	$7,795	$6,724	$9,462	$9,801	$8,561	$7,045
MA	$153,434	$135,173	$130,633	$160,839	$171,463	$172,146	$182,898	$184,860
RI	$45,405	$46,800	$46,082	$54,549	$46,469	$39,281	$37,905	$38,026
CT	$357	$739	$470	$449	$3,754	$3,082	$4,250	$3,078
NY	$19,438	$23,484	$25,398	$23,569	$23,928	$21,650	$21,630	$18,888
NJ	$41,179	$43,257	$42,060	$51,992	$55,242	$51,598	$54,585	$63,406
DE	$2,504	$2,459	$2,570	$3,292	$1,699	$1,263	$1,037	$1,171
MD	$955	$1,560	$1,430	$1,356	$1,558	$1,208	$937	$809
VA	$19,367	$19,260	$18,735	$25,365	$31,376	$30,366	$33,430	$35,799
NC	$7,376	$10,524	$12,777	$17,754	$21,131	$20,658	$25,416	$29,299
FL	$2,458	$1,634	$1,221	$916	$1,251	$1,587	$1,933	$2,191
Other	$841	$944	$161	$494	$1,611	$1,249	$73	$101
Total	**$339,489**	**$327,839**	**$318,869**	**$382,718**	**$405,977**	**$389,118**	**$407,025**	**$414,543**

Table 50 – Total revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by homeport state

State	1996	1997	1998	1999	2000	2001	2002	2003
ME	$16,579	$14,866	$14,957	$16,248	$18,834	$19,378	$16,934	$15,365
MA	$53,852	$55,185	$53,973	$53,729	$54,377	$60,021	$59,101	$48,110
NH	$3,858	$3,666	$4,646	$3,401	$4,579	$4,719	$3,768	$3,309
RI	$3,699	$4,686	$7,347	$7,004	$8,483	$8,253	$10,035	$8,704
CT	$74	$3	$171	$185	$799	$667	$461	$164
NY	$1,676	$1,732	$2,982	$3,316	$4,207	$3,058	$3,294	$2,683
NJ	$1,119	$429	$1,111	$1,513	$1,702	$915	$761	$940
DE	$1,056	$987	$976	$1,251	$1,016	$796	$550	$531
MD	$1	$0	$1	$0	$4	$2	$3	$<1
VA	$280	$159	$556	$497	$455	$818	$201	$244
NC	$18	$321	$765	$427	$848	$1,113	$886	$888
FL	$176	$211	$129	$44	$1	$0	$1	$<1
Other	$57	$0	$0	$0	$0	$0	$0	$0
Total	**$82,444**	**$82,244**	**$87,613**	**$87,615**	**$95,306**	**$99,740**	**$97,997**	**$80,938**

Table 51 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by homeport state

6.4.2.6 Expected Impacts of Amendment 13

Extensive information on the expected impacts of Amendment 13 management measures on the commercial fishing industry was included in the FSEIS (NEFMC 2003). While the economic returns are positive over the length of the rebuilding program, those returns depend on harvesting all stocks at the target fishing mortality. There is analysis in Amendment 13 that suggests that some stocks will be harvested at less than the target fishing mortality unless programs are developed to use Category B DAS. Amendment 13 analyzed short-term impacts on commercial fishing vessel gross revenues with the assumption that only Category A DAS would be used since it was not certain which Category B DAS program would be available upon implementation. These impacts were estimated for different categories of commercial vessels. Categories were based on dependence on groundfish revenues, vessel size, gear,

homeport state, and port group. While the following summary reports median results (half the vessels have greater losses, half have lower losses), Amendment 13 also reported the distribution of losses across all vessels.

Amendment 13 measures are expected to reduce revenues on fishing trips that catch groundfish. Fleet wide, the median revenue loss compared to the 1998 – 2001 average was estimated to be 19.6 percent. Impacts are expected to fall most heavily on those vessels that depend on groundfish for a higher percentage of their fishing revenues. As an illustration, the median loss for vessels that depend on groundfish revenues for 25 percent or less of fishing revenues was estimated to be only 2.5 percent, while vessels that rely on groundfish revenues for 75 percent of more of their revenues were estimated to have a median loss of 35 percent. Median losses for three vessel size classes were expected to be similar, but there were differences in the distribution of revenue losses. While all most large vessels are expected to have at least some revenue losses, some small vessels may experience revenue gains under Amendment 13.

When both gear and vessel size was examined, the median losses for both small and large hook vessels ranges from 10.8 percent to 0.6 percent. Median losses for small, medium, and large trawl vessels were 17.4 percent, 25.4 percent, and 24.2 percent, respectively. Median losses for small gillnet vessels were estimated at 0.2 percent, while large gillnet vessels were estimated to lose 18.2 percent.

The median revenue losses for groundfish vessels claiming Maine (-29 percent) and Massachusetts (-26.2 percent) were similar. Median losses in New Hampshire were not as severe (-16.9 percent). Losses for these states were larger than for other states because vessels are more dependent on groundfish. Median expected losses for New York/Connecticut, New Jersey, and Rhode Island ranged from 10 to 15 percent.

While it is too soon to evaluate whether these estimated impacts were realized, some information is available on the CAII Yellowtail Flounder SAP that was considered during development of FW 40B. As implemented, vessels could begin fishing in this SAP on June 1, 2004. The SAP attracted extensive interest and resulted in large catches of yellowtail flounder during June through September. The SAP was closed on September 3, 2004 after 319 trips were taken. According to NMFS estimates (http://www.nero.noaa.gov/ro/fso/usc.htm), about 8.2 million pounds (3,720 mt) of yellowtail flounder were caught (kept and discarded), along with 1.1 million pounds (499 mt) of haddock and 35,397 pounds (16.1 mt) of cod. Since an additional 2.5 million pounds (1,134 mt) were caught outside of the SAP, the Eastern U.S./Canada area was closed to all fishing on a groundfish DAS and possession of yellowtail flounder was prohibited in the Western U.S./CA area on October 1, 2004 unless fishing under an approved SAP (which became possible November 19, 2004 after approval of FW 40A). According to NMFS this action was taken to reduce the risk of exceeding the GB yellowtail flounder TAC adopted under the U.S./CA Resource Sharing Understanding. This prohibition on possession of yellowtail flounder in the Western U.S./CA area prompted interest in modifying this SAP so that in the future catches in the SAP would not affect fishing on Category A DAS outside of the SAP. This SAP successfully provided U.S. fishermen the opportunity to harvest more GB yellowtail flounder than has been taken in recent years in spite of Amendment 13 effort reductions, but had the unintended consequence of shortening the season when that stock could be targeted. The Eastern U.S./CA area was re-opened January 14, 2005 and possession of yellowtail flounder was allowed subject to a landing limit of 15,000 lbs./trip when NMFS determined that this could be allowed with little risk of exceeding the GB yellowtail flounder TAC.

Amendment 13 also implemented a DAS leasing program that could affect fishing mortality. Some information is available on the transfer of DAS through the leasing program. From May 1, 2004 through January 12, 2005, NMFS received 193 applications for DAS leases, of which 173 were approved.

A total of 4,846.64 DAS were exchanged at a total cost of about $2.3 million, with an average cost (across all leases) of $482.43 per DAS leased. The highest cost per DAS transferred was $2,000, and the lowest cost was $0. Thirteen percent (twenty-three) of the leases were at no cost, while twenty-six percent (forty-five) were at a price per DAS of $10 or less (including no cost leases). Just over fifty percent (51.45 percent, or 99 leases) were at a price per DAS of $325 or less, while seventy-five percent (130) were at a price per DAS of $642 or less.

Movement of DAS between states is shown in Table 52. Permits from Massachusetts and Maine gained the most DAS through leasing, followed by New Hampshire and Rhode Island. Thirty-six percent of the DAS leased came from permits in Massachusetts, thirty-three percent from permits in Maine, with no other state contributing more than ten percent. For all DAS leased, sixty-six percent remained in the original permit state. For the states that accounted for most of the leasing activity, most DAS remained in state: 92% of the DAS leased in Massachusetts remained in state, while 88% of the DAS leased in Maine did the same. Only Massachusetts and Maine showed a net increase in DAS as a result of leasing activity, with all other states losing DAS.

Table 53 shows the number of DAS lease by vessel size. Most (47 percent) DAS leases took place with vessels of less than 5 tons. Vessels between 5 and 50 tons accounted for 19.5 percent of the DAS leased, vessels between 50 and 150 tons accounted for 16.5 percent, and vessels over 150 tons accounted for 17 percent. The average price per DAS leased increased with vessel size.

Table 54 shows the flow of revenues from leasing activity. These fund transfers should not be interpreted as changes in fishing revenue. Presumably vessels acquiring DAS (lessee vessels) do so on the assumption that revenues from the leased DAS will exceed the leasing price and so the “losses” shown in this table will be at least partially offset by increased fishing revenues. For lessor vessels, the “gains” in this table may represent a partial increase in the revenue that earned from fishing those DAS but may represent a more substantial increase in profit since vessel operating costs may be reduced. In terms of net dollar flows, vessels in Rhode Island gained $415,248 through leasing activity, followed by New Jersey ($166,276) and New York ($117,000). Massachusetts-based vessels, on the other hand, had a net dollar loss of $725,394 and Maine-based vessels had a net dollar loss of $204,309.

Exchanges of DAS through leasing may not only move DAS between states, but may move DAS between vessels with different efficiency. Data are not yet available on the catches of groundfish made on leased DAS, so the only indication of possible mortality impacts is the movement between states. Since the net change in DAS resulted in gains by vessels from Massachusetts and Maine, some indication of where this effort may be used can be gained by looking at the vessel size associated with leases. For Massachusetts vessels, leasing led to a net increase of 541 DAS for vessels over 50 tons and 252 DAS for vessels under 50 tons. For Maine vessels, leasing led to a net increase of 103 DAS for vessels over 50 tons and 131 DAS for vessels less than 50 tons. Larger vessels with homeports in Massachusetts and Maine are more likely to fish offshore on Georges Bank, while smaller vessels are more likely to fish inshore in the GOM. In general, these impacts are consistent with the analysis of the leasing program that was included in Amendment 13.

	Lessee (Gaining) State							
Lessor (Losing) State	MA	ME	NH	NY	RI	Total	Lost to Other States	Net Change
CT/LA/VA	139.12		12.61		52.8	204.53	204.53	-204.53
MA	1600.07	79.78	38	22		1739.85	139.78	793.77
ME	153.95	1408.61	43			1605.56	196.95	234.27
NH	43.8	194	207.08			444.88	237.8	-125.29
NJ	50	90.73	18.9		52.8	212.43	212.43	-212.43
NY	149.66	66.71				216.37	216.37	-194.37
RI	397.02				26	423.02	397.02	-291.42
Total	2533.62	1839.83	319.59	22	131.6	4846.64	52.93	
Gained from Other States	933.55	431.22	112.51	22	105.6			

Table 52 – DAS movement between states as a result of leases (NMFS unpublished data through January 12, 2005)

	Permit Size Range (tons)				
	Less than 5	5-50	51 -150	Over 150	Grand Total
Total DAS leased	2,270.1	945.7	798.9	832.0	4,846.6
Total Dollars	$ 473,761	$ 352,124	$ 625,969	$ 860,860	$2,312,714
Average Price/DAS	$ 209	$ 372	$ 784	$ 1,035	

Table 53 – DAS leases and expenditures by permit size range ((NMFS unpublished data through January 12, 2005)

	Lessee State							
Lessor State	MA	ME	NH	NY	RI	Total	Total received from other states	Net Change
CT/LA/VA	$ 141,656		$ 5,000		$26,400	$ 173,056	$ 173,056	$ 173,056
MA	$ 726,971	$ 38,340	$ 4,000	$ 12,000		$ 781,311	$ 54,340	$ (725,394)
ME	$ 39,030	$ 414,517	$ 100			$ 453,647	$ 39,130	$ (204,309)
NH	$ 8,800	$ 66,023	$ 50,953			$ 125,776	$ 74,823	$ 58,123
NJ	$ 20,000	$ 112,276	$ 7,600		$ 26,400	$ 166,276	$ 166,276	$ 166,276
NY	$ 102,200	$ 26,800				$ 129,000	$ 129,000	$ 117,000
RI	$ 468,048				$ 15,600	$ 483,648	$ 468,048	$ 415,248
Total	$ 1,506,705	$ 657,956	$ 67,653	$ 12,000	$ 68,400	$ 2,312,714		
Total sent to other States	$ 779,734	$ 243,439	$ 16,700	$ 12,000	$ 52,800	$ 1,104,673	$,104,673	$ 0

Table 54 – Dollar transfers between states from DAS leasing activity (NMFS unpublished data through January 12, 2005)

6.4.2.7 Expected Impacts of Framework Adjustment 40A

The Council submitted FW 40A in July, 2004 and it was implemented in November. This action adopted three additional programs for using Category B DAS: a hook gear SAP to target haddock in CAI, a SAP to target haddock in the Eastern U.S./Canada area using appropriate gear, and a pilot program for using Category B (regular) DAS. In addition the framework included a provision that would allow vessels to fish inside and outside the Western U.S./Canada area on the same trips. While data were not available to provide estimates of the economic impacts of these programs, the analyses in FW 40A concluded that these programs would provide positive economic benefits to participants. These positive benefits will help mitigate the negative economic impacts of Amendment 13. Some preliminary catch information is available for the programs implemented by FW 40A. The CAI Hook Gear Haddock SAP (as implemented, only available to GB Cod Hook Sector vessels) closed on December 31, 2004 after landing 1,054,254 pounds of haddock on 166 trips (an average of 6,350 lbs./trip). Only 20,505 pounds of cod were landed for a haddock/cod ratio of over 51:1. Through January 20, 2005, 130 Category B (regular) DAS trips were taken (115 in the groundfish fishery, 15 in the monkfish fishery). Catches are not yet available for those trips. Only four trips were taken in the Eastern U.S./Canada Area SAP before it closed on December 31, 2004. These trips were not successful in catching haddock and avoiding cod. Data published by NMFS shows that 21,895 pounds of cod and only ten pounds of haddock were caught. Revenue data is not yet available to provide additional information on the impacts of FW 40A.

6.4.2.8 Summary

Groundfish revenues declined by four percent (in constant 1999 dollars) between 1994 and the adoption of Amendment 5 and FY 2002. The nadir was reached in 1996 and 1997 when revenues had declined by 13 percent from 1994. Groundfish revenues climbed until 2001 before showing the slight decline in FY 2002. The increase in groundfish revenues since 1994 was not evenly distributed. While bottom trawl vessels increased groundfish revenues by 16 percent between 1994 and 2001, longline revenues declined by 78 percent and gillnet revenues by 30 percent. Vessels fifty feet and more in length saw revenues increase five percent, while those less than fifty feet saw revenues decline by six percent.

The management measures in place in FY 2002 imposed many changes on the groundfish fishery compared to the fishery in FY 2001. While the number of vessels landing groundfish (-12 percent), DAS used (-36.6 percent), and groundfish landings (-18.9 percent) all declined substantially, groundfish revenues only declined by 1.5 percent (in constant 1999 dollars) from FY 2001 to FY 2002. Overall, this suggests that in aggregate the groundfish fishery provided higher revenues per vessel or DAS fished in FY 2002 than in the previous year. Impacts differed depending on vessel size, gear, and homeport state. Bottom longline vessels showed a substantial decline in groundfish revenues, while other gears either showed smaller declines or, in the case of bottom trawls, an increase. Vessels over 75 feet in length increased groundfish revenues, while all other vessel sizes experienced a decrease. This information should not be used to indicate profitability, however, as it does not take into account fixed and variable costs.

Preliminary landings and revenue information for FY 2003 suggest a sharp decline in groundfish revenues since FY 2002 even though landings only declined 3.5 percent. In terms of constant 1999 dollars, revenues in FY 2003 were 13.4 percent lower than revenues in FY 1994 and 1.2 percent lower than revenues in FY 1996 (the year Amendment 7 was implemented). The three primary gears (trawl, longline, and sink gillnet) had lower groundfish revenues in FY 2003 than in FY 1994.

Understanding the impacts of the court ordered measures and the resulting implications for Amendment 13 measures is difficult given the apparent revenue decline in FY 2003. From FY 2002 to FY 2003, the number of vessels landing groundfish continued to decline (-5.5 percent from FY 2002),

DAS use remained relatively constant (+2.2 percent), groundfish landings declined (-3.5 percent), but revenues appear to have declined considerably (-17.5 percent) and in terms of constant dollars are at the lowest observed level since FY 1994. At the same time, for the vessels with multispecies permits that landed groundfish, the average groundfish revenues per vessel in FY 2003 were sixty-seven percent higher than in FY 1996 (in constant 1999 dollars; see Table 35 and Table 38). The reasons for the decline in FY 2003 revenue have not been determined. The apparent revenue decline could be due to incomplete preliminary data, an increase in the producer price index that devalued nominal revenues, a shift to other sources of supply by buyers that lowered demand and prices for groundfish, lower landings of more valuable species such as cod, or a combination of these and other factors.

While the total number of DAS (both Category A and B combined) allocated by Amendment 13 is similar to the number of DAS allocated in FY 2002, the distribution of those DAS is different. With respect to Category A DAS that can be used to target any groundfish stock, bottom longline vessels have more DAS allocated for FY 2004 than were allocated to those vessels in FY 2002. The other two primary groundfish gears – otter trawls and sink gillnets – have fewer Category A DAS in FY 2004 than DAS allocated in FY 2002. In terms of the combined Category A and B DAS, the three primary groundfish gears have more DAS allocated in FY 2004 than in FY 2002, with bottom longline and otter trawl vessels having the greatest increase, followed by sink gillnet vessels. All vessel length classes have fewer Category A DAS allocated in FY 2004 than in FY 2002, but the differences are not the same - larger vessels lost fewer DAS. The number of combined Category A and Category B DAS allocated to vessels over fifty feet in length is more DAS than these vessels were allocated in FY 2002, while vessels under fifty feet have fewer combined DAS in FY 2004 than they were allocated in FY 2002. When examined by homeport state, all states have fewer Category A DAS allocated in FY 2004 than in FY 2003, with Maine having the least loss (-28 percent) while New York has the largest difference (-57 percent). If both Category A and B DAS are considered, vessels listing Maine as a homeport have 20 percent more DAS allocated in FY 2004 than in FY 2002, New Hampshire and Massachusetts have small increases, and other states have fewer DAS allocated.

The FY 2004 DAS allocations show which vessel categories will have Category B DAS available to use in the programs proposed in this action, and which categories may need to use those DAS. For example, since bottom longline vessels have more Category A DAS available in FY 2004 than DAS allocated in FY 2002, there will be less need for them to use Category B DAS. The decline in groundfish revenues for this group that occurred in FY 2002, however, suggests that the increase in Category A DAS and the proposed CAI Haddock SAP will help this group return to its earlier share of groundfish revenues. The increase in groundfish revenues in the larger vessel size classes, even though DAS use declined, reflect the ability of these vessels to target healthy offshore stocks. Finally, the number of available Category B DAS, and their distribution to gears and states that are active in the groundfish fishery, suggests that care must be taken in designing Category B DAS programs so that the combined effort of Category A and B DAS does not threaten Amendment 13 mortality objectives.

6.4.3 Recreational Harvesting Sector

This sector consists of two main components: recreational fishermen who access the resource either from shore or through the use of privately-owned vessels, and recreational fishermen who access the resource by using a vessel that carries passengers for hire. The latter group is referred to as "party/charter" vessels. The distinction between the two is that party vessels carry large numbers of passengers and are generally licensed and inspected by the Coast Guard to carry passengers for hire, while charter vessels are usually smaller vessels that carry up to six passengers. Only party/charter vessels are required to have a permit issue under the multispecies FMP. Recreational fishermen generally target

cod, haddock, pollock, and winter flounder, though they catch other regulated groundfish species. The targeted stocks include GOM and GB cod, GOM and GB haddock, and GOM and SNE/MA winter flounder. The recreational groundfish fishery with access to these resources is concentrated between southern Maine and Rhode Island, though winter flounder is targeted by recreational fishermen as far south as New Jersey.

Amendment 13 provided a detailed description of the recreational harvesting sector. Because this proposed action does not include any recreational fishing management measures, this information is not repeated and has not been updated.

6.4.4 Processing and Wholesale Trade Sector

Fresh fish processing and frozen fish processing are two separate industries in New England. This sector is described in detail in Amendment 13. In general terms, the number of processing firms in New England has declined since 1995, while the number of wholesaling firms has increased. Processing sector employment increased until 1997, and then declined. Wholesale employment showed the opposite trend – declining until 1997, followed by an increase until 1999. While in 1999 the number of fresh-fish processing plants had been stable since 1995, the number in business was estimated to be one-third fewer than in 1992. Landing declines have forced processors to acquire additional imports from Canada and the west coast. Public testimony during public hearings on Amendment 13 noted that processors are under increasing pressure to provide retail outlets with predictable supplies of fish that can be incorporated into sophisticated marketing plans. Because supplies of local groundfish can fluctuate due to closed areas and seasons, processors have been forced to search for other sources of supply to meet market needs. Subsidiary impacts are a loss in the ability to handle large influxes of fresh fish when seasonal closed areas open, depressing prices. There is a concern that because of fluctuating supplies caused in part by regulatory actions, wholesale purchasers will abandon local suppliers. If that happens, some industry experts believe the processing of fresh fish may be exported, dealers will have difficulty retaining workers, and the local processing industry will vanish (Norton, pers.comm.).

6.4.5 Communities

6.4.5.1 Background

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is “a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.” Current guidance on National Standard 8 specifies that communities are place-based: geographic units such as towns and cities that might fit the Census Bureau's definition of a “place.” But actual methodological guidelines are still in the process of refinement and resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. For example, the weigh-out data and the permit files document landing and home ports, but these are not necessarily the same places where people live, where specific styles of and knowledge about fishing are practiced, or where the impacts of management are most strongly felt. It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other communities in the region.

In terms of the keywords “substantially dependent” and “substantially engaged,” some have suggested, for example, that "substantial dependence" be measured in terms similar to the U.S. Department of Agriculture’s criteria for determining whether rural communities are dependent on agriculture or logging. The Economic Research Service of the USDA, for example, classifies counties as farming dependent given a certain percentage of economic activity, in this case labor and proprietor income. Some of the sources of data to consider in making determinations of fishing dependence are thus supplied in current guidance, such as landings information or numbers of participants, and the socio-cultural importance of the fishery. With respect to determining whether a community is "substantially engaged" in the harvesting or processing of a fishery, existing guidance does not provide clear criteria. While the application of a percentage of economic income activity may be an appropriate way to determine "substantial dependence", there may be other valid criteria for determining "substantial dependence." For example, it could be based on some minimum absolute level of activity (such as landings, number of vessels, etc.), or the presence of particular type of infrastructure (auctions, co-ops, state fish piers), or level of fishing activity (revenues, landings in weight, time spent fishing) that indicate a community is "substantially engaged" in fishing. This approach was used in Amendment 13 to identify fishing communities that are "substantially engaged" in fishing.

The Amendment 13 Affected Human Environment and the SIA also discuss ports and groups based on gear or other characteristics in order to meet the requirements of the fishery impact statements to examine the impacts to all the individuals, communities, and other groups that participate in the fishery. However, assessment of the impacts of the measures proposed in this action includes not only those communities that meet the strict interpretation of fishing communities, but also other ports or port groups that will certainly experience impacts from the proposed action. Not all of these port groups necessarily meet the legal definition of a fishing community as promulgated through National Standard 8, which can be considered a subset of the broader ports and groups involved in the groundfish fishery. The Northeast Region has begun to make some headway in collecting the kinds of information and performing the kinds of analyses to support National Standard 8 determinations, most notably the Marine Fisheries Initiative (MARFIN) project on fishing communities and fishing dependency in New England (Hall-Arber, *et. al* 2001) and an updated port-profiles report for the Mid-Atlantic (McCay and Cieri, 2000). While some of these efforts include discussions of communities at larger levels than a “place,” they still usefully provide context and background for understanding the impacts that fishing communities defined by National Standard 8 might experience. However, they do not identify all the fishing dependent communities that may require action under National Standard 8, an exercise that is still in progress.

In Amendment 13, coastal communities throughout the Northeast region were organized into primary and secondary *port groups* based on participation in the groundfish fishery since the 1994 fishing year. The port groups were assembled in such a way that additional information about them can be obtained by cross-referencing information about the sub-regions in the MARFIN Report. The port groups identified in Amendment 13 are essentially subsets of the sub-regions identified in the MARFIN Report. Since social and demographic statistics are often compiled at the county level, the port groups are divided by county or adjacent counties, depending on how the MARFIN sub-regions are structured, so that county-level data may be used to characterize changes in these communities and ports.

The port groups are separated into primary and secondary groups. ***Primary groups*** are those communities that are substantially engaged in the groundfish fishery, as explained above, and which are likely to be the most impacted by groundfish management measures. ***Secondary groups*** are those communities that may not be substantially dependent or engaged in the groundfish fishery, but have demonstrated some participation in the groundfish fishery since the 1994 fishing year (FY94). Because of the size and diversity of the groundfish fishery, it is not practical to examine each secondary port

individually, which is why most secondary ports are grouped with others in the same county or in geographically adjacent counties.

To identify primary and secondary port groups, groundfish landings by port were examined for the time period 1994-1999 from the dealer weighout database. Primary port groups represent the most active ports (currently) in the groundfish fishery and were selected based on groundfish landings greater than one million pounds annually since 1994 and/or the presence of significant groundfish infrastructure (auctions and co-ops, for example). In Amendment 13 and in the absence of specific guidance, these ports are considered fishing communities (as defined by the MSFCMA) because they have demonstrated a continued substantial engagement in fishing, here in particular the groundfish fishery. Secondary port groups consist of groups of ports in which some level of groundfish activity has been observed since 1994. This approach provides a way to consider the impacts of management measures on every port in which some amount of groundfish has been landed since 1994, and identifies some as fishing communities (as defined by NS8) based on substantial engagement. Though the analysis does not identify those fishing communities that meet the "substantial dependence" criteria, it is unlikely that the analysis misses any port which may be a fishing community based on the substantial dependence criteria because the impacts of the amendment are considered on nearly every port that has groundfish activity,

It is important to remember that because significant geographical shifts in the distribution of groundfish fishing activity have already occurred, the characterization of some ports as primary or secondary ports may not reflect their historical participation in and dependence on the groundfish fishery. A good example is Rockland, Maine. Historically, Rockland would have been considered a primary groundfish port, landing large quantities of redfish, flounders, and other groundfish, and serving as an important groundfish processing port, and would have met the test for "substantial engagement." In recent years, however (since the establishment of the Hague Line in 1984 and the decline of groundfish stocks in the early 1990s), fishing activity in Rockland has shifted from groundfish to other species like lobster and herring. This also reflects the apparent concentration of the groundfish fishery around Portland, Maine and the loss of the fishery to many coastal communities in northern Maine.

The outline below lists the Amendment 13 primary and secondary port groups. Additional information about each of these groups appears in Amendment 13. Primary multispecies ports are considered fishing communities under NS8.

I. DOWNEAST MAINE – WASHINGTON COUNTY

A. Primary Multispecies Port
1. None

B. Secondary Multispecies Ports
1. Downeast Maine: Jonesport, West Jonesport, Beals Island, Milbridge, Machias, Eastport, and Dyers Bay

II. UPPER MID-COAST MAINE – HANCOCK, WALDO, AND KNOX COUNTIES

A. Primary Multispecies Ports
1. None

B. Secondary Multispecies Communities
1. Upper Mid-Coast 1: Rockland, Port Clyde, Sprucehead, Owls Head, Friendship, Friendship Harbor, Camden, and Vinalhaven
2. Upper Mid-Coast 2: Stonington and Sunshine/Deer Isle
3. Upper Mid-Coast 3: Winter Harbor, Southwest Harbor, Bar Harbor, Northeast Harbor, and Northwest Harbor

III. LOWER MID-COAST MAINE – LINCOLN, SAGADAHOC, AND CUMBERLAND COUNTIES

A. Primary Multispecies Ports
1. Portland

B. Secondary Multispecies Ports
1. Lower Mid-Coast 1: New Harbor, Bristol, South Bristol, Boothbay Harbor, East Boothbay, Medomak, Southport, and Westport
2. Lower Mid-Coast 2: Cundys Harbor, Orrs Island, Yarmouth, Harpswell, East Harpswell, South Harpswell, Bailey Island, and Cape Elizabeth
3. Lower Mid-Coast 3: Sebasco Estates, Small Point, West Point, Five Islands, and Phippsburg

IV. SOUTHERN MAINE – YORK COUNTY

A. Primary Multispecies Ports
1. None

B. Secondary Multispecies Ports
1. Southern Maine: York, York Harbor, Camp Ellis, Kennebunkport, Kittery, Cape Porpoise, Ogunquit, Saco, and Wells

V. OTHER MAINE – all other coastal Ports in Maine

VI. STATE OF NEW HAMPSHIRE – ROCKINGHAM AND STRAFFORD COUNTIES

A. Primary Multispecies Ports
1. Portsmouth

B. Secondary Multispecies Ports
1. NH Seacoast: Rye, Hampton/Seabrook, Hampton, and Seabrook

VII. OTHER NEW HAMPSHIRE – all other coastal Ports in New Hampshire

VIII. GLOUCESTER AND NORTH SHORE – ESSEX COUNTY

A. Primary Multispecies Ports
1. Gloucester

B. Secondary Multispecies Ports
1. The North Shore: Rockport, Newburyport, Beverly/Salem, Beverly, Salem, Marblehead, Manchester, and Swampscott

IX. BOSTON AND SOUTH SHORE – MIDDLESEX, SUFFOLK, NORFOLK, AND PLYMOUTH COUNTIES

A. Primary Multispecies Ports
1. Boston

B. Secondary Multispecies Ports
1. The South Shore: Scituate, Plymouth, and Marshfield (Green Harbor)

X. CAPE AND ISLANDS – BARNSTABLE, DUKES, AND NANTUCKET COUNTIES

A. Primary Multispecies Ports
1. Chatham/Harwichport

B. Secondary Multispecies Ports
1. Provincetown
2. Other Cape Cod: Sandwich, Barnstable, Wellfleet, Woods Hole, Yarmouth, Orleans, and Eastham
3. The Islands: Nantucket, Oak Bluffs, Tisbury, and Edgartown

XI. NEW BEDFORD COAST – BRISTOL COUNTY

A. Primary Multispecies Ports
1. New Bedford/Fairhaven
B. Secondary Multispecies Ports
1. Other Bristol County: Dartmouth, and Westport

XII. OTHER MASSACHUSETTS – all other coastal Ports in Massachusetts

XIII. STATE OF RHODE ISLAND – WASHINGTON AND NEWPORT COUNTIES

A. Primary Multispecies Ports
1. Point Judith
B. Secondary Multispecies Ports
1. Western RI: Charlestown, Westerly, South Kingstown (Wakefield), and North Kingstown (Wickford)
2. Eastern RI: Newport, Tiverton, Portsmouth, Jamestown, Middletown, and Little Compton

XIV. OTHER RHODE ISLAND – all other coastal Ports in Rhode Island

XV. STATE OF CONNECTICUT – NEW LONDON, MIDDLESEX, NEW HAVEN, AND FAIRFIELD COUNTIES

A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports
1. Coastal CT: Stonington, New London, Noank, Lyme, Old Lyme, East Lyme, Groton, and Waterford

XVI. OTHER CONNECTICUT – all other coastal Ports in Connecticut

XVII. LONG ISLAND, NEW YORK – SUFFOLK, NASSAU, QUEENS, AND KINGS COUNTIES

A. Primary Multispecies Ports
1. Eastern Long Island: Montauk, Hampton Bay, Shinnecock, and Greenport
B. Secondary Multispecies Ports
1. Other Long Island: Mattituck, Islip, Freeport, Brooklyn, Other Nassau County, and Other Suffolk County

XVIII. OTHER NEW YORK – all other coastal Ports in New York

XIX. NORTHERN COASTAL NEW JERSEY – MONMOUTH AND OCEAN COUNTIES

A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports
1. Northern Coastal NJ: Point Pleasant, Belford, Long Beach/Barnegat Light, Barnegat, Highlands, Belmar, Sea Bright, and Manasquan

XX. SOUTHERN COASTAL NEW JERSEY – ATLANTIC AND CAPE MAY COUNTIES

A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports
1. Southern Coastal NJ: Cape May, Wildwood, Burleigh, Sea Isle City, Ocean City, Stone Harbor, and Avalon

XXI. OTHER NEW JERSEY – all other coastal Ports in New Jersey

XXII. DELAWARE

XXIII. MARYLAND

XXIV. VIRGINIA

XXV. NORTH CAROLINA

6.4.5.2 Expected Impacts of Amendment 13

Amendment 13 includes detailed descriptive information on the primary and secondary port groups. Because the amendment was only implemented on May 1, 2004, it is not possible to update that information so that it reflects the impacts of management measures adopted. This section summarizes the expected impacts of Amendment 13 on the identified port groups.

Short-term reductions in fishing vessel gross revenues are expected to have a negative impacts on port groups. Analysis in Amendment 13 estimated that many port groups would have reductions in sales and income as a result of Amendment 13. While compared to the entire economies of these groups the losses are generally minor, they may have substantial impacts on fishing-related businesses. New Bedford MA is likely to have the most serious short-term impacts, followed by lower Mid-Coast Maine, Gloucester MA, and Boston MA. The distribution of the total impacts is illustrated in Figure 10 through Figure 12. These figures demonstrate that the impacts are not evenly distributed across all ports. Generally, those ports with an active groundfish fleet are expected to have more negative impacts. Some exceptions can also be seen. For example, the fact that Boston is a large financial, shipping, and insurance hub results in large impacts, even though the groundfish fleet in this port is small. During Amendment 13 public hearings, concern was expressed that the loss in fishing revenues and reductions in fishing time would lead to the failure of fishery support businesses such as gear and ice suppliers, etc., and the analyses underestimated these impacts.

While these impacts represent specific economic impacts on fishing communities, Amendment 13 was also expected to affect the social fabric of the fishing industry and its communities. Five social impact factors were identified:

- Regulatory discarding
- Safety
- Disruption of daily living
- Changes in occupational opportunities and community infrastructure
- Formation of attitudes

The SIA in Amendment 13 concluded that as a result of regulations implemented since 1994, many groundfish vessels were having difficulty operating efficiently, maintaining year round income, and competing in domestic and international markets. Regulations were splintering the fleet, boxing each vessel into a specific fishery and often making them more dependent on groundfish than in the past. The loss of fishing related infrastructure and support services in some communities was increasing concern about the future of fishing as a part of the community. The Amendment 13 measures that have the most chance of creating positive short-term social impacts are trip limit adjustments and special access programs. To the extent that increasing the Gulf of Maine cod trip limit can reduce regulatory discarding without compromising the long-term objectives of the amendment, short-term social impacts are likely to be positive. The Closed Area II yellowtail flounder access program has potential to mitigate some of the negative impacts of DAS modifications for large vessels. The positive impacts of this program will depend on whether or not vessels will find it worthwhile to use their remaining DAS to travel to Closed Area II.

The Amendment 13 management measures that have the most chance of producing negative short-term (and most likely long-term) social impacts are DAS reductions and additional year-round area closures. DAS reductions and additional year-round area closures are likely to produce long-term impacts on affected vessels, families, and communities. Just as they have in the past, vessels and communities will likely adapt and adjust to minor modifications to the area closures, additional gear restrictions, etc. However, it will be more difficult to adjust to reductions in groundfish opportunities (DAS. It is very likely that smaller operations that are currently operating marginally will not be able to adapt to these kinds of measures.

Mitigation is an important consideration given the magnitude and extent of the impacts likely to result from Amendment 13. The elements of Amendment 13 that have the most likelihood of mitigating some of the negative social impacts of the measures, at least in the short-term, include, permit transfer, the DAS leasing program, and special access programs to harvest groundfish stocks that can support more effort. The programs proposed to allow the leasing of unused DAS from vessels and/or the purchase/transfer of DAS require capital investment. Many vessels that are currently marginal will not have the financial ability to participate in such programs unless they sell their DAS, further reducing their opportunities in the groundfish fishery. Some marginal vessels may be able to take advantage of the DAS leasing program – leasing out DAS to reduce their operating costs – but this option may be viewed as abandoning a way of life. There may also be some opportunities to use Category B DAS, but under Amendment 13 those opportunities are limited.

To an extent, mitigation can also be realized from the ability for affected individuals to exit the fishery altogether and capitalize on alternative employment opportunities. For fishermen, this has always been a difficult reality to face. Fishing Family Assistance Centers can help individuals seek alternative employment and train them for new/different job skills. Centers are currently located throughout communities in Maine, as well as in Gloucester, New Bedford, and on Cape Cod. It is likely that the importance of retraining centers in these communities will increase as a result of Amendment 13, especially because these are some of the communities that will be most negatively impacted by Amendment 13. However, retraining and obtaining alternative employment cannot be assumed to fully mitigate the impacts of such a severe reduction in the groundfish fishery. Only a small percentage of affected individuals can be expected to participate in the retraining programs that the centers offer. Because of the independence and freedoms associated with fishing as an occupation and a way of life, many fishermen are not interested in retraining for shore side employment that lacks many of the characteristics that drew them to fishing in the first place. In addition, education and language barriers will continue to limit the possibilities for retraining, despite other important skills that fishermen have acquired at sea.

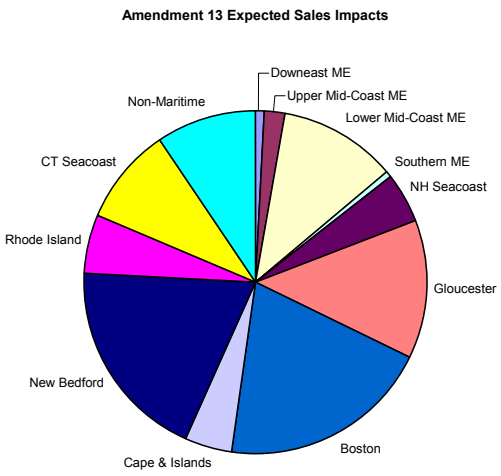


Figure 10 – Amendment 13 expected sales impacts, by port group

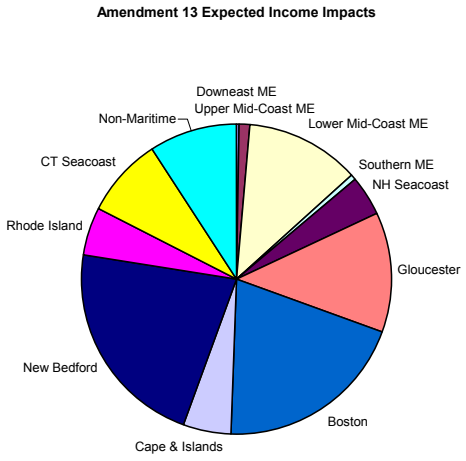


Figure 11 – Amendment 13 expected income impacts, by port group

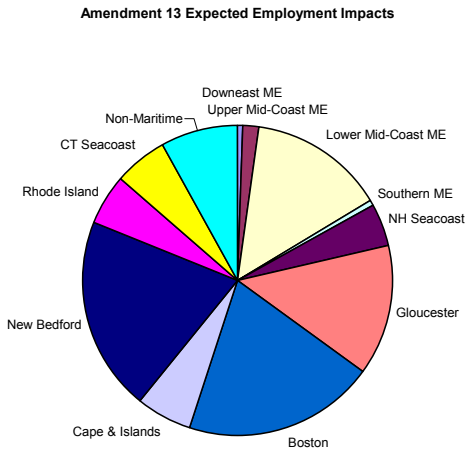


Figure 12 – Amendment 13 expected employment impacts, by port group

6.4.6 Description of the Atlantic Herring Fishery

A detailed description of the Atlantic herring fishery is provided in the Herring FMP and is incorporated into this document by reference. In addition, the Stock Assessment and Fishery Evaluation (SAFE) Reports for the Atlantic herring fishery, developed by the Herring PDT since the implementation of the Herring FMP, as well as the recently-submitted specification package for the 2005 fishing year provide updated information relative to the herring fishery and should be referenced for additional information.

Herring fisheries have existed in Europe for over 1,000 years and in the Northwest Atlantic for about 450 years. The U.S. Atlantic herring fishery occurs over the Mid-Atlantic shelf region from Cape Hatteras to Maine. In recent years, vessels have also pursued fish on Georges Bank. While fixed gear dominated the U.S. fishery in the 1960s, purse seines became the dominant gear type in the 1980s and early 1990s. Since the mid-1990s, the herring fishery has evolved and is now prosecuted primarily by midwater trawl (single and paired) vessels.

Most U.S. commercial catches occur between May and October in the Gulf of Maine, consistent with the peak season for the lobster fishery. In addition, there is a relatively substantial winter fishery in southern New England, and catches from Georges Bank have increased somewhat in recent years. There is a very small recreational fishery for Atlantic herring that generally occurs from early spring to late fall, and herring is caught by tuna boats for use as live bait in the recreational tuna fisheries. In addition, there is a Canadian fishery for Atlantic herring from New Brunswick to St. Lawrence, which primarily utilizes fixed gear. Fish caught in the New Brunswick (NB) weir fishery are assumed to come from the same stock (inshore component) as that targeted by U.S. fishermen.

Some updated information about the herring fishery is provided in the following subsections and was extracted from the 2005 specification package and EA for the Atlantic herring fishery. This

document was very recently submitted to NMFS and should be referenced for more detailed information about the herring fishery. In addition, detailed information about seasonal and annual fishing patterns in the herring fishery (by gear type and management area) is provided in section 7.8.1.7.1 of this document. The information in section 7.8.1.7.1 is intended to supplement the general description of the Atlantic herring fishery provided in the subsections below.

6.4.6.1 The Atlantic Herring Fleet

In general, there are three sectors of the Atlantic herring fleet that should be considered relative to the potential impacts of the measures proposed in this framework adjustment. These sectors were chosen based on gear type and the region in which the vessels' principal port of landing is located (based on vessel trip reports and the port in which the majority of the vessel's herring landings were identified). Herring vessel characteristics for the primary gear types are summarized in Table 55.

The **Maine purse seine fleet** consists of five vessels with principal ports of Addison, Prospect Harbor, Rockland, and Stonington ME. This sector made 340 trips and landed 20,256 mt of herring in 2003. The majority of the landings were from vessels with a port designation of Rockland or Stonington ME. Ninety five percent of the landings by this sector came from Area 1A in 2003. Eighty two percent (82%) of the total revenues for this sector came from Atlantic herring in 2003.

The **North of Cape Cod midwater trawl fleet** (pair and single) consists of 15 vessels with principal ports of Gloucester MA, Newington NH, New Harbor ME, Portland ME, Rockland ME, and Vinalhaven ME. This sector made 720 trips and landed 62,145 mt of herring in 2003. Vessels with a Portland designation landed 26,493 mt (43%), and those with a Gloucester designation landed 15,294 mt (25%). Sixty six percent (66%) of the herring landings by this sector came from Area 1 (5% from Area 1B) in 2003, 14% from Area 2, and 20% from Area 3.

The **South of Cape Cod midwater trawl fleet** (pair and single) consists of eight vessels with principal ports of New Bedford MA, Newport RI, North Kingstown RI, and Point Judith RI. This sector made 181 trips and landed 17,189 mt of herring in 2003. Vessels with a New Bedford designation landed 13,176 mt (77%). Eleven percent (11%) of the herring landings by this sector came from Area 1A in 2003, 10% from Area 1B, 34% from Area 2, and 45% from Area 3.

	Purse Seine	**Single Midwater Trawl**	**Pair Trawl**
Number of Vessels	5	7	16
Average Length (ft) (min, max)	59 (43, 79)	80 (38, 128)	102 (67, 149)
Average Gross Ton (min, max)	82 (5, 170)	179 (17, 476)	188 (74, 394)
Average Horse Power (min, max)	483 (333, 580)	1,196 (485, 2,985)	1,253 (450, 2,100)

Table 55 Herring Vessel Characteristics by Principal Gear (for vessels which averaged more than 2,000 lbs per trip)

6.4.6.2 2003 Herring Catch and Landings Statistics

The annual catch numbers and landings for the Atlantic herring fishery are monitored using two harvester-based reporting systems and mandatory dealer reporting.

Harvesters record trip level information using Vessel Trip Report (VTR) forms and submit them on a monthly basis. This reporting system provides detailed catch information including, set time and duration, the coordinates where fishing activity occurs, incidental catches and any observed bycatch. VTR data are useful for stock assessment and effort information.

Harvesters are also required to submit catch reports using the Interactive Voice Response (IVR) system. These reports are made using a call-in system that records the total weekly catch by federal management area. This reporting system is useful for near real-time quota monitoring. IVR data are not generally useful for stock assessment, or management questions that require trip level information.

Federal Atlantic herring dealers submit trip-level landings reports on a monthly basis. These data include the vessel name, gear type, general catch area and amount purchased. The information from this reporting system is generally not useful for stock assessment but does contribute to economic analyses.

The catch-at-age (CAA) matrix is developed by applying the commercial harvest data (from VTRs) to samples of fish taken from the commercial fleet using a program called BIOSTAT. This matrix is developed for each area by month. The results by area are then summed fishery wide from which they can be utilized in an age structured population model, or analyzed for other fishery dependent statistics.

6.4.6.2.1 VTR Data

As reported by the National Marine Fisheries Service (NMFS) and the Maine Department of Marine Resources (ME DMR), and as of May 1, 2004, a total of 100,676 metric tons (mt), of herring were caught during the 2003 fishing year (Table 56). This amount represents a fishery wide increase of 8,084 mt from the previous year. The catch from Management Area 1A (59,451 mt) accounted for approximately 59% of the total landings, followed by Area 3 which accounted for 20% (20,226 mt).

Within Area 1A, purse seines accounted for approximately 30% of the catch, but only accounted for 18% of the annual catch for the entire stock complex (Figure 13 and Figure 14). Single boat mid-water trawlers accounted for 13% of the Area 1A catch, while pair trawlers accounted for 57%.

Maine had the highest reported landings (46%) in 2003, followed by Massachusetts (38%), New Hampshire (8%), and Rhode Island (7%) (Figure 15).

1999	Month												
MGMT AREA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**TOTAL**
1A	805	120	93	3,945	4,995	8,432	13,371	11,731	10,759	6,057	9,863	5,414	75,585
1B	311		41		181	57		35	113	731	106	57	1,632
2X	7,335	9,488	4,504	559	15	8	79	158	0	1	4	560	22,712
3X		143	272	1,007	160	1,460	289	96	1,297	994			5,718
TOTAL	**8,451**	**9,751**	**4,910**	**5,512**	**5,352**	**9,956**	**13,738**	**12,020**	**12,169**	**7,783**	**9,973**	**6,031**	**105,647**
2000													
MGMT AREA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**TOTAL**
1A	3	99	76	1,525	7,398	9,946	14,997	12,259	4,777	9,081	631		60,793
1B		0	127	82	128	234	489	73	209	0	6,126		7,468
2X	9,340	9,838	2,358	203	19	0	0	2	23	2	860	4,552	27,198
3X	54		537	87	38		743	3,006	6,686	2,048		0	13,199
TOTAL	**9,397**	**9,937**	**3,098**	**1,896**	**7,582**	**10,181**	**16,230**	**15,341**	**11,694**	**11,132**	**7,617**	**4,552**	**108,658**
2001													
MGMT AREA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**TOTAL**
1A	3	1,767	1,273	2,814	6,526	8,701	7,884	7,254	5,046	9,741	2,662	57	53,728
1B	18	1	68	45	195	110		1,302	2,192	237	6,198	6,336	16,704
2X	9,129	4,376	447	869	56	100	55	2	96	3	64	623	15,821
3X						755	7,675	7,807	12,146	6,328	314	53	35,079
TOTAL	**9,150**	**6,144**	**1,788**	**3,728**	**6,778**	**9,666**	**15,615**	**16,366**	**19,480**	**16,310**	**9,237**	**7,069**	**121,332**
2002													
MGMT AREA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**TOTAL**
1A	1,653	1,223	933	3,087	249	9,755	13,269	7,453	7,801	5,897	8,621	103	60,044
1B	1,701	753	355	126	1,062	412	665	159	293	31	14	1,766	7,335
2X	5,232	4,237	593	79	187	0	1	1	138	1	125	445	11,038
3X	589	0		43	805	792	3,211	2,041	3,953	2,739	4		14,177
TOTAL	**9,175**	**6,212**	**1,881**	**3,335**	**2,302**	**10,959**	**17,146**	**9,653**	**12,185**	**8,668**	**8,764**	**2,314**	**92,594**
2003													
MGMT AREA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**TOTAL**
1A	185	11	14	260	4,151	8,998	6,581	11,714	12,559	7,653	7,326	0	59,452
1B	0	0	0	122	9	194	689	178	71	1	540	3,113	4,917
2X	4,670	3,101	1,901	378	353	1	1	2	419	37	277	4,939	16,079
3X	0	0	12	149	122	673	9,977	3,967	1,719	3,592	13	2	20,226
TOTAL	**4,855**	**3,112**	**2,023**	**2101**	**5,611**	**15,250**	**97,064**	**47,597**	**28,520**	**40,019**	**8,260**	**8,070**	**262,482**

Table 56 - Atlantic Herring Catch (mt) by Management Area and Month, 1999 – 2003*

**2003 data are preliminary.*

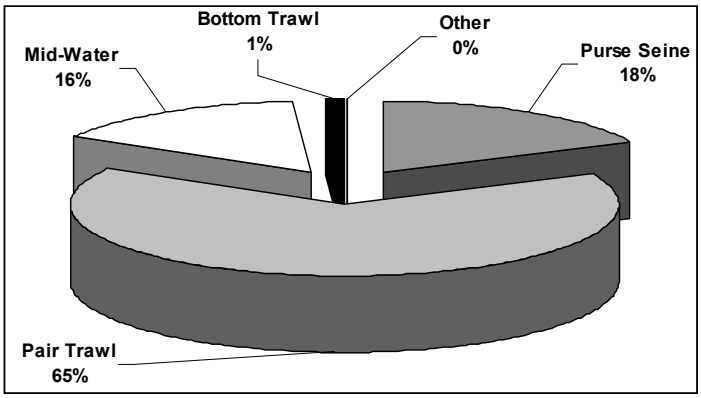


Figure 13 - 2003 Landings of Atlantic Herring by Gear Type

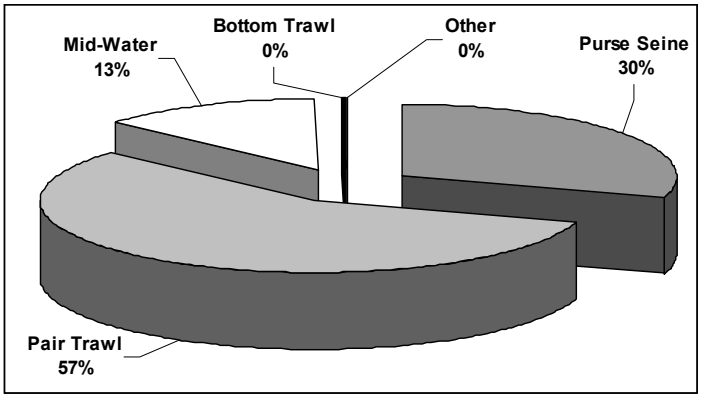


Figure 14 - 2003 Landings of Atlantic Herring by Gear in Management Area 1A

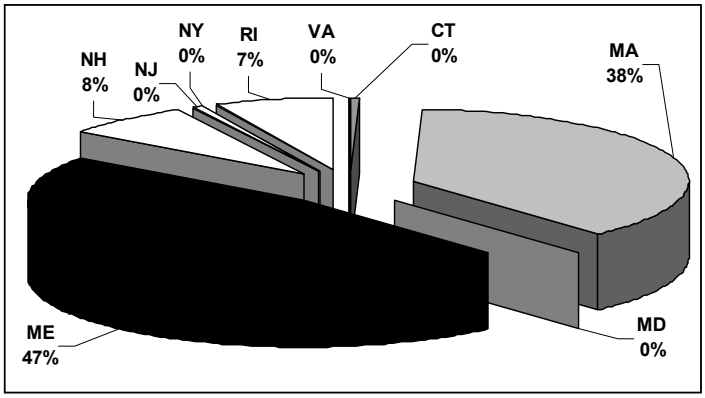


Figure 15 - Percentage of 2003 Herring Landings by State

Note: Figure 15 reflects where herring were landed, not necessarily where they were caught.

6.4.6.2.2 IVR Landings

The Interactive Voice Response (IVR) call-in system is also a harvester report. Harvesters report combined catches by management area on weekly schedule. While both trip level information and precise location are not reported, this system is useful for near real-time quota monitoring. IVR data are not generally useful for stock assessment or management questions that require information by sub-area or gear. Both IVR and VTR data incorporate landings to foreign vessels by domestic harvesters (JV or IWP, but not TALFF).

A total of 105 vessels had a Category 1 permit in 2003 (up from 96 in 2002). Of those vessels, 64 made positive reports using the IVR system. Although IVR reporting compliance among Category 1 herring permit holders was about 61%, the dedicated herring fleet (about 25 in number) had a compliance level approaching 100%.

The total IVR catch in 2003 reached 100,544 mt, a 9% increase from 2002. The Area 1A harvest accounted for approximately 62% of the total catch, followed by Area 3 with 21%, Area 2 with 12% and Area 1B with 5%. The fishery in Area 1A started very slowly in 2003, with virtually no landings prior to the middle of May (Figure 16). This resulted in almost all of the Period 1 TAC rolling over into the Period 2 fishery. By early July, the Area 1A fishery caught up to the 2002 catch levels, and in late September, the Area 1A catch almost exactly matched that of 2002 and 2001. The final catch in Area 1A was slightly over the TAC of 60,000 mt. However, it is important to note that IVR data are based on hail weights and generally are overestimated in comparison to the VTR data. Preliminary VTR data (as of May 1, 2004) indicate that the total Area 1A catch in 2003 was 59,451 mt and the total catch for all management areas was 100,676 mt (Table 56, p. 159).

Note: Direct comparisons among years are difficult because of changes in the "days out" effort controls and spawning closures.

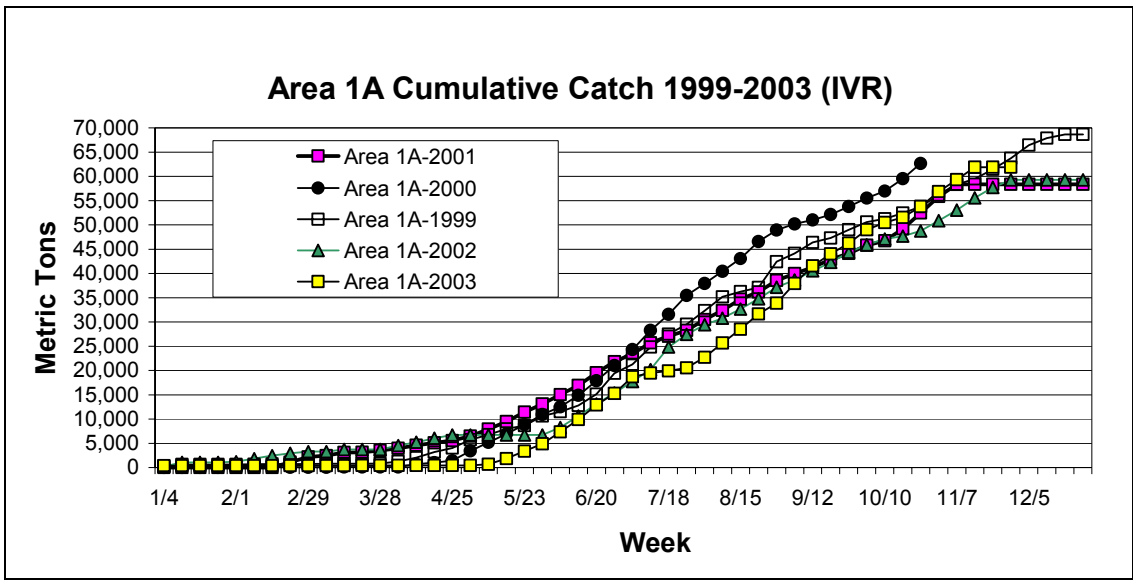


Figure 16 IVR Reports for Area 1A 1999-2003

6.4.6.3 Economic Factors Related to the Herring Fishery

In 2003, the gear type that brought the largest amount of herring to market was the midwater pair trawl at 65,901 mt. This is a 40% increase from 2002 levels. Seventeen vessels pair trawled in 2003, which is three more than 2002. Single vessel midwater trawls accounted for 15,841 metric tons of herring, which is 32% lower than 2002. Purse seine landings totaled 17,870 metric tons; a 9% decline from 2002. Bottom trawl gear accounted for 1,037 metric tons. Landings by U.S. weirs in 2003 amounted to one metric ton.

The total number of vessels landing herring in 2003 (Table 58) increased to 154, which is 14 more than in 2002. However, most of this is attributed to movement in and out of the bottom trawl and "other" (non-traditional herring gear) gear sectors. There was some movement among traditional herring gear sectors with the pair trawl fleet gaining three vessels and the single midwater trawl fleet losing nine vessels. The purse seine fleet remained at six vessels.

Most herring sold in 2003 was taken from Area 1A (59,451 mt) – just 905 mt more than 2002. Area 1B landings (4,919 mt) were 34% lower than they were in 2002. The Area 2 landings were 16,081 metric tons (up from 10,868 in 2002). Area 3 landings were 20,227 metric tons, up from 14,203 mt in 2002. Table 57 shows landings from the various gears used in 2003 and the activities of each in the herring management areas.

Table 58 differs from Table 57 in that instead of listing herring landings by gear used, each vessel was assigned a principal gear based on the gear it used that landed the most herring. Since some vessels used multiple gears to catch herring, this principal gear designation was necessary to describe herring fishery activity by vessel. For example, some vessels which primarily used midwater trawl gear landed herring with other gears; the actual gear used is shown in Table 57, while Table 58 lists all landings under the primary gear used by the vessel. For pair trawl gear, trips and days are counted for each participating vessel. For example, if two vessels make a two day pair trawl trip, the total number of trips would equal two and the total number of days at sea would equal four.

The Herring FMP distinguishes between vessels catching herring incidentally while pursuing other species and those targeting herring by defining vessels that average less than 2,000 pounds of herring caught per trip (in all areas) as incidental herring vessels. Table 154 provides the same information as Table 58 except it excludes the incidental herring vessels. In the 2003 fishing year, there were 38 vessels, defined as directed herring vessels, which sold 100,598 metric tons of herring.

Since Area 1A is the management area in which the TAC is most likely to be reached, it is important to summarize the activity of vessels targeting herring in Area 1A. Table 60 provides information for the 25 vessels that averaged more than 2,000 pounds per trip in Area 1A in 2003. Those vessels landed 59,400 mt of herring from Area 1A.

Prices for herring ranged from a low of $0.054 per pound in July to a high of $0.16 per pound in October. The average yearly price was $0.08 per pound in 2003, which is a 23% increase over the average 2002 price. Using the average monthly price of herring sold in 2003 the total value of all herring sold was $17,065,417.

Table 61 reports the average dependence on herring by state of landing and principal gear. Vessels principally using purse seine gear are the most dependent on herring in that 82% of the value of their catch is derived from herring. For pair and single mid-water trawl vessels, 59% and 32% of their

revenue is from herring, respectively. The highest state level dependency rates of 82% for both pair trawl and purse seine gear occurs in Maine.

Table 62 shows the breakdown of quantity and value of landings by state landed and gear used. The state of Maine lands 46,795 mt of herring at a value of $7.4 million. Massachusetts follows next in the ranking with landings of 38,213 mt and a value of $6.5 million. Rhode Island and New Hampshire have significantly less landings of herring. Each of these states has landings in the range of 7,000 to 7,700 mt at a value of $1.3 to $1.65 million.

Table 63 and Table 64 provide information on the number of crew members employed in the herring fishery. Table 63 reports the average, minimum, and maximum number of crew members (including the captain) per trip as reported on logbooks. Table 64 defines fleet sectors by a vessel's principal gear and the state in which the vessel made the majority of its landings. Then, using the average crew size per vessel, the number of vessels and total number of crew they employ are reported by fleet sector.

	1A	1B	2	3	Total
Midwater Pair Trawl	33,765	3,784	10,967	17,385	65,901
Midwater Trawl	7,846	1,001	4,238	2,756	15,841
Purse Seine	17,738	132	0	0	17,870
Bottom Trawl	88	1	862	86	1037
Weir	0	0	1	0	1
Other	14	1	13	0	28
Total	59,452	4,920	16,081	20,227	100,680

Table 57 - Metric Tons of Herring Sold by Gear and Management Area in 2003

		1A	1B	2	3	Total
Midwater Pair Trawl 16 vessels	**Number of trips**	396	37	105	131	669
	Days at Sea	907	98	343	561	1909
	Landings (mt)	32,804	3,784	11,286	17,576	65,450
Midwater Trawl 9 vessels	**Number of trips**	179	11	55	10	255
	Days at Sea	313	25	152	49	539
	Landings (mt)	7,352	980	3,001	2,565	13,898
Purse Seine 6 vessels	**Number of trips**	324	5	12	0	341
	Days at Sea	625	10	14	0	649
	Landings (mt)	19,193	153	810	0	20,156
Bottom Trawl 63 vessels	**Number of trips**	273	8	152	39	472
	Days at Sea	279	12	287	238	816
	Landings (mt)	88	1	970	86	1145
Weir	**Landings (mt)**	0	0	1	0	1
Other Gear 60 vessels	**Number of trips**	120	4	406	0	530
	Days at Sea	125	4	418	0	547
	Landings (mt)	14	1	12	0	27
Total 154 vessels	**Number of trips**	1292	65	730	180	2267
	Days at Sea	2249	149	1214	848	4460
	Landings (mt)	59,451	4,919	16,080	20,227	100,677

Table 58 - Number of Vessels, Herring Trips and Days, and Herring Sold (mt) by Management Area and Principal Herring Gear for 2003

		1A	1B	2	3	Total
Midwater Pair Trawl 16 vessels	**Number of trips**	396	37	105	131	669
	Days at Sea	907	98	343	561	1909
	Landings (mt)	32,804	3,784	11,286	17,576	65,450
Midwater Trawl 7 vessels	**Number of trips**	156	11	55	10	232
	Days at Sea	290	25	152	49	516
	Landings (mt)	7,337	980	3,001	2,565	13,883
Purse Seine 5 vessels	**Number of trips**	323	5	12	0	340
	Days at Sea	623	10	14	0	647
	Landings (mt)	19,193	153	810	0	20,156
Bottom Trawl 10 vessels	**Number of trips**	17	0	43	36	96
	Days at Sea	17	0	147	215	379
	Landings (mt)	66	0	958	85	1109
Total 38 vessels	**Number of trips**	892	53	215	177	1337
	Days at Sea	1837	133	656	825	3451
	Landings (mt)	59,400	4,917	16,055	20,226	100,598

Table 59 - Number of Vessels, Herring Trips and Days, and Herring Sold (mt) by Management Area and Principal Herring Gear for Vessels Averaging more than 2,000 pounds of Herring per Trip in All Areas During 2003

		1A	1B	2	3	Total
Midwater Pair Trawl 12 vessels	**Number of trips**	396	34	99	118	647
	Days at Sea	907	88	315	511	1,821
	Landings (mt)	32,804	3,484	10,785	15,559	62,632
Midwater Trawl 5 vessels	**Number of trips**	156	11	48	9	224
	Days at Sea	290	25	103	38	456
	Landings (mt)	7,337	980	2,520	2,447	13,284
Purse Seine 5 vessels	**Number of trips**	323	5	12	0	340
	Days at Sea	623	10	14	0	647
	Landings (mt)	19,193	153	810	0	20,156
Bottom Trawl 3 vessels	**Number of trips**	17	0	0	0	17
	Days at Sea	17	0	0	0	17
	Landings (mt)	66	0	0	0	66
Total 25 vessels	**Number of trips**	892	50	159	127	1228
	Days at Sea	1837	123	432	549	2941
	Landings (mt)	59,400	4,617	14,115	18,006	96,138

Table 60 - Number of Vessels, Herring Trips and Days, and Herring Sold (mt) by Management Area and Principal Herring Gear for Vessels Averaging more than 2,000 Pounds of Herring per Trip in Area 1A During 2003

	MA	ME	NH	RI	Average for all States
Midwater Pair Trawl	60%	82%	36%	5%	59%
Midwater Trawl		36%		4%	32%
Purse Seine		82%			82%
Bottom Trawl				3%	<1%

Table 61 - Average Herring Value as a Percentage of Total Revenue by Principal Herring Gear and Principal State for 2003

		MA	ME	NH	RI	Other Mid-Atlantic	Other New England	Total
Midwater Pair Trawl	**MT**	35,375	20,764	5,883	3,228	407	242	65,899
	Value	5,989,225	3,200,748	1,048,157	774,929	63,553	40,898	11,117,510
Midwater Trawl	**MT**	2,353	9,784	558	3,021	0	126	15,842
	Value	455,850	1,528,183	91,985	625,165	0	21,277	2,722,460
Purse Seine	**MT**	456	16,232	1,183	0	0	0	17,871
	Value	59,824	2,706,408	177,515	0	0	0	2,943,747
Bottom Trawl	**MT**	18	9	62	819	23	105	1036
	Value	3,576	1,759	8,162	239,264	3,606	20,148	276,515
Weir	**MT**	1	0	0	0	0	0	1
	Value	71	0	0	0	0	0	71
Other	**MT**	10	6	0	0	12	0	28
	Value	1,686	1,005	0	0	2,416	0	5,107
Total	**MT**	38,213	46,795	7,686	7,068	442	473	100,677
	Value	6,510,232	7,438,103	1,325,819	1,639,358	69,575	82,323	17,065,410

Table 62 - Landings and Value by Gear Used and State

	Average	Minimum	Maximum
Midwater Pair Trawl	4.6	1	7
Midwater Trawl	3.7	1	12
Purse Seine	5.4	1	6
Bottom Trawl	3.3	1	13

Table 63 - Average Crew Size (including captain) by Gear Used

		MA	ME	NH	RI	Total
Midwater Pair Trawl	Number of Vessels	9	4	2	1	16
	Total # of Crew	44	18	8	3	73
Midwater Trawl	Number of Vessels		6		3	9
	Total # of Crew		15		20	35
Purse Seine	Number of Vessels		6			6
	Total # of Crew		31			31
Total	Number of Vessels	9	16	2	4	31
	Total # of Crew	44	64	8	23	139

Table 64 - Total Number of Vessels and Crew (including captain) Employed per Fleet Sector

6.4.6.4 Herring Processors

An updated, detailed description of herring processors is under development and will be included in the DSEIS for Amendment 1 to the Herring FMP. At this time, herring processors include:

- Two U.S. sardine canneries owned by Connors Bros. Ltd/Bumblebee Tuna, located in Bath ME and Prospect Harbor ME
- The Northern Pelagic Group (NORPEL), a freezer plant that opened in late 2002, located in New Bedford MA
- Cape Seafoods, Inc., a freezer plant that opened in 2001, located in Gloucester MA
- Lund's Fisheries, a freezer plant located in Cape May NJ
- Several representative bait processors, including Shafmaster Fishing Co./The Bait Lady (Newington NH), O'Hara's (Rockland ME), Purse Line Bait (Sebasco Estates ME), Channel Fish (Boston MA), Nancy's Shellfish (Portland ME), Beaver Enterprises (Rockland ME), Sunshine Seafoods (Stonington ME), and other lobster bait dealers
- Sea Freeze Ltd., an at-sea processing company located in North Kingston RI

6.4.6.5 Fishing Communities

To identify the "communities of interest" for consideration in Amendment 1 to the Herring FMP, the Herring PDT developed a variety of criteria. The primary communities/ports that have been identified meet at least two of the five criteria, while secondary communities/ports meet only one of the criteria but also may serve as "essential providers of services" to the herring fishery.

The five criteria for identifying herring communities of interest include:

1. Herring landings of 10 million pounds in each of five years, or anticipated landings above this level (based on interviews and documented developments);
2. Infrastructure dependent in whole or part on herring (includes trucking/at-sea processing);
3. Dependence on herring as lobster or tuna bait;
4. Geographic isolation and dependence on herring; and
5. Use of herring for value-added production.

The eight primary ports/communities (or clusters of communities) that have been tentatively identified for consideration in Amendment 1 to the Herring FMP include:

- Gloucester, MA
- New Bedford, MA
- Portland, ME
- Rockland, ME
- Vinalhaven, ME
- Lubec and Eastport, ME
- Prospect Harbor, ME and
- Bath, ME.

The secondary ports/communities that have been tentatively identified for consideration in Amendment 1 include:

- Cape May, NJ
- Point Judith/Southern RI, and
- New Hampshire ports.

As part of the development of the social impact assessment (SIA) for Amendment 1 to the Herring FMP, profiles of each of the primary ports identified above will be provided. These profiles will be based on a review of recent literature, including the Aguirre report prepared for Amendments 5 and 7 to the Multispecies FMP, the MARFIN Report, and the original Herring FMP; field interviews; and data from related community projects. More detailed information about these communities and their dependence on the Atlantic herring fishery will be provided in the DSEIS for Amendment 1 to the Herring FMP. Many of the communities identified above also participate in and/or depend on the multispecies fishery, so a substantial amount of information about these communities was provided in Amendment 13 to the Multispecies FMP; this document can be referenced for additional information.

7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF IMPACTS

7.1 Introduction

FW 40B proposes a range of management measures to address different issues. While the measures were being considered many were grouped into distinct alternative packages since they may interact with each other. Alternative 1 included all of the proposed measures that were grouped together, and the discussion of the impacts of Alternative 1 contains the detailed descriptions of the analysis of each measure. Rather than repeat much of this discussion for every alternative, the impacts of the Proposed Action and the other alternatives include only short summaries of the impacts of the measures.

Some independent measures are less likely to have synergistic effects and were analyzed individually. Sections describing the impacts of the Proposed Action include detailed descriptions of the independent measures. For those independent measures that were considered but are not included in the Proposed Action, the impacts are analyzed in a separate section.

The impacts of the existing multispecies fishery on endangered and threatened whales, sea turtles, and fish have been discussed in the existing Biological Opinion on the Northeast Multispecies FMP dated June, 2001 and in subsequent Section 7 informal consultations conducted by NMFS in accordance with the Endangered Species Act. In addition, the Supplemental Environmental Impact Statements and Environmental Assessments prepared for each multispecies management action have addressed the most recent impacts of the fishery on marine mammals as well as threatened and endangered species. While the agency could add additional information in its evaluation of Framework Adjustment 40B, the Council has drawn its conclusions from its assessment of the current baseline of impacts to protected species from multispecies fishing activities.

Bottom trawl, longline gear and hook-gear are classified as Category III fisheries under the Marine Mammal Protection Act's *List of Fisheries for 2004* and are, therefore, determined to have a remote likelihood of, or no known incidental mortalities and serious injuries of marine mammals. Gillnet gear is a Category I fishery, one that has been determined to have frequent incidental mortality or serious injury of marine mammals. The Framework 40B discussion, therefore, focuses on the measures proposed and associated with gillnet activity. Other gear types, however, are addressed relative to their potential interactions with protected species where information is available or inferences can be made because of known interactions with similar gear in other regions.

Amendment 13 anticipated that groundfish measures implemented in that action would have negligible and possibly even beneficial impacts on protected species. For instance, days-at-sea reductions and additional gear restrictions are expected to significantly reduce effort in the groundfish fishery and consequently have positive impacts on reducing risks to protected species. Further, the Amendment 13 measures added to actions implemented through the Interim Final Rule for the Northeast Multispecies Fishery, coupled with the existing area closures and Take Reduction Plan measures also will likely contribute to an overall reduction in risk to protected species inhabiting the multispecies management unit. Despite that risk reduction, however, encounters between gear and protected species are still likely to occur, where gear and species overlap, particularly in marine mammal high use areas.

7.2 Proposed Action

This section summarizes the impacts of the proposed action. The proposed action is similar to Alternative 2 combined with several of the independent measures. For specific information that is not include in this section detailing the analysis of any individual measure, refer to the impacts analysis of Alternative 1 (section 7.4). The measures included in the proposed action are:

- Changes to the DAS transfer conservation tax (Measure A.1): a reduction of the tax on permanent transfers of Category A and B DAS from forty percent to twenty percent.
- Measure B: revisions to the incidental catch TACs due to changes to SAP programs.
- Measure C.2: creation of an SAP to target haddock using rod and reel in the WGOM Closed Area.
- Measure C.3: revisions to the starting date, number of trips, and number of trips by vessel for each month for the CAII Yellowtail Flounder SAP.
- Measure D: a re-categorization of DAS so that permits that do not have any effective effort will have ten Category B (reserve) DAS that can be used in specific SAPs.
- Measure E: revisions to the requirements for entry in the GB Cod Hook Sector and in the calculation of the sector's share of GB cod.
- Measure F: maintaining the DAS allocations that were implemented on May 1, 2004.
- Measure G: removal of the requirement that vessels transferring DAS permanently consider gross and net tonnage.
- Measure H: an allowance of a one-time downgrade of a vessel's baseline for DAS leasing purposes only.
- Measure I: provisions for obtaining a DAS credit for standing by an entangled whale.
- Measure J: additional reporting requirements for certain vessels fishing for herring in the GOM and GB in order to facilitate observer coverage.
- Measure K: removal of the restriction on the number of nets that can be used by trip gillnet vessels.

7.2.1 Biological Impacts

7.2.1.1 Impacts on Groundfish

The measures in this alternative can be divided into specific programs that are designed to harvest healthy stocks (the two Special Access Programs in Measure C.2 and C.3 and the resulting re-allocation of incidental catch TACs in Measure B) and measures that may have impacts across a range of groundfish species. Overall, this alternative is not expected to have significant impacts on any regulated groundfish stock but some provisions increase the uncertainty over the biological impacts of Amendment 13.

Changes to the DAS Leasing and Conservation Tax (Measure A.1)

This measure reduces the conservation tax in the DAS transfer program from forty percent to twenty percent. In general, the reduction of the conservation tax in the transfer program is designed to facilitate the use of that program and would be expected to increase the number of DAS used in the short-term. The biological impacts of DAS exchanges through the transfer program will depend on how effort is re-distributed. Absent empirical data, it is not possible to estimate these impacts with any certainty. At the same time, any conservation tax applied to the transfer program will reduce potential effort over the long-term, though since the proposed change reduces the conservation tax these impacts are not as great as could have occurred under Amendment 13. As of the date of this document, however, no DAS

transfers have occurred and so any future reduction in DAS resulting from the conservation tax adopted by Amendment 13 is speculative and was not realized. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

Incidental Catch TACs (Measure B)

The proposed action modifies the incidental catch TACs to allocate a portion of the GOM cod incidental catch TAC to the WGOM Closed Area Rod/Reel SAP. In addition, it reallocates a portion of the GB cod TAC as a research set-aside. Since the total incidental catch TACs are not changed, there are not expected to be any biological impacts compared to the No Action alternative. A recent assessment of GB cod, however, suggests that the incidental catch TAC for GB cod may be slightly higher than warranted. This issue will be addressed when an updated assessment of the GB cod stock is performed in 2005. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

WGOM Closed Area Rod/Reel SAP (Measure C.2)

There is little data available with which to analyze the impacts of this proposed SAP, and the available data may not accurately reflect commercial rod/reel operations in the WGOM Closed Area. The WGOM Closed Area Rod/Reel SAP will result in a very slight increase in GOM haddock mortality but is not expected to threaten Amendment 13 mortality targets. The catch of haddock is limited to a 50 mt TAC and recent catches of GOM haddock have been about one-fourth of the TAC. Cod may be caught in this SAP, but is limited by a small incidental catch TAC so that it does not threaten Amendment 13 targets. All cod caught must be discarded in order to discourage targeting. Since the fish are being caught by rod and reel, at least some of these cod are expected to survive. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

Changes to the CAII Yellowtail Flounder SAP (Measure C.3)

The changes to the Closed Area II Yellowtail Flounder SAP will not increase mortality on yellowtail flounder. The adjustment to the number of trips in this SAP may actually help control mortality since the number of trips in the SAP will be adjusted annually in order to more closely match the TAC established for this stock. As a result, there is less likely to be a period during the fishing year when yellowtail flounder are discarded in the Western U.S./CA area because possession of yellowtail flounder is prohibited when the TAC is caught. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

Minimum Effective Effort Allocation (Measure D)

Measure D allocates a minimum amount of effective effort to permits that did not receive any DAS in Amendment 13. While this will increase the pool of available effort, these DAS can only be used in specific SAPS. As long as SAPs continue to be strictly limited so that the catch of target and incidental catch species is controlled, this allocation of effort will not have any biological impacts in the short-term. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

GB Cod Hook Sector Allocation (Measure E)

The proposed changes to the GB Cod Hook Sector (Measure E) are not expected to increase mortality for groundfish. It is possible that there may be a reduction in discards that results from these measures if vessels using non-selective gear enter the sector and fish with more selective hooks. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

DAS Baseline Allocations (Measure F)

Measure F (changes to the DAS baseline calculation) will not have any biological impacts (compared to No Action) since it does not change the DAS allocations, and thus the potential fishing levels of fishing effort, implemented by Amendment 13. For a detailed description of the biological impacts of this measure, see section 7.4.1.1.

Removal of Tonnage Criterion From DAS Transfer Program (Measure G)

This measure would remove the current requirement that the baseline gross tonnage of two vessels exchanging DAS through the DAS transfer program must be within ten percent. Vessels must still be within the replacement vessel restrictions for length and horsepower. The tonnage restriction was originally implemented to reduce the possibility that a replacement vessel would have significantly greater fishing power than the original permitted vessel, but this may be only partially effective because net and gross tonnage are imperfect measures. A vessel's measured tonnage can be altered through creative use of construction or modification of the vessel without changing the fishing ability of the vessel. This raises questions over whether the restriction serves a useful purpose.

For any permit owner that is attempting to acquire DAS through this program, removing the tonnage requirement may increase the pool of vessels that are available for a transfer. This could result in more transfers of DAS in this program. Under Amendment 13, the Category A and B DAS that are transferred are subject to a 40 percent conservation tax and Category C DAS are subject to a 90 percent conservation tax. While this framework adjustment may change the conservation tax for Category A and B DAS, as long as the tax is not completely removed an increase in the number of transfers would reduce the number of allocated DAS. Another possible result is that DAS will be transferred from vessels that are not using the DAS to vessels that will use the DAS, so an increase in transfers might increase the DAS that are actually fished.

There is no information available to conclude how these two impacts will interact, since no vessels have used the DAS transfer program to date. If the number of DAS used were to increase, and those DAS were used to target unhealthy stocks, removing the tonnage restriction might increase groundfish fishing mortality. On the other hand, the overall number of allocated DAS will decline with an increase in transfers as long as a conservation tax is imposed.

One-Time Permit Baseline Characteristics Downgrade (Measure H)

Each limited access permit has identified permit baseline characteristics for length, horsepower, net and gross tonnage. These characteristics are used when determining the ability of vessels to lease or transfer DAS. The baseline characteristics remain with the permit. In some cases, the baseline characteristics may be larger than the actual characteristics of the vessel using the permit.

In general, smaller vessels have more possible candidate vessels from which they can lease DAS. If a vessel operator is using a permit that has larger baseline characteristics than the physical characteristics of the vessel, he will have a smaller number of candidate vessels from which to lease DAS than if the vessel characteristics were used. By allowing permit holders to make a one-time downgrade in permit baseline characteristics for leasing purposes, the pool of available vessels will increase. This change is thus likely to result in the leasing of additional DAS. In general, an increase in the number of DAS leased would be expected to increase fishing mortality since leased DAS are likely to be used. It cannot be determined if this threatens mortality objectives since that will depend on which stocks are targeted with the leased DAS and the efficiency of the vessel that leases the DAS.

DAS Credit for Standing By Entangled Whales (Measure I)

This proposed measure would provide DAS credit if a vessel operator stands by an entangled whale. The impacts of this measure on regulated groundfish fishing mortality are uncertain, but are likely to be negligible. In 2003 there were thirty-four large whale entanglements. Assuming a similar number of entanglements (forty), and if a groundfish vessel were to stand-by each one for twelve hours, there would be 480 total hours of DAS credit, or twenty DAS. If the vessels standing by the whales continue to fish as efficiently as they do, then this represents an increase in groundfish effort and a potential increase in mortality. Twenty DAS, however, represent about 0.06 percent of the 35,000 DAS that will be used under

Amendment 13. In addition, it is doubtful that vessels will be able to continue to fish as efficiently as during normal operations while maintaining contact with the whales, so that even this negligible impact will probably not be realized.

Herring Vessel Interactions with Regulated Groundfish (Measure J)

Herring fishing is prosecuted primarily by purse seine and mid-water trawl vessels (including paired mid-water trawl) vessels (NEFMC 1997). Under current regulations, mid-water trawl vessels are allowed to fish for herring in all groundfish year round and seasonal closed areas, while purse seine vessels are allowed to fish for herring in the seasonal closed areas, the WGOM closed area, and the Cashes Ledge Closed Area. The Council considered three options that would have prohibited fishing for herring with mid-water (including paired mid-water) trawls and/or purse seines in the year round groundfish mortality closures. The proposed action (Option 4) would improve the monitoring of the herring fishery to collect additional data.

Possible impacts on regulated groundfish (discussed in detail in section 7.8.1.1.1) from herring fishing vessels include:

- Catch of groundfish in herring fishing operations. Since purse seine and mid-water trawls use small mesh nets, there is a possibility that the catch could include both juvenile and adult groundfish. Under current regulations, purse seine and mid-water trawls are considered exempted gear. Exempted gear is gear that is deemed to be not capable of catching NE multispecies. Vessels using exempted gear are not allowed to fish for, possess, or retain regulated groundfish and any groundfish caught must be discarded.
- Interference with groundfish spawning activity.
- Removal of groundfish forage. Herring is an important prey item for Atlantic cod (Link and Garrison 2002). Most piscivorous groundfish feed on herring, including cod, haddock, pollock, white hake, and halibut (Colette and Klien-MacPhee 2002).
- Impacts on groundfish habitat. Gear effects evaluations in Amendment 13 concluded that purse seine and mid-water trawl gears do not have impacts on groundfish essential fish habitat. Since there is no new information to challenge this conclusion, these possible impacts will not be discussed further.

The proposed action places requirements on the herring fishery in order to improve monitoring. If selected, this option will not have any different impacts on regulated groundfish than the No Action alternative impacts. Since the proposed action does not place any additional limitations on the operation of the fishery, herring mid-water and purse seines are expected to continue to catch regulated groundfish. As described in section 7.8.1.1.1, to date these catches, while minor, have occurred more frequently in the mid-water (including paired mid-water) trawl fisheries. If monitoring improves as a result of these measures the quality of information on groundfish bycatch may improve in the future. This could lead to future management actions that may have beneficial impacts on regulated groundfish.

Trip Gillnet Net Limitations (Measure K)

Prior to May 1, 2002, there were no regulatory limits on the number of nets fished by trip gillnet vessels. Vessels were required to bring all gillnets back to port at the end of a trip, which meant vessels could only fish the number of nets that could be carried. As described in section 7.2.4.12, the median number of nets fished in FY 2001 ranged from 50 in SNE/MA to 75 on GB, while the maximum ranged from 160 on GB to 300 in the GOM. Ninety percent of trips in all areas fished less than 160 nets. FY 2001 activity may not be representative of future net use, however, as vessel operators may compensate for the effort reductions of Amendment 13 by fishing more nets if their vessels are capable of carrying

number of nets. The following analysis expands on the analysis of the biological impacts of gear restrictions adopted in Amendment 13.

As a result of an interim rule, in FY 2002 and 2003 trip gillnet vessels were limited to 50 nets in the GB RMA, 75 nets in SNE, and 150 nets in the GOM RMA (these numbers refer to stand-up nets). The biological impacts of these restrictions were evaluated in an EA that supported the regulations and were estimated to be positive but minor since trip gillnets accounted for a small proportion of groundfish landings for many stocks. Amendment 13 increased the number of nets that could be fished in the GB RMA to 150 nets, matching the number of nets in the GOM. The analysis of this change in Amendment 13 was based on the EA and resulted in a slight reduction in the mortality reductions estimated to result from the gear restrictions that adopted by the interim rule. Table 65 summarizes the expected reduction in landings of the change in the number of nets for trip gillnet vessels based on Amendment 13 and compares this to the total expected for all gears. With the exception of pollock caught on GB, the change in net limits was not expected to reduce landings of any stock by more than one percent. This reduction was combined with other gear changes and effort reductions to estimate changes in mortality. Absent other measures, removal of the net restriction would be expected to increase landings by a similar amount.

	GOM	GB	SNE/MA	Total (all gears)
GOM Cod	-0.6%	0.0%	0.0%	-2.6%
GB Cod	0.0%	-0.4%	-0.1%	0.0%
GOM Winter	-0.2%	0.0%	0.0%	-0.8%
GB Winter	0.0%	0.0%	0.0%	0.0%
SNE Winter	0.0%	0.0%	0.0%	0.0%
GB Yellowtail	0.0%	0.0%	0.0%	0.0%
SNE/MA yellowtail	0.0%	0.0%	0.0%	0.0%
CC/GOM yellowtail	-0.2%	0.0%	0.0%	-0.6%
MA Yellowtail	0.0%	0.0%	0.0%	0.0%
Plaice	0.0%	0.0%	0.0%	-0.1%
S Windowpane	0.0%	0.0%	0.0%	0.0%
N. Windowpane	0.0%	0.0%	0.0%	0.0%
GOM Haddock	-0.2%	0.0%	0.0%	-0.7%
GB Haddock	0.0%	-0.1%	0.0%	-0.7%
White Hake	-0.1%	-0.5%	0.0%	-0.9%
Pollock	-0.7%	-1.1%	-0.4%	-4.0%
Redfish	-0.2%	-0.9%	-0.6%	-2.0%
Witch Flounder	0.0%	0.0%	0.0%	-0.1%

Table 65 – Estimated reduction in landings as a result of trip gillnet gear restrictions adopted in Amendment 13

Recent fishing activity may give an indication of the stocks most likely to be affected by the removal of the cap on the number of nets that can be fished by trip gillnet vessels. VTR records were summarized for those vessels declared into the trip gillnet category for each year during FY 2001 through 2003. Landings and reported discards were summarized for trips using gillnet gear and were assigned to three areas (GOM, GB, SNE/MA) based on statistical area. These area classifications are similar to, but not identical with, the three RMAs, and do not correspond to stock definition areas for some stocks.

During this three year period, trip gillnet vessels kept a wide range of species in all areas - monkfish, cod, pollock, various skate species, white hake, red hake, various flounders, haddock, lobsters, etc. – but primary components of the kept catch were monkfish (including livers and tails), cod, pollock, skates, haddock, white hake and red hake (Table 66). The following analysis focuses on the major components of the catch rather than all species caught, and percentages refer to this subset of species. On GB, the major component of the reported kept catch was monkfish (including tails and livers) in all three years, ranging from 31 to 40 percent of the kept catch. Cod declined from 26 percent of the catch in FY 2001 to 20 percent in FY 2002, and then to 19 percent in FY 2003. Pollock, the third largest component in FY 2001 at 19 percent, had increased in importance to the second largest component in FY 2003 at 25 percent. In the GOM, pollock was the largest component of the catch at 41 percent in FY 2001, and was still the largest component at 40 percent in FY 2003. Cod and monkfish were similar in importance during all three years, each ranging from 14 percent to 17 percent. White hake increased in importance to 16 percent in FY 2003. Small amounts of haddock were also caught by trip gillnet vessels in the GOM. Catch composition in the SNE/MA area was very different with far more reliance on monkfish, which ranged from 73 to 81 percent of the catch. Various skate species and products (wings) rounded out most of the catch in this area (11 to 18 percent of the catch) followed by small amounts of cod.

Reported discards were also summarized from VTRs (Table 67). On GB, 92 to 98 percent of the annual reported discards were dogfish (both spiny and smooth), with the bulk of the remainder either cod, pollock, or skates. In the GOM, dogfish (spiny and smooth) accounted for 54 to 66 percent of the reported discards, cod ranged from 21 to 31 percent, and a mix of species accounted for the remainder, with pollock, red hake, and monkfish the largest components. In the SNE/MA area reported discards were dominated by spiny dogfish, monkfish, and various skates, with considerable year to year variability. In all areas these discards are similar to those documented in the observer database (see Table 70), with the exception that observed cod discards in the GOM generally appear to be lower than those reported in VTRs.

To summarize the reported catch of trip gillnet vessels during this period, in the GOM the landed catch was primarily pollock, monkfish, and cod, while discards were dogfish and cod. On GB, the kept catch was primarily monkfish, pollock, and cod while discards were overwhelmingly dogfish. In the SNE/MA area, monkfish and skates were the major kept catch and discards were dogfish, monkfish, and skates.

Changes in the number of trip gillnet vessels make it difficult to evaluate the biological impacts of this measure. Permit holders make an annual declaration into either the day or trip gillnet category. This declaration does not restrict the vessel to gillnet gear, but does determine the regulations that must be followed if gillnet gear is used. The number of permits in the trip gillnet category peaked at 127 in FY 2001 but declined to 68 by FY 2003. As of December 17, 2004, 53 vessels had declared into the trip gillnet category for FY 2004. While some vessels may have left the groundfish fishery, none of the vessels in the trip gillnet category in FY 2001 were removed from the fishery as a result of the Fishing Capacity Reduction Program. Most of the vessels claim Massachusetts or Maine as the principal port state. The number of DAS allocated to vessels declared into the trip gillnet category (excluding carry-over, sanctions, etc.) peaked at 12,413 DAS in FY 2001 but declined to 4,126 in FY 2003. The number of DAS used by vessels that declared as trip gillnet vessels was 4,092 in FY 2001 but declined to 2,754 in FY 2003 (these totals reflect DAS used without regard to the type of gear used on a trip. Compared to FY 2001, in FY 2003 there were 46 percent fewer vessels in the trip gillnet category and they used 32.6 percent fewer DAS. The number of DAS used by trip gillnet vessels in FY 2004 will not be available until the end of the fishing year.

While the number of trip gillnet vessels declined in recent years, it is possible that fishermen responded to the constraint on the number of nets in FY 2002 and 2003 by changing to day gillnet vessels

or using different gear. A vessel that was in the trip gillnet category in FY 2001 but is no longer in that category may still be fishing for groundfish and using DAS, either as a day gillnet vessel or with other gear. For example, nineteen of the vessels in the trip gillnet category in FY 2001 were not in that category in FY 2003. This group of vessels used a total of 1,498 DAS in FY 2001 and 1,365 DAS in FY 2003, a decline of only 8.8 percent. Clearly, a decline in the number of vessels in the trip gillnet category does not necessarily mean that all of those vessels left the fishery and are not contributing to fishing mortality. Removing the net limit through this action may result in an increase in the number of vessels declared into the category. Allowing trip gillnet vessels to fish an unlimited number of nets could create an incentive for day gillnet boats (currently limited to 50 nets in most areas) to enter this category in order to fish more nets.

One possible reaction to lifting the net restriction is that fishermen may change the species targeted. An indicator that this may happen would be if vessels changed their targeting behavior with the imposition of the net limits in FY 2002 and FY 2003. In order to determine if targeting behavior changed with the imposition of the net limits, the landings by vessels that declared into the trip gillnet category in FY 2001 were summarized for FY 2002 and 2003, whether or not they were declared into the trip gillnet category in those years as well. Only landings using gillnet gear were included. The change in landings that can be attributed to the gear changes, as opposed to other management measures (DAS reductions, mesh size increases) cannot be isolated. There does not appear to have been a significant change, as the catch composition in this analysis (Table 68) is similar to that discussed earlier. For this group of vessels, the landings of most species declined in FY 2002 and FY 2003 – the exception is the catch of monkfish in the SNE/MA area in FY 2003. A review of landings for those vessels that were in the trip gillnet category in FY 2001 but not in FY 2003 also does not show a change in targeting behavior.

As discussed in section 7.2.4.12, removing the limit on the number of trip gillnets may have different impacts on the number of nets fished in different management areas if activity in FY 2001 is assumed to represent future net use. This information can be combined with the catch composition in recent years to suggest the stocks most likely to be affected by the increase in the number of nets. In terms of groundfish species (other species will be addressed in a later section), there are likely to be different impacts in different areas. In the GOM, trip gillnet vessels primarily caught pollock, cod, and white hake in the last three years. Amendment 13 determined that both cod and white hake were overfished and subject to overfishing and are subject to formal rebuilding programs, while pollock was not considered overfished and overfishing was not occurring. In addition, Amendment 13 estimated that pollock mortality would be reduced more than necessary. On GB, the primary groundfish species caught by trip gillnet vessels are pollock and cod. GB cod is overfished and overfishing is occurring, while pollock (the same stock as in the GOM) is not. There is little regulated groundfish caught by trip gillnet vessels in SNE/MA, as only small amounts of cod (this area is part of the GB cod stock area) have been caught in recent years.

In summary, removing the limit on the number of nets fished by trip gillnet vessels will likely increase the number of nets fished. It is not possible to state with certainty whether increased regulated groundfish catches will occur or will threaten Amendment 13 mortality objectives until the actual impacts of Amendment 13 have been evaluated. While removing the net restrictions will likely lead to more mortality on groundfish stocks than if the net restrictions are not lifted, it should be noted the impact of the net restrictions evaluated in Amendment 13 accounted for only a small portion of the mortality reduction targeted by that amendment (see Table 65). Based on FY 2001 activity, the number of nets fished is most likely to increase in the GOM. This could increase catches of pollock (particularly in the GOM), GOM cod, GB cod, and white hake (again, particularly in the GOM). Given the status of pollock and expected impacts of Amendment 13 management measures, the increase in the catch of pollock is unlikely to increase mortality sufficient to threaten mortality objectives. Increases in the catch of GOM cod, GB cod, and white hake are more of a concern since these stocks are subject to formal rebuilding

programs. GOM cod and GB cod are subject to landing limits that may deter increased targeting of those stocks, but it is possible that an increase in nets could lead to additional discards. While additional vessels may re-enter the trip gillnet category, this would represent an incremental groundfish mortality increase above their current fishing activity and as a result is likely to be minor.

	Pounds Kept, By Area and Fishing Year								
	GB			GOM			SNE/MA		
Species	2001	2002	2003	2001	2002	2003	2001	2002	2003
Cod	485,285	571,499	240,724	842,379	415,571	556,648	11,097	15,080	2,505
Cusk	6,590	5,263	1,981	31,738	8,749	11,660	100	100	
Dogfish, Spiny	5,000	67,108	5	22,690	1,274	267	1,800	43,323	690
Winter Flounder	8,767	1,780	3,832	25,945	2,048	6,637	9,746	14,145	11,647
Yellowtail Flounder	2,713	318	2,352	41,563	1,713	24,827	902	230	115
Haddock	33,484	78,427	8,350	140,626	26,729	41,012	126	1,312	8
Hake (non-specific)	85,424	97,340	84,652	358,033	247,565	227,071	1,340	3,000	
Mackerel	372	4,236	10	1,077	583	1,094	12,057	13,560	3,461
Monkfish	643,205	890,970	505,273	661,734	452,592	581,354	2,154,703	1,940,438	2,789,747
Monkfish, Livers	15,267	11,480	2,725	9,956	4,853	9,779	29,895	32,644	46,993
Monkfish, Tails	12,061	6,519	8,344	36,946	11,690	34,359	7,976	7,029	54,924
Pollock	357,260	454,733	322,263	1,982,033	1,143,082	1,638,027	6,294	7,564	115
Redfish	17,339	9,264	10,356	69,739	35,992	64,425		500	
Red Hake	24,594	12	9,501	195,481	3,905	107,482	20		
Silver Hake	4,516	8,817	335	6,594	2,296	30,023	125		284
Skate	17,215	496,602	32,603	25,534	2,024	1,843	400,270	528,222	470,386
SkateW		860	30	1,790	693	87	101,508	41,155	16,194
Skate (wings)			11,993		56	4,501			29,351
Skate, Winter			81						413
Skate, Winter (wings)			165			159			
White Hake	117,359	146,294	53,440	386,214	306,814	667,786		35	
Whiting, King	114	18,933	60	2,568	24,237	81,945	34	6	

Table 66 – Reported pounds kept for vessels declared into the trip gillnet category (gillnet gear only)

Only major catch components shown. (Source: NMFS VTR database)

	Pounds Discarded, by Area and Fishing Year								
	GB			GOM			SNE/MA		
Species	2001	2002	2003	2001	2002	2003	2001	2002	2003
Cod	9,435	4,645	763	139,118	38,395	30,118	341	1,024	17
Dogfish, Smooth	150,000			107,000	40,000		40	350	10
Dogfish, Spiny	231,270	138,840	141,525	276,665	99,105	53,455	90,050	21,710	1,540
Haddock	141	90	84	853	423	271			
Monkfish	537	2,435	195	436	562	3,777	8,425	15,362	13,381
Monkfish, Livers									
Monkfish, Tails				0	20	180			10
Pollock	310	980	1,980	7,664	2,625	6,606	10	50	
Redfish	97	153	2	3,342	1,007	1,312			
Red Hake	200		10	2,723		2,410			
Skate	765	3,530	585	11,214	215	355	43,760	10,992	10,477
Skate (wings)				0				200	
Skate (wings)						35			400
Skate, Winter									200
Skate, Winter (wings)									

Table 67 – Reported pounds discarded for vessels declared into the trip gillnet category (gillnet gear only). Only major discard components shown. (Source: NMFS VTR database)

	Pounds Kept, By Area and Fishing Year					
	GB		GOM		SNE/MA	
Species	2002	2003	2002	2003	2002	2003
Cod	436,662	277,741	575,309	597,931	17,549	1,953
Cusk	5,271	1,964	11,059	12,151	110	5
Dogfish, Smooth					1,100	5
Dogfish, Spiny	11,008	0	7,794	267	43,323	690
Winter Flounder	2,604	4,397	15,950	12,658	7,426	11,751
Yellowtail Flounder	130	2,395	32,411	26,634	118	125
Haddock	63,056	8,623	28,094	85,363	1,336	
Hake (non-specific)	91,472	87,950	256,900	276,185	3,000	
Mackerel	988	96	751	1,122	4,332	2,721
Monkfish	719,922	518,875	598,603	660,867	1,568,649	2,444,383
Monkfish, Livers	18,577	9,011	10,258	15,060	40,019	54,452
Monkfish, Tails	14,841	26,496	14,678	52,152	6,960	71,716
Pollock	376,127	304,068	1,094,201	1,672,733	8,138	65
Redfish	9,574	9,245	38,949	66,575	520	
Red Hake	39,203	9,441	44,496	49,767		
Silver Hake	4,831	286	2,687	28,789		
Skate	135,779	305,946	12,102	1,384	344,982	364,686
Skate (wings)	30,790	1,180	1,543	87	160,559	33,014
Skate (wings)		60,355	13,105	11,026	685	150,938
White Hake	114,066	53,024	381,715	748,758	1,458	131
Whiting, King	9,633	213	23,697	82,651	6	

Table 68 – Reported pounds kept for vessels declared into the trip gillnet category (gillnet gear only) in FY 2001. Only major discard components shown. (Source: NMFS VTR database)

7.2.1.2 Impacts on Other Species/Bycatch

The proposed action may have impacts on other species. The most probable impact is the result of catches of other species that result from groundfish fishing activity. The following section discusses the catch of non-groundfish species that may result from each proposed measure. Part of this catch may be discarded, generally described as bycatch by the M-S Act. For regulated groundfish species, bycatch is discussed in the previous section.

Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

The impacts of this measure on bycatch are uncertain. In general, the DAS leasing program and transfer programs are expected to increase fishing effort in the short term. An increase in effort will increase bycatch if discard rates remain constant. Nothing specific to this individual measure would be expected to change discard rates. The application of a conservation tax, however, reduces the likely increase in effort, with analysis in section 7.4.1.1 noting that a tax of at least twenty percent may be necessary to avoid an effort increase. Complicating this evaluation is that as long as a transfer program is subject to a tax, over the long-term it will reduce available effort and thus may contribute to a long-term reduction in bycatch.

Incidental Catch TACs (Measure B)

Changing the allocation of the incidental catch TACs for groundfish caught by vessels using Category B DAS programs does not affect bycatch. The programs using these TACs, however, could change fishermen's behavior and could affect bycatch. These impacts will be discussed for each specific program.

WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

As noted previously, an experiment has not been conducted that would provide information on the catch of non-groundfish species that may result from this proposed SAP. Recreational fishermen in this area often encounter dogfish while attempting to target cod, so it is likely that this fishery will also catch an unknown amount of dogfish. It is possible that the proposed season may reduce these encounters, but recent angler complaints of the ubiquitous presence of spiny dogfish make this unlikely. The small size of this fishery, requirement to use hand-gear, and limited season make it unlikely catches of dogfish will be significant.

Closed Area II Yellowtail Flounder SAP (Measure C.3)

Two of the proposed changes to this program are not expected to have any impacts on bycatch of other species. Information on catches in the SAP in FY 2004 is not available to determine if discard rates differed during different months. As a result, it is not possible to predict if moving the starting date to July 1, or limiting vessels to one trip per month, will affect bycatch.

This measure also provides a mechanism to change the number of trips in the SAP. An increase in the number of trips will increase effort in the program and in general would be expected to increase bycatch if discard rates remain constant. The overall catch of GB yellowtail flounder, however, is set by a TAC and is not affected by the number of trips in this SAP. It is not yet clear how overall fishing effort is affected by fishing in the SAP and other fishing for GB yellowtail flounder. Area and season specific discard information is not available to determine whether discards will increase or decrease as the number of trips in the SAP is changed.

Minimum Effective Effort Allocation (Measure D)

The allocation of a minimum level of effective effort represents a potential increase in DAS use. If this effort is used, it would be expected to result in an increase in bycatch if discard rates remain the same. These DAS can only be used in specific SAPs where the amount of effort that can be used is capped by a TAC for targeted and incidental catch groundfish species. Allocating a minimum level of effort does not change these TACs and so this allocation, while increasing the pool of eligible participants for those SAPs, is not likely to increase the amount of effort used in the SAPs. As a result, this measure is not likely to change bycatch amounts or rates.

GB Cod Hook Sector Revisions (Measure E)

The impacts of this measure are uncertain, but could result in a decrease in bycatch of finfish. Under this measure, vessels that exclusively used trawl or gillnet gear would be eligible to join the hook sector. These gears can have more bycatch since they catch a broader range of species. By changing these vessels to hook gear, there may be less bycatch of skates and some other species. It is not clear whether any vessels will take advantage of this opportunity and join the sector.

This measure would also allow vessels to bring in their entire cod history into the sector regardless of how caught. This would not be expected to affect bycatch unless this change encourages more vessels that used trawl or gillnet gear to join the sector.

Change to DAS Effective Effort Baseline Calculation (Measure F)

The proposed action does not change the DAS allocations implemented on May 1, 2004 and would not have any impacts beyond those analyzed in Amendment 13 and FW 40A.

Removal of Tonnage Criterion From DAS Transfer Program (Measure G)

Removing the tonnage criterion as a restriction in the DAS transfer program may result in more transfers. The impacts on other species are difficult to determine. When the DAS are transferred, all other permits expire. This would reduce potential fishing pressure on other stocks. In addition, if the DAS are transferred they are likely to be used to fish for groundfish. If this increases fishing effort on groundfish, it would be expected to increase catches of other species such as skates, dogfish, and monkfish that are often caught on groundfish trips.

Estimating the impacts of this change on bycatch is difficult. If this measure increases the number of transfers and results in a short-term increase in effort, bycatch may increase (compared to the No Action alternative) if discard rates remain constant. Over the long-term, however, the application of a conservation tax will reduce the pool of potential DAS and could result in less bycatch if discard rates remain unchanged. Discard rates could change if the distribution of DAS is altered as a result of DAS transfers. There is no information available to judge the changes that will result from the transfer program since no DAS have been exchanged through this program.

One-Time Permit Baseline Characteristics Downgrade (Measure H)

Allowing permit holders a one-time downgrade of the permit characteristics could result in more exchanges of DAS through the DAS leasing programs. These DAS are likely to be used, but whether this will result in an increase in total DAS used depends on the conservation tax that is applied to leases or transfers. If it does result in an increase in DAS use, this measure would be expected to increase catches of other species such as skates, dogfish, and monkfish that are often caught on groundfish trips.

DAS Credit for Standing By Entangled Whales (Measure I)

As discussed in section 7.8.1.1.1, this measure could result in a negligible increase in fishing effort. This measure is not likely to have any impacts on other species since any possible increase in effort is negligible (see section 7.8.1.1.1). While in general an increase in effort will increase discards if discard rates are constant, the increase in effort is so slight that this measure is not expected to have any noticeable impacts on bycatch when compared to the No Action alternative. It may have positive impacts on entangled whales, as discussed in section 7.2.3.3.

Herring Vessel Interactions with Regulated Groundfish (Measure J)

The additional notification requirements for herring vessels that are proposed are not expected to change herring fishing operations compared to the No Action alternative. As a result, they are not expected to have any impacts on other species or to change bycatch. Over the long term, if the measure improves observer coverage of the herring fishery, it may increase information on catches of other species, including regulated groundfish.

Trip Gillnet Net Limitations (Measure K)

The biological impacts on other (non-groundfish) species of removing the net limit was analyzed by examining both VTRs and observed trips. The description of the VTR analysis is in section 7.2.1.1. The observer database was also queried to determine if there were other stocks discarded that were not reported in the VTRs. Only hauls using sink gillnets on trips that were expected to last more than one day were examined. In addition, only hauls targeting groundfish or related species were analyzed (target species: monkfish, cod, winter flounder, witch flounder, yellowtail flounder, haddock, red hake, king whiting, pollock, spiny dogfish, skates, lobster, or other groundfish). A total of 204 trips were identified. The area fished for each trip was also identified based on the starting location of individual (Table 69).

The total in this table is 285, since some trips took place in more than one area. Observed discards on these trips are summarized for the top fifteen discarded species by year and area in Table 70.

The information from the observer data is similar to that in the VTRs. Observed discards on GB were primarily spiny dogfish, ranging from 63 to 95 percent of the identified species. Skates (primarily little and winter) and cod accounted for most the remainder. In the GOM, spiny dogfish was again the primary discard (42 to 81 percent). Excluding FY 2002 (when only eleven trips were observed in this area), cod, monkfish, and lobster were the largest components of the remainder. Thorny skate accounted for about one percent of the discards in this area each year. Discards in the SNE/MA area were dominated by skates, followed by monkfish and spiny dogfish. There was considerable variability in this area between fishing years.

	Fishing Year			
Area	2001	2002	2003	Total
GB	32	33	36	101
GOM	11	44	33	88
SNE/MA	27	33	36	96
Total	70	110	105	285

Table 69 – Observed gillnet trips of more than one day targeting certain species (Source: NMFS OBDBS)

	Area/Fishing Year									Grand Total
	GB			GOM			SNE/MA			
Species	2001	2002	2003	2001	2002	2003	2001	2002	2003	
Spiny Dogfish	18,831	5,201	77,175	83	20,162	20,036	372	176	651	142,686
Skate, Little	430	1,434	1,686		36	55	217	90	16,760	20,707
Monkfish	20	2	140		743	687	253	693	5,439	7,977
Cod	734	751	733	100	3,153	1,292	6	31	2	6,801
Skates									4,859	4,859
Skate, Barndoor			5		5	56		191	4,051	4,308
Seaweeds			1		10	9	36		4,129	4,185
Crab, Jonah	135	34	654		528	358	17	148	2,165	4,039
Skate, Winter	69	321	820		293	200	106	111	844	2,763
Lobster	89	34	571	3	562	1,132	2	5	131	2,529
Sea Raven	164	143	1,104	3	510	402	4	19	48	2,397
Crab, Rock	142	12	132	5	415	209	6	26	457	1,403
Skate, Clearnose		2			19	4	12	900	3	940
Sponge	18		97		29	17	14		766	940
Skate, Thorny	32	51	6	3	454	177				723
Grand Total	20,664	7,985	83,121	197	26,919	24,631	1,045	2,390	40,304	207,255

Table 70 – Observed discards (top fifteen species, pounds) on observed gillnet trips or more than one day targeting certain species (Source: NMFS OBDBS)

Based on the VTR analysis, monkfish (including livers and tails) is a major component of the catch of trip gillnet vessels in all three areas, and thus is the most likely stock to be affected by the change in net limits. There is considerable overlap between monkfish and groundfish regulations. Monkfish

management focuses on two areas: the Northern Fishery Management Area (NFMA) and the Southern Fishery Management Area (SFMA) (see Figure 17). In the NFMA, gillnet vessels possessing the appropriate monkfish permit may fish for monkfish while on a groundfish DAS and using gear authorized by the groundfish plan. These vessels are not subject to a trip limit. In contrast, vessels fishing in the SFMA while on a multispecies (and not a monkfish) DAS are subject to a possession limit.

Removal of the net limit could result in an increased number of nets and increased fishing mortality for monkfish, particularly in the NFMA. As discussed in section 7.2.1.1, if activity in FY 2001 is an indication of future activity, vessels fishing in the GOM are likely to increase the number of nets fished if the limit is removed. The most recent evaluation of monkfish status concluded that in the NFMA monkfish is no longer overfished and is ahead of the rebuilding scheduled adopted by Monkfish Framework 2. In the SFMA the stock is no longer overfished and is slightly behind the rebuilding schedule. The status of the monkfish stocks with respect to fishing mortality reference points is unknown, since there are no estimates of current fishing mortality. The following table shows the status of the stocks with respect to the biomass targets (annual and overall) and threshold:

kg/tow	2000	2001	2002	2003	2003 3-yr. Ave.	2003 target	Bthreshold	Btarget
NFMA	2.495	2.052	2.103	1.925	2.030	1.49	1.25	2.5
SFMA	0.477	0.708	1.253	0.828	0.930	1.02	0.93	1.86

Table 71 - Monkfish biomass stock status through 2003.

The stock status, through the fall 2003 NMFS bottom trawl survey, relative to the annual and overall biomass reference points are shown in Figure 18 and Figure 19, for the northern and southern stocks, respectively. Based on the current reference points and estimates of stock status, the Monkfish Monitoring Committee concluded that both stocks are no longer overfished, but, while the northern stock is ahead of the annual rebuilding targets, the southern stock is still lagging behind the rebuilding schedule.

Other species that may be affected by an increase in the number of nets include dogfish (both spiny and smooth) and skates. VTR and observer records document that dogfish are the major species discarded by trip gillnet vessels, and an increase in the number of nets may increase dogfish discards. Skates are both a target species (primarily in the SNE/MA area) and are discarded. While the bulk of the skate catch is little and winter skates, there is a small catch of thorny skates in the GOM. An increase in the number of nets would likely increase the catch of skates. The impacts of an increased skate catch are described in section 8.1.4.

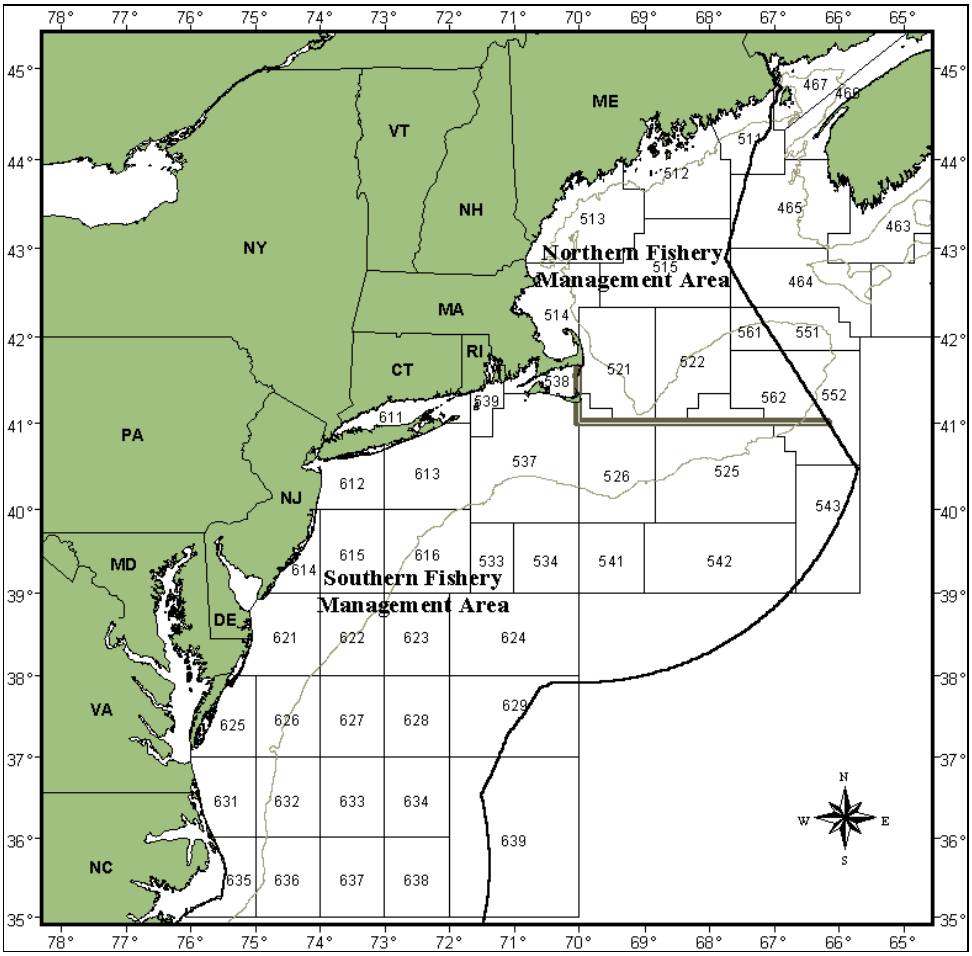


Figure 17 – Monkfish management areas

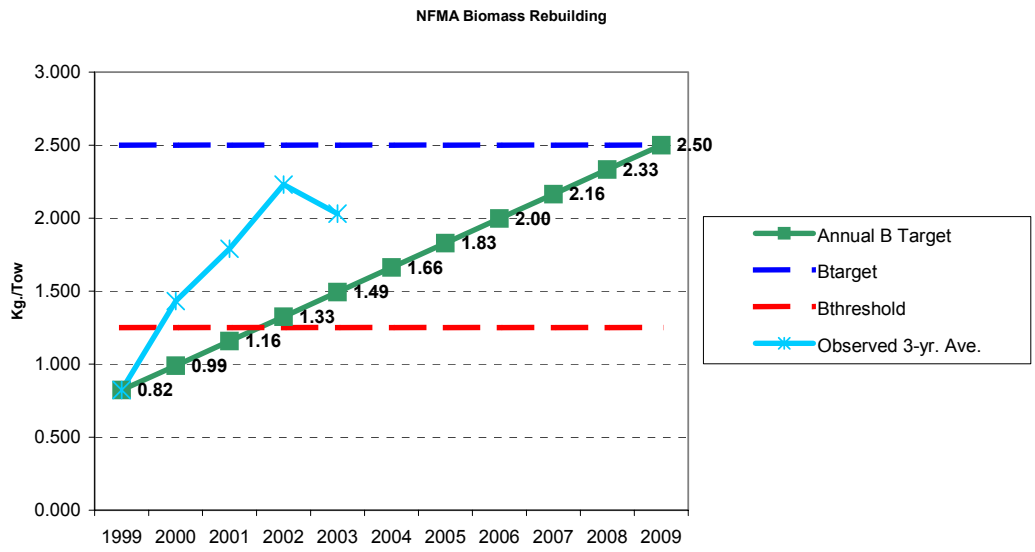


Figure 18 NFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Monkfish Framework 2.

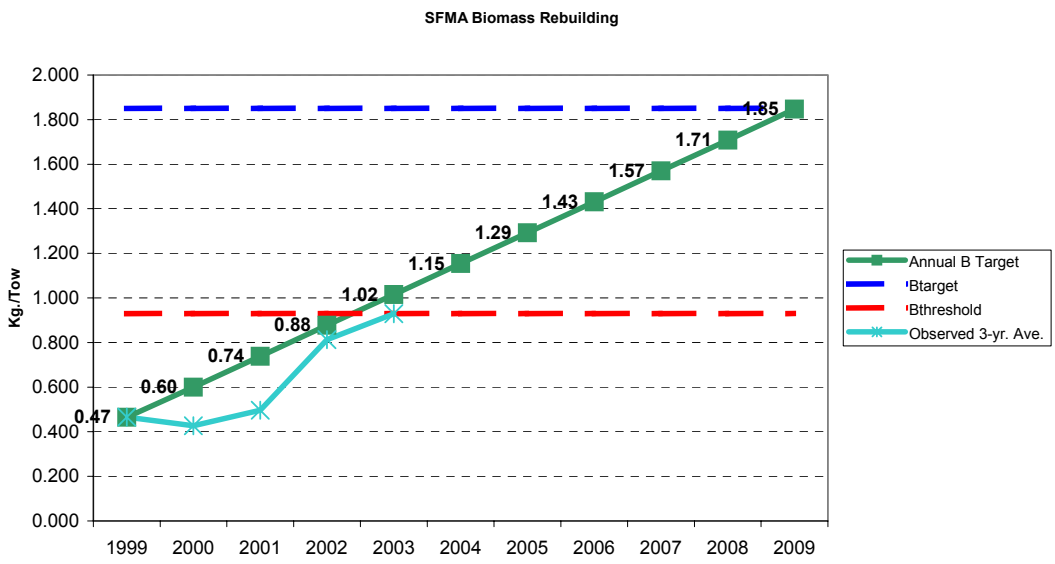


Figure 19– SFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Monkfish Framework 2.

7.2.1.3 Summary

The proposed action will not have substantial nor significant impacts on regulated groundfish as compared to No Action. As discussed in detail in other sections, the stocks most likely to be affected are GOM haddock, GOM cod, and GB Yellowtail Flounder. This is because the proposed action would adopt a SAP to target GOM haddock in the WGOM Closed Area and proposes to modify the CAII Yellowtail Flounder SAP. The small increase in GOM haddock catches (50 mt, compared recent catches of about 1,000 mt and a target TAC of 4,700 mt) represents a slight increase in exploitation that will not threaten mortality targets. While some cod may be caught in this SAP, catches are limited to an incidental catch TAC so that mortality targets will not be threatened. The changes to the CAII Yellowtail Flounder SAP may benefit GB yellowtail flounder since there will be a more explicit link between fishing in the SAP and the amount available for harvest. This could result in reduced discards of yellowtail flounder and a more strict adherence to the TAC. GOM cod could also be affected by the removal of the net limit for trip gillnet vessels. This is not expected to be substantial given the small size of this sector.

Changes to the DAS leasing and transfer programs are more difficult to evaluate. The relatively minor changes being made to both programs may increase the number of DAS transfers and leases that occur. In general, increases in DAS exchanges are expected to increase the number of DAS used. It is difficult to determine the impacts on fishing mortality, since that will depend on what stocks are targeted with DAS. The application of a conservation tax on DAS transfers will also reduce the overall pool of available DAS, so increasing the number of transfers could serve to reduce DAS use. With little empirical data available on these programs, it is not possible to predict the impacts on mortality with any certainty.

Impacts on other species are expected to be limited to skates, monkfish, and dogfish, and result primarily from removing the net limit for trip gillnet vessels. These impacts are likely to be concentrated in the GOM, where in the past some vessels fished twice as many gillnets as currently authorized. In other areas past gillnet use has been similar to the current net limit. This change could result in an increase in catches of monkfish in the northern management area.

7.2.2 Habitat Impacts

Section 7.4.2 includes an analysis of the habitat measures that are proposed that were grouped into distinct alternatives. The impacts of these measures are summarized below, along with the independent measures that are included in the proposed action. To summarize the habitat impacts of the measures in this alternative:

- Changes to the DAS Leasing and Conservation Tax (Measure A.1): Impacts on essential fish habitat are minimal
- Incidental Catch TACs (Measure B): Will not increase habitat impacts.
- WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2): This measure will not have any habitat impacts.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): This measure will not compromise the baseline level of protection for essential fish habitat.
- Minimum Effective Effort Allocation (Measure D): This measure will not produce any discernible habitat impacts.
- GB Cod Hook Sector Revisions (Measure E): This measure will not produce any discernible habitat impacts.
- Changes to DAS Effective Effort Calculation (Measure F): As long as additional Category B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.

- Removal of the Tonnage Criterion for the DAS Transfer Program (Measure G): This measure proposes to only base the assessment for transfer on the length and horsepower characteristics of the vessel and remove the tonnage variable. This measure will not have any discernible habitat impacts as it will not increase effort or infringe on Habitat Closed Areas.
- Permit Baseline Characteristics Downgrade (Measure H): This measure proposes to allow a one-time downgrade of the baseline characteristics for a permit to encourage the use of the DAS transfer and leasing programs. This measure will reduce the amount of latent fishing capacity inherent in small permits but may increase the amount of short-term active fishing effort. While this may increase active fishing effort over the short-term, it will potentially reduce the amount of latent effort that could be re-applied to the fishery in the long-term as stocks rebuild. Effort reduction was an important tool employed by the Council under Amendment 13 to minimize the adverse effects of bottom-tending gear on EFH. Significant effort reductions and DAS categorizations assisted in, not only rebuilding stocks, but also in reducing the number of DAS that a vessel can use. However, the main mitigation tool employed by the Council to minimize for the effects of bottom-tending mobile gear on EFH was the creation of the Habitat Closed Areas. Under this alternative, these areas will remain closed and any additional short-term effort resulting from this alternative will be applied outside the Habitat Closed Areas, in areas that are currently being fished. Therefore, the essential fish habitat impacts of this measure will be minimal.
- DAS Credit for Standing by Entangled Whales (Measure I): There will be no habitat impacts of this measure.
- Herring Vessel Interactions with Regulated Groundfish (Measure J): This alternative will cause minimal impacts on habitat as the use of herring midwater trawls does not result in impacts to EFH that are more than minimal and less than temporary. The proposed measure only adds a reporting requirement to facilitate observer coverage and does not alter herring fishing practices in any way
- Removal of Net Limit for Trip Gillnet Vessels (Measure K): Gillnets have been determined not to cause habitat impacts that are more than minimal and, as such, the EFH impacts of this measure will be minimal.

7.2.3 Impacts on Threatened, Endangered and Other Protected Species

An analysis of measures that were grouped into distinct alternatives and are contained in the proposed action is provided in Section 7.4.3. – Alternative 1, in this document. As with Alternatives 2, 3 and 4, the omission of some measures --- in this case, the DAS transfer modification alternative, the GB haddock fishery SAP, and several of the independent measures --- will not change the conclusion that the overall Framework 40B measures will account for few if any impacts on protected species beyond those already identified in Amendment 13. While not quantifiable, that impacts of that action are most likely to be beneficial as a result of overall effort reductions in groundfish fishing effort, and a general decline in gillnet fishing effort. To briefly summarize these measures:

- Changes to the DAS Leasing and Conservation Tax (Measure A.1): Changes to the DAS transfer program may result in more such transfers. Increased use of this option should generally result in an overall decrease in DAS over the long term and should not result in any impacts beyond those analyzed and discussed in Amendment 13.

- Incidental Catch TACs (Measure B): The proposed action does not change the incidental catch TACs and should not result in impacts beyond those analyzed in Amendment 13 and FW 40A.
- WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2): Hand-tended rod/reel gear is not implicated in protected species interactions (with the exception of sea turtles). Given the March-April time for this SAP and the turtle preference for warm water temperatures, encounters with sea turtles in this SAP are unlikely.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): The changes to this SAP will not result in increased interactions with endangered, threatened, or protected species.
- Minimum Effective Effort Allocation (Measure D): While this measure will result in an increase in effort, that effort can only be used in SAPs that will not have negative impacts on protected species.
- GB Cod Hook Sector Revisions (Measure E): This measure has the potential to shift effort from other gear types to hook gear. To date, hook gear has had few if any interactions with protected species in the Northeast.
- Changes to DAS Effective Effort Calculation (Measure F): The proposed action does not change the DAS allocations implemented May 1, 2004 as a result of Amendment 13. Therefore, it will not have any impacts on protected species beyond those described in that action.

7.2.3.1 Removal of Tonnage Criterion for the DAS Transfer Program (Measure G)

A measure that limits DAS transfers to vessels with similar characteristics, but removes the tonnage restriction specified in Amendment 13 is unlikely to affect protected species, either positively or negatively. No action will result in maintenance of the Amendment 13 standards, again without consequences for protected species.

7.2.3.2 Permit Baseline Characteristics Downgrade (Measure H)

The one-time permit baseline downgrade for the purpose of leasing only is unlikely to resulting any changes in impacts to protected species beyond those described in Amendment 13. Only one downgrade will be allowed for each permit and all vessel characteristics must be changed to match the characteristics of the vessel that uses the permit, mitigating any potential unintended consequences, such as increases in efforts. The impacts discussed and analyzed in Amendment 13 and Framework Adjustment 40A would remain unchanged under the No action alternative.

7.2.3.3 DAS Credit for Standing by Entangled Whales (Measure I)

This measure will have clear benefits to entangled whales given that it provides an incentive for vessels on DAS to stand by until rescue efforts can get underway if the animal is alive or until the disposition of a dead animal can be determined. Important information can be obtained in either case. This is particularly important with respect to highly endangered northern right whales. By comparison, the No Action alternative could result in reports from fewer vessels and decreased opportunities for information collection and/or release of a live animal.

7.2.3.4 Herring Vessel Access to Groundfish Closed Areas (Measure J)

Herring mid-water trawl and purse seine vessels do have records of interactions with protected species, particularly pinnipeds and small cetaceans. Observations aboard mid-water trawl vessels have documented harbor seals, white-sided dolphins and pilot whales. Interactions with purse seine vessels are more likely to occur inshore than in offshore areas. Any meaningful discussion relative to protected species interactions is hampered by lack of observer data, although it can definitively stated that the WGOM Area is a high use region for many species of marine mammals in the spring and summer seasons. The proposed action will require Category 1 herring vessels to notify NMFS prior to a trip. While this will not increase the number of observed trips, it will help facilitate planning for observer coverage and may lead to improved sampling of herring vessels as a result. This could lead to an improved understanding of the interactions between herring vessels and threatened species, particularly marine mammals.

7.2.3.5 Removal of Net Limit for Trip Gillnet Vessels (Measure K)

On its face, removal of the measures that limit the number of nets that trip gillnet vessels may carry would appear to have negative impacts for protected species. However, until recent history, trip gillnet fishing effort was primarily controlled through DAS and the capacity of the vessel to carry only a limited number of nets. Under that scenario vessels had takes of marine mammals and harbor porpoise in particular, but in relatively low numbers. During that period harbor porpoise mortality decreased to levels substantially below PBR, most likely as the result of pinger requirements and the removal of effort altogether from seasonal and year round closed areas. Given these positive outcomes occurred before the implementation of net limits, and although this gear is responsible for some takes of marine mammals, it is doubtful that removal of the net limit itself will result in any meaningful changes from the No Action alternative. Clearly, 150 nets still have the capability of interacting with protected species, but overall impacts have been reduced through the Harbor Porpoise and Large Whale Take Reduction Plans, and the other effort reduction measures in Amendment 13.

7.2.4 Economic Impacts

The proposed action would implement twelve different measures. Some of these measures would have strictly additive impacts while others would have synergistic effects. The following describes anticipated economic impacts of each of the twelve measures treated independently as well as a summary discussion that identifies the potential interactions between measures. As in other impact sections, detailed descriptions of the analysis of specific measures is found in section 7.4.4.

7.2.4.1 DAS Leasing and Transfer Program Conservation Tax (Measure A.1)

This measure would reduce the conservation tax on the DAS transfer program to 20% while leaving DAS leasing with no conservation tax. The potential value of a DAS transfer would be increased with a lower conservation tax but is not likely to be sufficient to encourage a larger trading market unless the selling vessel held no other limited access permits. Vessels may be better off leasing groundfish DAS or simply selling their vessel and permits outright rather than going through the DAS transfer program. Nevertheless, reducing the conservation tax would improve the value of the DAS transfer would be expected to have some positive albeit small economic benefit. For further discussion, see section 7.4.4.1.

7.2.4.2 Incidental Catch TACs (Measures B)

Incidental catch TACs ensure that catches from any SAP or other use of Category B DAS do not compromise the biological objectives and the economic opportunities for available Category A DAS. The proposed action would not change the method for creating a total set-aside for incidental catch TACs but would change the allocation of the share of incidental TACs to accommodate anticipated demand for fishery experiments that would take Georges Bank cod and one new SAP (the WGOM Closed Area Rod/Reel Haddock SAP). However, since the target TACs for FY2005 will be higher for both cod stocks than they were in FY2004, the nominal incidental catch TACs allocated to any given SAP or experiment will actually increase. As long as catch rates remain constant in either of the two existing programs then any nominal increase in TAC would result in increased fishing opportunities, hence improved economic returns. By contrast, if catch rates improve then fishing opportunities in existing programs could increase, stay the same, or be reduced depending upon the magnitude of any such improvement, the amount by which the TAC is raised, and how much of that TAC has been reallocated to new programs. For additional discussion, see section 7.4.4.3.

7.2.4.3 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

This SAP would permit use of hand-tended rod and reel commercial fishing gear inside the WGOM closed area during March and April. SAP participants would not be able to retain any cod, although any cod catch would be counted against an incidental catch TAC of 6.3 MT for FY2005. Given a haddock TAC of 50 mt the economic benefits of the SAP would be limited to about $140 thousand valued at $1.27 per pound, the average price for FY2003. Given that hook gear primarily takes cod or haddock there is unlikely to be sufficient component catch that would contribute appreciably to potential trip income.

Available data make it very difficult to ascertain the likelihood that the potential benefit from the SAP will be realized. Specifically, the only available data on catch rates of cod relative to haddock inside the proposed area come from party/charter VTR records. These data suggest that the cod to haddock ratio using the same gear as that proposed for the SAP would not meet the 1:2 requirement. However, it is notable that the party/charter data reflects a fishery that generally targets cod and has no incentive to avoid catching cod. Similarly, available commercial hand gear data does not reflect a targeted haddock fishery and does not provide any information on what expected catch rates may be inside the SAP.

Assuming that haddock can be successfully targeted inside the SAP, given the relatively short duration of the SAP and the relatively low TAC, the likely participants would still be individuals with a recent or previous history of using hand gear in the Gulf of Maine. Based on FY 2004 permit categories there were a total of 91 vessels that fished with hand gear on at least one occasion in the Gulf of Maine during FY2003 (Table 110). Of these vessels, all listed a homeport state bordering the Gulf of Maine with the exception of one vessel with a Rhode Island home state. The majority of vessels were from Massachusetts home ports (71) followed by New Hampshire (12) and Maine (6). Dependence on hand gear hook fishing was highest for New Hampshire vessels (84%) and was lowest for Maine vessels (34%). The latter depended on lobster for one-third of total fishing revenue so Maine vessels relied on either hook fishing or lobster for over two-thirds of total fishing revenue.

Total revenue from hook trips where haddock was landed in the Gulf of Maine averaged approximately $300 for Maine and Massachusetts vessels but was less than $200 for New Hampshire vessels. The expected revenue from the proposed SAP is likely to be higher than available data indicate because hand gear has typically targeted cod not haddock and a substantial number of participants (42 of 91) were fishing under an open access hand gear permit which was subject to trip limits on combined cod,

haddock and yellowtail founder. For these reasons the number of trips and their contribution to participant's fishing revenue cannot be reliable estimated.

Vessels participating in the SAP would be required to have an approved VMS and would be required to report daily catches (landings and discards) of all regulated groundfish. Additionally, non-DAS limited access vessels (Category C and Handgear A permits) would be required to notify of the intent to fish in the SAP and would not be able to fish anywhere else on the same trip. By contrast, limited access DAS vessels would be required to enroll in the SAP for a minimum of one week and would be unable to fish anywhere else. Of these conditions, the VMS requirement may be the most cost prohibitive. Most vessels that may be expected to participate in the SAP are small vessels that are unlikely to have VMS now and would have limited ability to meet all of the requirements to keep the unit turned on at all times. Although the VMS requirement may be prohibitive for some vessels it will not be for all vessels. For these vessels, the SAP would provide a limited opportunity to improve fishing business income.

Home Port State	Number of Participating Vessels	Average Dependence on Hook Fishing	Average Dependence on Lobster	Average Trip Revenue on Trips Landing Haddock
ME	6	34%	33%	312
NH	12	84%	8%	166
MA[a]	73	68%	11%	297
a Includes one vessel from Rhode Island				

Table 72 – Vessels using handgear in the Gulf of Maine, FY 2003

7.2.4.4 Closed Area II Yellowtail Flounder SAP (Measure C.3)

The Closed Area II Yellowtail SAP was implemented with Amendment 13. At implementation there was no clear provision to change the number of allowable trips in response to changing stock conditions. The proposed change in the SAP would change the season, adjust the trip limit, limit the number of trips that could be taken, and would more clearly link the SAP with management objectives outside the SAP. A detailed description of the economic impacts of this measure can be found in section 7.4.4.6.

In general, most of the proposed changes to the SAP would mitigate the derby effects that resulted in depressed prices received by fishermen as large quantities of yellowtail flounder landed at one time could not be absorbed in the market. Adjusting the SAP season to begin in July instead of June would better align fishing opportunities with biological concerns as June is an important month for Georges Bank yellowtail flounder spawning. June also happens to be a month where yellowtail flounder prices have been lowest in the past (June prices in New Bedford for yellowtail flounder averaged $0.67 per pound as compared to between $0.90 and $1.46 from July to December, 2003). Limiting vessels to one trip a month to the SAP would also spread out landings. The 10,000-pound trip limit would reduce the size of spikes of yellowtail flounder brought to market. All of these changes would likely result in improved average prices received for yellowtail flounder for all vessels whether they participate in the SAP or not. However, these changes come at some cost. The change in trip limit effectively increases the overall cost of catching the available TAC by increasing the number of trips needed to take the quota

assuming that the SAP can be profitably prosecuted (see below) at all. Imposing a limit on number of trips per month interferes with trip planning and may prevent vessels from optimizing business plans to take into account either unexpected market or weather conditions.

During FY2004 there were a number of anecdotal reports of lower yellowtail flounder prices caused by spikes in landings associated with the SAP. The lowering of the trip limit would reduce this effect but raises issues as to whether the proposed 10,000 pound trip limit would be sufficient to justifying the expense of taking a trip given current fuel prices and potential low prices for yellowtail flounder. In part, the 30,000-pound trip limit implemented for FY2004 was based on industry recommendations as being what would be needed in order to justify making a trip. Data used to justify the SAP in the first place indicated that bycatch rates of species of concern were low. This means that trip revenue is effectively capped by the yellowtail flounder trip limit unless vessels are able to fish inside and outside of the SAP on the same trip. To evaluate the potential impact of the proposed change in trip limit VTR records for FY2004 were queried to identify potential trips that may have been taken inside the SAP. Specifically, trips that were taken in statistical area 562 and that landed between 15 and 30 thousand pounds of yellowtail flounder were selected for further analysis. These trips were selected because they would have been taken, if not inside the SAP in close proximity to it, and reported landings were within trip limit requirements in effect for the SAP.

Under FY2004 conditions, the estimated median gross revenue per trip ranged across horsepower classes from $25 to $35 thousand of which 40% goes to the boat and 60% to crew (Table 112). For vessels in the lowest horsepower class boat share ranged from a high of $25 thousand to a low of $8 thousand. The effect of fuel costs on returns to crew is evident as net payment per crew member was highest for the vessels in the lowest horsepower class with the sole exception of the high end of the range of performance for the largest horsepower class (more than 672). That is, lower horsepower engines consume less fuel lowering fuel costs and raising potential crew payments net of trip costs. On the high end of trips taken by vessels in the highest horsepower the higher fuel costs were more than offset by higher trip revenues resulting in an increase in payment per crew member.

Under a 10,000 pound trip limit, trip duration, median boat share, crew share, and net payment per crew all fell although in different proportions. Depending on horsepower class, total days absent fell between 40% and 43%. However, time spent fishing fell by at least 60% since vessels must still steam to and from the SAP. The reduction in boat share and crew share was similar to that of the reduced fishing time (63-64%) while net payments to crew generally fell between 52 and 54%. Crew payments fell less than that of boat payments because the costs savings associated with fuel payments were proportionally greater than the change in gross revenue. Note that total share net of fuel costs fell by 43% for crew on vessels in the highest horsepower class, but since these vessels typically carry more crew the reduction in net payment per crew member was similar to that of crew on vessels in lower horsepower classes.

While the above analysis was based on observed trips whether they actually took place inside the SAP is not certain although they were selected because they met criteria that likely reflected the type of fishing that did take place inside the SAP. The estimated economic performance for these trips may not reflect actual experience since revenues had to be estimated from 2003 data which would not necessarily reflect the depressed price effects reported by fishermen. Actual economic performance would also be likely to differ from that estimated herein, because not all trip costs were included and fuel costs had to be engineered from secondary sources. In spite of these limitations, the analysis does provide some indication of the relative change in potential economic return to participation in the SAP under a 10,000 pound trip limit. That is, unless vessels redirect effort inside the SAP on species other than yellowtail flounder or are able to fish inside and outside the area on the same trip, the potential economic return may not be sufficient for vessels to participate in the SAP.

	FY2004			Preferred Alternative			
Horsepower Class Less than 450	Low	Median	High	Low	Median	High	Change at Median
Days Absent	4.9	6.7	8.7	3.1	3.8	4.8	-43.1%
Days Fished	2.7	4.5	6.5	0.9	1.6	2.6	-64.2%
Boat Share $ (40% of gross)	$8,188	$10,702	$16,839	$3,257	$3,959	$6,221	-63.0%
Crew Share $ (60% of gross)	$12,282	$16,053	$25,259	$4,886	$5,938	$9,331	-63.0%
Crew Share Net of Fuel Costs $	$7,043	$10,534	$19,749	$3,674	$4,782	$7,848	-54.6%
Net Share per Crew $	$2,030	$2,633	$4,480	$927	$1,205	$1,796	-54.3%
Horsepower Class 450 to 672							
Days Absent	4.4	6.1	7.8	3.1	3.6	4.2	-41.0%
Days Fished	2.2	3.9	5.6	0.9	1.4	2.0	-63.8%
Boat Share $ (40% of gross)	$7,966	$10,209	$14,883	$3,181	$3,651	$5,211	-64.2%
Crew Share $ (60% of gross)	$11,949	$15,313	$22,324	$4,771	$5,477	$7,817	-64.2%
Crew Share Net of Fuel Costs $	$5,124	$8,645	$15,448	$3,200	$4,114	$6,350	-52.4%
Net Share per Crew $	$1,252	$1,926	$4,018	$664	$912	$1,588	-52.6%
Horsepower Class More than 672							
Days Absent	4.8	6.3	8.4	3.1	3.8	4.5	-39.6%
Days Fished	2.6	4.1	6.2	0.9	1.6	2.3	-61.0%
Boat Share $ (40% of gross)	$9,628	$13,880	$26,258	$3,418	$5,047	$12,364	-63.6%
Crew Share $ (60% of gross)	$14,442	$20,819	$39,386	$5,127	$7,571	$18,546	-63.6%
Crew Share Net of Fuel Costs $	$5,626	$9,159	$24,686	$3,103	$5,223	$11,315	-43.0%
Net Share per Crew $	$1,125	$2,148	$6,046	$704	$1,045	$2,829	-51.4%

Table 73 - Estimated Impact of the Proposed Change in Georges Bank Yellowtail Flounder SAP Trip Limit

7.2.4.5 Minimum Effective Effort Allocation (Measure D)

This measure would provide an opportunity for vessels that received a zero DAS baseline under the criteria implemented for Amendment 13 to qualify for a minimum allocation of 10 reserve B DAS. This allocation would only enable these vessels to participate in established SAPs and would not be eligible to participate in any regular B DAS fisheries. The economic impact of this measure is expected to be positive for vessels that would receive a minimum allocation but could adversely affect other vessels did receive a non-zero DAS baseline. That is, since the economic benefit of any given SAP is effectively limited by TACs for both target species and incidental TACs for stocks of concern, any increase in the potential number of participants will spread the potential benefits across more vessels. In essence, granting increased access to SAPs represents an implicit tradeoff between vessels that have only been peripherally involved in the groundfish fishery since 1996 and vessels that have been comparatively more active.

For FY2004 there were a total of 448 vessels that received a zero DAS baseline, of which, 44 were enrolled in the CPH program as of September, 2004. The majority of vessels that were not in CPH were from Massachusetts home ports (173) with no other state having more then 50 (Table 113). Based on vessel size more than 75% of vessels that received a zero baseline for FY2004 were less than 50 feet LOA (Table 114). Based on 448 vessels, this measure would add 4,480 Category B (reserve) DAS to DAS allocations for the fleet.

Half of all vessels with a zero baseline reported some fishing activity through FY2003 dealer records. However, this percentage differed substantially across states and vessel size class. For example, from Rhode Island southward at least two-thirds of all vessels reported some fishing activity. Also, about the same percentage of vessels 50-feet and upward, reported activity in FY2003. By contrast, only 22% of Maine home port state vessels with a zero baseline reported any activity. Similarly, less than half of all vessels from both New Hampshire and Massachusetts reported fishing activity.

Among vessels that did report fishing activity in FY2003 almost all of them depended on a single species for the majority of their reported fishing revenue. For example, there were 30 vessels for which scallops represented the majority of fishing income of which, over half (16) were from Massachusetts (Table 115). The average dependence on scallops across all 30 vessels was 96%. The average dependence for active vessels on summer flounder, monkfish, groundfish (10 large mesh species combined), lobster, surfclam, jonah crab, mackerel, tilefish, hagfish, and menhaden all exceeded 80%. These data indicate that the majority of active vessels were heavily engaged in fisheries other than groundfish. Whether this level of activity represents a shift away from groundfish to these other fisheries is not known. Certainly, such a shift would have occurred prior to 1996, otherwise their baseline allocation would not have been zero.

The economic effect of providing a minimum of 10 reserve B DAS is uncertain. During FY2003 all of these vessels would have had a total of 8 DAS during which they would have been able to target groundfish. Of the 26 vessels which relied on groundfish for the majority of fishing revenue the average gross revenue from all species was about $8 thousand of which $5.2 thousand was groundfish. Although fishing revenues of this magnitude probably represent part-time or supplemental income, removal of the ability to target groundfish would have a significant affect on these vessel owners, and their crew, unless they were able to seek out alternative fisheries or other sources of income. Providing a minimum baseline of 10 reserve B DAS would not be equivalent to restoring fishing opportunities that were available in FY2003 since the DAS would only be able to be used inside an SAP. At present, most vessels (if they are like the 26 noted herein) may not be able to take immediate advantage of either existing SAPs or those proposed under Framework 40A and for the present action (40B) with the possible exception of the

proposed rod and reel SAP in the WGOM. This does not mean that the proposed measure will have no beneficial economic effect since at least some vessels will be able to participate in any one or more of these SAPs. However, the realized economic gains from granting a minimum allocation of 10 reserve B DAS may not be expected to be large in magnitude or broad-based but would certainly be positive for some vessels.

The previous discussion was based on the perspective of an individual vessel or fishing business. Treated from a more broad perspective, management of SAPs and other programs prescribing ways in which B DAS has been based on TAC set-asides that limit the economic benefits that may be derived. This also means that increasing the potential number of individuals that may be eligible to participate in an SAP has allocative effects. That is, the proposed measure represents a potential transfer of income from vessels with more recent groundfish activity to vessels that do not have a recent history of groundfish.

7.2.4.6 Georges Bank Cod Hook Sector Allocation (Measure E)

Initial history for purposes of establishing a quota share for the GB Cod Hook Sector was limited to cod landings using hook gear even though sector participants may have had documented landings of GB cod using any number of different gears. This alternative would revise the sector share by recalculating landings history including all Georges Bank cod landings regardless of gear type. Presumably, any additional cod that may be attributable to sector participants will increase the overall cod TAC that will be available to the membership.

The economic impact of this measure would be two-fold. Most obviously, the hook sector will be able to increase overall fishing revenues (although how these benefits may be distributed among the membership is not known) as its allocation of GB cod may increase. The second impact is less obvious. Specifically, an increase in GB cod TAC may be more valuable as a bycatch in other directed fisheries; either as regular B DAS or in SAPs. While changing the qualification criteria for the GB Cod Hook Sector would undoubtedly benefit the sector and its membership, the resulting increase in TAC share would be accompanied by a corresponding decrease in TAC share to everyone else. Even though the TAC to non-sector participants is a target which would not result in an in-season closure it does increases the probability (by some unknown small amount) that the target TAC would be exceeded unless some type of compensatory action is taken to account for the lowered target TAC. In essence, this is a zero-sum game and any change in TAC allocation means that enhanced income opportunities to one group will have to be offset by a reduction in income opportunities to others.

7.2.4.7 Change to Effective Effort Calculation (Measure F)

The proposed action would make no change to the DAS allocations as they were implemented for FY2004 and would have no economic effect relative to taking no action. This action was selected to avoid the potential uncertainties and economic effects that would have resulted with a change in criteria to establish each vessel's effective effort baseline. That is, changes to these criteria were considered that would have resulted in an increase in baseline DAS for between 195 and 390 vessels depending on the selected option. However, due to the need to achieve specified conservation objectives the split between Category A and B DAS would have had to be modified such that at least 80% of limited access vessels with a non-zero baseline allocation would have seen the number of Category A DAS reduced in FY2005 compared to the number of allocated A days in FY2004. The proposed changes were also determined to result in a possible net increase in effort as Category A DAS tended to be transferred from smaller to larger vessels. If realized, this change could have required further adjustments to the Category A and B DAS split.

7.2.4.8 Removal of the Tonnage Criterion for the DAS Transfer Program (Measure G)

Removal of tonnage from the DAS transfer program restrictions would make the DAS transfer program subject to the same baseline conditions as that of the leasing program. Removing tonnage would also make it more likely that vessels would be able to find other compatible vessels with whom a DAS transfer could be executed. The extent to which such a change would facilitate trades is not known but is likely to positive and would have positive economic impacts.

7.2.4.9 Permit Baseline Characteristics Downgrade (Measure H)

Both DAS transfer and DAS leasing limit trades based on groundfish permit baselines. However, this limitation applies to trades that would move DAS from vessels with smaller baselines to vessels with larger vessels but trades from large to small would be allowed. In this respect, it is advantageous to have a smaller baseline since large vessels may only trade with other large vessels but smaller vessels have a larger pool of potential trading partners since they may acquire DAS from other small vessels as well as any vessel with a larger baseline. Through a recent or past ownership transfer or vessel replacement, some vessels may actually have smaller physical dimensions than when the permit was originally obtained. This measure would give vessel owners the option for a one-time downgrade in baseline to reflect the characteristics of their current vessel for the purposes of leasing DAS. Vessel owners that avail themselves of this opportunity would be able to better take advantage of the DAS leasing programs. The economic impact of this option is likely to be positive although neither the number of vessels that might downgrade their vessel nor the economic value of the downgrade is quantifiable.

7.2.4.10 DAS Credit for Standing By Entangled Whales (Measure I)

This measure would provide both an economic benefit to vessels and to large whales. The DAS credit would provide vessels with an incentive to stand by an entangled whale since recovery of the time spent in that activity would be recoverable. The extent to which this measure would result in an improvement in successful disentanglement efforts is not known, but even small improvements for species such as the Northern right whale would be beneficial. The economic value of this improvement cannot be quantified but studies of endangered species protection programs do indicate positive benefits to both existence and non-consumptive use values (whale watches, for example).

7.2.4.11 Herring Vessel Interactions with Regulated Groundfish (Measure J)

The proposed action would require all Category A herring vessels to notify the observer program prior to taking a trip. Since the herring fishery is already receiving 15% to 20% coverage, this action would not change current practice from what is already being done. However, the notification requirement would impose some costs on trip flexibility. As noted above, herring fishing is subject to considerable variability and advance trip scheduling may be difficult. The extent to which this requirement would compromise economic efficiency is not known. Even when a waiver is granted, vessels would still be required to notify NMFS enforcement prior to entering port to allow for inspection of the catch. This option would affect any vessel that held a Category A herring permit (107 vessels in CY2003) every time a trip was taken (1221 purse seine or mid-water trawl trips taken by 28 vessels during CY2003).

7.2.4.12 Trip Gillnet Net Limitation (Measure G)

This measure would remove the limit on the number of groundfish nets that may be used by trip gillnet vessels. Amendment 13 limits trip gillnet vessels to no more than 150 nets in the water (more may

be on-board) and requires that each net be tagged. Some trip gillnet vessels carry nets of multiple mesh sizes including nets used to target regulated groundfish and larger mesh that may be used for species like monkfish. Operationally, if a vessel operator wants to switch over to different size nets he/she must remove net tags from one set of gear and put them on another which is cumbersome and time consuming while at-sea. Removing the net limit would obviate the need for net tags for groundfish and would allow vessel operators to keep tags only on their monkfish gear, which would still be required. This change would provide operators greater flexibility to change targeting decisions as fishing conditions warrant. The economic impact of affording trip gillnet operators with greater flexibility in addition to the cost savings associated with having to switch net tags is not known but would certainly be positive. Assuming, vessels do not change the number of nets that are fished vessels would not receive any additional revenue. The veracity of this assumption has implications for potential revenue gains that trip gillnet vessels may be able to obtain as well as any biological impacts that an increase in net use would entail.

Since net use by trip gillnet vessels has been limited by regulatory action taken since the Settlement Agreement in FY2002 VTR data from FY2001 (i.e. a time when net use for groundfish was not limited) was used to evaluate the number of nets used by trip gillnet vessels under normal operating conditions. These data indicate that the number of nets used on groundfish trips was less than 150 nets for 90% of all trips taken in either the GOM, GB, or SNE/MA stock areas (Table 74). The maximum number of nets used in the GB stock area was 160 while the maximum number of nets used in the GOM was 300. Thus, past use of gillnet gear on Georges Bank was only slightly higher than current limits. Assuming past experience is a reliable predictor of future use removing the net limit on Georges Bank may not result in any appreciable change in economic opportunity or biological impact. However, the maximum number of nets used in the GOM during FY2001 was twice that of what is currently allowed. This does not necessarily mean that removing the limit on gillnets used by trip gillnet vessels will result in a dramatic increase in the number of gillnets used in the GOM but past practice indicates that it is a possibility.

	GOM	GB	SNE/MA	Other
Median	60	75	50	75
75th Percentile	100	100	102	100
90th Percentile	140	120	120	120
Maximum	300	160	180	160

Table 74 - Summary of Distribution of Number of Nets by Stock Area for Trip Gillnet Vessels

7.2.4.13 Impact of the Combined Proposed Action Measures

The proposed action would implement a number of separate measures that in combination would likely have only modest economic effect. With few exceptions, the proposed measures have few interactive effects since there is little overlap among vessels that may be affected by any given measure or combination of measures.

The proposed changes to the DAS conservation tax and removal of tonnage from DAS transfer program restrictions have positive economic effects on the DAS transfer program. Given the noted problems that have prevented a viable DAS transfer market from developing the combined effect of these changes may still not be sufficient for an active DAS transfer market to emerge but they would not make DAS transfer more difficult. Allowing a one-time permit baseline downgrade would benefit the DAS leasing program.

Given the experience from FY2004 the change to the CAII Yellowtail Founder SAP may have the most broad-based economic effects. The proposed action would create a more explicit link between the total available TAC and expected catches of yellowtail flounder on Category A DAS outside of the SAP. In effect, this action provides a higher level of assurance that the full economic benefits from fishing on Category A DAS would be realized. Note that this is of particular importance since vessels that may not choose to participate in any particular SAP would be disproportionately affected by a closure caused by meeting the TAC in an SAP.

In addition to the potential impact on Category A DAS, the proposed action would implement two measures that could have an impact on the use of Category A DAS. The change in the GB Cod Hook Sector Allocation would likely result in an increased allocation of GB cod to the sector. The direct effect of this action would be to provide sector participants with increased fishing opportunities in directed cod fishing or in improving opportunities in SAPs where cod is an incidental catch. However, a reallocation of cod to sector participants means the target TAC that the remaining vessels would have to meet would have to be reduced by a corresponding amount. Whether this effect would actually result in non-sector vessels exceeding the target TAC is not known, but would depend on magnitude of the reallocation.

The second measure that would have an affect on Category A DAS is the removal of the net limit for trip gillnet vessels. This action would improve economic performance of trip gillnet vessels by restoring their operational options to pre-Amendment 13 conditions. Past performance indicates that at least on Georges Bank the number of nets used by gillnet vessels was similar to no action limits (150 nets). These vessels may not realize any measurable affect on fishing revenues but would be relieved from the requirement to change gillnet tags while at sea. Past practice suggests that trip gillnet vessels fishing in the Gulf of Maine may choose to significantly increase the number of nets fished. This likelihood that this increase in nets would be realized is not known but would at least be partially offset by trip limits on Gulf of Maine cod.

The WGOM rod and reel SAP and the minimum effective effort allocation may have interactive effects assuming that vessels receiving the minimum 10 Reserve B DAS would be most likely to use those DAS inside the rod and reel SAP. That is, most vessels with no effective DAS baseline for FY2004 were either fishing in the Mid-Atlantic region or were smaller vessels from New England. The former are unlikely to leave a Mid-Atlantic fishery to fish in any particular SAP and the only SAP that the latter would be capable of prosecuting, if they participate at all, would be the rod and reel SAP. This also means that vessels that receive a minimum effective effort allocation would be competing with limited access DAS that did receive an allocation as well as limited access non-DAS vessels for the limited haddock TAC inside the proposed SAP.

In addition to these impacts, the proposed action would affect NMFS costs for the observer program. The WGOM Closed Area Rod/Reel Haddock SAP would impose additional costs on the observer program. While the notification requirements for Category 1 herring vessels does not change the observer requirements, it suggests the current level of coverage will continue. A complete discussion of these issues, including an analysis of the costs that apply, is in section 7.4.4.10. Costs depend in part on the level of coverage that is determined to be necessary to insure the management objectives of each program are met. For the WGOM Closed Area Rod/Reel SAP, the estimated costs range from $28,658 to $333,270. The cost to provide observers to the herring fishery ranges from $224,664 (at ten percent of trips covered) to $1,123,320 (if fifty percent of trips are covered). There is a possibility that the changes to the CAII Yellowtail Flounder SAP may reduce costs to the observer program, since it is likely that there will not be any trips authorized in this SAP for FY 2005. This may only be a short-term change, however.

7.2.5 Social Impacts

The need to assess social impacts emanating from federally mandated fishing regulations stems from National Environmental Protection Agency (NEPA) and Sustainable Fisheries Act (SFA) mandate 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 this amendment.

Daily routines, safety, occupational opportunities, and community infrastructure are examples of social impacts that can be affected by changes in management measures. 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.

Occupational opportunities within the fishing industry in general appear to be largely on the decline with more people leaving the industry then entering it. Management measures that further reduce occupational opportunities may have profound social impacts on the future occupational viability of commercial fishing. Impacts that decrease occupational opportunities in turn can affect community infrastructure. More specifically, port infrastructure may be affected by the gradual loss of shore-based services essential to a strong working waterfront. The measures in this framework are intended to alleviate some of the negative impacts resulting from Amendment 13.

7.2.5.1 Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

The proposed action would reduce the conservation tax to 20% for the transfer of category A and B DAS. Category C DAS would remain at a 90% conservation tax. The reduction in conservation tax for category A and B DAS transfer is in response to the underutilization of this program. The reduction in conservation tax is an incentive to participate. The transfer program allows for the transfer of permits between vessels resulting in the permanent departure from the fishery of the vessel relinquishing DAS. There is currently no conservation tax for DAS leasing. Reduction in the DAS transfer conservation tax may result in positive social benefits to recipient vessels. The permanent addition of DAS may improve the overall viability of acquiring vessels while resulting in the potential financial and social instability of those exiting the fishery. Those vessels for whom this represents a complete exit from the fishing industry may be the most vulnerable to social instability unless they possess skills that are transferable to other industries.

7.2.5.2 Incidental Catch TACs (Measure B)

Catches of those stocks taken with a Category B DAS are constrained by a "hard" incidental catch TAC adopted in FW 40A so that the conservation objectives of Amendment 13 will not be compromised. These TACs are allocated to programs using, regular or reserve, Category B DAS. This

measure proposes to adopt one additional SAP over the two previously adopted in FW 40A. As this action proposes to adopt an additional SAP, FW 40 A will need to be modified to account for these changes. Management measures in Amendment 13 were designed to meet the mortality objectives of the amendment using Category A DAS. The use of Category B DAS would result in an increase in effort which, if not constrained, may compromise mortality objectives. The research set- aside, e.g., 10% of the total incidental catch TAC for GB cod, for which no application has been made will be released to category B DAS programs on May 1. Social impacts, while positive, are likely to be limited by incidental catch TACs that restrict the degree of benefit. Social benefits will accrue most to those that qualify to participate in either a SAP or the regular B DAS program.

7.2.5.3 Western GOM Rod/Reel SAP (Measure C.2)

This SAP will permit the use of commercial hand-tended rod and reel fishing gear inside the WGOM closed area. This program is limited to the months of March and April and constrained by a relatively low TAC. The most likely participants for this program are those with recent history of fishing in this area. Total crew days absent rate is an indicator of both present and future potential involvement in this SAP. VTR data for 2003 show the greatest activity, in terms of the number of crew days absent from port on a hand gear trip, originating from communities in Massachusetts located between Cape Ann and mid to outer Cape Cod. Gloucester (338) had the highest total crew days absent rate followed by Boston (99), and Scituate (84). Additional communities can be viewed in Table 75. Based on available information, the likely consequences of this measure are not clear. However, the data used for this analysis suggest that participants from the above communities as well as additional ones mentioned in Table 75 may benefit from improved access to this SAP as a means to mitigate the effects of other Amendment 13 measures. Improved or maintained access to fishery resources is likely to have positive social outcomes though given restrictions on time and catch these benefits may be minimal.

HPORT	HPST	Vessels Using Hand Gear	Total Vessel Trips	Ave. Trips per Vessel Hand Gear	Ave. Crew per Trip	Ave. Days per Trip	Ave. Crew per Trip x Days Absent	Total Crew Days Absent
GLOUCESTER	MA	26	295	11	2	1	2	338
BOSTON	MA	9	76	8	2	1	2	99
SCITUATE	MA	6	32	5	2	1	2	45
HAMPTON	NH	4	15	4	2	1	2	12
KITTERY	ME	3	7	2	3	2	5	11
MARSHFIELD	MA	3	17	6	2	1	2	7
All Other Ports Combined		46	513	460	75	43	81	836

Table 75- Crew History in WGOM Rod and Reel SAP

7.2.5.4 Closed Area II Yellowtail Flounder SAP (Measure C.3)

The season for CAII Yellowtail Flounder SAP is revised from a June 1 start date to a July 1 through December 31 season. Additional proposed changes include adjustments to the trip limit and limitations on the number of trips that could be taken. As described in the economic analysis of this document the potential impact of the 10,000 pound trip limit depends on a variety of factors which have the potential to affect financial returns to crew including vessel horsepower class and the ability of vessels

to fish both in and outside of the SAP. For example, because lower horsepower engines, in general, consume less fuel it is possible that crew shares will be greater than with higher horsepower engines. An exception is vessels with the highest horsepower engines for which higher fuel costs are more easily offset by increased revenue. Nevertheless, under the 10,000 pound trip limit boat share, crew share, and net payments to crew all fell. Total days absent decreased between 40% and 43% depending on horsepower. Reduction in boat and crew shares ranged from 63% to 64% and net payments to crew fell by 52% to 54%. While overall lower horsepower vessels and select higher horsepower vessels will potentially be impacted less, there may be insufficient gains from this SAP for it to be broadly attractive to those vessels seeking to mitigate the effects of Amendment 13. The desired positive social impacts of this SAP may be inadequate for vessels to participate in this program.

7.2.5.5 Minimum Effective Effort Allocation (Measure D)

This measure provides an opportunity to vessels that received 0 DAS under the provision of Amendment 13. Qualifying vessels would have ten Category C DAS re-categorized as 10 CategoryB (reserve) DAS. A limiting factor to this measure is the requirement that these DAS be used in a SAP program. While this measure allows additional participants to take advantage of SAP programs, it has the potential to reduce overall per vessel harvest. Of the 404 permitted vessels taken from dealer records for FY 2003, only 50% were considered active vessels that may seek participation in this program. Port communities with three or more permitted vessels are found in Table 76. Of these, Montauk, NY (90%, 12); New Bedford, MA (80%, 13); New York, NY (70%, 11); Point Judith, RI (60%, 6); Gloucester, MA (50%, 7); Boston, MA (30%, 10); and Scituate, MA (30%,3) , reported 10 or more permitted vessels per community. The first value reported above is the percent active vessels and the second value represents the number of active vessels. Many of the vessels likely to participate in this program may fall into the small vessel size class as discussed above in the economic analysis.

7.2.5.6 Georges Bank Cod Hook Sector Allocation (Measure E)

This alternative would recalculate the sector share based on landings history and would include Georges Bank cod landings for all gear types. As discussed in the economic analysis for this measure, it will allow the hook sector the opportunity to increase revenue through a potential increase in allocation of Georges Bank cod. While this is likely to improve revenue to the hook sector, it will in turn result in a reduction in income opportunities to those not in the sector.

7.2.5.7 Change to DAS Baseline Calculation (Measure F)

The proposed action does not change the calculation of the DAS baseline adopted by Amendment 13. DAS allocations as implemented for FY 2004 and future default DAS reductions remain the same. Social impacts for this measure are unlikely.

7.2.5.8 Removal of Tonnage from DAS Transfer Program Restrictions (Measure G)

Current guidelines dictate that vessel baseline characteristics must fall within the guidelines for permit upgrading restrictions for length, horsepower, and tonnage. DAS can be transferred between vessels when the vessel baseline characteristics of the permits fall within the guidelines. This measure removes the tonnage permit upgrade restriction resulting in the same base line characteristics as the leasing program Removal of the tonnage restriction increased the potential pool of vessels that may be able to transfer permits. Social impacts from this measure are likely to be positive.

HPST	HPORT	Total Vessels	Inactive	% Inactive	Active	% Active
MA	BOSTON	40	30	0.8	10	0.3
MA	NEW BEDFORD	16	3	0.2	13	0.8
NY	NEW YORK	16	5	0.3	11	0.7
NY	MONTAUK	13	1	0.1	12	0.9
MA	GLOUCESTER	13	6	0.5	7	0.5
MA	SCITUATE	11	8	0.7	3	0.3
RI	POINT JUDITH	10	4	0.4	6	0.6
NJ	BARNEGAT LIGHT	9	2	0.2	7	0.8
MA	CHATHAM	8	2	0.3	6	0.8
NJ	BELFORD	7	3	0.4	4	0.6
NJ	CAPE MAY	6	1	0.2	5	0.8
RI	NEWPORT	6	2	0.3	4	0.7
MA	BEVERLY	5	1	0.2	4	0.8
MA	FAIRHAVEN	5	2	0.4	3	0.6
MA	WESTPORT	5	2	0.4	3	0.6
MA	ROCKPORT	5	3	0.6	2	0.4
NH	HAMPTON	5	3	0.6	2	0.4
MD	OCEAN CITY	4	0	0.0	4	1.0
NJ	WILDWOOD	4	1	0.3	3	0.8
MA	EDGARTOWN	4	2	0.5	2	0.5
MA	BRANT ROCK	4	3	0.8	1	0.3
MA	HULL	4	3	0.8	1	0.3
MA	NEWBURYPORT	4	3	0.8	1	0.3
ME	STONINGTON	4	4	1.0	0	0.0
RI	SAKONNET POINT	3	0	0.0	3	1.0
MA	FALL RIVER	3	1	0.3	2	0.7
MA	SANDWICH	3	1	0.3	2	0.7
NH	PORTSMOUTH	3	2	0.7	1	0.3
NJ	POINT PLEASANT	3	2	0.7	1	0.3
MA	GREEN HARBOR	3	3	1.0	0	0.0
ME	VINALHAVEN	3	3	1.0	0	0.0
	Total	229			123	0.5
Reports communities with 3 or greater vessels. Data Source: Dealer Data.						

Table 76 - xx % Active Vessels Reporting Landings for FY 2003

7.2.5.9 Permit Baseline Characteristics Downgrade (Measure H)

For DAS leasing purposes only, the proposed action will allow vessel owners to make a one-time downgrade of vessel permit characteristics (length, horsepower, and gross and net registered tonnage). Smaller vessels may have an advantage over larger vessel as smaller vessels have a larger potential pool of trading vessels. While large vessels can only trade with other large vessels, smaller vessels may acquire DAS from either small or large vessels. The outcome of this measure is likely to be positive though the value or number of vessels downgrading cannot be measured at this time.

7.2.5.10 DAS Credit for Standing by Entangled Whales (Measure I)

Limited access groundfish vessels may be provided DAS credit up for standing by an entangled whale. This measure provides some economic and social benefits to vessels and to large whales. It provides an incentive to vessels to remain present for entangled whales until other assistance arrives without loosing DAS for the time spent in proximity to the whale.

7.2.5.11 Herring Vessel Access to Groundfish Closed Areas (Measure J)

This measure was developed as a result of recent information that suggested that herring vessels may catch regulated groundfish. This measure would investigate options to help restrict interactions between herring fishing and regulated groundfish. It may result in the collection of information that may provide insight on the nature of the problem. It would require that Category 1 herring vessels that are intending to catch herring in the GB or GMRM areas must request an observer at least 72 hours in advance of a herring trip. NMFS enforcement must be notified via VMS of the time and place of landing prior to crossing the VMS demarcation line.

7.2.5.12 Trip Gillnet Net Limitation (Measure K)

This measure will remove the restriction on the number of nets that can be carried by trip gillnet vessels fishing in a regulated mesh area. Presently, trip gillnet vessels are required to remove all gillnets from the water while in transit. Those gillnets must be carried on board when returning to port. Net tags are required. It is necessary to change net tags when there is a change in target species. Trip gillnet vessels often change from groundfish to monkfish. Because vessels are issued a limited number of tags, it is necessary to change them at sea when another fishery is targeted. Removal net limit will make it easier for vessels to target a mix of species rather than groundfish. Targeting multiple species provides some relief to the pressure on groundfish while improving the targeted species diversification of individual vessels. As tagging is a time consuming task, the removal of tag requirements may improve the profitability of the vessel. It would enable vessel operators to respond to changing conditions resulting in positive economic and social impacts.

7.2.5.13 Social Impacts of Combined Proposed Actions Measures

The proposed action measures, in combination, would result in the implementation of measures that may only have minimal social benefits. There would be minor beneficial synergistic social impacts, as there would be little overlap between vessels and measures. Proposed changes to the DAS conservation tax, removal of tonnage from transfer restrictions, and the permit baseline downgrade are likely to have positive social impacts. Changes to the CAII Yellowtail Flounder SAP would have the broadest social benefits. Changes in the GB Cod Hook Sector Allocation may increase allocation of GB

cod to the sector. The removal of the net limit would affect Category A DAS by restoring operational options to pre Amendment 13 options. There may be some interactive effect of the WGOM rod and reel SAP and the minimum effective effort allocation if those receiving the 10 Reserve B DAS may also use them inside the rod and reel SAP.

7.2.6 Safety

National Standard 10 requires that the impact of proposed management measures on the safety of life at sea be considered during the development of an FMP. A brief discussion of the likely safety impacts of each measure is provided. This discussion was coordinated with the U.S. Coast Guard, First Coast Guard District, Boston, MA.

Changes to the DAS Transfer Program Conservation Tax (Measure A.1), Permit Baseline Characteristics Downgrade (Measure H), and Removal of the Tonnage Criterion for the DAS Transfer Program (Measure G)

The DAS reductions of Amendment 13 could adversely affect safety of life at sea since the ability of vessel owners to maintain their vessels depends in part on the revenue generated. With fewer fishing opportunities, vessel owners may defer maintenance or purchase of safety equipment. In general, the DAS leasing and transfer programs are expected to improve the safety of life at sea. These two programs provide an opportunity for vessels to obtain additional DAS or for owners of more than one permit to combine the DAS on one vessel. This should result in increased revenues for operating vessels. The proposed action may have minor benefits on vessel safety since three measures are designed to increase the use of the DAS leasing and transfer programs.

Incidental Catch TACs (Measure B)

The proposed action modifies the incidental catch TACs to provide for an additional SAP and to create a research set-aside for GB cod. This action is not expected to have an safety impacts. A discussion in FW 40A noted that it is possible that the incidental catch TACs could lead derby fisheries in either SAPs or the Category B (regular) DAS Pilot Program if vessels rush to fish before the TAC is caught.

WGOM Closed Area Rod/Reel Haddock SAP

This SAP provides a limited opportunity to target haddock in the WGOM Closed Area during March and April. Poor weather during the spring months may cause safety issues for the smaller vessels likely to participate in this SAP. The closest permanent offshore weather reporting station to the WGOM Closed Area is located at the Isles of Shoals, approximately fifteen miles west of the northwestern boundary of the area. According to historical reports from this station, March and April have the third and fifth highest average wind speeds for the year (average wind speed is defined as the average wind over a two minute period). The highest average winds observed at this station during these two months exceeded forty-five knots during the period 1984 through 2001 (see Figure 20). The mean average wind in March was just under fifteen knots, the fourth highest for the year. The highest peak winds in this area were observed in March during the period 1996 through 2001 (Figure 21). The highest mean peak winds for the year also occurred in March (just over twenty knots). No wave reports are provided as this station.

Vessels most likely to participate in this SAP are those commercial vessels that landed groundfish using hand gear in the GOM in recent years. Other vessels that may participate are vessels that have used gillnet and longline gear in the same area. In FY 2002 and FY 2003 these vessels tended to be smaller and the average age was nearly twenty years (Table 77). Smaller, older vessels are more likely to be limited by poor weather. The combination of season and likely participants may create safety concerns for this SAP, but Coast Guard accident information analyzed for Amendment 13 did not show a clear relationship

between vessel length and number of accidents (NEFMC 2003). Mitigating safety concerns to some extent is the fact that these vessels will be fishing relatively close to shore and generally make fishing trips of less than one day. They are thus more able to time their operations to periods of good weather, and are less likely to be surprised by rapidly moving weather systems.

	Sink Gillnet	Handgear	Longline	Overall
Average Year Built	1985	1986	1984	1985
Max Year Built	2003	2003	2002	2003
Min Year Built	1947	1955	1957	1947
Average Length	43	31	39	36
Max Length	76	96	55	96
Min Length	18	13	26	13
Average GTONS	25	10	18	16
Max GTONS	100	131	79	131
Min GTONS	1	0	3	0
Average VHP	352	302	305	318
Max VHP	2000	2760	740	2760
Min VHP	70	15	130	15
Total Vessels	142	239	57	

Table 77 – Characteristics of vessels landing regulated groundfish from the Gulf of Maine, FY 2002 and FY 2003

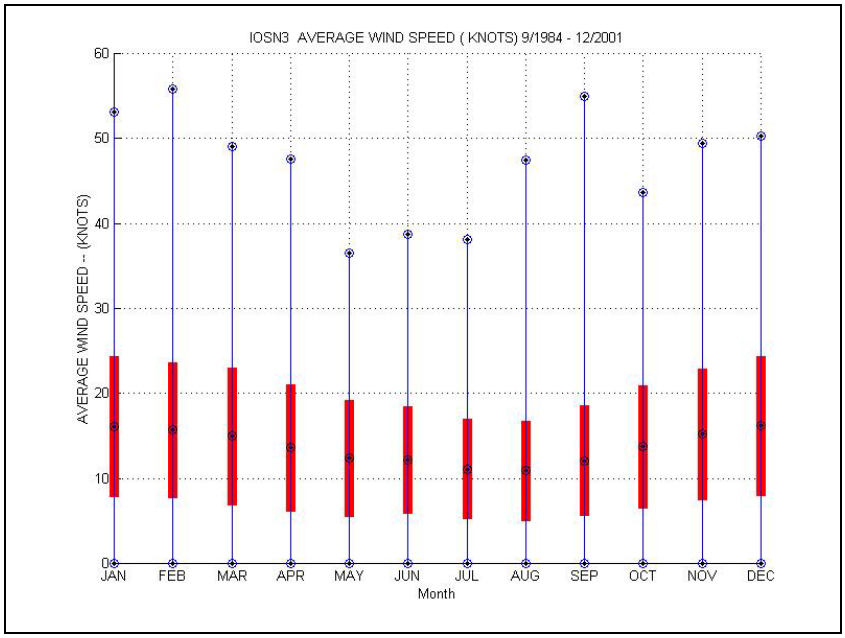


Figure 20 – Average observed wind speeds at Isles of Shoals, 1984-2001

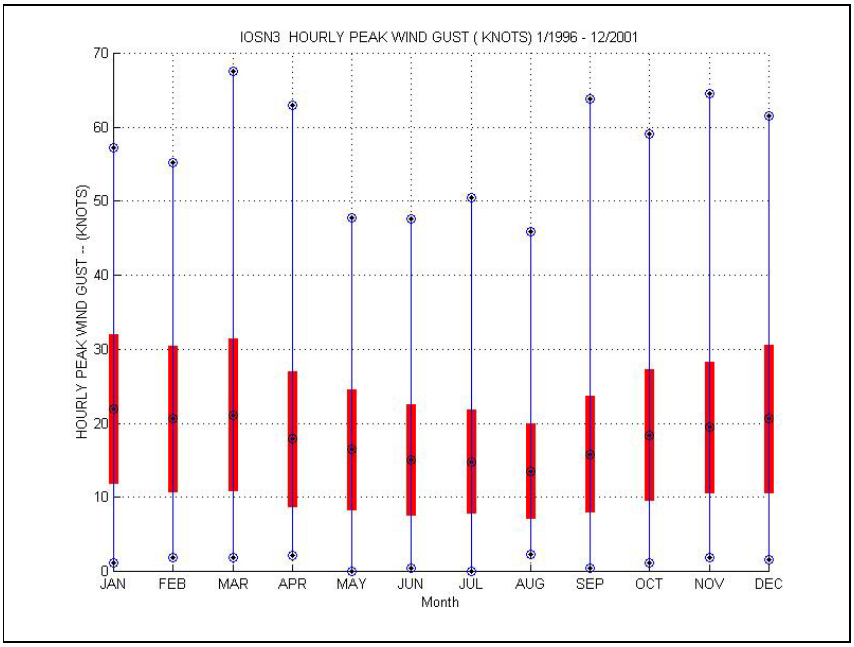


Figure 21 – Peak wind speeds observed at Isles of Shoals, 1996 – 2001

Closed Area II Yellowtail Flounder SAP (Measure C.3)

The proposed action provides a mechanism to adjust the number of trips, limits vessels to one trip per month, reduces the possession limit for yellowtail flounder, and changes the starting date of the SAP to July 1. These changes are not expected to impact vessel safety when compared to the No Action alternative. The changes are expected to prevent the SAP from opening in FY 2005, but this is not expected to be a permanent closure of the SAP. The low possession limit may also discourage participation in this SAP, reducing the number of trips to the offshore area, which could be viewed as improving vessel safety.

Subsequent to approval of FW 40B, the Council received complaints that the measures governing fishing in the Eastern U.S./Canada area discourage vessels from seeking shelter in poor weather. While these complaints were received after this SAP was closed, it is possible that the measures for this SAP may have the same effect. While these complaints were received too late to influence this action, the Council will discuss these issues in the coming year and may make adjustments for FY 2006.

Minimum Effective Effort Allocation (Measure D)

The re-categorization of ten DAS from Category C to Category B (reserve) is not expected to have safety impacts. These DAS can only be used in certain SAPs.

DAS Credit for Standing By Entangles Whales (Measure J)

This measure is not expected to have impacts on safety as it merely provides a DAS credit if a vessel reports and stand-by an entangled whale.

Herring Vessel Interactions with Regulated Groundfish (Measure J)

The requirement that herring vessels notify NMFS prior to sailing and prior to offloading herring does not restrict vessel operations in any way. It is not expected to have safety impacts.

Removal of Net Limit for Trip Gillnet Vessels (Measure K)

This measure may provide some benefits to safe vessel operations. The current regulations, coupled with normal fishing practices, require trip gillnet vessels to change gillnet net tags from one set of gear to another while at sea when the vessel operator changes target species. This is a tedious, time-consuming task that is done on deck with a limited amount of workspace. Removing the restriction on the number of nets will reduce the necessity for this operation.

7.2.7 Impacts on Other Fisheries

Some of the measures in the proposed action may affect other fisheries. There are two primary ways this can occur: through shifting of effort into or out of other fisheries as a result of groundfish regulations or through increased or decreased catches of other target species by vessels fishing under groundfish regulations. As summarized in Section 7.3.6, there is a possibility that the reduced groundfish fishing opportunities resulting from Amendment 13 could shift effort into other fisheries, most notably the monkfish, scallop, and squid fisheries. FW 40A mitigated those concerns to some extent by creating opportunities to use Category B DAS to target healthy groundfish stocks.

The reduction of the conservation tax on DAS that are transferred under the DAS transfer program may increase the number of DAS transfers. The impacts on other fisheries are difficult to predict, since it is not clear if this change will result in any DAS transfers (none have occurred to date). Since the vessel selling DAS must exit all state and federal fisheries and all non-groundfish permits expire, if this change increases the number of transfers it may help reduce potential or actual fishing effort in other

limited-access fisheries. There may be similar effects resulting from the removal of tonnage from the DAS transfer program restrictions (Measure G) and the one-time vessel characteristics downgrade allowed for the DAS leasing program (Measure H).

The proposed action provides one additional opportunity to use using Category B DAS in a SAP (the WGOM rod and reel SAP). Based on the vessels that have used rod and reel gear to target groundfish in the GOM in recent years, this SAP is not likely to affect vessels that may participate in fisheries managed by the MAFMC or that are able to fish for monkfish or scallops. This SAP is not likely to have any noticeable impacts on other fisheries.

The changes to the CAII Yellowtail Flounder SAP include three changes that may extend the season. The SAP will not open until July 1, vessels will be restricted to one trip per month, and NMFS can adjust the possession limit per trip. If these changes extend the season, it may keep vessels fishing for groundfish rather than shifting into other fisheries. An additional change allows the number of trips to be varied according to the available TAC. The impacts of this change are difficult to evaluate. It is likely that in FY 2005 the TAC will not be sufficient to support a SAP. While this removes one opportunity to fish, it also means that the TAC of GB yellowtail flounder is less likely to be caught during the fishing year, resulting in a closure of the eastern area and a prohibition on the possession of yellowtail flounder in the Western U.S./Canada area. On the whole, the changes to this SAP will probably help mitigate effort shifts into other fisheries or areas since it will enable a more rational prosecution of the fishery for GB yellowtail flounder.

The minimum effective effort allocation will likely have few impacts on other fisheries. While this will provide a limited opportunity for some vessels to participate in some SAPs, the amount of effort granted to these vessels is small and is not likely to change their dependence on non-groundfish revenue. The proposed changes to the GB Cod Hook Sector are also not likely to impact other fisheries. The vessels that are most likely to join the sector as a result of these changes are probably fishing for groundfish and sector participation is not likely to change their other activity. Changing the calculation of the sector's cod share is also unlikely to alter fishing behavior for sector vessels.

The proposed action maintains the DAS baseline/effective effort determination made under Amendment 13. As such, this action will not have any additional impacts on other fisheries. Another measure not likely to have an impacts on other fisheries includes the DAS credit for standing by entangled whales (Measure I).

Category 1 herring vessels fishing in the GOM or GB will be required to provide advance notice of fishing trips to the observer program, and will be required to notify NMFS enforcement prior to offloading a trip so that enforcement has an opportunity to observe the offload. These measures may decrease flexibility for herring vessels and creates an additional administrative burden. They are not likely to change fishing activity, however.

The removal of the limit on the number of nets that can be carried by trip gillnet vessels could lead to the use of additional nets, particularly in the GOM. As discussed in section 7.2.1.2, monkfish is the major non-groundfish species targeted in this area. Vessel using groundfish gear and fishing on a groundfish DAS are allowed to target monkfish without a trip or possession limit. If this measure increases fishing effort on monkfish in this area it could lead to additional restrictions in the monkfish fishery in the future. This could also occur in the SNE/MA area, but monkfish trips in this area are limited by a possession limit and it is not as likely that an increase in the number of nets will increase monkfish mortality. Other fisheries that could be affected by an increase in nets include the skate fishery (as discussed in section 8.1.4) and the dogfish fishery.

In summary, most of the measures in the proposed action are expected to have either positive or negligible impacts on other fisheries. The measure most likely to affect other fisheries is the removal of the limitation on the number of nets used by trip gillnet vessels. This could affect the monkfish fishery, particularly in the GOM.

7.2.8 Cumulative Effects of the Proposed Action

The National Environmental Policy Act (NEPA) requires that cumulative effects of "past, present, and reasonably foreseeable future actions" (40 CFR § 1508.7) be evaluated along with the direct effects and indirect effects of each proposed alternative. Cumulative impacts result from the combined effect of the proposed action's impacts and the impacts of other past, present, and reasonably foreseeable future actions. These impacts can result from individually minor but collectively significant actions taking place over a period of time. The Council on Environmental Quality (CEQ) directs federal agencies to determine the significance of cumulative effects by comparing likely changes to the environmental baseline. On a more practical note, the CEQ (1997) states that the range of alternatives considered must include the "no-action alternative as a baseline against which to evaluate cumulative effects." Therefore, the analyses in this document, referenced in the following cumulative impacts discussion, compare the likely cumulative effects of the proposed actions to the effects of the no-action alternative.

CEQ Guidelines state that cumulative effects include the effects of all actions taken, no matter who (federal, non-federal or private) has taken the actions, but that the analysis should focus on those effects that are truly meaningful in terms of the specific resource, ecosystem and human community being affected. Thus, this section will contain a summary of relevant past, present and reasonably foreseeable future actions to which the proposed action may have a cumulative effect. Cumulative effects were recently analyzed in Amendment 13 (NEFMC 2003) and FW 40A (NEFMC 2004). Those analyses took into account (both pre- and post-FMP) and present condition of the multispecies fishery. This document summarizes those analyses.

In terms of past actions for fisheries, habitat and the human environment, the temporal scope of this analysis is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis examines the period between implementation of this framework (expected May 2005) and the planned benchmark assessment of the groundfish stocks scheduled for 2008. That assessment may lead to additional changes in groundfish management that are not possible to predict with any degree of certainty. The geographic scope of the analysis of impacts to fish species and habitat for this action is the range of the fisheries in the Western Atlantic Ocean, as described in the Affected Environment and Environmental Consequences sections of the document (Sections 6.0 and 7.0). For endangered and protected species the geographic range is the total range of each species (Section 6.4). The geographic range for the human environment is defined as those fishing communities bordering the range of the groundfish fishery (Section 6.5.5) from the U.S.-Canada border to, and including North Carolina.

The cumulative effects analysis focuses on Valued Ecological Components (VECs). For actions prior to Amendment 13, the VECs used are Resource, Habitat, and Community Benefits. For Amendment and later actions, the VECs used are:

1. Regulated groundfish stocks
2. Non-groundfish species (incidental catch and bycatch)

3. Endangered and other protected species
4. Habitat, and
5. Human environment, including the economics of the fishery and fishing communities

NOAA Fisheries staff determined that the 5 VECs (target species, non-target species, protected species, habitat and communities) are appropriate for the purpose of evaluating cumulative effects of the proposed action based on the environmental components that have historically been impacted by fishing, and statutory requirements to complete assessments of these factors under the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, Regulatory Flexibility Act, and several Executive Orders. The VECs are intentionally broad (for example, there is one devoted to protected species, rather than just marine mammals, and one on habitat, rather than Essential Fish Habitat) to allow for flexibility in assessing all potential environmental factors that are likely to be impacted by the action. While subsistence fishing would ordinarily fall under the "communities" VEC, no subsistence fishing or Indian treaty fishing take place in the area managed under this FMP. The vessels participating in the groundfish fishery must comply with all federal air quality (engine emissions) and marine pollution regulations, and, therefore, do not significantly affect air or marine water quality. Consequently, the management measures contained in Amendment 2 would not likely result in any additional impact to air or marine water quality.

The discussion of the cumulative effects on those VECs will be based on the analysis of direct and indirect impacts contained in the Environmental Consequences section of this EA (section 7.0, particularly section 7.2) as well as on the discussion in this section of actions outside of the FMP affecting the VECs.

7.2.8.1 Summary of Non-Fishing Effects

Non-fishing impacts were assessed in Amendment 13. For fish habitat, non-fishing effects were reviewed in the Essential Fish Habitat Amendment for Groundfish prepared by the NEFMC (Amendment 11 to the Groundfish FMP, NEFMC 1998). Table 78 below summarized the potential effects of numerous chemical, biological, and physical effects to riverine, inshore, and offshore fish habitats. In general, the closer to the coast, the greater the potential for impact. For the offshore area, with the exception of events such as oil spills and algae blooms, which can spread over large areas, moderate effects were generally localized to a well-defined and relatively small impact area such as oil/gas mining and dredged material disposal. Thus, only small portions of fish stocks would potentially use these sparsely located areas and would be adversely affected. For example, dredged material disposal sites, usually about 1 nm^2 in size, are managed by the U.S. Army Corps of Engineers and the U.S. EPA to minimize physical effect to the defined disposal area and allow no chemical effects at the site based on stringent sediment testing.

For fishery resources, there are several non-fishing threats that could have a direct and/or indirect impact on the groundfish stocks. Several of the items identified as non-fishing threats to fish habitat, identified in Table 78, could also pose a threat to groundfish stocks, such as the oil spills, pesticides, and radioactive wastes. Similar to the discussion above on non-fishing impacts to fish habitat, generally the closer the proximity of groundfish stocks to the coast, the greater the potential for impact (although predation, a non-fishing impact, would be one threat that would occur everywhere). Many groundfish species reside in both inshore and offshore areas at different stages of their lives and during different seasons throughout the year. However, some stocks, such as SNE/MA winter flounder, live out a large portion of their lives closer to shore and may likely be impacted by inshore threats to a greater degree than some of the other groundfish species. In the offshore areas, such effects would likely be low because the localized nature of the effects would minimize exposure to organisms in the immediate area.

An additional inshore threat of note would be the effect on fishery resources presented by power plants. The operations of power plants are thought to be especially of consequence to fish eggs, larvae and juveniles. Entrainment, or intake of cooling seawater for the purposes of cooling power plant reactors, is known to draw in eggs and larvae and, therefore, could have a negative impact on groundfish resources that spawn in areas in close proximity to active power plants. An additional threat associated with power is the discharge of warm water. This thermal discharge is believed to have a negative impact on reproduction capability and recruitment of affected fishery resources.

Although still speculative at this time, foreseeable future non-fishing threats to fishery resources could include global warming and the effects that this may have on water temperature. The impacts to the fish stocks are not certain and therefore could not be incorporated into this assessment. The possibility of windmill construction in marine waters for the purposes of harnessing alternative means of energy could also have an impact on fishery resources, especially as it relates to disruption of habitat. This project is the subject of a recently prepared EIS prepared by the Army Corps of Engineers. The impacts of this project to the fisheries are yet to be determined. At present, the only wind farm that has been discussed would be established outside of the EEZ (in accordance with section 306(a)(2)(B) of the M-S Act, a proposed wind farm in Nantucket Sound is not within an area subject to federal jurisdiction for fishery management purposes) and is thus not included in the geographic scope of the cumulative effects analysis.

Another possible impact could be caused by the construction of pipelines or offshore petroleum products terminals. Impacts to fish stocks from such activity are uncertain as the impacts depend on the terminal location, construction techniques, and operation of the facility. In the northeast region of the U.S., LNG facilities are currently being proposed for construction in Searsport, ME; Boston, Somerset, Fall River, Mount Hope Bay, and Everett, MA; Providence, RI; Belmar, Logan Township, and Gloucester County, NJ; and New Castle County, DE.

Natural gas is transported via tanker to specialized terminals at a super-cooled temperatures of –260 F degrees. Upon arrival, the LNG is warmed by using either seawater (open loop system) or an enclosed heating medium/liquid (closed loop system), within a regassification facility. At this point, LNG can be transported into existing pipelines. Depending on the specific location and type of LNG facility, a range of impacts to fisheries and/or fisheries habitat may result from both construction and operation of terminals.

Due to the large size of LNG tankers, dredging may need to occur in order to access onshore terminals. Dredging can result in direct loss of fish and/or shellfish habitat and can elevate levels of suspended sediment within the water column. As with other dredging, suspended sediments can impact various life stages of fish and shellfish. The construction of pipelines and fill associated with site construction can have adverse impacts on intertidal habitats and salt marshes in the area.

In addition, the operation of LNG facilities can have adverse effects on fishery habitats. Ballast water intakes for LNG vessels as well as intakes for re-gassification facilities can impinge and entrain fish eggs and larvae and can have a significant impact on coastal ecosystems. Closed loop systems that do not use seawater for re-gassification can help to reduce this impact. If open loop systems are utilized, water is generally returned to the water body at cooler temperatures. Depending on the location of the discharge, changes in temperature have the potential to alter ecosystems and obstruct anadromous fish passage. For LNG facilities located offshore, anchor lines and increases in vessel traffic have the potential to impact protected resources in the area. Due to the potentially hazardous nature of the facilities, security zones are generally established around LNG facilities. Depending on the location of the facility, this can restrict access to areas traditionally used for fishing and shellfishing.

THREATS	RIVERINE	INSHORE	OFFSHORE
Chemical			
oil	M	M	M
heavy metals	M	M	M
nutrients	H	H	L
pesticides	M	M	L
herbicides / fungicide	M	M	L
acid	H	M	
chlorine	M	M	
thermal	M	M	
metabolic & food wastes	M	M	
suspended particles	M	M	L
radioactive wastes	L	M	M
greenhouse gases	M	M	M
Biological			
nonindigenous / reared	M	M	M
nuisance / toxic algae	M	H	M
pathogens	M	M	M
Physical			
channel dredge	M	H	
dredge and fill	H	H	
marina / dock construction	M	H	
vessel activity	M	H	L
erosion control			
bulkheads	M	M	
seawalls		M	
jetties		M	
groins		M	
tidal restriction	M	H	
dam construction / operation	H	M	
water diversion			
water withdrawal	H	M	
irrigation	M	M	
deforestation	H	M	
mining			
gravel/mineral mining	M	M	M
oil/gas mining	L	M	M
peat mining	L		
debris	M	M	M
dredged material disposal	L	M	M
artificial reefs	L	M	M

Table 78- Potential non-fishing threats to fish habitat in the New England region prioritized within regions (H = high; M = moderate; L = low)2

[1] From NEFMC (1998)

[2] Prioritization developed by compilation of *EFH Technical Team* survey

7.2.8.2 Summary of Fishing Gear Effects on EFH

The effects of mobile bottom-tending gear (trawls and dredges) on fish habitat have been recently reviewed by the National Research Council (NRC 2002). This study determined that repeated use of trawls/dredges reduce the bottom habitat complexity by the loss of erect and sessile epifauna, smoothing sedimentary bedforms and bottom roughness. This activity, when repeated over a long term also results in discernable changes in benthic communities, which involve a shift from larger bodied long-lived benthic organisms for smaller shorter-lived ones. This shift also can result in loss of benthic productivity and thus biomass available for fish predators. Thus, such changes in bottom structure and loss of productivity can reduce the value of the bottom habitat for demersal fish. These effects varied with sediment type with lower level of impact to sandy communities, where there is a high natural dynamic nature to these bedforms, to a high degree of impact to hardbottom areas such as bedrock, cobble and coarse gravel, where the substrate and attached epifauna are more stable. In the Northwest Atlantic, the more valued groundfish habitat is located in areas where there is a high percentage of gravel and cobble (NREFHSC 2002).

Use of trawls and dredges are common in inshore and offshore areas and somewhat less common in riverine areas. Section 9.3.1.2 of Amendment 13 discusses the numerous types of gear used in estuarine and offshore habitats. This section indicates that mobile bottom-tending gears are commonly used in most inshore and offshore habitats. In the Northeast, otter trawls are used to prosecute most M-S Act managed fisheries including Northeast Multispecies. Smaller trawls are used in inshore areas and lower estuaries, which are managed by states and not subject to the MSA. In addition, in some states smaller dredges are used for harvesting oysters, bay scallops, sea urchins, quahogs, and mussels. Hydraulic dredging for softshell clams and bottom trawling for shrimp is also accomplished in certain nearshore and riverine habitats.

It is assumed for this analysis that the effects of gear are generally moderate to high in the riverine, inshore and offshore areas, depending upon the type of bottom and the frequency of fishing.

7.2.8.3 Endangered and Other Protected Species

The following summarizes the cumulative impacts to protected species that were included in the Amendment 13 Final Environmental Impact Statement.

Large whales may be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries. Ship strikes and fishing gear entanglement continue to be the most likely sources of injury or mortality for the right, humpback, fin and minke whales. Gear entanglement occurs in the vertical buoy lines of sink gillnet and pot/trap gear, the groundlines of pot/trap gear, and also in the net panels of gillnet gear. Sei, blue and sperm whales are also vulnerable, but fewer ship strikes or entanglements have been recorded. Mobile bottom trawls are less of a concern for the large whale species. Other marine mammals, such as harbor porpoise, dolphins and seals, are also vulnerable to entanglement in net gear (including seines, gillnets and drift nets).

Low frequency sonar may pose an additional threat, although the extent of its continued use by the U.S. military is unclear at this writing. A successful lawsuit brought by environmental groups limited the use of such sonar following a number of marine mammal deaths in the vicinity of naval exercises in several places around the world. A recent modification to the MMPA could override the lawsuit settlement agreement since it provides for a national security exemption in some circumstances and focues on the “likelihood” of significant disruptions to behavior critical to survival rather than the “potential.”

The potential impact of pollution is more likely problematic in nearshore areas closer to the source, such as agricultural and urban runoff and sewer outfalls. Nutrients can also promote toxic phytoplankton blooms, which have been known or suspected in killing whales and other marine mammals.

Turtles have been entangled in shrimp trawls, pound nets, bottom trawls and sink gillnets. Shrimp trawls are required to use turtle excluder devices. The diversity of the sea turtle life history also leaves them susceptible to many other human impacts, including impacts on land, in the benthic environment, and in the pelagic environment. Anthropogenic factors that impact the success of nesting and hatching include: beach erosion, beach armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, and an increased presence of native species (e.g., raccoons, armadillos, and opossums) which raid and feed on turtle eggs. Entanglement in debris or ingestion of marine debris are also seen as possible threats.

The factors discussed above, and other factors, potentially have had cumulative adverse effects on most protected species to varying degrees. Because of a lack of cause-effect data, little is known about the magnitude and scope of these factors and how they have contributed to the species' special listing. The direct and indirect effects of the alternatives in this amendment are discussed in Section 8.0 and do not appreciably increase those discussed and analyzed previously.

Potential future actions whose effects would be cumulative to the proposed action include actions taken to protect marine mammals, and endangered and threatened species. Current measures in effect are discussed in Section 7.0. These could be modified in the future under either a fishery management plan, marine mammal take reduction plan, or regulation promulgated under authority of the Endangered Species Act.

Specifically, known or anticipated future actions include: short-term closures to sink gillnets under the Atlantic Large Whale Take Reduction Plan Dynamic Area Management (DAM) system; changes to the Harbor Porpoise Take Reduction Plan; and measures adopted under the NMFS final rule implementing large-mesh gillnet closures off the North Carolina/Virginia coast to protect sea turtles. Since the specific nature of those potential changes are not known at this time, their effects cannot be determined at this time. Additionally, NOAA Fisheries is currently preparing an Environmental Impact Statement for the ALWTRP to solicit comments on the management measures and provisions in the plan and possible modifications to reduce interactions of right, humpback fin and minke whales with commercial fisheries.

7.2.8.4 Summary of Past, Present and Future Actions Affecting the Multispecies Fishery

7.2.8.4.1 Past and Present Actions

Past management actions through 2003, and their impacts on the VECs, were summarized in section 5.7.6.1 of Amendment 13. That summary is repeated below. The groundfish fishery of New England in the 19th Century was originally prosecuted on sailing vessels using such low impact techniques such as handlines, jigging and later longlines. When steam-powered vessels came into prominence in the early 1890s, mobile gear such as trawls were found to be very efficient harvesters of groundfish. By 1930, otter trawls became the dominant gear. As a result of more efficient gear, faster and larger vessels and better preservation, haddock landings, for example, grew from 20,000 mt/year in 1900 to over 100,000 mt/yr in 1920 (Collette & Klein-MacPhee 2002). Fishing effort expanded in the 1950s due to the influx of foreign vessels after World War II, and in the late 1970s/early 1980s, when the domestic fishery expanded in the wake of the Magnuson Act of 1976. There are currently several gear types employed in the multispecies fishery. As reported in the Amendment 13 Affected Environment section, the major gear types used now are bottom trawl, bottom longline, hook and line, and sink gillnet gear.

Although management measures for groundfish were first enacted for the EEZ in 1977 under the original Groundfish Fishery Management Plan, the dramatic increase in larger vessels, bigger gear and electronic aids such as fishfinders and navigation equipment contributed to a greater efficiency and intensity of fishing, which in turn resulted in a precipitous drop in landings during the 1980s to an all-time low in the early 1990s. Table 79, below, describes the major regulatory actions taken to manage the New England groundfish fishery since the original Magnuson Act was enacted and their effect on groundfish resources, community, and EFH. The first several years of groundfish management included annual and quarterly catch quotas for cod, haddock and yellowtail flounder, quota allocations by vessel class, and trip limits. The quota and trip limits imposed during the inception of the Groundfish FMP led to frequent fishery closures of one or more segments of the fishing fleet, interrupting the normal activities of the industry. Consequently, this form of management frequently imposed both economic inefficiencies and hardships on the industry, which led to a breakdown in support of these measures. This in turn, led to widespread misreporting and non-reporting by the industry as a way to circumvent the regulations. Starting in the early 1980's a new management program was implemented through the 1982 Interim Fishery Management Plan. This plan, and the next several groundfish actions (through Amendment 4 in 1991) managed the groundfish fishery (now expanded to include 13 species) primarily through seasonal closures and minimum mesh and fish size restrictions. However, these measures proved not enough since the condition of the resources, especially cod, haddock and yellowtail flounder continued to decline to record low levels.

To end overfishing and address the severe decline in the groundfish resources and the influx of more and larger vessels, the Council began development of Amendment 5 to the FMP. This action, which became effective in 1994, implemented a moratorium on permits as well as an effort-control program that proposed to reduce a vessel's days-at-sea (DAS) by 50% over a 5-7 year period. Amendment 5, thus, was the first action to restrict both access and effort in the multispecies fishery. The FSEIS for Amendment 5 determined that this action would have significant effects on a substantial number of small entities, specifically those vessels less than 45', which, at the time, consisted of 36% of the qualified vessels. Although the FSEIS demonstrated that Amendment 5 provided economic and social benefits to the fishery in the long-term, vessels were expected to incur significant short-term loses in revenue.

Despite implementation of Amendment 5, however, stocks continued to decline rapidly and a "Special Advisory" was issued by the Northeast Fisheries Science Center in 1994 stating that Amendment 5 was "too little, too late" to address the critical status of many of the groundfish stocks. In response, the Council requested that NMFS implement an emergency action to close, on a year-round basis, three large areas to all vessels capable of catching groundfish (Closed Area I, Closed Area II, and the Nantucket Lightship Closed Area), while it developed Amendment 7 to the FMP. NMFS implemented the emergency action to close these three areas in December of 1994. These closure areas have been thought to have a major beneficial effect on groundfish stocks, as they afforded protection over large areas and for extended amounts of time. Indirect benefits to other species accrued from these closures as well, such as protection of sea scallops. Although there were large benefits attributed to these closures, it is important to note that they may have had a negative effect on other groundfish stocks as vessels moved elsewhere to fish. Framework 9, implemented in 1995, extended the emergency action permanently and also implemented a prohibition on all small mesh fisheries in the GOM, GB and SNE Regulated Mesh Areas, unless it was determined that the fishery had less than 5% bycatch of regulated species. Through elimination of small mesh fisheries where groundfish bycatch exceeded 5%, discard of groundfish was largely reduced by vessels fishing in non-groundfish fisheries. Amendment 7, implemented in 1996, accelerated the Amendment 5 DAS effort-reduction schedule and expanded the 5% bycatch rule to include a prohibition on all non-DAS fisheries, further reducing bycatch of regulated species. Amendment 7 also implemented recreational fishing restrictions and framework adjustment criteria that would allow management measures to be implemented under a more accelerated mechanism than through an amendment. These actions, in combination, have reduced fishing effort significantly and have provided large areas of year-round protection, especially on Georges Bank, for several species of groundfish. In response, the status of several groundfish stocks have improved over the past several years and landings have increased as a result. Similar to Amendment 5, the FSEIS for Amendment 7 specified that this action was expected to have a significant impact on a substantial number of small entities in the short-term, with higher, long-term benefits accruing to the industry and to the Nation. Overall revenues were projected to be reduced by 10-25% in the first 3 years, with differential effects on gear groups, with trawlers projected to be more disadvantaged than others are.

Following Amendment 7, there have been several framework adjustments implementing further and, in some cases, extensive restrictions in the groundfish fishery. Due to concerns primarily regarding the status of GOM cod, Frameworks 20, 25, 26, 27, 31 and 33 implemented additional management measures to further protect this stock. These measures included new GOM seasonal and year-round closures, gillnet effort-reduction measures (including limits on the number of allowable nets), and adjustments of the GOM cod trip limit. Additionally, measures in these actions also increased the haddock daily trip limit and increased the minimum square mesh size throughout the GOM/GB/SNE Regulated Mesh Areas. While the combination of measures implemented since the adoption of Amendment 5 have improved stock status (increasing biomass and reducing fishing mortality) for many stocks, as discussed in section 9.2.1.1, the improvement has not been achieved for all stocks. Because the main focus of these actions was to protect GOM cod, the socio-economic impact was primarily felt within communities located in the states of Maine, New Hampshire and Massachusetts, due to the proximity of these communities to the GOM fishing areas.

In response to a Federal Court decision in the case of *Conservation Law Foundation, et al. V. Evans, et al.*, NMFS, in August 2002, implemented management measures consistent with a Settlement Agreement through an interim final rule. Measures contained in the interim rule included a freeze of DAS at the highest annual level used during fishing years 1996-2000 and a 20% cut from that level; increased gear restrictions for certain gear types, including gillnets, hook-gear, and trawl nets; modifications and additions to the closure areas; limits on yellowtail flounder catch; and more restrictive recreational fishing measures. Biological impacts of the "Settlement Agreement" management measures that were first implemented on August 1, 2002, vary by species. Based on a quantitative analysis only, the July 2002 EA

estimated the resultant decrease in fishing mortality to range from 1% for GB winter flounder and 16% for GOM cod. It has been recently projected in the June 2003 EA, completed for an Emergency Action to extend the August 2002 interim rule measures, that, based upon the number of DAS used in 2002, continuation of the Settlement Agreement for the duration of the 2003 fishing year would result in a 25-35% reduction in fishing effort.

Measures implementing the Settlement Agreement have further protected several groundfish species, most notably GOM cod, and increased the likelihood of timely stock rebuilding. A particularly important aspect of these rules is the control of latent DAS. The DAS freeze has significantly limited the extent to which latent DAS can be activated and, therefore, has limited the extent to which the increases in fishing mortality from the use of such DAS could undermine efforts to control fishing mortality. The DAS allocations for the 2002 fishing year were 45.7% less than the DAS allocations for the 2001 fishing year (including carryover days). As a result of these allocations, the number of DAS used declined by 36.6 percent from FY 2001 to FY 2002, and by 35.2 percent from FY 2002 to FY 2003.

Overall, the DAS restrictions resulting from the Settlement Agreement impacted most those vessels that rely on groundfish for a majority of their income. For vessels with high dependence on groundfish income, the adverse income effects of the Settlement Agreement were nearly twice that of vessels that rely on groundfish for less than half of their annual fishing income. Estimated revenue losses were greatest for vessels bordering the GOM (Gloucester, Portland, Portsmouth, Chatham/Harwich). DAS reductions were largest for the home port states of New Jersey, New York, Maine, and Massachusetts (in descending order). Charter/party vessels experienced a decrease in the number of trips booked, however the majority of the economic impacts were borne by approximately 20-25 charter/party operators whose primary business is in offering groundfish trips.

Bottom trawl, longline gear and hook-gear are classified as Category III fisheries under the Marine Mammal Protection Act and are, therefore, determined to have a remote likelihood of, or no known, incidental mortalities and serious injuries of marine mammals. Gillnet gear has been categorized as a Category I fishery; a fishery that has been determined to have frequent incidental mortality or serious injury of marine mammals. Many of the groundfish actions discussed above have had an overall beneficial impact on protected resources. For instance, the DAS reductions have significantly reduced effort in this fishery. Extensive area closures to protect groundfish stocks, including harbor porpoise closure areas specific to gillnet vessels, and reductions in fishing gear, such as reductions in allowable gillnet gear, have all contributed to benefiting protected resources.

Development of other recent management actions, such as for whiting and monkfish, have also benefited groundfish stocks as they have likely reduced groundfish discards (e.g., through the development and implementation of a whiting grate fishery, and coupling of multispecies and monkfish DAS). Also, it should be noted that a vessel buyout program, starting in 1996, has contributed to reducing the socio-economic impacts on small entities associated with the groundfish actions.

Amendment 13, implemented on May 1, 2004, adopted major changes to groundfish management. The expected impacts of that action are described in detail in the amendment document. A short summary of the expected impacts includes:

- Regulated groundfish: ending overfishing for all groundfish stocks, and rebuilding overfished stocks by 2014 for most stocks (2018 for CC/GOM yellowtail flounder, 2026 for GB cod, and 2047 for redfish). Reduced discards due to adoption of increased mesh size.

- Other stocks: reduced bycatch of skates, dogfish, monkfish as a result of effort reductions.

- Endangered and other protected species: negligible or possibly beneficial impacts on endangered and other protected species as a result of effort reductions.

- Habitat: benefit habitat through adoption of areas closed to mobile gear to protect habitat, benefits of other measures (effort reductions)

- Human environment: short-term reductions in revenue will have negative impacts on fishing communities, but over the period of the rebuilding program revenues will increase. Considerable uncertainty over whether current fishery participants will benefit from rebuilding.

One possible impact that is not discussed in Amendment 13 is the impact of the CAII yellowtail flounder SAP on the CAII Haddock SAP that is part of FW 40A. FW 40 A adopted an incidental catch TAC for GB cod, and allocates part of that TAC to the CAII haddock SAP. The CAII yellowtail flounder SAP catches small amounts of cod, but was not specifically allocated a GB cod incidental catch TAC because that measure was not part of Amendment 13. The cod catch in the yellowtail flounder SAP, however, will count against the eastern GB cod TAC established by the U.S./Canada Resource Sharing Understanding. It is possible that the cod catch for the CAII Yellowtail Flounder SAP may limit opportunities for the CAII Haddock SAP that will not be implemented until FW 40A is adopted.

Other recent management actions that affect groundfish include the adoption of Scallop Amendment 10 and Scallop Framework Adjustment 16/Multispecies Framework Adjustment 39. Scallop Amendment 10, implemented on June 23, 2004, established a rotational management system for the scallop fishery. In summary, Amendment 10 creates a system for opening and closing areas to scallop fishing in order to maximize scallop yield. Framework 16/39, implemented November 2, 2004, defined the requirements for extending scallop fishery area management into the groundfish mortality closed areas. Scallop dredges have historically caught groundfish. In fact, in some years scallop fishermen have used dredges to target yellowtail flounder. For this reason scallop dredges were prohibited from the groundfish mortality closed areas in 1994. In recent years, improvements in dredge design have greatly reduced the incidental catch of groundfish by scallop dredges, changes in regulations have reduced the incentive for scallop dredge vessels to target groundfish, and several programs have allowed scallop dredge fishing in groundfish closed areas subject to strict limits on yellowtail flounder catches. Framework 16/39 adopts an approach similar to that used in earlier access programs. Caps have been set on the amount of yellowtail flounder that can be caught inside groundfish mortality closed areas (ten percent of the GB yellowtail and SNE/MA yellowtail flounder target TACs), and the retention of cod is restricted to small amounts. Unlike the incidental catch TACs in FW 40A that are allocated to specific Category B DAS programs, the caps in FW 16/39 did not represent specific allocations for groundfish to the scallop fishery. For example, while the FW 16/39 cap for SNE/MA yellowtail flounder caught by scallop dredges in the groundfish closed areas was set at ten percent of the target TAC, it did not reduce the SNE/MA yellowtail flounder target TAC for groundfish. While the caps in FW 16/39 were designed to limit any increase in catches of yellowtail flounder to levels that would not threaten Amendment 13 mortality targets, they were not developed in concert with the incidental catch TACs in FW 40A. NMFS, however, chose to implement these caps as if they were a specific allocation of yellowtail flounder to the scallop fishery. Since GB yellowtail flounder is subject to a hard TAC (because Amendment 13 adopted the U.S./Canada Resource Sharing Understanding), treatment of the cap as an allocation reduced the amount of yellowtail flounder that can be caught by groundfish vessels and led to a prohibition on the possession of yellowtail flounder by groundfish vessels for the remainder of the fishing year in October

2004. Treatment of the cap as an allocation was not described or analyzed in Amendment 13, FW 16/39, or FW 40A.

From the standpoint of cumulative effects on regulated groundfish, this is not likely to be an issue for either SNE/MA yellowtail flounder or GB yellowtail flounder. There is only a limited opportunity to use Category B (regular) DAS in the SNE/MA yellowtail flounder stock area, and no SAPs that will allow the use of Category B DAS in this area. For GB yellowtail flounder, all catches will be counted towards the hard TAC adopted by the U.S./Canada Resource Sharing Understanding. Actions imposed when this TAC is reached will reduce the possibility that mortality goals will be threatened. Analysis in FW 16/39 suggests that yellowtail flounder catches may actually decrease further as a result of the access program.

FW 16/39 also limits scallop dredge vessels fishing in groundfish closed areas to 100 lbs. (45.4 kg.) of cod per trip for personal use. Based on the number of trips expected in CAI and CAII, this could amount to a substantial amount of GB cod. Analysis of observed scallop trips into the closed areas, however, reveals that scallop dredge vessels catch little cod. Expansions of the observed data, taking into account changes in scallop and cod abundance, resulted in estimates that the total cod catch resulting from the access programs would be one metric ton, less than 0.03 percent of the FY 2004 target TAC for this stock, an insignificant amount (Tables 103 through 106, FW 16/39).

Multispecies FW 40A, implemented November 19, 2004, created three opportunities for groundfish vessels to target healthy stocks. These included a pilot project SAP to target haddock in the Eastern U.S/Canada area, a SAP for longline vessels to target haddock in CAI, and a Category B (regular) DAS pilot program that allows vessels to target healthy stocks in all areas while using Category B DAS (DAS that cannot be used outside these programs). These three programs are expected to provide benefits to fishermen and fishing communities through increased landings and revenues derived from healthy stocks. The Eastern U.S./Canada area SAP pilot project will provide only limited benefits in FY 2004 because the SAP closed on January 1, 2005, but should provide additional benefits next year. The CAI longline SAP, as implemented, will only provide benefits to the GB Cod Hook Sector since non-sector vessels are not allowed to participate. All three programs are designed so that they will not threaten the mortality targets adopted by Amendment 13. This was accomplished by establishing incidental catch TACs for stocks of concern and requiring that the programs end when these TACs are caught. In addition to these three programs, FW 40A restored flexibility to fishermen by allowing them to fish inside and outside the Western U.S./Canada area on the same trip, a practice that was prohibited by regulations implementing Amendment 13.

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1977	Original FMP	Cod, haddock and yellowtail annual and quarterly catch quotas Quota allocations by vessel class Trip or weekly catch limits	Moderate	Negligible	Moderate - High
1982	Interim Plan	George Bank Closed Areas (seasonal) Minimum mesh size requirements when fishing for cod, haddock or yellowtail flounder in GB and portions of the GOM (5.5") Minimum fish size requirements Permit requirements	Moderate-High	Low	Moderate-High
1986	Multispecies Plan	Inclusion of pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder, and white hake Additional minimum fish size restrictions Extensions of GB spawning areas closures to protect haddock (seasonal) A SNE closure to protect yellowtail (seasonal)	Moderate	Moderate	Moderate
1987-1991	Amendments 1-4	Closure of the Southern New England/Mid-Atlantic Yellowtail Area during March-May Extension of GB RMA Minimum mesh size requirements in SNE Exclusion of scallop dredge vessels from SNE closure Minimum fish size changes Gear restrictions in the Northern Shrimp fishery Inclusion of silver hake, red hake, and ocean pout	Moderate-High	Moderate	Moderate-High
1994 (01/03/94)	Emergency Action	Implementation of a 500-lb haddock trip limit Expansion of CAII in area and time (from 4 month to 6 months) Prohibition on scallop dredge vessels from possessing haddock during January-June Prohibition on pair-trawling for multispecies	Moderate	Low	Moderate

Table 79 - History of Management Actions and Associated Impacts

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1994	Amendment 5	Implementation of '94 Emergency Action year-round Moratorium on new entrants to the multispecies fishery An effort reduction program for most vessels whereby historical DAS would be reduced by 50% over a 5-7 year period SNE and MidAtl Regulated Mesh Area (RMA) (5.5") Increase mesh in GOM/GB RMA (6.0") Minimum fish sizes Suspension of CAI (except for gillnet vessels) Finfish excluder requirement for shrimp vessels Mandatory reporting and observer requirements Framework adjustment provisions	High	High	High
1994	Amendment 6	Implementation of March1994 Emergency Action measures on a permanent basis	Moderate	Moderate	Moderate
1994	Emergency Action	Year-round closure of redefined CAI, the Nantucket Lightship Closed Area and CAII - to protect cod, haddock and yellowtail flounder Prohibition on scallop vessels from fishing in the closed areas A small mesh prohibition - disallowance on any fishery utilizing mesh smaller than the minimum mesh size requirements, with the exception of fisheries that have been determined to have a catch of less than 5 % by weight of regulated species Prohibition on retaining regulated species w/ sm mesh Increase in SNE mesh size (6.0") Winter flounder exemption in state waters	High	High	High
1995	Framework 9	Implementation of December 1994 Emergency Action measures on a permanent basis	High	High	High

Table 79 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1996	Amendment 7	Acceleration of Amendment 5 DAS reduction schedule Elimination of exemptions to effort control program Implementation of seasonal GOM closures Implementation of a 1,000 lb haddock trip limit Expansion of the 5% bycatch rule, where vessels fishing in the GOM/GB/SNE RMAs are allowed to fish only in an exempted fishery, under a mults or scallop DAS ,or under the Small Vessel permit category Establishment of an annual target TAC for cod, haddock and yellowtail stocks, and expansion of framework provisions to set annual TACs Restrictions on party/charter and recreational vessels	High	High	High
1997 (05/01/97)	Framework 20	Implementation of GOM cod daily trip limit (1,000 lb) Seasonal increase in haddock daily trip limit (1,000 lb) Gillnet effort-reduction measures, including net limits	Moderate	Moderate	Moderate
1998 (04/09/98)	Framework 24	Adjustment to GOM cod trip limit – vessels must remain in port & run clock to account for cod overage Implementation of DAS carry-over provision Implementation of NAFO exemption	Low	Low	Moderate
1998 (05/01/98)	Framework 25	Implementation of GOM Inshore Closure Areas Implementation of year-round Western GOM Closure Area Addition of a seasonal offshore GOM closure area (Cashes Ledge Closure Area) Reduction in the GOM cod daily trip limit (700 lb)	High	High	High
1999 (01/19/99)	Framework 26	Expansion of April GOM Inshore Closure Area Addition of seasonal inshore GOM and Georges Bank area closures	Low	Low	Moderate
1998	Amendment 11	Designated EFH for Multispecies Required Federal agencies to consult with NMFS on actions that may adversely effect EFH. NMFS provides recommendations to avoid or minimize impacts to EFH	Low	High	Low

Table 79 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1999 (05/01/99)	Framework 27	Elimination of the Northeast Closure Area Establishment of seasonal inshore GOM Rolling Closure Areas of greater size and duration than Inshore Closure Areas (from 1 month 2 months) Reconfiguration of the seasonal Cashes Ledge Closure Area and expansion in time (from 1 to 4 months) Exemption for scallop dredge vessels to fish within the GOM Rolling Closure Areas and Cashes Limitation on roller and rockhopper trawl gear to a maximum diameter of 12" within a GOM inshore area Decrease in the GOM cod daily trip limit (200 lb), w/ mechanism to reduce further if necessary (reduced to 30 lb on 5/28/99) Increase in the haddock daily trip limit (2,000 lb) Increase in GOM/GB/SNE square mesh size (6.5”)	Moderate-High	Moderate	Moderate-High
1999 (07/29/99)	Interim Rule	GOM cod daily trip limit revision (100 lb/500 lb max) DAS running clock revised-cod overage limit to 1 day	Moderate	Low	Moderate
1999 (11/15/99)	Amendment 9	Prohibition on the use of Brush-Sweep Trawl gear Inclusion of halibut into the FMP Possession and size limit on halibut - 1 fish (36”)	Moderate	High	Moderate
2000 (01/05/00)	Framework 31	Increase in GOM cod daily limit (400 lb/4,000 lb max) Additional February inshore GOM closure Extension of ’99 Interim rule running clock measure	Moderate	Low-Moderate	Moderate
2000 (05/01/00)	Framework 33	Addition of a Georges Bank Seasonal Closure Addition of 2 1-month conditional GOM closure areas Increase in haddock daily trip limit (3,000 lb)	Moderate	Negligible	Moderate

Table 79 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
2002 (05/01/02)	Interim Action (Settlement Agreement)	Restriction on vessels using more than 25% of their DAS allocation during May-July 2002 Modification of DAS clock – all vessel trips 3-15 hours counted as 15 hours during May-July 2002 Year-round closure of Cashes Ledge Area Closure Expansion of Rolling Closure Area III and IV Prohibition on front-loading the DAS clock Increase in GOM trawl (codend) & gillnet mesh (6.5") Limitations on Day gillnets Restrictions on party/charter and recreational vessels	High	Moderate-High	High
2002 (08/01/02)	Interim Action (Settlement Agreement cont'd)	May 2002 interim measures continued Establishment of "used DAS baseline" and reduction of 20% from this baseline Freeze on Handgear permits & trip limit reduction Elimination of GOM January & February seasonal closure areas Increase in SNE trawl (codend) mesh (7.0/6.5" sq/diamond) Increase in GB gillnet mesh (6.5") Further limitations of both Day & Trip gillnets Increase in SNE gillnet mesh (6.5") Longline gear restrictions - prohibition on de-hookers (crucifiers) w/ < 6" spacing between fairlead rollers, hook size restrictions, and limit on number of hooks Increase in commercial cod fish size (22") Possession limits and restrictions on yellowtail catch Increase in GOM daily cod trip limit (500/4000 lb max)	High	Moderate	High
2004 (05/01/04)	Amendment 13	Formal rebuilding programs for overfished stocks Categorization of DAS based on permit history during FY 1996 through FY 2001 Reduced DAS that can target any stock by 40 percent Changes to gear requirements Increased GOM cod landing limit, decreased GB cod landing limit Adopted U.S./Canada Resource Sharing Understanding Adopted process for implementing voluntary sectors Special Access Programs (SAPs) DAS leasing and transfer provisions Areas closed for habitat protection	High	Moderate	High

Table 79 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
2004 (6/23/04)	Framework 16/39	Establishes requirements for scallop vessel access to groundfish mortality closed areas in order to facilitate scallop rotational management	Medium	Low	High
2004 (11/19/04)	Framework 40A	Incidental catch TACs for using Category B DAS Eastern U.S./Canada Area SAP Pilot Program CAI Hook Gear Haddock SAP Category B (regular) DAS Pilot Program Combined trips to the Western U.S./Canada Area	Medium	Low	Medium

Table 79 - History of Management Actions and Associated Impacts (cont.)

7.2.8.4.2 Future Actions

Several reasonably foreseeable future federal fishery management actions may affect the multispecies fishery. These include:

- Monkfish Amendment 2: The Council submitted this amendment in November 2004 and then submitted a revised version in December 2004. As submitted, the amendment modifies monkfish management but continues to link monkfish and groundfish DAS for vessels with Category C or D monkfish permits. The Amendment is currently being reviewed by NMFS.

- Legal action resulting from Amendment 13: As of January 1, 2005, at least five legal actions were filed objecting to elements of Amendment 13. The legal briefs addressed a wide range of issues in relation to the amendment. It is not possible to predict with any certainty how these court cases will be resolved or what their impact will be on groundfish management.

- Experimental Fishing Permits (EFPs): Under the M-S Act, NMFS is authorized to require permits for experimental fishing activities. There are several ongoing programs that coordinate and fund experiments that test fishing gear or fishing operations. Many of these experiments are designed to identify ways to target healthy groundfish stocks and could lead to the future development of SAPs or other Category B DAS programs that are authorized by Amendment 13. As a result, the experiments often catch regulated groundfish and request and exemption from existing regulations. NMFS reviews these requests and grants approved experiments and EFP. The Council and NMFS are attempting to identify a way to grant these permits without threatening the mortality objectives of Amendment 13. To date, NMFS has required some of these experiments to use Category A DAS so that mortality falls within the range of impacts analyzed by Amendment 13. The Groundfish PDT recently evaluated the EFPs received for FY 2004 and concluded that the expected catches of GB cod and CC/GOM yellowtail flounder were high enough to cause concern. The PDT concluded that for other stocks the catches were minimal and not a threat to mortality objectives. It is probable that any future decisions on these requests will be made so that the experiments do not threaten Amendment 13 mortality objectives.

- Future multispecies actions: An updated assessment for all groundfish stocks is planned for 2005. The Council may adjust management measures based on these assessments. It is not possible at this stage to predict how management measures will change as a result of this assessment. Measures that may be considered in this action include adjustments to default measures adopted in Amendment 13, extensions of the DAS leasing program, Eastern U.S./Canada SAP Pilot Project, and Category B (regular) DAS Pilot Project, changes to the DAS transfer program, modifications to other existing SAPs, and measures to facilitate experimental fishing permits.

- Herring Amendment 2: The Council is developing an amendment to the Atlantic Herring Management Plan. One of the measures considered for this amendment would establish bycatch TACs for groundfish caught by herring fishing vessels. This amendment is not likely to be implemented until the 2006 fishing year.

In addition to federal fishery management actions, there are other reasonably foreseeable future actions by other state, local, or federal agencies. These actions were identified and discussed in Amendment 13. While that discussion is not repeated here, the actions are identified in the table that summarizes the cumulative effects (see Table 80).

7.2.8.5 Cumulative Effects of the Proposed Action

The following table summarizes the cumulative effects of past, present, and reasonably foreseeable future actions on the VECs identified in section 7.2.8.

7.2.8.5.1 Cumulative Effects on Groundfish Stocks

The cumulative effect on groundfish stocks of this action and other past, present, and reasonably foreseeable actions is positive. In general, the prior multispecies actions of Amendment 5 and Amendment 7 initiated rebuilding the multispecies stocks. While the pace of rebuilding did not meet the requirements of the 1996 amendment to the M-S Act, these two actions and subsequent frameworks reversed a decades long decline in groundfish stock biomass. Amendment 13 will increase the pace of rebuilding so that it complies with the M-S Act. FW 40A adopted measures to facilitate fishing on healthy stocks without jeopardizing those rebuilding programs. The proposed action includes several measures that may result in a short-term increase in fishing effort as a result of changes to the DAS leasing and transfer programs. In addition, it includes one SAP that may increase fishing mortality on GOM haddock by a small amount. None of these changes are expected to threaten the mortality objectives of Amendment 13. As long as the Amendment 13 mortality objectives are met, groundfish stock status should improve as stocks are expected to continue to increase. Indeed, Amendment 13 includes provisions for periodic review of rebuilding progress that will, if necessary, provide the information necessary to ensure rebuilding programs remain on track.

7.2.8.5.2 Cumulative Effects on Other Stocks

The cumulative effect on other stocks of this action and other past, present, and reasonably foreseeable actions is positive. The overall reduction in groundfish fishing effort begun in Amendment 5, accelerated in Amendment 7, and further controlled by Amendment 13 benefits other stocks by reducing the number of interactions between vessels fishing for groundfish and other stocks. Additional elements of these amendment contribute as well: increases in mesh size have reduced the catch of all stocks of small fish, limits on the amount of gear that can be set reduces discards, requirements for specific gears

adopted through the amendment and other framework actions have reduced bycatch. While the proposed action may result in a small increase in mortality for some stocks (i.e. monkfish, skates) due to removal of the net limit for trip gillnet vessels, this increase is not likely to have a substantial impact on these species. Total effort in the groundfish fishery will remain well below the levels observed in FY 2000 and FY 2001.

7.2.8.5.3 Cumulative Effects on Endangered and Other Protected Species

As was stated earlier in this document, the Council does not anticipate the measures proposed Framework Adjustment 40B will adversely impact threatened, endangered or protected species beyond those analyzed and discussed on Amendment 13. Under optimal conditions (little overlap of fishery operations and the distribution of protected species), the measures could provide benefits to protected species inhabiting the management unit because of anticipated reductions in fishing effort. Most likely, however, the measures will have negligible impacts or those that cannot be quantified. This conclusion coupled with the discussion of impacts in the document leads the Council to believe that significant cumulative effects will not occur as the result of implementation of the management measures proposed in this action.

7.2.8.5.4 Cumulative Effects on Habitat

The cumulative effects of this measure on habitat are expected to be minimal. Amendment 13 adopted a suite of measures that minimized, to the extent practicable, the adverse effects of fishing on EFH. These measures included areas restricted to all mobile bottom-tending gear and benefits that accrue from the effort reductions and other provisions of the amendment. While the proposed action will allow a small increase in fishing effort, the increase relative to the effort reductions in Amendment 13 is small and represents roughly six percent of the effort that may be used under Amendment 13. In addition, the proposed action continues to honor the areas identified as needing protection from mobile gear.

7.2.8.5.5 Cumulative Effects on Communities

Past management actions have had negative effects on communities. Management actions taken prior to Amendment 5 failed to reverse increases in fishing mortality and declines in groundfish stock size. As a result, landings and revenues began a slow decline until the mid-1990's. These economic losses translated into reductions in the number of fishing vessels and fishermen, caused consternation in fishing communities, and led to a regulatory response that exacerbated many of these problems. Beginning with Amendment 5 and Amendment 7, and expected to continue with Amendment 13, reductions in fishing effort required to meet mortality objectives further reduces the size of the groundfish fleet and the positive benefits of the fishery on communities. Some communities lost access to the resource entirely as vessels left the fishery or stock size contracted. As stock size began to increase as a result of Amendments 5 and 7, landings and revenues also began a slow rebound.

Because fishing mortality still exceeded legal requirements, Amendment 13 imposed further restrictions on the industry. In the short term, these are expected to reverse recent increases in landings and revenues that have benefited communities. The measures will also limit the opportunities for many fishermen to participate in the groundfish fishery through DAS reductions – indeed, over 300 permit holders do not have any Category A DAS needed to fish for any stock of groundfish. Over the longer term, however, the pace of stock rebuilding is expected to increase under Amendment 13 and landings and revenues will increase as well. These increases will benefit fishing communities.

The proposed action will provide some short-term mitigation of the negative effects on communities of Amendment 13. Because the proposed action allows for a limited increase in fishing

effort by improving the DAS transfer and leasing program, modifying the CAII yellowtail flounder SAP so that the number of trips matches the available resource, and creating a small rod and reel SAP in the WGOM closed area, revenues will be higher than they would be without this action. The economic returns are expected to provide some benefits to vessels. These benefits are not expected to be substantial compared to the negative short-term impacts of Amendment 13, or the significant benefits that will accrue in the future as a result of stock rebuilding.

7.2.8.5.6 Summary of Cumulative Effects

The cumulative effects of this action are not likely to have a substantial impact on any of the valuable ecological components (VECs) associated with the multispecies fishery. The overall reductions in fishing effort adopted by previous actions will have a positive impact on groundfish and other stocks. While the proposed action may result in a small increase in effort, enough controls are included that these increases will not threaten the mortality objectives of the management plan. While there may be a small increase in mortality for some stocks (monkfish, skates) as a result of the removal of the limit on nets fished by trip gillnet vessels, this increase is not likely to have a significant impact. With respect to endangered and other protected species, the proposed measures will have negligible impacts. The expected impacts on habitat are also minimal. The cumulative impacts of this proposed action will mitigate some of the negative economic and social impacts of Amendment 13. Overall, the proposed action will not have significant cumulative impacts.

Alternative or Action	Cumulative Effects on Communities	Cumulative Effects on Groundfish Stocks	Cumulative Effects on Other Stocks	Cumulative Effects on Protected Species	Cumulative Effects on Habitat
Non-Fishing Entities and Actions					
• Inshore	Chemical/biological – negative Physical – positive, short-term; possibly negative long-term	Negative, moderate	Negative, moderate	Unknown – possibly negative	Negative, moderate-high
• Offshore		Negative, low	Negative, low	Unknown	Negative, low
Past Actions	Short-term negative, high Long-term positive, low	Positive, moderate-high	Positive, moderate - high	Positive-low	Positive, low
• Amendment 13	Short-term negative, high Long-term, positive, low	Positive, high	Positive, low	Positive, low	Positive, moderate
• Framework 16/39	Short-term positive Long-term positive	None	Positive, moderate	None	None
• Framework 40A	Positive, low to moderate	Negligible	Negligible	None	
Reasonably Foreseeable Future Actions					
Local					
• Preserve industry waterfront access	Positive	None	None	None	None
• Promotion of tourism, waterfront development	Negative (fishing community)	Positive	Positive	Cetaceans Negative-low	Unknown
State					
• Coastal facility permitting decisions	Unknown	Unknown	Unknown	Unknown	Unknown
• Fishing industry support	Positive	None	None	Negative-low	None
• University support for fishing industry research	Positive	Positive	Positive	Unknown	Positive
Federal					
• Amendment 13 legal action	Short-term – negative Long-term - unknown	Unknown	Unknown	Unknown	Unknown
• Monkfish Amendment 2	Unknown	Unknown	Positive, low	Unknown	Unknown
• Regulatory decisions for other fisheries	Unknown	Unknown	Unknown	Unknown	Unknown
• Direct industry support	Positive	Unknown	Unknown	Unknown	Unknown
• Offshore permitting decisions	Unknown	Unknown	Unknown	Unknown	Unknown
• Multispecies plan adjustment (2006)					
Framework 40B					
• Changes to the DAS transfer conservation tax	Positive, low	Negligible	Negligible	Negligible	Negligible
• Incidental catch TACs	Negligible	Negligible	Negligible	Negligible	Negligible
• WGOM Closed Area Rod/Reel SAP	Positive, low	Negligible	Negligible	Negligible	Negligible
• CAII Yellowtail Flounder SAP	Positive, low	Positive	Negligible	Negligible	Negligible
• Minimum Effective Effort Allocation	Positive, low	Negligible	Negligible	Negligible	Negligible

Table 80 – Summary of cumulative effects

Alternative or Action	Cumulative Effects on Communities	Cumulative Effects on Groundfish Stocks	Cumulative Effects on Other Stocks	Cumulative Effects on Protected Species	Cumulative Effects on Habitat
• GB Cod Hook Sector Allocation	Positive, low	Negligible	Negligible	Negligible	Negligible
• DAS Baseline Calculation	Negligible	None	None	Negligible	Negligible
• Removal of Tonnage from the DAS transfer program restrictions	Positive, low	Negligible	Negligible	Negligible	Negligible
• One-time permit baseline characteristics downgrade	Positive, low	Negligible	Negligible	Negligible	Negligible
• DAS credit for standing by entangled whales	Negligible	Negligible	Negligible	Positive, low	Negligible
• Herring vessel interactions with regulated groundfish	Negligible	Negligible	Negligible	Negligible	Negligible
• Trip gillnet net limitations	Positive, low	Negative, low	Negative, low	Negligible	Negligible

Table 80 – Summary of cumulative effects (cont.)

7.2.9 Rationale for the Proposed Action

The Proposed Action was determined to be the best alternative that addressed the identified need. This section discusses the rationale for not selecting the alternatives to the proposed action. It is based on the analyses of impacts of the proposed action (section 7.2) and the alternatives (sections 7.3 through 7.7). In addition, it considers the comparison of the alternatives in section 7.9.

The No Action alternative was not selected because it would not meet the identified purpose and need. Under the No Action alternative, management measures implemented by Amendment 13 and FW 40A would not be revised. The effort control program adopted by Amendment 13 would continue to be hampered by inefficiencies such as restrictions that limit the effectiveness of the DAS leasing and transfer programs, a potential mis-match between the number of trips in the CAII Yellowtail Flounder SAP and the available harvest, limited opportunities for fishermen to use Category B DAS in the GOM, and unreasonable restrictions on the GB Cod Hook Sector. The No Action alternative also does not address rising concern over the possibility of regulated groundfish bycatch in the herring fishery.

Alternative 1 was not selected because some of the measures in that alternative were viewed as unworkable or in need of additional development. The proposed DAS Transfer Program Modifications (Measure A.2) left many questions unanswered with respect to the treatment of vessel DAS and catch history, interaction with other management plans, and benefits of the proposed changes. The analysis of the proposed GB Haddock Fishery North of CAI SAP (Measure C.1) suggested it would provide few opportunities for fishermen at the cost of considerable complexity. In addition, the restrictive measures in the SAP caused some to believe the no one would choose to participate. Overall, the benefits of this SAP were determined insufficient to justify the SAPs adoption.

The proposed action is based on Alternative 2 with a few relatively minor modifications to address problems that were identified. Minor revisions were made to the measures for the CAII Yellowtail Flounder SAP and the Permit Baseline Characteristics Downgrade (Measure H). These changes were made to address NMFS concerns over the measures as originally designed.

Alternative 3 was not adopted because it did not include changes to the DAS transfer program conservation tax, the WGOM Rod/Reel Haddock SAP, the Minimum Effective Effort Allocation, and changes to the GB Cod Hook Sector Allocation. The Council considered all of these measures essential to meeting the need for this action. The WGOM Closed Area Rod/Reel Haddock SAP and the Minimum Effective Effort Allocation are viewed as essential to providing opportunities for limited access groundfish fishermen to continue to participate in the fishery. The reduction in the conservation tax for the DAS transfer program is necessary to encourage use of this program. Overall, Alternative 3 did not include measures that the Council believed were critical to meeting the need identified for this framework.

Alternative 4was not selected for similar reasons. Much like Alternative 1, if selected this alternative would have implemented a SAP (the GB Haddock Fishery North of CAI SAP) that was determined to provide few benefits justifying the complexity of the SAP. This alternative did not include the Minimum Effective Effort Allocation, nor the Changes to the GB Cod Hook Sector Allocation, two measures that will improve access to the fishery.

7.3 No Action

The No Action alternative represents the measures adopted by Amendment 13, as approved and as implemented by regulation on May 1, 2004 and as altered by FW 40A, implemented on November 19, 2004. Because of the short time between implementation and submission of this document, it is difficult to evaluate current conditions beyond the analysis included in Amendment 13 and FW 40A.

7.3.1 Biological Impacts

7.3.1.1 Impacts on Groundfish

If the proposed action is not adopted, the impacts on groundfish stocks should be the same as described in Amendment 13 (NEFMC 2003) and FW 40A (NEFMC 2004). Impacts on groundfish are described in the amendment in two different ways. Estimates of future stock size are presented that are based on target fishing mortality rates. These target fishing mortality rates were developed in order to rebuild the stocks in the time mandated by the M-S Act. The mortality rates were selected before the design of management measures, and thus these projections are not specific to any suite of management measures. The mortality rates were also selected so that the median sock size would be at the target biomass in the required time period.

Based on the analysis in Amendment 13, groundfish stocks that are subject to a formal rebuilding program are expected to rebuild by the following years if fished at the target fishing mortality rate:

2014:
- GOM cod
- GB haddock
- GOM haddock
- SNE/MA yellowtail flounder
- SNE/MA winter flounder
- White hake
- Windowpane flounder (south)
- Ocean pout

2023:
- CC/GOM yellowtail flounder

2026:
- GB cod

2051:
- Acadian redfish

Additional analysis in Amendment 13, however, estimates the fishing mortality rates that are expected to result from the suite of management measures that were implemented. These estimates are based on the use of Category A DAS only. As explained in Amendment 13, these estimates should not be viewed as precise predictions and so reductions within ten percent of the target are assumed to meet the target. Because of uncertainty over the impact on DAS use of some Amendment 13 measures (DAS leasing, DAS transfer), the estimates are based on three different levels of DAS use, shown as reductions from FY 2001. Because of the difficulty in designing management measures for a multispecies fishery, for some stocks the Amendment 13 measures will result in fishing mortality rates that are well below the

target called for by the amendment. These stocks are GB haddock, GOM haddock, GB yellowtail flounder, GOM winter flounder, GB winter flounder, windowpane flounder (north and south), ocean pout, and SNE/MA winter flounder. In the case of SNE/MA winter flounder, Amendment 13 includes a SAP that will allow a small harvest of this stock outside of the DAS program, so fishing mortality is expected to be closer to the target than indicated by the table. The impacts of a lower fishing mortality for these stocks means that stock size may increase faster than the biomass trajectories that are based on the target fishing mortality rates. Expressed in a different manner, it means that the probability of achieving the target biomass by the end of the rebuilding period will increase.

As discussed in Amendment 13, there are other expected impacts of the management measures on the regulated groundfish stocks. Changes in mesh size and minimum fish size (for cod) are expected, over time, to provide an increase in yield per recruit. As stock size increases, the geographic range of the stocks should expand. Increases in stock size may also result in increased recruitment, though this varies from stock to stock and is subject to considerable uncertainty given the number of factors that affect recruitment. Finally, the age structure of the stocks should expand as more fish survive, which may also impact other stock characteristics such as time of spawning, predation, etc.

FW 40A, as implemented, would be expected to result in additional impacts on groundfish stocks as it created opportunities for fishermen to target healthy groundfish stocks. These opportunities could increase fishing effort by between 2,500 and 4,400 DAS. These DAS will be used to target healthy groundfish stocks but some catch of other stocks can be expected. Fishing mortality is expected to increase on GB haddock primarily as a result of two SAPs (the CAI Hook Gear Haddock SAP and the Eastern US/CA Area Haddock SAP). Fishing mortality is also expected to increase on other healthy groundfish stocks targeted through the Category B (regular) DAS pilot program. The stocks that are most likely to be targeted in this program include GOM haddock, GOM winter flounder, pollock, GB haddock, GB winter flounder, and GB yellowtail flounder. While redfish is another stock that could be targeted, the minimum mesh regulations will make it difficult to target redfish and so mortality for that stock is not likely to increase. Based on the analysis in Amendment 13 and in FW 40A, the fishing mortality for these stocks that will result is not expected to exceed the overfishing thresholds established by Amendment 13.

Fishing mortality may also increase for several groundfish stocks of concern that may be caught under these programs. The catches of these stocks will be constrained by a “hard” TAC. This TAC is established at a level so that, based on the analyses in Amendment 13 and FW 40A, the risk of exceeding rebuilding targets will be small. For four stocks, the calendar year 2003 preliminary landings statistics suggest that there is little risk of exceeded the target TAC or mortality targets adopted by Amendment 13 as long as the incidental TACs are adequately monitored and in force. There are four other stocks (GB cod, GOM cod, white hake, CC/GOM yellowtail flounder) where the incidental catch TAC was set at a lower level to reduce the risk that the proposed programs will threaten rebuilding plans.

7.3.1.2 Impacts on Other Species/Bycatch

If the Council does not select any of the proposed measures contained in this framework action no additional impacts on the mortality of non-target species is expected. The multispecies fishery results in bycatch of both regulated groundfish and other species. Section 9.4.2.8 of Amendment 13 summarizes recent estimates of discards by gear used in the multispecies fishery (for most stocks, discards are not estimated by fishery, but by gear). In addition to regulated groundfish, other species that are discarded by gear used in the groundfish fishery include dogfish, monkfish, and most species of skates.

Amendment 13 further analyzed the impact of each measure on bycatch of both regulated groundfish and other species (section 5.2.8 of Amendment 13). The general approach used qualitatively

determined whether the measures in the amendment would result in an increase or a decrease in bycatch compared to the measures in place in FY 2001, the baseline used for evaluating all measures in the amendment. The detailed analysis in that document is not repeated here. In general, the overall large reductions in DAS that were adopted by the amendment are expected to reduce bycatch of all species in the groundfish fishery. Compared to FY 2001 DAS use, Amendment 13 is expected to reduce fishing effort by at least thirty-four percent. There are also measures included in Amendment 13 that are expected to reduce the rate of bycatch. These include the requirement to use the haddock separator trawl in the U.S./Canada area, increases in mesh size, restrictions in the amount of gear that can be fished, and increases in the landing limit for GOM cod. Reduced landing limits for several stocks of yellowtail flounder and GB cod may result in increased discards.

The measures implemented as a result of FW 40B may result in a small increase in fishing effort compared to Amendment 13 and FW 40A. As a result, there may be increased impacts on other species that are caught by vessels fishing for groundfish, but these impacts will not be significant or substantial.

7.3.2 Habitat Impacts

The habitat impacts of the No Action Alternative in this framework will not be any different than the implemented measures from Amendment 13 and FW 40A. See below for a summary of the habitat impacts of these measures.

The measures implemented in Amendment 13 contain a wide variety of management measures and it the largest and most comprehensive amendment to the Northeast Multispecies FMP since Amendment 9. As such, the changes to the FMP are widespread. The implemented measures have varying impacts on essential fish habitat (EFH). Many of these changes are benign for Essential Fish Habitat (e.g. clarifications of stock status, status determination criteria, and MSY control rules), some new management measures have additional negative impacts on EFH (e.g. US/Canada Resource Sharing Program) while still others perpetuate the negative impacts on EFH under the Status Quo. An example of this can be found under the Closed Area Administration program that allows bottom tending mobile gears to continue to operate in complex habitats (e.g. shrimp trawls in the Western Gulf of Maine Closure). With this in mind, however, the overall or net impact to EFH is positive. This results from the substantial positive impacts from the management measures to address the FMP's management unit's rebuilding requirements through significant effort reductions (DAS), the elimination or restriction of latent effort as potential adverse effects and the retention of the current groundfish closed areas. Habitat Alternative 2 was intended to capture these positive benefits to EFH through the use of the fishery's own need to reduce effort, modify gears and close important areas to groundfish fishing. The net result of these measures to EFH is positive. Additionally, Amendment 13 also implemented other measures developed to directly benefit EFH by minimizing, to the extent practicable, the adverse effects of fishing on EFH.

Management measures that reduce fishing effort and contact of gear on the bottom will most certainly provide the greatest protection to habitat. Those most beneficial for habitat protection are limitations on DAS and year-round closed areas. The four year-round groundfish closures – Closed Area I, Closed Area II, Western Gulf of Maine Closed Area, and Nantucket Lightship Closed Area – most directly benefit benthic habitats by prohibiting the use of most mobile, bottom-tending gear types. Additionally, the suite of Habitat Closed Areas, much of which overlap with the year-round groundfish closed areas that prohibit gears capable of catching groundfish, provide additional habitat benefits by explicitly prohibiting the use of bottom tending-mobile gear. Year-round closures allow for regeneration of benthic communities that are adversely impacted by fishing, as well as the natural recovery of seafloor structure. Seasonal closures may also be beneficial, depending on the time of year when they are in effect,

their duration, and the nature of the habitats and the organisms that exist in the closed areas. DAS requirements also limit fishing activity by restricting fishing effort and bottom contact time over the course of each fishing year.

FW 40A provides a complete assessment of the potential habitat impacts of the measures adopted by that action. The actions proposed in that framework adjustment under the highest DAS utilization scenario are expected to result in a 9.5% DAS increase (predominantly by otter trawls) in actual fishing pressure on EFH by otter trawls and a minimal increase in fishing pressure on EFH by hook gear. Over time and space addressed by those measures, the adverse effects by FW 40A on the EFH of any managed species will not be more than minimal and temporary in nature relative to the baseline conditions established under Amendment 13.

A13 Measure	Overall Habitat Impact	Feature	Description of Habitat Impact
US/Canada Resource Sharing Agreement	Negative Impact (-)	Adoption of understanding with hard TACs for cod, haddock, and yellowtail flounder with incentives for participation	This area is primarily sand and gravelly sand. About half of this relatively small access area is deep undisturbed bottom with a high cover of emergent epifauna (Collie et al., 2000).
Effort Controls	Positive Impact (+)	A days (60% of effective effort) B days (40% of effective effort) C days (FY01 allocation)	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish. There are studies that document the recovery of benthic habitats following the cessation of bottom fishing.
Closed Areas	Positive Impact (+)	Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit the EFH and rare kelp beds found in that area.
A13 Measure	**Overall Habitat Impact**	**Feature**	**Description of Essential Fish Habitat Impact**
Alternative 2	Positive Impact (+)	Benefits of other measures implemented in A13	Several measures that are being implemented in A13 were not intended to minimize adverse effect of fishing on EFH, but they will have complementary habitat benefits.
Alternative 7	Positive Impact (+)	Prohibition of clam dredges in year round closed areas	Hydraulic clam dredges have been demonstrated to cause an adverse impact to EFH (see Gear Effects Evaluation section). Prohibiting this gear will benefit the EFH of species found within the section of the NLCA (NW corner) where this fishery is prosecuted.
Alternative 10b	Positive Impact (+)	Closed areas to minimize impacts on EFH	Year round closures have beneficial impacts on adversely effected EFH, and many of these areas are considered important habitat areas with complex bottom or high EFH value.

Table 81 – Summary of the potential habitat benefits of non-habitat measures implemented in Amendment 13 that are applicable to the proposed measures in FW40A.

Habitat benefits identified above apply primarily to bottom trawls, not to fixed gear such as hooks and gill nets

7.3.3 Impacts on Endangered and Other Protected Species

Amendment 13 anticipated that groundfish measures implemented in that action would have negligible and possibly beneficial impacts on protected species. For instance, days-at-sea reductions and additional gear restrictions will significantly reduce effort in the groundfish fishery. Further, the Amendment 13 measures, added to actions implemented through the Interim Final Rule for the Northeast Multispecies Fishery, the existing rolling closures and Take Reduction Plans potentially contribute to an overall reduction in risk to protected species inhabiting the multispecies management unit. Despite that risk reduction, encounters between gear and protected species are still likely to occur, where gear and species overlap, particularly in marine mammal high use areas. The No Action alternative, therefore, will simply continue the potentially positive outcomes that could accrue as the result of Amendment 13 implementation.

While the measures implemented by FW 40A will increase fishing effort through the use of Category B DAS, they are not likely to adversely affect the protected species conclusions discussed in the Amendment 13 Final Environmental Impact Statement. Overall effort reductions are occurring as the result of reduced effort and other fishing restrictions on groundfish stocks, possibly reducing risks to protected species on the positive end of the spectrum. Most likely, the proposed measures will have a negligible impact because they do not appreciably affect effort beyond Amendment 13 levels in times and places where protected species occur. Fishing in the U.S./Canada area could concentrate effort, including gillnet effort, in an area where marine mammals do occur, but specific information is lacking at this time to draw any meaningful conclusions. An enhanced monitoring program should facilitate a better evaluation of the impacts of this measure in the future.

7.3.4 Economic Impacts

Taking no action would leave all current fishery regulations in place. These regulations include all actions implemented on May 1, 2004 as well as the measures implementing FW 40A that were implemented November 19, 2004. Given the very short time period that has elapsed information on the realized impacts of Amendment 13 and FW 40A is not available. The anticipated or predicted impacts of the Amendment were described in the Amendment 13 FSEIS to the Multispecies FMP and the EA that accompanied FW 40A.

The Amendment 13 evaluation of the policy decision to pursue a rebuilding program was based on achieving the target fishing mortality rates. If none of the measures in this framework are adopted, it is less likely that mortality targets for healthy stocks will be reached – particularly for GB haddock, but also for GOM haddock, pollock, and redfish. If mortality is well below the targets, yield will be sacrificed. The CAII yellowtail founder SAP implemented as a result of Amendment 13 may allow the harvest of that stock at the target fishing mortality. As a result, there will be a gap between the theoretical benefits of the rebuilding program and the actual benefits. Optimum yield will not be reached for these stocks and the fishery as a whole, placing the FMP in conflict with the goals of the M-S Act and the requirements of National Standard 1. Future management actions will be necessary to bring the FMP in compliance with the M-S Act objective of achieving optimum yield.

If none of the measures proposed by this framework are adopted, the expected economic impacts on vessel revenues and communities will be consistent with those described in Amendment 13 and FW 40A. The analysis of these impacts in the amendment is based on the fishing mortality rates that are expected to result from the suite of adopted management measures. These measures were analyzed on the

basis of Category A DAS only – the analyses did not include any revenues that may result from the use of Category B DAS or any SAPs.

As noted in the FSEIS much of the predicted impacts were based on a number of assumptions, did not take into account several potential adjustments or changes in fishing patterns; and did not quantify the potential economic relief that would be afforded to some segments of the groundfish fleet attributable to measures such as sector allocation, DAS leasing or transfer, and the Georges Bank Yellowtail SAP. Taken at an aggregate level, these considerations suggest that the total realized impacts may well be less than that predicted in the FSEIS even though realized impacts for specific individuals or ports may be more severe than predicted. Bearing these caveats in mind, the following provides a synopsis of the economic impacts reported in Sections 5.4.4.1, 5.4.6.1, 7.3.3.7.1, and 7.3.3.7.2 of the FSEIS.

Relative to average conditions from 1998-2001, predicted losses in groundfish revenue were $24 million while total revenue losses on groundfish trips were an additional $16 million for a total loss of $40 million in gross sales to commercial fishing vessels. The reduction in available seafood would also affect seafood dealers and processors that rely on local production and would have additional indirect impacts on fishing related and support sectors of the New England economy. Assuming substitute sources of seafood were not available, the total impact on gross sales to the New England economy was estimated to be $135 million. This aggregate impact represents approximately 0.02% of the New England economy.

Across sub-regions of the New England economy, economic impacts were predicted to be highest in the Boston and New Bedford sub-regions at more than $25 million. Gross sales impacts were estimated to be between $15 and $20 million for both the Gloucester and Lower Mid-Coast Maine (includes Portland) sub-regions. Note that total impacts for all Massachusetts sub-regions combined ($77 million) were almost 4 times that of all Maine sub-regions combined ($19 million), but because the Maine sub-regions have a higher economic dependence on commercial seafood production, the relative impact on the Maine coastal economy (0.05%) was higher than that on the Massachusetts coastal economy (0.02%).

Assessment of vessel-level impacts indicate that vessels that have high levels of dependence on groundfish for total fishing income would be relatively more affected during fishing year 2004 than vessels that are less dependent on groundfish. Among gear sectors trawl vessels tended to be more adversely affected than either hook or gillnet vessels. However, since the Gulf of Maine cod trip limit increased while the Georges Bank cod trip limit was reduced the predicted relative change in impacts for these fixed gears depends on whether the vessel fishes predominantly in the Gulf of Maine or on Georges Bank. The predicted revenue impacts were similar for both medium (50 to 70 feet) and large (over 70 feet) vessels but were generally lower for vessels less than 50 feet. Expected vessel-level impacts were higher for vessels with home ports states bordering the Gulf of Maine as compared to vessels from all other states. Of the former, there was no notable difference in the relative distribution of impacts between Maine and Massachusetts-based vessels but estimated impacts on New Hampshire vessels tended to be lower than either Maine or Massachusetts home port vessels. Among port groups predicted impacts were highest for the ports of Boston, Chatham/Harwich, New Bedford, Portland, and combined ports in the Upper Mid-Coast Maine region. Less (yet still significantly) affected ports included Gloucester, Portsmouth, Provincetown, and Point Judith.

Commercial fishing business failure rates are difficult to predict due to a lack of reliable estimates of costs particularly fixed costs including debt service. A simulation of groundfish vessel cost and returns indicated that the business failure rate could range between 22 and 31% depending on the assumed level of debt the may best represent a fleet-wide average. Across differing vessel gear/size combinations the

estimated failure rate was lower for both gillnet and bottom long-line gears and was highest for large trawl vessels.

These economic impacts are expected to be mitigated, to some extent, through the opportunities to use Category B DAS that were provided through FW 40A. The aggregate economic benefit of these opportunities will be maximized to the extent that the TACs associated with any one of the proposed measures lasts. If all of the incidental TACs are taken, it would generate additional revenues of $2.3 million valued at calendar year 2002 prices. This estimate does not include the value of all other species that may be landed on these trips. Additional revenues would be earned from the stocks that are targeted. For example, the CAI hook gear haddock SAP revenues may equal $2.5 million (section 7.2.4.3 of FW 40A). For the CAII haddock SAP and the Category B (regular) DAS pilot programs it is not possible to accurately estimate the changes in revenues from target stocks because catch composition and catch rates are unknown.

FW 40A requires an operational VMS unit to be installed in order to participate in either SAP or the regular B DAS pilot program. Of the proposed measures, the Closed Area I Hook Gear Haddock SAP would most likely benefit vessels that have agreed to participate in the hook gear sector allocation. Based on 2001 VTR data these vessels would be unlikely to participate in the regular B DAS pilot program due to the predominance of stocks of concern (GB cod, particular) in their catch records. Just as the hook gear SAP would be most likely to benefit a single gear sector, the Category B (regular) DAS pilot program, Closed Area II Haddock SAP, and allowing combined trips in the Western U.S./Canada area would likely benefit the same groups of vessels. That is, vessels which are able to take advantage of the Closed Area II Haddock SAP will also be fishing in the Western U.S./Canada area and because they would also have an installed VMS unit they would be able to take advantage of the Category B (regular) DAS pilot program.

7.3.5 Social Impacts

This alternative would leave present regulations in effect. These regulations were implemented on May 1, 2004 and then modified on November 19, 2004 - not leaving sufficient time between initial implementation and this action to determine actual impacts. Therefore, this discussion summarized the predicted impacts described in Amendment 13 and FW 40A. Daily routines, safety, occupational opportunities, and community infrastructure will be negatively impacted by the no action alternative.

Vessels with homeports in easy access to the Gulf of Maine were predicted to be more likely to experience greater revenue impacts as a result of Amendment 13. Ports with the highest predicted impacts were Boston, Chatham/Harwich, New Bedford, Portland, and ports in the upper mid-coast Maine region followed by Gloucester, Portsmouth, Provincetown, and Point Judith. The management measures outlined in Amendment 13 are predicted to result in significant and far reaching social impacts. These impacts will result in changes in daily routines, safety, occupational opportunities, and community infrastructure.

FW 40A may mitigate the social impacts of Amendment 13. The beneficial social impacts of that action may be more concentrated in communities that provide shore side services to vessels that fish in proximity to Georges Bank. Given the uncertain investment climate for installing VMS, vessels that do not currently have an operating unit, most likely those that fish in the Gulf of Maine may not choose to take advantage of the regular B DAS pilot program or either proposed SAP. This means that social impacts to communities that provide homes and services to vessels and crew that fish predominantly in the Gulf of Maine will not be as great.

7.3.6 Impacts on Other Fisheries

As discussed in section 7.3.6, Amendment 13 effort reductions may result in a shift in fishing effort into several fisheries managed by the MAFMC. FW 40A may mitigate such effort shifts since some opportunities were provided to use Category B DAS. The No Action alternative would not mitigate this possible change in any way.

7.4 Alternative 1

The details of this alternative are described in section 5.2. To summarize, this alternative would:

- Change to the conservation tax for the DAS leasing and DAS transfer programs
- Remove of the tonnage criterion in the DAS transfer program
- Allow a one-time downgrade of permit baseline characteristics
- Modify incidental catch TACs to reflect the addition of two additional SAPs
- Create a research set-aside for the GB cod incidental catch TAC
- Create a SAP to target GB haddock north of CAI
- Create a SAP to target GOM haddock in the WGOM closed area, using rod and reel
- Change the starting date for the CAII Yellowtail Flounder SAP
- Allocate a minimum of ten Category B (reserve) DAS to permits that did not have any Category A or Category B DAS under Amendment 13
- Modify the criteria for joining the GB cod hook sector and the provisions for catch history that contribute to the sector's allocation of GB cod
- Allows a DAS credit for vessels standing by an entangled whale

7.4.1 Biological Impacts

This section examines the direct and indirect biological impacts of this alternative. The impacts are analyzed with respect to:

- Impacts on regulated groundfish. In the case of the proposed SAP(s), these are divided into impacts on targeted and incidental catch groundfish stocks. For other measures that do not target specific species, all groundfish impacts are described in the "target stocks" discussion.
- Impacts on other species
- Impacts on the bycatch of both regulated groundfish and other species. To some extent, this discussion duplicates parts of the first tow analyses. Because of the M-S Act requirement to minimize bycatch, to the extent practicable, these impacts are highlighted.
- Skate baseline review. Under certain conditions, the Skate FMP requires a review of the impacts of a proposed action on the skate fishery. This review is discussed in a later section 8.1.4.

7.4.1.1 Impacts on Groundfish

7.4.1.1.1 Target Stocks

Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

The biological impacts of the DAS leasing and transfer program are uncertain but are likely to result in increased DAS use and higher fishing mortality than would occur without either program. Analysis in Amendment 13 based on a simulation model suggested that a DAS leasing program would result in ninety-eight to ninety-nine percent of allocated DAS used. If this were to occur, it is not likely that the mortality targets in the amendment would be met unless DAS allocations are reduced to about 36,000 DAS or less. The simulation model used in Amendment 13 included several assumptions that may not reflect the actual DAS leasing market. The model maximized fleet revenues. By definition, all vessels will either fish or lease their DAS in this model – the only vessels who do not are those whose predicted revenue falls short of predicted variable costs and cannot find a more profitable lessee for their DAS. The model also assumes no transaction costs, perfect information and communication, and instantaneous lease trades, each taking place under the most profitable terms. The salient point is that in the model vessels that are expected to clear any profit at all by either fishing or leasing will do so. Historical trends in DAS use indicate that this may not be the case – some DAS will not be used.

The proposed measure would adopt one of three options for a conservation tax for the DAS leasing and transfer programs. A conservation tax reduces the number of DAS that are acquired in any DAS exchange. Any conservation tax applied to the exchange of DAS will reduce the pool of available DAS (that is, DAS that can be fished during a fishing year) if a lease or transfer occurs. In the case of a transfer, the pool of available DAS is permanently reduced, while in the case of a lease, it is only reduced for that fishing year (or the life of the lease). The proposed options in this alternative consider reducing the conservation tax for DAS transfers (the current tax is forty percent for Category A and B DAS) and establishing a tax for DAS leases.

A lower tax on transfers may increase the number of transfers that take place. While the overall number of DAS available may decrease as a result of a conservation tax, DAS that are transferred are likely to be used at a higher rate than those that are not transferred and may result in a short-term increase in DAS use while the potential for future DAS use declines. The interaction between the tax and the increased use will determine whether fishing effort increases. In general, an increase in fishing effort would be expected to result in a higher fishing mortality, but there may also be changes in the distribution of DAS use so the changes in mortality may vary from stock to stock. No DAS transfers have taken place as of October 1, 2004, so there is no empirical data that suggests the changes that may occur.

Under Amendment 13, DAS that are leased are not subject to a conservation tax. The application of any tax will thus reduce the number of DAS available if leases occur. About 4,850 DAS have changed hands as a result of leases (through January 12, 2005, see section 6.4.2.6). It is likely that leased DAS will be used at a higher rate than DAS that are not leased, but this assumption has not yet been validated. Once again, the interaction of the tax and the higher rates of use for leased DAS will determine if the number of DAS used will increase and result in an increase in fishing effort. There may also be distributive effects as a result of leases, since DAS could be leased from one area and used in another. This could change the stocks targeted by DAS and result in different impacts on fishing mortality from stock to stock. It is difficult to estimate these impacts without observing the results of the leasing program for at least one full fishing year.

In order to expand on the analysis in Amendment 13, another simulation model was developed to address some of the limitations of the model used in Amendment 13. To summarize, a database of FY 2001 DAS use and FY 2004 Category A DAS allocations was created (the data may differ slightly from the final allocations under Amendment 13 due to appeals, correction of errors, vessels moving into or out of the CPH category, changes in homeport state, etc.). The model first identified "buyers" and "sellers" of DAS. Buyers are those vessels that have fewer Category A DAS allocated than were used in FY 2001, while sellers have more DAS allocated than were used in the same year. The model has an individual buyer attempt to lease enough DAS at the lowest cost to obtain the number of DAS used in FY 2001 or the maximum number that can be acquired under Amendment 13 regulations. Leases were only allowed to occur if vessel characteristics and the lease price were a match between buyer and seller. DAS that are not leased are assumed to be used at an 85 percent use rate, consistent with the mid-point assumption on DAS use in Amendment 13. If a vessel leases DAS, all DAS for that vessel are assumed to be used at a ninety-seven percent use rate. Different tax rates are applied to see how they impact the number of DAS available for use after lease transactions occur, the total of DAS leased, and the number of DAS used. The model was iterated at each tax rate with the order of buyers selected at random to get a distribution of likely results, but the results show little dispersion. Details of the model, a discussion of its limitations, and model results are included in Appendix I. These results are subject to several assumptions that can be tested as additional information is learned on the impacts of Amendment 13 measures, including the DAS leasing program.

The model results suggest that DAS leasing and/or transfers will probably increase Category A DAS use unless a conservation tax of twenty percent or more is adopted for all leases and transfers. This is because while a tax reduces the number of Category A DAS available for use, the assumed higher use rate for all Category A DAS on vessels that obtain DAS outweighs the tax. The model shows Category A DAS moving from vessels reporting Connecticut, New Jersey, New York and Rhode Island as homeport state to vessels that list Maine, Massachusetts, or New Hampshire. At any tax of up to and including forty percent, more DAS will be available to Maine and New Hampshire vessels. Vessels claiming Massachusetts as the homeport state will have more DAS available for any tax up to and including thirty percent. The model also shows that DAS tend to flow to smaller vessels. Vessels less than 50 feet in length have more DAS available for any tax up to and including a thirty percent conservation tax. At all tax levels, there are fewer DAS available for vessels over 50 feet in length. A preliminary comparison with the DAS leasing program through January, 2005 suggests that the simulation model exchanges of DAS may be consistent with the observed program. As reported in section 6.4.2.6, there has been a net gain in DAS in Massachusetts and Maine as a result of leasing, and more DAS are leased by vessels of less than 50 tons – both consistent with the model results. One difference, however, is that the model predicts a net increase in DAS in New Hampshire, which has not been observed.

Based on these results, fishing mortality is likely to increase on Gulf of Maine and Georges Bank stocks as a result of the DAS leasing or transfer programs compared to what would be expected without a leasing program. Mortality may decline on SNE/MA yellowtail flounder and SNE/MA winter flounder as DAS move north from Rhode Island, New York, and New Jersey ports. In general, the higher the conservation tax the smaller the likely increase in fishing effort. A tax of at least twenty percent may be necessary to prevent an increase in fishing effort over the level assumed to occur in Amendment 13. While this tax may reduce DAS available and help control DAS use, the tax will probably not prevent changes in the distribution of DAS that may result in different mortality impacts on different stocks.

Estimated DAS Available			
Tax	**Run 1** Limited to FY 2001 DAS used Leased DAS Used at 97 percent	**Run 2** Limited to FY 2001 DAS used Leased DAS Used at 90 percent	**Run 3** Limited to A13 maximum Leased DAS Used at 90 percent
No leases/transfers	43,332	43,332	43,332
0	43,332	43,332	43,332
0.1	42,854	42,854	42,854
0.2	42,396	42,395	42,380
0.3	41,942	41,943	41,913
0.4	41,491	41,491	41,441

Table 82 – Simulation model results (mean DAS available for use after leasing/transfer)

Estimated DAS Used			
Tax	**Run 1** Limited to FY 2001 DAS used Leased DAS Used at 97 percent	**Run 2** Limited to FY 2001 DAS used Leased DAS Used at 90 percent	**Run 3** Limited to A13 maximum Leased DAS Used at 90 percent
No leases/transfers	36,832	36,832	36,832
0	38,291	37,440	37,707
0.1	37,749	36,977	37,225
0.2	37,281	36,554	36,795
0.3	36,743	36,106	36,303
0.4	36,208	35,659	35,821

Table 83 – Simulation model results (mean estimated DAS used after leasing/transfer)

DAS Transfer Program Modifications (Measure (A.2))

This measure includes three options that are intended to increase participation in the DAS transfer program. The options are not exclusive and different combinations could be adopted. As described in the previous section, participation in the DAS transfer program will likely increase DAS use in the short term, even as the total number of DAS available for use are reduced and the program reduces the potential use of DAS. Thee impacts, however, depend on the conservation tax that is imposed on any transfers. There may also be distributive effects as DAS are moved from vessels in one area to another. No DAS transfers occurred as of October 1, 2004, so there is no empirical data with which to evaluate the proposed changes.

If Option 1 is adopted, a vessel acquiring DAS through the transfer program could also acquire additional permits that are held by the selling vessel. Any DAS acquired would be subject to the appropriate conservation tax. From the standpoint of groundfish mortality, this change would differ from

the no action alternative only in that it may increase the number of transfers that take place. This may increase DAS use and groundfish mortality in the short term, but will reduce available overall effort.

Option 2 would allow a vessel acquiring DAS through the transfer program to reject all other permits. In this respect, it is similar to the existing program, which does not allow a vessel to acquire the other permits attached to the selling vessel. The difference is that if this measure were adopted, the DAS acquired would not be subject to a conservation tax. This measure would likely increase DAS use in the short term and would not reduce the pool of available DAS in the long term. As a result, this measure could be expected to result in increased groundfish fishing mortality without reducing the available overall effort.

Option 3 would alter the existing DAS transfer program provision that requires the selling vessel to exit all federal and state fisheries. If this option were adopted, a third vessel with a similar permit baseline would be required to exit all state and federal fisheries. The impacts of this change on groundfish mortality are difficult to evaluate. This appears to add a third vessel and its groundfish permit to the exchange of DAS under the transfer program. This means that for one vessel to acquire DAS, a second vessel transfers its groundfish permit and DAS to the first vessel, and a third vessel loses its groundfish permit and any attached DAS and exits all state and federal fisheries. This would appear to further reduce available potential groundfish effort while facilitating an immediate increase in DAS use and thus groundfish mortality. It is likely that any third vessels that exit the fishery will be vessels that are not currently fishing and/or have few DAS that can be used, so there will be little overall benefit from this third vessel exiting the groundfish fishery. It is also possible that this change will facilitate DAS transfers so that the most efficient vessel remains in the fishery.

Incidental Catch TACs (Measure B)

Incidental catch TACs were adopted in FW 40A to limit the catch of stocks of concern taken while using Category B DAS. The TACs are set at very low levels to reduce the risk to Amendment 13 mortality objectives. This measure distributes the TACs to account for additional SAPs. For some of the proposed Category B DAS programs, these TACs are so low that they may be caught and the program may be ended early, limiting the catch of the target stocks. In general, however, this measure is not expected to change the fishing mortality of target stocks.

GB Haddock Fishery North of CAI SAP (Measure C.1)

This alternative includes a SAP to target haddock in an area adjacent to the northern boundary of CAI. Analysis of the impacts on the haddock resource in this section will focus on catches of haddock.

The proposed measure limits catches of haddock in this SAP to 1,000 mt, with a possible adjustment based on catches of haddock in other Category B DAS programs and while using Category A DAS. The combined GB haddock catch (kept and discarded) from all of these programs should be limited to the GB haddock target TAC. According to Amendment 13, the target GB haddock TAC for FY 2005 is 27,692 mt (combined U.S. and Canadian catch), about a 3,000 mt increase over the Amendment 13 target TAC for FY 2004. This increase applies to the entire GB haddock stock. Using the catches for the eastern and western areas from 2000 through 2003, the increase can be allocated to the eastern and western areas. (These catches include both U.S. and Canadian catch).

Year	WGB	EGB
2001	4028	7383
2002	5412	7403
2003	3998	8353
Total	13438	23139
Percent	36.7%	63.3%

Subsequent to the analysis in Amendment 13, the Trans-boundary Resource Assessment Committee (TRAC) performed an updated assessment of eastern GB haddock (TRAC 2004). Based on projections for this assessment, the TMGC recommended a TAC of 23,000 mt for eastern GB haddock, only 4,692 mt less than the target TAC for the entire stock that was included in Amendment 13. The U.S. share of this TAC is 7,590 mt, while the Canadian share is 15,410 mt. Subtracting the Canadian eastern GB haddock TAC from the Amendment 13 FY 2005 total TAC leaves 12,282 mt for the total U.S. GB haddock target TAC for FY 2005. This estimate, however, does not include consideration of the new assessment information for eastern Georges Bank and likely under-estimates the target TAC that would result if a new assessment was conducted of the total stock. While this action does not change the target TAC adopted by Amendment 13 since a new target TAC has not been estimated for the entire stock, an estimate of its likely size can be calculated using the percentage distribution of catches as an indicator of stock distribution. If the eastern GB TAC of 23,000 mt set by the TMGC represents 63.3 percent of the TAC for the entire stock, the TAC for the entire stock would be about 36,000 mt. The U.S. target TAC that remains after deduction of the Canadian share is about 20,600 mt. The stock and yield is projected to increase rapidly through 2007.

Amendment 13 estimated that fishing mortality for GB haddock would be reduced by between thirty and forty-one percent from the 2001 estimate of F=0.22. Assuming the smaller reduction, fishing mortality on Category A DAS may be about 0.15, or fifty-seven percent of the F_{MSY} (0.26) used to calculate the target TAC. The resulting mortality equates to an exploitation rate that is sixty-one percent of the exploitation rate at F_{MSY}. Applying this difference in exploitation rates to the estimated target U.S. TAC suggests the GB haddock catch on Category A DAS will be about 12,600 mt. Given the additional DAS reductions in Amendment 13, it is difficult to see how FY 2005 catches will reach this estimate. A low estimate of the catch on Category A DAS would be 6,000 mt, the average of the catch in 2002 and 2003, rounded to the nearest 1,000 mt.

Catch in the CAI hook gear haddock SAP proposed in FW 40A is limited to 1,000 mt.

The eastern U.S./Canada Resource Sharing Understanding TAC for haddock binds the catch of haddock in this CAII Haddock SAP proposed in FW 40A. It is likely that vessels using Category A DAS will catch some of this TAC (either in or outside of the SAP) and vessels using Category B DAS in the SAP will catch some. If the entire eastern U.S./Canada TAC is harvested, the U.S. catch in FY 2005 would be 7,590 mt. Since it is likely by vessels fishing on a Category A DAS will catch some of this TAC, this catch cannot just be added to that caught on Category A DAS. A restrictive TAC on GB cod also binds vessels fishing in this SAP. Analyses in FW 40A suggest that the incidental catch TAC will be caught before the entire haddock TAC from this area is taken. FW 40A estimated haddock catch rates in this SAP of between 5,400 and 7,420 lbs./day fished. The framework also estimated the cod TAC could be caught in 221 days (based on assumptions about the catch rates of cod while using a haddock separator trawl). Combining these two estimates produces an estimated haddock catch in this SAP of 541 to 744 mt while using Category B DAS. Even if cod catch rates are half what was estimated in FW 40A, the haddock catch in the SAP would still be limited by the cod TAC and might range from 1,000 to 1,500 mt.

FW 40A also proposed a Category B (regular) DAS Pilot Program. The program is limited to 2,000 DAS that can be used in any area. Some vessels will likely use this program to target haddock on Georges Bank, but there is no data with which to develop an estimate of haddock catches. A rough estimate can be derived by assuming all 2,000 Category B (regular) DAS are used in the Georges Bank haddock stock area and multiplying these DAS by standardized haddock catch rates (564 lbs./DAS). This estimate can then be adjusted by the expected increase in stock size between 2001 and 2005 (1.66) to estimate the catch of haddock from this program. The result is 1.8 million pounds, or about 1,000 mt. If only half the DAS are used on Georges Bank, a lower estimate of 500 mt results.

Table 84 summarizes catch estimates from the existing programs for FY 2005. The amount of catch available to the Category B (regular) DAS Pilot Program and the proposed new SAP could range from 3,600 mt to 8,659 mt. The table does not predict catches in following years. As the haddock stock increases in the short-term, catch rates would be expected to increase in programs that are not limited by a hard TAC. It is not likely that catches would increase enough to threaten the conclusion that there is enough haddock yield available to support this proposed SAP.

Program	Estimated Catch		
	High	Low	Comments
Category A DAS	11,100	6,000	Includes catch in eastern US/CA area while on a Category A DAS, and assumes entire US/CA TAC is caught
CAI Haddock SAP	1,000	1,000	
CAII Haddock SAP (Category B DAS)	1,500	541	
Category B (regular) DAS Pilot Program	1,000	500	
Total	14,600	8,041	
Estimated U.S. TAC	20,600	20,600	Assumes an increase above A13 projection (12,282) based on an updated assessment of the eastern GB stock
Available Catch	6,000	12,600	Rounded to the nearest hundred

Table 84 – Estimated haddock catch in FY 2005 under various programs

Instead of trying to add up all the uncertain catches and subtract from the target TAC, an alternative would be to use an expected yield per unit area argument. This SAP is limited to a small area of about 5'x 53', roughly 945 sq km (9.625 km x 98.209 km). If one sets the TAC at 3,600 mt then one expects to extract about 4 mt per square km in a SAP that does not take place during the entire year. This seems too large. If one compares the GB haddock MSY (52,900 mt) to the area of Georges Bank (52,500 sq km), the ratio is about 1 mt per square km - and this is for a fully rebuilt stock. Given the stock is probably about half the target right now, a TAC of 3,600 mt would correspond to 8 times the expected yield per unit area. In this case, the target TAC of 27,692 mt gives an expected yield per unit area of about ½ mt. The area of the SAP times this amount gives a TAC of roughly 500 mt. The area proposed for the SAP might have increased yield because haddock appear to use it as a migratory corridor and/or feeding area. Using a yield of roughly 1 mt per sq. km. results in a TAC of 1,000 mt. Given the extensive uncertainty over all of these estimates, the Council proposes to limit the Haddock Fishery North of CAI SAP to 1,000. This may not utilize the full projected potential haddock yield (negative) but leads to more rapid rebuilding of the stock (positive) and possibly less bycatch or cod (if the haddock TAC is constraining).

This measure includes authorization for the Regional Administrator to adjust the TAC in-season. Any increase is limited to a maximum TAC of 2,000 mt. As shown in Table 84, it appears that the minimum difference between the TAC and expected catch in FY 2005 will be 6,000 mt. The difference will likely increase in future years. If the TAC in this SAP is increased to 2,000 mt through an in-season adjustment there is little chance that the overall TAC will be exceeded and mortality targets will be threatened. In addition, before making the adjustment the Regional Administrator must conclude that catches will not exceed 75 percent of the total TAC. This provides further assurances that an increase will result in exceeding the target TAC.

An experiment has not been conducted that provides information on haddock catch rates using a haddock separator trawl in this area. This makes it difficult to determine the number of trips and/or DAS that may be used in this SAP. A recent experiment tested a haddock separator trawl on Georges Bank, but vessels in the experiment did not catch much haddock and it is questionable whether the catch rates that resulted are applicable to this program.

Observed tows in the proposed SAP area during December through April, calendar years 2001 through 2003 were examined to estimate the likely catch of haddock and the number of DAS that may be used in this SAP. Since most effort in this area targeting haddock is by otter trawl vessels, only those observations were examined. Observed tows were grouped by fishing year. Tows were plotted based on the beginning position of the tow. For some tows, this information was not recorded and thus the tows were not included in the data analyzed. A summary of the haddock catch on observed tows is shown in Table 85.

	FY 2000(1)	FY 2001	FY 2002	FY 2003
Tows Observed	98	47	170	132
Mean haddock catch, all tows (lbs.)	853	182	894	1,063
Tows Observed Targeting Haddock	67	11	100	71
Mean haddock catch, tows targeting haddock (lbs.)	1,080	449	1,151	1,963
Tows Observed Not Targeting Haddock	30	36	70	61
Mean haddock catch, tows targeting other species (lbs.)	374	100	526	16

Table 85 – Observed otter trawl tows, December through April, fishing years 2000 – 2003, proposed SAP area (NMFS OBDBS database)

(1) January through April

For each observed tow or trip, the observer records the targeted species (more than one species can be a target on an individual tow). Observed otter trawl tows in the proposed SAP area targeted monkfish, cod, haddock, flounders (witch, plaice, yellowtail), and other groundfish. Tows that specified haddock as a target species were compared to tows that did not. In each year, the average catch of haddock was higher for tows targeting haddock, and the difference was statistically significant at an $\alpha = 0.05$. In general, the catch per tow on trips targeting haddock increased from FY 2000 through FY 2003, possibly in response to increases in stock size as well as changes in the haddock trip limits. For this analysis the average haddock catch observed in FY 2003 will be used in order to reflect the most recent conditions.

This SAP requires that vessels use a haddock separator trawl in the area. The haddock separator trawl minimizes the catch of cod through a design that considers the behavior of fish in response to the gear. Generally, haddock swim to the upper part of a net and cod swim to the lower part of the net. By

inserting a horizontal mesh panel in the net and using two extensions (see cover photograph), the catch can be effectively divided. The cod escape if the extension on the lower part of the net is left open. This net has been in use for some time by Canadian vessels fishing on Georges Bank under a quota system. Some loss of haddock catch can be expected when using this net. An experiment conducted by the Canadian Department of Fisheries and Oceans found that 88 to 96 percent of haddock was caught in the top cod end, equivalent to a loss of between four and twelve percent (DFO 1992). An experiment conducted in the Barents Sea by Norwegian researchers experienced similar results, with 89 percent of the haddock caught in the upper cod end (Engås et al. 1998). A recent experiment conducted on Georges Bank was inconclusive. Because this recent experiment encountered small amounts of haddock, it did not detect a significant difference between the top and bottom cod end for haddock (Raymond and Manomet 2004). (See section 7.4.1.1.2 for a discussion of the results of this experiment for other species).

In order to estimate the number of Category B DAS that will be used to harvest the haddock TAC in this area, the FY 2003 catch rates for observed tows targeting haddock were reduced by ten percent (1,767 lbs/tow) since experimental results suggest the separator trawl catches ninety percent of the haddock in the upper cod end. This estimate falls within the range of observed catch rates in the eastern US/CA area during six observed trips in May and June, 2004. Seven tows per day were assumed, resulting in an assumed catch rate of 12,367 lbs./day fished. Based on this catch rate, 178 days fished would be needed to harvest the 1,000 mt (2.2 million pounds) TAC for this area. These estimates were not adjusted for any increase in catch rates that may occur due to increases in stock. The total number of Category B DAS that will be used will include transit time to the area. Assuming sixty trips of three days each are taken to the area, and a total of one day in transit for each trip, the total number of Category B DAS used will be approximately 238. If the TAC is increased, roughly 90 additional days fished and 30 days in transit (120 Category B DAS) will be used to harvest each additional 500 mt.

It is theoretically possible that vessels could use Category B DAS under this SAP to catch the TAC in the SAP, and then use Category A DAS to catch additional haddock outside the area. Such a transfer of effort, if large enough, could threaten haddock mortality targets. As shown in Table 86, however, there is a large gap between recent haddock catches and the TAC for FY 2004. Catches would have to more than triple to exceed the target TAC for FY 2004. This is unlikely given the restrictions on fishing effort implemented by Amendment 13.

Year			**U.S. Catch**
2000			3,366
2001			4,637
2002			6,325
2003			5,561
Year	**A 13 Target TAC**	**CA TAC**	**U.S. TAC**
2004	24,855	9,900	14,955
2005	27,692*	15,410.	20,600
2006	31,866*	Unk.	Unk.

Table 86 – Target TACs (mt) for 2004 through 2005 and recent U.S. haddock catches

* *See text; estimated prior to TRAC 2003 and does not include impact of 2003 year class*

WGOM Closed Area Rod/Reel Haddock SAP

This SAP would allow certain limited access permit holders to fish for haddock in the WGOM Closed Area. Specific requirements are described in section 5.2.3.2. The following discussion focuses on the impacts of this proposed SAP on GOM haddock, the target stock. Impacts on two other species that may be caught – cod and pollock – are described in section 7.4.1.1.2.

The proposed measure limits the catch of GOM haddock in this SAP to 50 mt (110,231 lbs.). The Amendment 13 target TACs for this stock are compared to recent landings in Table 87. The TAC proposed for this SAP represents only one percent of the total target TAC. Recent catches of GOM haddock have been well below the Amendment 13 target TACs. In addition, Amendment 13 estimated that fishing mortality on GOM haddock would actually be reduced from that in FY 2001 by 33 to 43 percent, suggesting that catches will continue to be below the target TAC. FW 40A includes a Category B DAS pilot program that allows for an increase in fishing effort of up to 4,000 Category B (regular) DAS over four consecutive quarters. In broad terms, if all 2,000 additional DAS are used in each fishing year (FY 2004 and FY 2005) it represents an increase in effort of 5.7 percent over the midpoint estimate of 35,000 used DAS that were evaluated in Amendment 13. A rough approximation of this increase in effort is that it will result in a similar increase in fishing mortality, but the impacts for each stock depend on how the effort is distributed. Only if fishing mortality on GOM haddock tripled from that estimated to result from the measures in Amendment 13 would there be a risk of exceeding the mortality target. This is unlikely. Based on these comparisons, there does not appear to be any possibility that this SAP will increase total catches of GOM haddock to a level that will threaten rebuilding targets.

Year	Landings
FY 2000	738
FY 2001	1,238
FY 2002	752
FY 2003	1,007
	Target TAC
FY 2004	4,831
FY 2005	4,735
FY 2006	4,642

Table 87 – Recent landings of GOM haddock and Amendment 13 target TACs

The season for this SAP is March and April. These two months are identified as peak spawning periods for GOM haddock (Reid et al. (1999), summarized in NEFMC 2004). This SAP was examined for possible impacts on haddock spawning. The only impacts likely to result from rod and reel fishing is from the removal of spawning fish. Given the low haddock TAC authorized for this fishery, these impacts are negligible.

An experiment has not been conducted that would provide information on haddock catch rates in this fishery. As a result, it is not possible to estimate the number of days fished that will be necessary to harvest the haddock TAC. Catch rates by commercial handline vessels outside the area are not likely to reflect the catch rates that will be observed in the closed area. Catch rates on party/charter vessels in the area may also not be representative of commercial fishing practices.

Analysis in Amendment 13 estimated that the exploitation rate for GOM haddock would be less than one-third of the threshold exploitation rate (see Table 88). Amendment 13 also estimated the target TAC for FY 2005 as 4,735 mt and for FY 2006 as 4,642 mt. GOM haddock landings were 1,238 mt in FY 2001, 752 mt in FY 2002, and 1,006 mt in FY 2003. While FW 40A provides limited opportunities to target GOM haddock using Category B DAS, the total increase in effort is only 2,000 DAS in FY 2005 and this increase is not expected to threaten mortality objectives for GOM haddock. The haddock catch in

this SAP amounts to only one percent of the total target TAC in FY 2005 and 2005 and will have negligible influence on the overall mortality for this stock. This SAP includes requirements for observer coverage, mandatory use of VMS, and daily reporting. These requirements will result in effective monitoring of the SAP so that there will be a high degree of confidence that the TAC will not be exceeded.

Another possible impact on the target species could result if the SAP interferes with haddock spawning activity. Peak spawning months for GOM haddock are March through April, with spawning extending into May (Reid et. al. 1999). MARMAP surveys from 1978 through 1987 detected haddock eggs inshore of the WGOM closed area and in Massachusetts Bay. Ripe and running haddock have been caught in the NMFS spring trawl surveys (March through April) in vicinity of the WGOM closed area (see Figure 22), but also in other locations in the GOM. Rod and reel fishing is not expected to have any impact on spawning fish other than that caused by the removal of spawning fish. The small catches allowed in this fishery are expected to have only negligible impacts on spawning haddock.

Stock	Target Fishing Mortality	Expected Fishing Mortality
GOM Haddock (Catch/Index)	0.23	0.07
Pollock (Catch/Index)	5.88	2.27

Table 88 – Comparison of target and expected fishing mortality for GOM haddock (based on Category A DAS only)

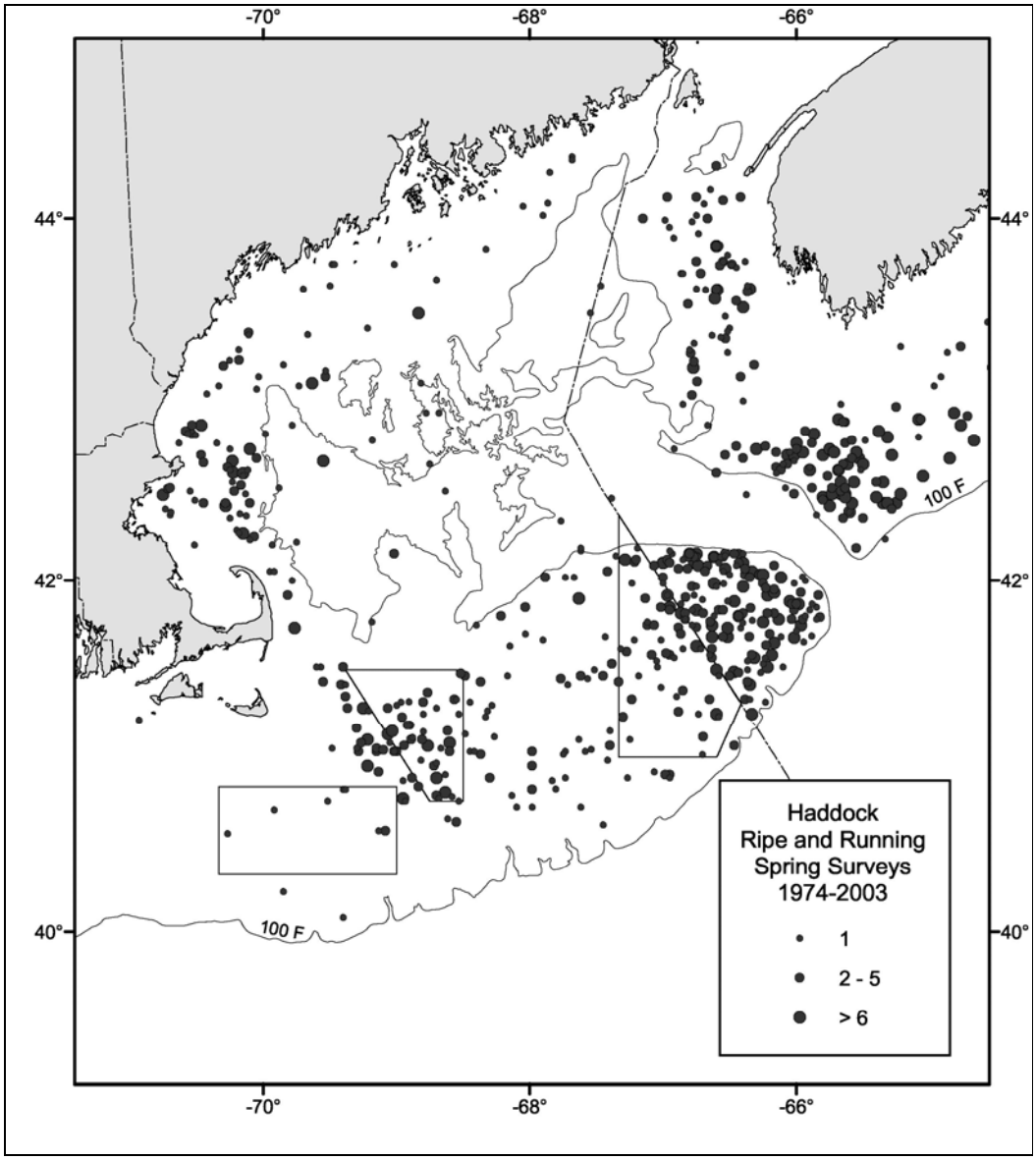


Figure 22 - Catch of ripe and running haddock in the spring trawl survey, 1974-2003

CAII Yellowtail Flounder SAP (Measure C.3)

Fishing mortality for GB yellowtail flounder is controlled through a combination of effort controls and a hard TAC, as established by Amendment 13. Catches in the SAP are applied against this hard TAC. Effective monitoring systems, including observer coverage, required VMS, and daily

reporting, have been adopted to make sure that catches are accurately documented. As long as the total catch of yellowtail flounder does not exceed the TAC, fishing mortality for this stock will meet the mortality targets of Amendment 13. The current measures allow fishing to continue in some areas with possession of yellowtail flounder prohibited. This means that if the TAC is reached early in the fishing year, discards that occur during the rest of the year could result in an overage. Any overage ids deducted from the following fishing year's TAC.

As adopted in Amendment 13, the SAP is limited to a specific number of trips, with a fixed trip limit of 30,000 lbs. The number of trips and the trip limit were established with the assumption that the total TAC for this fishery would be at least 8,000 mt. In FY 2004, however, the TAC was only 6,000 mt, but no adjustment was made in the number of trips or in the trip limit. As a result, eighty-five percent of the TAC was harvested by October 1, 2004. While the possession of yellowtail flounder was prohibited at that point, there is a risk that discards of yellowtail flounder could result in exceeding the TAC before the end of the fishing year.

This measure, if adopted, would implement a mechanism so that the number trips in the CAII Yellowtail Flounder SAP can be adjusted based on the available TAC. The number of trips would be set so that the catch in the SAP is limited to the difference between the total target TAC and an estimate of the catch (landings and discards) by groundfish and other vessels that are fishing outside of the SAP. A formula is proposed for FY 2005 that is based on recent catches of GB yellowtail flounder (see Table 89). Based on the recent average, annual catches outside the SAP could approach, but are not likely to exceed, 4,000 mt. Any available TAC over this amount could be caught in the SAP. Adopting this measure will have positive benefits on the yellowtail flounder stock because it will increase the probability that fishing will continue through the entire year and will not be concentrated in one time or season. This will make it less likely the TAC will be reached early in the fishing year and make it unlikely that discards of yellowtail flounder that may take place after that TAC is reached will result in an overage of the TAC.

This measure also changes the starting date of the SAP to July 1 (from June 1). This change will prevent the SAP from taking place during June, which is one of the months identified as a peak spawning month for yellowtail flounder on Georges Bank. This change may thus reduce any interference with spawning fish that may be caused by this SAP.

Year	Catch (mt)
2000	4,000
2001	4,300
2002	3,000
2003	3,600
Average	3,725

Table 89 – Recent U.S. catches of GB yellowtail flounder (Source: TMGC Guidance Document 2004/01)

Minimum Effective Effort Allocation (Measure D)

Some vessels did not receive any Category A or Category B DAS as a result of Amendment 13.This measure would reclassify ten Category C DAS into the same amount of Category B (reserve) DAS for those vessels. Those DAS could only be used in specific SAPs. Since the catch of target species in SAPs is controlled through the use of hard TACs or through limitations on the number of trips, an increase in the number of DAS that can be used in the SAPs does not have any direct impacts on the mortality of the target species. If more vessels choose to participate in these SAPs, it could result in the

target species TAC being caught more quickly, but as long as the catch can be accurately monitored, this change should not have any impacts on mortality of target species.

GB Cod Hook Sector Revisions (Measure E)

This measure would modify the requirements for joining the sector and the calculation of the sector share of GB cod. If adopted, the measure would allow any vessel to join the sector even if it had no history of using hook gear. In addition, all cod landing history attached to sector vessels would be used to calculate the sector's share of the GB cod TAC, regardless of the gear used to catch the cod. The sector's share of the cod TAC would still be limited to a maximum of twenty percent. Without knowing which vessels will choose to join the sector it is not possible to estimate with any confidence what the biological impacts of these changes will be.

There should not be any impacts on GB cod mortality since the calculation of the sector's share does not change the overall TAC or DAS allocations. If, however, the change increases the number of vessels in the sector to the point that the cap on the cod TAC takes effect, in theory there could be a reduction in mortality since the pool of vessels fishing on GB cod with Category A DAS would be reduced by more than the increase in the sector's share of the target TAC.

There may be impacts on the mortality of other regulated groundfish species depending on the fishing history of vessels that join the sector. Once vessels join the sector, they are required to use hook gear. While hook gear can be used to catch cod, haddock, pollock, and white hake, it is less effective at catching flatfish. If trawl or gillnet vessels with a history of catching flounders choose to enter the sector, it is unlikely that they will continue to catch the same amount of flounder as they did using other gears. This could reduce mortality on these species - in essence, the flounder history of these vessels will not longer be caught and will contribute to rebuilding.

Changes to the DAS Baseline Calculation (Measure F)

There are two options for the DAS baseline/effective effort calculation. Option 1 would leave the calculation as implemented by Amendment 13, and would have the same mortality impacts as analyzed in that action. Because of uncertainty over the number of DAS that will be used, Amendment 13 analysis examined three different assumptions on DAS use. Under all of those assumptions, the rebuilding mortality targets are expected to be met for all stocks. Amendment 13 analysis did note that at the high assumption of DAS use, mortality for GOM cod and witch flounder would have to be monitored to make sure it did not exceed the amendment targets.

Option 2 would revise the DAS baseline calculation. As shown in Table 116, this change would result in a higher level of effective effort (a higher baseline). As a result, the split between Category A and Category B DAS would be changed so that the expected use of Category A DAS that results is similar to the use expected to result from Amendment 13 allocations. Based on the allocations that resulted from Amendment 13, and a 60/40 split of Category A/Category B DAS, an 85 percent DAS use rate results in an estimate that 36,584 DAS will be used. Since the Option 2 baseline increases the number of DAS in the baseline, the Category A/Category B DAS split is changed to 55/45 in FY 2005.

On the surface, since the Category A/Category B DAS split is adjusted to give the same estimate of DAS used, it would appear the biological impacts of this measure should be similar to Option 1, or the No Action alternative. This may not be the case. As discussed in section 7.4.4.9, Option 2 results in a shift of DAS from smaller vessel to larger vessels and results in an increase in overall groundfish revenues. This projected increase in revenues reflects an increase in catch as the CPUE for larger vessels is more than for the smaller vessels. It is possible that changing the DAS baseline could result in increased groundfish catches. The exact impacts on fishing mortality cannot be predicted, since it is not clear what

stocks will be targeted by these vessels. If, for example, all of the increased catches come from healthy GB haddock stocks, then the change may result in lower fishing mortality for GOM stocks. The other possibility is that the increased catches will come from stock in poor condition, and the change in the baseline will increase fishing mortality on stocks of concern. The adoption of Option 2 creates additional uncertainty about the biological impacts of the management program.

7.4.1.1.2 Incidental Catch Stocks

Changes to the DAS Leasing and Transfer Conservation Tax

This measure does not have different impacts on regulated groundfish species based on whether the species are targeted or caught incidental to fishing for other species. All impacts on regulated groundfish are described in section 7.4.1.1.1.

DAS Transfer Program Modifications (Measure A.2)

This measure does not have different impacts on regulated groundfish species based on whether the species are targeted or caught incidental to fishing for other species. All impacts on regulated groundfish are described in section 7.4.1.1.1.

Incidental Catch TACs (Measure B)

FW 40A adopted Incidental Catch TACs that limit the catch of stocks of concern while vessels are using a Category B DAS. These TACs apply to all Category B DAS use. The TACs were specified for FY 2004, 2005 and 2006 for the following stocks: GOM cod, GB cod, CC/GOM yellowtail flounder, plaice, white hake, SNE/MA yellowtail flounder, SNE/MA winter flounder, and witch flounder. The TACs were set at low percentages of the target TACs of those stocks after considering the expected impacts of Amendment 13 and catches or landings in FY 2002 and 2003. The incidental catch TAC for each stock was then allocated to specific programs that may catch that stock, as appropriate.

This measure does not change the total incidental catch TACs that were developed and analyzed in FW 40A and thus does not increase mortality beyond what was assessed in FW 40A. This measure does change the allocations to specific programs since this action would add two new SAPs. It also proposes to allocate a percentage of the GB cod incidental catch TAC as a research set-aside. Since the overall catch of stocks of concern while using Category B DAS will not change under this measure, it is not expected to have any impacts on fishing mortality for those stocks. As shown in FW 40A, for four stocks (GOM cod, GB cod, CC/GOM yellowtail flounder, and white hake) there is a risk that these TACs may result in a small increase in fishing mortality. This may require adjustments in the management program for FY 2006 or FY 2009.

The incidental catch TACs are based on target TACs that were prepared during the development of Amendment 13. While there have not been any new assessments of groundfish stocks of concern since Amendment 13 was submitted, as part of the U.S./CA Resource Sharing Understanding an assessment of eastern GB cod was performed by the TRAC in June, 2004. The assessment documented a 2.7 percent decline in adult biomass between calendar year 2003 and 2004, from 14,300 mt to 13,900 mt. In contrast, the Amendment 13 projections predicted continued growth for the GB cod stock as a whole. Short-term projections performed at the TRAC estimated that eastern GB cod has a greater than median probability of a continued decline in 2005 if the 1,300 mt TAC established by the TMGC for 2004 and the 1,000 mt TAC for 2005 are harvested. If the status of the entire GB cod stock mirrors that of this portion of the stock, the analysis in FW 40A may under-estimate the impacts of the incidental catch TAC for GB cod. At present, it is not possible to determine the magnitude of the increased risk should this be the case. As of November 2004, U.S. cod catches in the area were estimated to be less than 20 percent of the TAC for

the fishing year and it is not certain the assumption of the TRAC that the entire TAC will be caught is accurate.

As noted, the measure would allocate a portion of the GB cod incidental catch TAC for research. In theory, this set-aside will allow gear experiments to take place by vessels that may catch cod without requiring those vessels to use a Category A DAS. It is not clear, however, how research experiments will account for the mortality of other species. While this measure will not have any direct impacts on GB cod, it may facilitate development of selective fishing practices that will reduce cod mortality in the future.

Haddock Fishery North of CAI SAP (Measure C.1)

An experiment has not been conducted that estimates the incidental catch species that will be taken during the Haddock Fishery North of CAI SAP. As a result, this analysis uses recent observer reports from the area and the results of several gear experiments to evaluate the impacts of this SAP on incidental catch species.

Observed otter trawl tows in the proposed SAP area during FY 2000 through 2003, December through April, were examined. A summary of the number of tows observed is in Table 85, while catches of the top twenty-five species encountered are shown in Table 90. Rather than show the catches for all observed tows, the information shown in this table is for tows where haddock was specifically listed as one of the target species. An exploratory data analysis showed that this criterion does not result in a statistically significant difference in catch/tow for all species and all years. Since the choice of target species (haddock) may influence behavior, and in order to use a consistent set of data for all species, the subsequent analysis uses the data from tows that listed haddock as a target species even though for some species the choice of target species did not result in a statistically significant difference in catch rates on the observed tows. Over the four years examined, haddock accounted for seventy percent of the total catch on these tows. Cod accounted for the largest percentage of other regulated groundfish catch (six percent) followed by small amounts of pollock, plaice, witch flounder, and ocean pout. Monkfish, spiny dogfish, and skates (various species) accounted for the bulk of the catch of other species and will be discussed in later sections.

Since cod is the only regulated groundfish stock of concern caught in any quantity, the proposed SAP is allocated a portion of the GB cod incidental catch TAC. The observed trips were examined further to determine catch rates of cod and to estimate the number of days that may be fished before the cod TAC is caught. Table 91 summarizes the observations, which are remarkable for the consistent average catch/tow. In the following analysis, the assumed cod catch rate is 117 lbs./tow based on the observations in FY 2002 and 2003.

Before estimating total cod catch that could be expected in this SAP, the impacts of the haddock separator trawl requirement must be considered. The haddock separator trawl minimizes the catch of cod through a design that considers the behavior of fish in response to the gear. Generally, haddock swim to the upper part of a net and cod swim to the lower part of the net. By inserting a mesh panel in the net, and using two cod ends, the catch can be effectively divided. If the cod end on the lower part of the net is left open, the cod escape. This net has been in use for some time by Canadian vessels fishing on Georges Bank under a quota system. With low cod quotas, Canadian vessels have had to develop ways to minimize cod catch in order to take advantage of higher haddock quotas. A Canadian DFO project studied the effectiveness of a haddock separator trawl while conducting over 150 tows in 1990 and 1991. These experiments showed about 60% of the cod caught in the bottom of the trawl, with a range from 75 percent to 40 percent. Additional data was collected on pollock, silver hake, plaice, yellowtail, winter flounder, halibut, and mackerel. Nearly all pollock was caught in the top cod end, silver hake was split evenly between the two, and most flounders were caught in the bottom cod end. The report also notes that skates and sculpins were caught almost entirely in the bottom cod end and were nearly completely absent in the

top cod end, though data were not reported on numbers and weights of these two species (DFO 1992). Engås et al. (1998) conducted experiments in Norwegian trawl fisheries using a separator panel and found similar results. 90 percent of the haddock were caught in the upper cod end, and between 60 and 70 percent of the cod were caught in the lower cod end. Engås et al. also noted some shifts in size selectivity, and commented that the height of the separator panel was critical and the optimum height may differ from area to area. One Canadian fleet owner recently reported that when effectively tuned, the net caught 95 percent of the cod in the lower cod end (which would be released with an open cod end) (d'Entremont, per. comm. 2002). An additional experiment was conducted on Georges Bank and in the Gulf of Maine in 2003 (Raymond and Manomet 2004). In this experiment, 21 percent of the cod caught (by weight) were caught in the top cod end, with the remainder in the bottom cod end. While some differences were noted between the performance of the net for large and small vessels, the experiment concluded that the net could be effective in reducing cod catches. In addition, nearly all plaice, white hake, and witch flounder was caught in the bottom cod end in this experiment, suggesting that the trawl will nearly eliminate catches of these species while using the net to target haddock. Finally, the Council was provided raw observer data from Canadian vessels fishing on Georges Bank (under 65 ft. vessels, ITQ fishery) in 2003. For vessels using a haddock separator trawl, the average cod catch per hour was 49.6 lbs., while the average haddock catch was 389 lbs., a haddock to cod ratio of 7.8 to 1 (Giroux, pers. comm. 2004).

Based on the results of these experiments, catch rates of cod by vessels in the SAP that are using a haddock separator trawl should be reduced by at least sixty to eighty percent compared to those observed in 2003. Additional reductions may be realized as vessel operators hone their use of the net, as has reportedly occurred with Canadian vessels. For trips targeting haddock, the estimated catch rate is between 23 and 49 lbs./tow after reducing observed catch rates for the effects of the separator trawl. On six observed trips to the eastern U.S./Canada area in May and June 2004, the average cod catch on the observed trips ranged from 15 to 95 pounds per tow with an overall average of 37 lbs./tow (Hermsen, pers. comm. 2004), so the estimated catch rate is similar to the recently observed catch rates. If seven tows per day are assumed, the catch of cod per day in both statistical areas would range from 161 lbs./day to 343 lbs./day. The Council is proposing a GB cod incidental catch TAC for this SAP of 7 mt (15,432 lbs.) in FY 2005 and 9.1 mt (20,062 lbs.) (see section 5.2.2). If the catch rates estimated are applied to these TACs, the number of days fished before the cod TAC is reached ranges from 45 to 125 (see Table 92 below) in fishing years 2004 and 2005. It is likely that participation in this SAP will be constrained by the incidental catch of cod rather than the haddock TAC given the analysis of haddock catch rates in a previous section (see section 7.4.1.1.1), and the total number of Category B DAS used in the program will be less than estimated in that section.

The proposed SAP adopts a cod landing limit of 100 lbs./DAS not to exceed a maximum of 1,000 lbs. per trip. Based on the observed trips in this area in FY 2002 and 2003, and the assumed performance of the haddock separator trawl based on experimental results, vessels may reach the overall cod trip limit in three to six days, and may exceed the daily limit. Even with an improvement in performance of the separator trawl, it is likely that this SAP will result in an increase in the cod discard-to-kept ratio compared to that observed in 2003 on Georges Bank (Table 93) for trips in this area that are longer than three days.

As noted, small quantities of plaice, witch flounder, yellowtail flounder, white hake, ocean pout, and pollock were also caught. With the exception of pollock, these stocks re subject to rebuilding plans or are experiencing overfishing and are stocks of concern. An experiment was conducted on Georges Bank and in the Gulf of Maine in 2003 (Raymond and Manomet 2004) to test the haddock separator trawl. In this experiment, nearly all plaice, white hake, and witch flounder was caught in the bottom cod end, suggesting that the trawl will nearly eliminate catches of these species while using the net to target haddock.

Because the likely constraint on the number of days fishing in this SAP will be the cod incidental catch, adequate monitoring of the cod catch (landings and discards) is crucial. The proposed measures include requirements for daily reporting of cod and haddock catches via VMS, helping NMFS to monitor progress to catching the respective TACs. In addition, there is a requirement for sufficient observer coverage to ensure the objectives of the SAP are met. An experiment has not been conducted that would provide data to estimate the level of precision that will result from this observer coverage (as was done for the CAI hook gear SAP). In the absence of an experiment, observed trawl trips on all of Georges Bank in 2003 were examined. The discard-to-kept ratios for cod were broken down by quarter (Table 93). The results were used to calculate the level of precision that will result from different numbers of observed trips (Figure 23).

The proposed season for this SAP is for December through April. The difference between the No Action alternative and this SAP is that a small amount of additional fishing effort using Category B DAS will be allowed in a narrow strip north of CAI. Given the limited effort, and the fact that fishing is already allowed in this area, there are not expected to be any significant impacts on groundfish spawning.

For decades, the closed areas on Georges Bank have been recognized as important to groundfish spawning, particularly for cod, haddock, and yellowtail flounder. The two areas were first established as seasonal spawning closures under ICNAF. They continued to be used as spawning closures – primarily to protect cod and haddock - under the groundfish plan until they became year round closed areas in 1994. Prior to their establishment as year round closed areas, however, scallop dredge fishing was allowed in the seasonal spawning closures. Closed area access programs since 1997 limited scallop dredge access to periods outside of peak spawning periods, and a similar restriction was recently submitted by the Council in Scallop Framework Adjustment 16. This proposed SAP does not allow any increased fishing activity in CAI and thus does not weaken the spawning protection provided by that closure.

	Fishing Year					
	2000 (1)	2001	2002	2003	Total	Percent of Total
ANGLER	10,490	456	13,117	3,199	27,262	5.8%
COD	7,912	758	11,674	8,281	28,625	6.1%
CRAB, JONAH	271	5	83	114	473	0.1%
DOGFISH SPINY	2,859	1,511	1,756	127	6,253	1.3%
FLOUNDER, AM. PLAICE	1,956	146	1,123	372	3,597	0.8%
FLOUNDER, WITCH	1,697	172	2,342	1,056	5,267	1.1%
FLOUNDER, YELLOWTAIL	172	0	105	61	338	0.1%
HADDOCK	72,338	4,936	115,130	139,339	331,742	70.5%
HAKE, RED	20	8	114	147	289	0.1%
HAKE, SILVER	241	12	265	42	560	0.1%
HAKE, WHITE	241	283	660	18	1,202	0.3%
LOBSTER	237	60	1,674	591	2,562	0.5%
POLLOCK	1,020	98	2,001	3,835	6,954	1.5%
POUT, OCEAN	345	6	391	27	769	0.2%
REDFISH	42	396	1,058	836	2,332	0.5%
SEA RAVEN	306	4	244	144	698	0.1%
SKATE, BARNDOOR	15	0	318	1	334	0.1%
SKATE, LITTLE	1,561	0	2,009	3,521	7,091	1.5%
SKATE, ROSETTE	0	0	531	0	531	0.1%
SKATE, THORNY	740	0	2,158	470	3,368	0.7%
SKATE, WINTER(BIG)	7,509	0	8,007	2,837	18,353	3.9%
SKATES	184	148	9,449	398	10,179	2.2%
STARFISH	34	0	117	69	220	0.0%
WOLFFISHES	377	47	71	86	581	0.1%
(blank)	5,169	14	3,452	566	9,200	2.0%
Total, twenty-five species	115,735	9,060	177,848	166,135	468,778	99.6%
Total, all species					470,743	

Table 90 – Weight (lbs. round weight) of species caught during observed tows targeting haddock in proposed SAP area, December through April (Source: NMFS OBDBS)

(1) January through April

	FY 2000	*FY 2001*	*FY 2002*	*FY 2003*
Mean (lbs.)	118	69	117	117
Median (lbs.)	100	71	57	43
Minimum (lbs.)	0	30	0	0
Maximum (lbs.)	500	130	1,035	2,000
Count	67	11	100	71

Table 91 – Summary of cod catch on observed tows targeting haddock (NMFS OBDBS)

Haddock Fishery North of CAI SAP	**Assumed Cod Catch Rates**	
2004 GB Cod TAC	**161 lbs./day**	**343 lbs./day**
7 mt	96 days	45 days
2005 GB Cod TAC		
9.1 mt	125 days	58.4 days

Table 92 – Estimated fishing days before GB cod incidental catch TAC is caught using two different assumed catch rates, FY 2005 and FY 2006

GEAR	NEGEAR	QTR	NTOWS	NTRIPS	DK RATIO	SE	CV	AVGTRIPLEN
Otter Trawl	050	1	870	44	0.022276	0.005249	0.23563	7.79545
Otter Trawl	050	2	1007	51	0.057103	0.022352	0.39144	7.56863
Otter Trawl	050	3	629	36	0.021859	0.007097	0.32467	7.41667
Otter Trawl	050	4	620	35	0.042271	0.011776	0.27858	7.34286

Table 93 - 2003 Discard/Kept ratios of Cod from Georges Bank otter trawl (050) trips by quarter

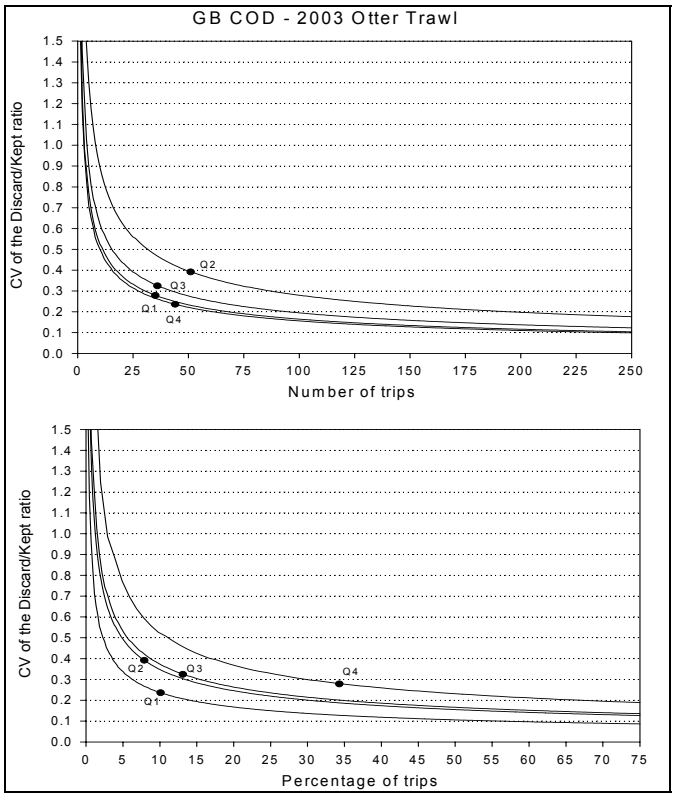


Figure 23 – CV resulting from a given number of observed trips, based on discard/kept ratio for cod as observed in 2003

WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

As noted in a previous section, an experiment has not been conducted in this SAP that would provide information on the catch of regulated groundfish. In the absence of an experiment, party/charter VTRs were examined to determine the likely catches of species other than haddock. While these are the only data available for rod/reel catches in the WGOM closed area, they are of limited use in evaluating the proposed WGOM Closed Area Rod/Reel Haddock SAP. They are trip level data, so it is not possible to determine if cod and haddock are caught in different locations. More importantly, party/charter vessels target cod and so these data might not accurately indicate catches if haddock is the target species. Finally, seasonal differences may be masked by changes in regulations during this period.

Party/charter logbooks (Vessel Trip Reports, VTRs) were queried for trips that landed regulated groundfish in fishing years 2001, 2002, and part of 2003 (logbook data is only available for May through November). Trips to the WGOM closed area were selected by plotting the latitude and longitude of the trip as reported in the logbooks. The regulated groundfish catch on these trips is summarized in Table 94. For all trips that reported catching haddock, a cod/haddock ratio was calculated using the number of fish caught. The mean ratio per trip and the distribution of ratios were calculated for each month. Results of these analyses are presented in Table 95 through Table 100 and are summarized below. Since pollock is another healthy stock that could be targeted by vessels participating in this SAP, a similar analysis was performed for trips that landed pollock. These data are presented in Table 101 through Table 106.

Interpretation of these data is confounded by the changes in party/charter regulations that occurred in FY 2002 and FY 2003. The major changes that applied to party/charter vessels fishing in the Gulf of Maine are summarized below:

FY 2001: Cod/haddock minimum size of 21 inches, no bag limit

FY 2002: *June 1*: Cod minimum size of 23 inches; bag limit of 10 cod or haddock, combined, per person per trip
August 1: Cod and haddock minimum size of 23 inches; April-November bag limit of 10 cod or haddock, combined, per person per trip; December – March bag limit of 10 cod or haddock, combined, with a maximum of 5 cod, per person per trip

FY 2003: *August 1*: Haddock minimum size of 21 inches; April-November bag limit of 10 cod or haddock, combined, per person per trip; December – March bag limit of 10 cod or haddock, combined, with a maximum of 5 cod, per person per trip

Party/Charter Groundfish Catch

Table 94 shows the number of trips and reported catch or regulated groundfish, in numbers, for party charter trips that listed fishing locations in the WGOM closed area during FY 2001, 2002, and 2003. Cod, haddock, and pollock accounted for most of the catch in all three years, though smaller amounts of redfish, white hake, and winter flounder (FY 2001 only) were also reported. While the cod catch was more than three times the haddock catch in FY 2001, haddock catches increased in subsequent years. Haddock catches were more than half the cod catch in FY 2002 and in FY 2003 (May through November) were eighty-two percent of the cod catch. Similarly, the number of pollock caught was 18.9 percent of the cod catch in FY 2001 but increased to 56 percent of the cod catch in FY 2003.

Cod/Haddock Ratios

The data show that most party/charter trips that catch haddock also catch cod. The cod/haddock ratios were highest in FY 2001 and declined in FY 2002 and FY 2003. It was a rare event when a party/charter trip caught haddock but did not catch cod as this occurred on only eight trips during the two and a half year period examined. In FY 2001, eighty-nine percent of the trips caught more cod than

haddock. This percentage declined to seventy-four percent of the trips in FY 2002 and sixty-seven percent of the trips in FY 2003 (May through November only).

For trips that reported catching haddock, the mean monthly ratio of cod/haddock was less than one only in October 2003 (0.99). In FY 2001 and FY 2002, the ratios declined in the fall. They also declined in August, September, and October 2003, possibly in response to the reduction in the minimum haddock size for recreational fishermen. The peak months were usually the summer months of June, July, and August, though in FY 2001 the peak month was March. Trips caught from two to almost five times as much cod as haddock in May.

Cod/Pollock Ratios

The data show that most party/charter trips to the WGOM closed area that caught pollock also caught cod. The cod/pollock ratios were highest in FY 2001 and then declined in FY 2002 and 2003. It was a rare event when a trip that caught pollock did not catch cod, as this only occurred nine times during this period. In FY 2001, 85 percent of the trips caught more cod than pollock. The percentage of trips that caught more cod than pollock declined to 71 percent in FY 2002 and 66 percent in FY 2003 (May through November).

For trips that reported catching pollock, the mean monthly ratio of cod/pollock was never less than one. The ratios appear higher in the winter and spring and lower in the late summer and early fall.

Conclusions

The main regulated groundfish catch on party/charter trips to the WGOM closed area was cod, haddock, and pollock during FY 2001, 2002 and 2003. Party/charter trips in this area caught only small amounts of redfish, white hake, and winter flounder.

Data reported by party/charter vessels that fished in the WGOM closed area during FY 2001, 2002, and 2003 (May through November only) shows that party/charter trips that catch haddock and pollock also catch cod. With only two exceptions, the mean of the ratio of cod to haddock or pollock is greater than one, showing that more cod is caught than haddock or pollock. It is unusual for party/charter trips to this area to not catch any cod at all. It is difficult to draw conclusions about seasonal differences because of the changes in party/charter regulations that were implemented in FY 2002 and FY 2003.

As discussed at the beginning of this section, these data may not be indicative of the catches that will result if commercial vessels target haddock in the WGOM closed area. In order to minimize the risk that catches of cod in this proposed SAP will threaten the mortality objectives of Amendment 13, cod catches (landings and discard) are constrained to a low incidental catch TAC. This TAC is part of the overall incidental catch TAC for GOM cod. As analyzed in FW 40A, this low TAC makes it unlikely that, in the short term, catches of cod on Category B DAS programs will threaten Amendment 13 mortality objectives. In order to ensure adequate monitoring of this SAP, the proposed measure includes requirements to use a VMS, report catches through VMS on a daily basis, and for trips to be subject to sufficient observer coverage to adequately monitor catches. In addition, the proposed action requires the use of circle hooks and does not allow the use of jigs. Any cod caught on baited circle hooks, if handled carefully, are believed to be more likely to survive than if caught on jigs.

VTRs for commercial handline trips in the GOM during FY 2002 were also examined for evidence of the ability to selectively target haddock. These data suffer from two limitations. First, no trips took place in the WGOM closed area and second, vessels may have been targeting cod. There were 643 trips that landed either cod or haddock, but only 48 trips that landed haddock. Of these 48 trips, the average ratio of the weight of cod to the weight of haddock was 8.8:1. Only ten percent of the trips had a ratio of 1:1 or less. These data show that handline vessels fishing outside the closed area in FY 2002 did

not have many trips that caught more haddock than cod. As mentioned, however, this may be of little use in evaluating the proposed SAP since the location and targeting behavior will be different in the SAP.

FY 2001	**May**	**June**	**July**	**August**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**March**	**April**	**Total**
Trips	161	230	208	238	168	68	12	Cannot report due to insufficient number of trips			37	113	1258
COD	12533	19107	18652	18250	9170	4346	1118				3157	10040	98603
HADDOCK	5386	5472	4360	5119	2780	1913	499				495	4207	30275
POLLOCK	645	1685	3156	6317	4211	1621	342				37	688	18704
REDFISH	83	83	118	262	38	20	0				63	51	718
WHITE_HAKE	0	3	19	139	144	51	0				0	0	356
PLAICE	0	0	0	0	0	0	0				0	0	0
WINTER	0	0	0	19	42	6	0				0	0	67
WINDOWPANE	0	0	0	0	0	0	0				0	0	0
WITCH	0	0	0	0	0	0	0				0	0	0
YELLOWTAIL	0	0	0	0	0	0	0				0	0	0
FY 2002													
Trips	166	191	225	164	163	28	No trips reported				4	34	975
COD	10156	8594	11247	5891	5947	1020					226	1981	45062
HADDOCK	5864	4640	5445	2671	2489	737					26	1592	23464
POLLOCK	3220	2491	6206	6520	4673	1475					0	228	24813
REDFISH	299	223	254	204	215	40					0	2	1237
WHITE_HAKE	0	0	6	14	43	0					0	0	63
PLAICE	0	0	0	0	0	0					0	0	0
WINTER	0	0	0	0	0	0					0	0	0
WITCH	0	0	0	0	0	0					0	0	0
WINDOWPANE	0	0	0	0	0	0					0	0	0
YELLOWTAIL	0	0	0	0	0	0					0	0	0
FY 2003													
Trips	94	128	151	190	74	19	Cannot Report						658
COD	4527	5923	5974	5843	2853	1044							26254
HADDOCK	3276	2652	3316	5173	5941	1069							21657
POLLOCK	824	1202	3729	7167	1111	607							14750
REDFISH	51	185	109	201	137	150							863
WHITE_HAKE	0	1	27	154	96	42							330
PLAICE	0	0	0	0	0	0							0
WINDOWPANE	0	0	0	0	0	0							0
WINTER	0	0	0	0	0	0							0
WITCH	0	0	0	0	0	0							0
YELLOWTAIL	0	0	0	0	0	0							0

Table 94 – Catch (numbers) of regulated groundfish on trips to the WGOM closed area as reported by party/charter vessels (Source: VTRs)

	May	*June*	*July*	*August*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*March*	*April*
Mean	4.73	8.36	7.64	8.17	5.86	4.86	2.73	Cannot report due to insufficient number of trips.			8.81	5.37
Standard Error	0.81	0.99	0.69	0.93	0.87	1.12	0.70				1.60	0.90
Median	2.17	3.65	4.00	4.00	2.75	2.13	2.00				6.70	2.00
Mode	1.50	4.00	2.00	1.67	2.00	1.38	1.00				10.00	2.00
Standard Deviation	9.73	14.11	9.40	13.37	9.56	8.78	2.31				7.84	8.26
Sample Variance	94.66	199.16	88.37	178.78	91.31	77.04	5.33				61.41	68.21
Minimum	0.00	0.00	0.00	0.40	0.60	0.38	0.50				0.58	0.09
Maximum	97.50	125.00	57.00	125.00	77.00	60.00	8.00				35.00	50.00
Haddock Trips	143	202	183	205	120	61	11				24	85
Total Trips	161	230	208	238	168	68	12				37	113

Table 95 – FY –2001: Descriptive statistics for cod/haddock ratio on party/charter trips to the WGOM closed area that reported catching haddock

	May		June		July		Aug.		Sept.		Oct.		Nov.		March		April		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	1	1%	1	0%	1	1%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	0%
0.2	5	4%	0	0%	0	1%	0	0%	0	0%	0	0%	0	0%	0	0%	2	2%	2	0%
0.4	1	5%	1	1%	1	1%	1	0%	0	0%	1	2%	0	0%	0	0%	3	6%	7	1%
0.6	7	10%	3	2%	5	4%	4	2%	1	1%	0	2%	1	9%	1	4%	6	13%	21	4%
0.8	8	15%	6	5%	4	6%	8	6%	3	3%	4	8%	1	18%	0	4%	7	21%	33	7%
1	8	21%	5	8%	6	9%	9	11%	6	8%	2	11%	2	36%	0	4%	2	24%	32	11%
2	39	48%	37	26%	32	27%	40	30%	35	38%	22	48%	2	55%	2	13%	25	53%	195	33%
4	34	72%	61	56%	45	51%	41	50%	32	64%	14	70%	2	73%	3	25%	12	67%	210	56%
8	22	87%	38	75%	39	73%	49	74%	25	85%	11	89%	3	100%	9	63%	11	80%	187	77%
More	18	100%	50	100%	50	100%	53	100%	18	100%	7	100%	0	100%	9	100%	17	100%	207	100%

Table 96 – FY 2001: Distribution of reported cod/haddock ratios for party/charter trips to the WGOM closed area that reported catching haddock

	May	June	July	August	September	October	March	April
Mean	3.60	2.98	5.06	4.05	3.32	1.56	8.57	2.71
Standard Error	0.62	0.36	0.57	0.52	0.32	0.25	2.15	0.81
Median	1.38	1.75	2.29	2.00	2.00	1.30	10.00	1.25
Mode	1.00	0.67	2.50	2.00	2.50	1.00	10.00	0.63
Standard Deviation	7.17	4.68	8.12	6.32	3.71	1.28	4.30	4.60
Sample Variance	51.43	21.90	65.95	39.98	13.78	1.65	18.45	21.13
Minimum	0.00	0.00	0.13	0.15	0.20	0.43	2.29	0.13
Maximum	58.00	49.00	59.00	35.00	24.00	7.00	12.00	25.00
Haddock Trips	132	173	204	150	138	26	4	32
Total Trips	166	191	225	164	163	28	4	34

Table 97 – FY –2002: Descriptive statistics for cod/haddock ratio on party/charter trips to the WGOM closed area that reported catching haddock

	May		June		July		August		September		October		March		April		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	2	2%	2	1%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	4	0%
0.2	7	7%	3	3%	2	1%	1	1%	0	0%	0	0%	0	0%	1	3%	14	2%
0.4	7	12%	5	6%	3	2%	2	2%	1	1%	0	0%	0	0%	2	9%	20	4%
0.6	5	16%	13	13%	8	6%	3	4%	5	4%	3	12%	0	0%	1	13%	38	9%
0.8	12	25%	15	22%	10	11%	6	8%	6	9%	2	19%	0	0%	7	34%	58	16%
1	16	37%	9	27%	13	18%	15	18%	15	20%	5	38%	0	0%	2	41%	75	24%
2	34	63%	53	58%	59	47%	59	57%	43	51%	12	85%	0	0%	9	69%	269	56%
4	25	82%	46	84%	54	73%	38	83%	39	79%	3	96%	1	25%	7	91%	213	80%
8	14	92%	16	94%	23	84%	9	89%	19	93%	1	100%	0	25%	0	91%	82	90%
More	10	100%	11	100%	32	100%	17	100%	10	100%	0	100%	3	100%	3	100%	86	100%

Table 98 – FY 2002: Distribution of reported cod/haddock ratios for party/charter trips to the WGOM closed area that reported catching haddock

	May	June	July	August	September	October	November
Mean	2.77	3.98	3.95	1.95	1.66	0.99	Cannot report due to insufficient number of trips.
Standard Error	0.39	0.48	0.55	0.23	0.40	0.21	
Median	1.73	2.11	1.69	1.18	1.00	0.75	
Mode	1.00	1.50	1.50	1.00	1.50	0.78	
Standard Deviation	3.72	5.33	6.39	2.90	3.20	0.91	
Sample Variance	13.84	28.44	40.83	8.41	10.24	0.83	
Minimum	0.13	0.19	0.25	0.19	0.00	0.00	
Maximum	28.00	31.00	44.00	23.00	24.00	4.00	
Haddock Trips	90	122	137	159	65	19	
Total Trips	94	128	151	190	74	19	

Table 99 – FY –2003: Descriptive statistics for cod/haddock ratio on party/charter trips to the WGOM closed area that reported catching haddock

	May		June		July		August		September		October		November		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	0	0%	0	0%	0	0%	0	0%	1	2%	1	5%	Cannot report due to insufficient number of trips.		2	0%
0.2	2	2%	1	1%	0	0%	1	1%	1	3%	1	11%			6	1%
0.4	5	8%	2	2%	4	3%	13	9%	6	12%	2	21%			33	7%
0.6	3	11%	4	6%	11	11%	13	17%	7	23%	2	32%			41	14%
0.8	8	20%	7	11%	8	17%	21	30%	8	35%	6	63%			58	24%
1	8	29%	6	16%	11	25%	19	42%	12	54%	1	68%			57	33%
2	31	63%	39	48%	44	57%	59	79%	22	88%	4	89%			199	67%
4	19	84%	31	74%	27	77%	17	90%	5	95%	2	100%			101	84%
8	7	92%	18	89%	16	88%	12	97%	1	97%	0	100%			54	93%
More	7	100%	14	100%	16	100%	4	100%	2	100%	0	100%			43	100%

Table 100 – FY 2003: Distribution of reported cod/haddock ratios for party/charter trips to the WGOM closed area that reported catching haddock

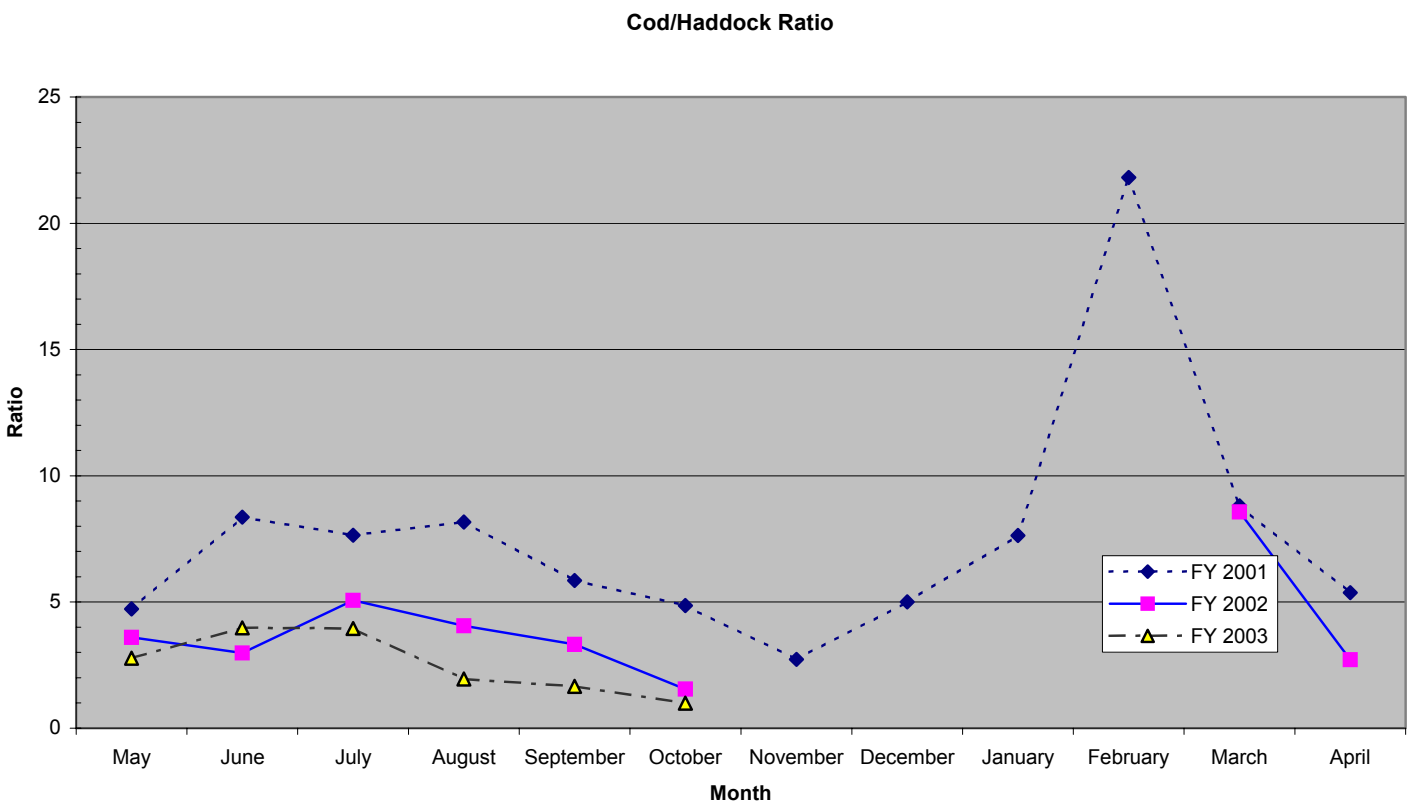


Figure 24 - Ratio of cod/haddock on party/charter trips to the WGOM Closed Area that caught haddock

	May	*June*	*July*	*August*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*March*	*April*
Mean	16.50	16.48	8.75	7.63	4.69	6.11	3.24	15.00	23.42	15.23
Standard Error	2.42	2.14	1.19	1.12	0.52	1.09	1.01	0.00	7.06	3.48
Median	10.00	7.50	4.75	2.88	2.47	2.44	1.67	15.00	18.25	6.67
Mode	10.00	10.00	6.67	2.00	6.00	5.00	#N/A	#N/A	#N/A	5.00
Standard Deviation	19.20	23.34	13.60	14.72	6.08	8.48	3.03	#DIV/0!	17.30	21.74
Sample Variance	368.76	544.57	185.04	216.57	36.95	71.99	9.15	#DIV/0!	299.44	472.66
Minimum	0.00	0.00	0.00	0.13	0.19	0.20	0.60	15.00	2.00	0.33
Maximum	75.00	166.00	105.00	150.00	50.00	39.00	9.35	15.00	52.00	87.50
Count	63	119	130	172	136	61	9	1	6	39

Table 101 – FY 2001: Descriptive statistics for cod/pollock ratio on party/charter trips to the WGOM closed area

that reported catching pollock

	May		June		July		August		Sept.		Oct.		Nov.		March		April		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	1	2%	2	2%	3	2%	0	0%	0	0%	0	0%	0	0%	0	0%	0	.00%	6	1%
0.2	0	2%	0	2%	1	3%	6	3%	1	1%	0	0%	0	0%	0	0%	0	.00%	8	2%
0.4	0	2%	0	2%	1	4%	7	8%	6	5%	2	3%	0	0%	0	0%	1	3%	17	4%
0.6	0	2%	1	3%	2	5%	5	10%	12	14%	2	7%	1	11%	0	0%	0	3%	23	7%
0.8	2	5%	0	3%	3	8%	10	16%	10	21%	5	15%	1	22%	0	0%	0	3%	31	12%
1	0	5%	2	4%	6	12%	8	21%	1	22%	3	20%	1	33%	0	0%	1	5%	22	15%
2	3	10%	14	16%	22	29%	31	39%	29	43%	18	49%	2	56%	1	17%	6	221%	126	32%
4	10	25%	22	34%	25	48%	30	56%	30	65%	6	59%	1	67%	0	17%	5	33%	129	49%
8	8	38%	20	51%	25	68%	33	76%	22	82%	11	77%	2	89%	0	17%	10	59%	131	67%
More	39	100%	58	100%	42	100%	42	100%	25	100%	14	100%	1	100%	5	100%	16	100.00%	243	100%

Table 102 – FY 2001: Distribution of reported cod/pollock ratios for party/charter trips to the WGOM closed area that reported catching pollock

	April	May	June	July	August	Sept.	Oct.
Mean	7.85	5.27	8.24	4.75	3.64	5.43	1.93
Standard Error	4.74	0.78	0.99	0.60	0.65	0.80	0.52
Median	2.88	2.67	3.50	2.28	1.33	1.58	0.88
Mode	#N/A	2.00	3.00	2.00	2.00	15.00	#N/A
Standard Deviation	14.97	7.27	9.47	7.33	7.31	8.88	2.59
Sample Variance	224.24	52.91	89.62	53.71	53.41	78.79	6.71
Minimum	0.72	0.29	0.15	0.07	0.05	0.01	0.08
Maximum	50.00	43.00	41.00	50.00	52.00	56.00	10.50
Sum	78.51	458.86	757.90	702.72	466.55	662.20	48.30
Count	10	87	92	148	128	122	25

Table 103 – FY 2002: Descriptive statistics for cod/pollock ratio on party/charter trips to the WGOM closed area that reported catching pollock

	May		June		July		August		Sept.		Oct.		April		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
0.2	0	0%	3	3%	8	5%	14	11%	11	9%	6	24%	0	0%	42	7%
0.4	1	1%	2	5%	5	9%	14	22%	11	18%	4	40%	0	0%	37	13%
0.6	2	3%	1	7%	9	15%	9	29%	11	27%	1	44%	0	0%	33	18%
0.8	5	9%	4	11%	6	19%	12	38%	11	36%	1	48%	1	10%	40	25%
1	0	9%	1	12%	10	26%	7	44%	4	39%	2	56%	0	10%	24	29%
2	26	39%	12	25%	33	48%	27	65%	17	53%	3	68%	3	40%	121	49%
4	25	68%	28	55%	34	71%	16	77%	17	67%	4	84%	3	70%	127	69%
8	13	83%	10	66%	17	82%	18	91%	17	81%	3	96%	1	80%	79	82%
More	15	100%	31	100%	26	100%	11	100%	23	100%	1	100%	2	100%	109	100%

Table 104 – FY 2002: Distribution of reported cod/pollock ratios for party/charter trips to the WGOM closed area that reported catching pollock

	May	June	July	August	Sept.	Oct.	Nov.
Mean	11.16	5.98	5.36	2.99	3.43	2.30	Cannot Report
Standard Error	2.29	1.08	0.89	0.34	0.50	0.74	
Median	4.50	3.33	2.15	0.98	2.00	1.18	
Mode	8.00	6.25	4.00	0.25	2.33	1.13	
Standard Deviation	14.67	7.88	9.34	4.11	3.65	3.12	
Sample Variance	215.34	62.10	87.17	16.87	13.33	9.73	
Minimum	0.53	0.29	0.00	0.02	0.00	0.00	
Maximum	62.50	35.50	70.00	20.00	16.33	13.33	
Count	41	53	111	150	53	18	

Table 105 – FY 2003: Descriptive statistics for cod/pollock ratio on party/charter trips to the WGOM closed area

that reported catching pollock

	May		June		July		August		Sept.		Oct.		Nov.		Total	
Ratio	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*	*Freq.*	*Cum. %*
0	0	0%	0	0%	1	1%	0	0%	1	2%	1	6%	Cannot Report		3	1%
0.2	0	0%	0	0%	11	11%	25	17%	3	8%	1	11%			40	10%
0.4	0	0%	2	4%	7	17%	21	31%	2	11%	0	11%			32	18%
0.6	2	5%	3	9%	6	23%	8	36%	4	19%	1	17%			24	23%
0.8	1	7%	2	13%	7	29%	16	47%	4	26%	2	28%			33	31%
1	1	10%	2	17%	4	32%	6	51%	1	28%	1	33%			15	34%
2	5	22%	12	40%	18	49%	18	63%	12	51%	7	72%			73	51%
4	9	44%	14	66%	16	63%	17	74%	10	70%	2	83%			68	67%
8	8	63%	6	77%	22	83%	23	89%	10	89%	2	94%			71	84%
More	15	100%	12	100%	19	100%	16	100%	6	100%	1	100%			69	100%
Total Trips	41		53		111		150		53		18				428	

Table 106 – FY 2003: Distribution of reported cod/pollock ratios for party/charter trips to the WGOM closed area that reported catching pollock

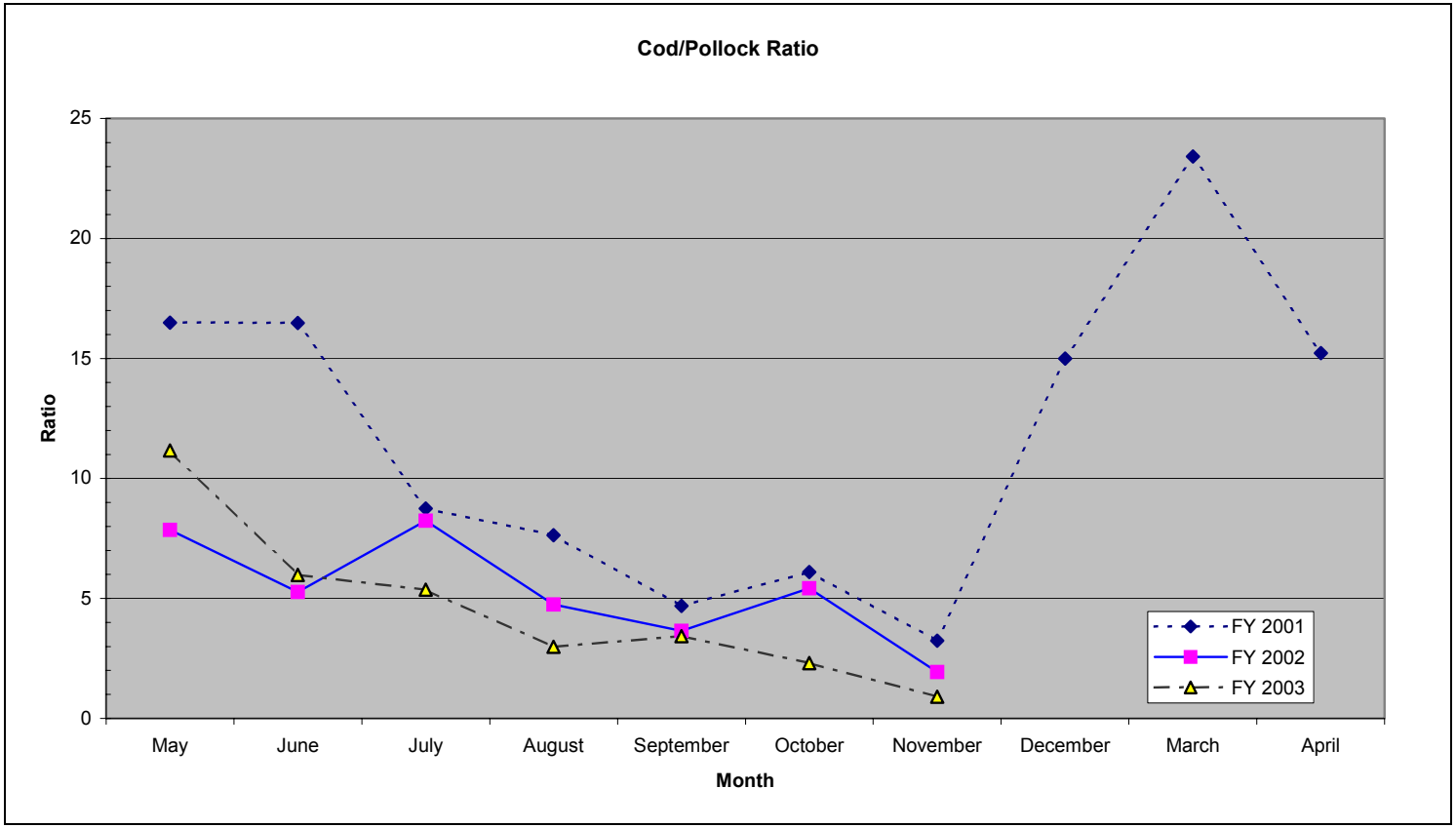


Figure 25 – Ratio of cod/pollock on party/charter trips to the WGOM Closed Area that caught pollock

Closed Area II Yellowtail Flounder SAP (Measure C.3)

The elements of this measure include a revision in the number of trips allowed for each vessel in a month from two to one, guidance on adjusting the number of trips in the SAP, and a change of one month in the starting date for the SAP. Only the last two elements are likely to affect the incidental catch of regulated groundfish. Limiting vessels to one trip per month will have economic impacts, but is not likely to affect the incidental catch of regulated groundfish.

Vessels participating in this SAP are allowed use Category B DAS and are not charged DAS while enroute the area. This SAP thus results in an increase in effort above the Category A DAS allocated by Amendment 13. The catch is controlled through limits on the number of trips. This measure establishes a procedure so that the number of trips authorized in this program could change on an annual basis. The number of trips will be determined by the Regional Administrator so that the SAP will catch the difference between the GB yellowtail flounder TAC and the catch that will occur outside the area. A formula is suggested for FY 2005 that assumes the catch outside the areas will be 4,000 mt. This assumption, however, is based on catches that occurred prior to the implementation of Amendment 13 and so the Regional Administrator is given authority to revise the formula based on the impacts of the regulations. If this measure is adopted, less than 320 trips will be authorized in FY 2005 since the TAC for the area will be 4,250 mt.

While the target species is yellowtail flounder, other groundfish species that were caught during an experiment in the area included winter flounder, haddock, cod, plaice, witch flounder, and windowpane flounder. With the exception of winter flounder and haddock, only small amounts of the other species were caught (NEFMC 2003). Changing the number of trips will change the catch of regulated groundfish in the SAP area – less than 320 trips will likely reduce catch, while an increase would be expected to increase catch. The catch of cod and haddock in this SAP is limited by a hard TAC as a result of the TAC applied to the Eastern US/CA area under the terms of the US/CA Resource Sharing Understanding, but the catches of other species are not controlled. Amendment 13 included estimates of the catch of other species for up to 400 trips (NEFMC 2003). Observer data is not yet available that was collected from the SAP during 2004 that could be used to update these estimates.

Changing the starting date of the SAP to July 1 may also change the catch of regulated groundfish. While observer data is not available from the SAP for FY 2004, catch reports are provided by NERO for cod, haddock, and yellowtail flounder. These reports show that the catch of cod slowed after July 1. Haddock catches also declined slightly. These limited data suggest that cod catches may be reduce if the SAP begins on July 1 rather than June 1 (Table 107).

	Pounds Caught			Ratio	
Period	Yellowtail Flounder	Cod	Haddock	Yellowtail/Cod	Yellowtail/Haddock
May 28 - July 1, 2004	3,212,484	26,488	648,239	121.3	5.0
July 2, 2004 - July 29, 2004	2,636,308	6,774	449,768	389.2	5.9

Table 107 – Comparison of cod, haddock, and yellowtail flounder catches in the CAII yellowtail flounder SAP, FY 2004

Minimum Effective Effort Allocation (Measure D)

This measure does not have different impacts on regulated groundfish species based on whether the species are targeted or caught incidental to fishing for other species. It could result in increased effort in SAPs. As long as the catch of incidental groundfish species is controlled through the SAP through the use of a TAC or gear requirements that eliminate its catch, the measure will not have any impacts on those species.

GB Cod Hook Sector Revisions (Measure E)

This measure does not have different impacts on regulated groundfish species based on whether the species are targeted or caught incidental to fishing for other species. All impacts on regulated groundfish are described in section 7.4.1.1.1.

Change to DAS Effective Effort Baseline Calculation (Measure F)

This measure does not have different impacts on regulated groundfish species based on whether the species are targeted or caught incidental to fishing for other species. All impacts on regulated groundfish are described in section 7.4.1.1.1.

7.4.1.1.3 Summary of Biological Impacts on Groundfish Species

This section summarizes the biological impacts of Alternative 1 on groundfish stocks, both those that are targeted and those that are caught incidentally. The measures in this alternative can be divided into specific programs that are designed to harvest healthy stocks (the three Special Access Programs being considered in Measure C and the resulting re-allocation of incidental catch TACs in Measure B) and measures that may have impacts across a range of groundfish species. Overall, this alternative is not expected to have significant impacts on any regulated groundfish stock but some provisions increase the uncertainty over the biological impacts of Amendment 13.

The GB haddock fishery north of CAI SAP will result in an increase in fishing effort of between 178 and 358 days fished in order to harvest an additional 1,000 to 2,000 mt of GB haddock. This will result in an increase in GB haddock mortality compared to the No Action alternative, but is not expected to cause mortality to exceed Amendment 13 targets. The WGOM Closed Area Rod/Reel SAP will result in a very slight increase in GOM haddock mortality but is also not expected to threaten Amendment 13 mortality targets. Cod may be caught in both of these SAPs, but is limited by an incidental catch TAC so that it does not threaten Amendment 13 targets. The changes to the Closed Area II yellowtail flounder SAP will not increase mortality on yellowtail flounder. The adjustment to the number of trips may actually help reduce mortality since the number of trips in the SAP will be adjusted annually in order to more closely match the TAC established for this stock.

Of the remaining measures, Measure F (changes to the DAS baseline calculation) is likely to have the most impact. There are three options. If options 2 or 3 are selected, there will be increased uncertainty over the biological impacts of the DAS reductions in Amendment 13 as effort will be redistributed. It is not possible to predict with any certainty how this redistribution will affect mortality. Measure D allocates a minimum amount of effective effort to permits that did not receive any DAS in Amendment 13. While this will increase the pool of effort, these DAS can only be used in specific SAPS. As long as SAPs continue to be strictly limited so that the catch of target and incidental catch species is controlled, this allocation of effort will not have any biological impacts in the short-term.

Measure A (Measures A.1 and A.2) would adopt changes to the DAS leasing and transfer programs. There are several options included in these measures and the impacts depend on which options are selected. In general, changes that are designed to facilitate the use of the transfer and leasing programs would be expected to increase the number of DAS used in the short-term. If a conservation tax is applied (as is currently the case for the transfer program and is proposed in some options for the leasing program) the likely increase in effort is reduced. In addition, any conservation tax applied to the leasing program will reduce potential effort over the long-term. The biological impacts of DAS exchanges (either through

the leasing or transfer programs) will depend on how effort is re-distributed. Absent empirical data, it is not possible to estimate these impacts with any certainty.

The proposed changes to the GB Cod Hook Sector are not expected to increase mortality for groundfish. It is possible that there may be a reduction in discards that results from these measures if vessels using non-selective gear enter the sector and fish with more selective hooks.

7.4.1.2 Impacts on Other Species/Bycatch

This alternative may have impacts on other species. The most probable impact is the result of catches of other species that result from groundfish fishing activity. The following section discusses the catch of non-groundfish species that may result from each proposed measure. Part of this catch may be discarded, generally described as bycatch by the M-S Act. For regulated groundfish species, bycatch is discussed in the previous section.

Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

The impacts of this measure on bycatch are uncertain. In general, the DAS leasing program and transfer programs are expected to increase fishing effort in the short term. An increase in effort will increase bycatch if discard rates remain constant. Nothing specific to this individual measure would be expected to change discard rates. The application of a conservation tax, however, reduces the likely increase in effort, with analysis in section 7.4.1.1 noting that a tax of at least twenty percent may be necessary to avoid an effort increase. Complicating this evaluation is that as long as a transfer program is subject to a tax, over the long-term it will reduce available effort and thus may contribute to a long-term reduction in bycatch.

DAS Transfer Program Modifications (Measure A.2)

The impacts of the options in this measure on bycatch are uncertain. The three options are designed to facilitate more DAS transfers and, if successful, would be expected to increase effort in the short-term. An increase in effort would increase bycatch if discard rates remain the same. If these options facilitate transfers and a conservation tax is applied, however, over the long-term effort – and thus bycatch – would be expected to be reduced. This would not be the case if Option 2 is adopted, since under certain circumstances DAS transfers would not be subject to a conservation tax. Option 3 also complicates the analysis, as it may allow for more effort in other fisheries since a proxy vessel that is removed from all fisheries may not be currently fishing.

Incidental Catch TACs (Measure B)

Changing the allocation of the incidental catch TACs for groundfish caught by vessels using Category B DAS programs does not affect bycatch. The programs using these TACs, however, could change fishermen's behavior and could affect bycatch. These impacts will be discussed for each specific program.

GB Haddock Fishery North of CAI SAP

This program will allow for a small increase in fishing effort through the use of Category B DAS in an area north of CAI. The number of days fished in the program is likely to be no more than 270 (see section 7.4.1.1.1).

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips for the proposed season and area were interpreted in light of the results of several haddock separator trawl experiments. The catch for the top twenty-five species caught on

observed trawl tows in FY 2000 through 2003 is shown in Table 90. Haddock accounted for over seventy percent of the catch. Various species of skates accounted for 8.5 percent of the catch, monkfish (angler) for 5.8 percent, and spiny dogfish for 1.3 percent.

Many of the species in Table 90 are not likely to be caught by vessels using a haddock separator trawl to target haddock, as required by this SAP. DFO (1992) noted an almost complete absence of skate species in the top cod end during an experiment in 1992. Raymond and Manomet (2004) found a highly significant difference between skates caught in the top and bottom cod ends, with only six percent of the skate catch for the entire experiment caught in the top cod end. This same experiment demonstrated that most monkfish, sculpins, and sea ravens, and all lobster, were caught in the bottom cod end. While neither experiment document scallop catches, it is likely that scallop catches will mimic other sessile species and will also be caught by the bottom cod end.

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter skates and other species. While the high-value species (monkfish, etc.) may be retained (if caught) consistent with regulatory limits, most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches of most of these species, including the skates. Because this net has been proven to be so effective in reducing catches of these species, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

WGOM Closed Area Rod/Reel Haddock SAP

As noted previously, an experiment has not been conducted that would provide information on the catch of non-groundfish species that may result from this proposed SAP. Recreational fishermen in this area often encounter dogfish while attempting to target cod, so it is likely that this fishery will also catch an unknown amount of dogfish. It is possible that the proposed season may reduce these encounters, but recent angler complaints of the ubiquitous, year round presence of spiny dogfish make this unlikely. The small size of this fishery, requirement to use hand-gear, and limited season make it unlikely catches of dogfish will be significant.

Closed Area II Yellowtail Flounder SAP (Measure C.3)

Two of the proposed changes to this program are not expected to have any impacts on bycatch of other species. Information on catches in the SAP in FY 2004 is not available to determine if discard rates differed during different months. As a result, it is not possible to predict if moving the starting date to July 1, or limiting vessels to one trip per month, will affect bycatch.

This measure also provides a mechanism to change the number of trips in the SAP. An increase in the number of trips will increase effort in the program and in general would be expected to increase bycatch if discard rates remain constant. The overall catch of GB yellowtail flounder, however, is set by a TAC and is not affected by the number of trips in this SAP. It is not yet clear how overall fishing effort is affected by fishing in the SAP and other fishing in for GB yellowtail flounder. Area and season specific discard information is not available to determine whether discards will increase or decrease as the number of trips in the SAP is changed.

Minimum Effective Effort Allocation (Measure D)

The allocation of a minimum level of effective effort represents a potential increase in DAS use. If this effort is used, it would be expected to result in an increase in bycatch if discard rates remain the same. These DAS can only be used in specific SAPs where the amount of effort that can be used is capped by a TAC for targeted and incidental catch groundfish species. Allocating a minimum level of

effort does not change these TACs and so this allocation, while increasing the pool of eligible participants for those SAPs, is not likely to increase the amount of effort used in the SAPs. As a result, this measure is not likely to change bycatch amounts or rates.

GB Cod Hook Sector Revisions (Measure E)

The impacts of this measure are uncertain, but could result in a decrease in bycatch of finfish. Under this measure, vessels that exclusively used trawl or gillnet gear would be eligible to join the hook sector. These gears can have more bycatch since they catch a broader range of species. By changing these vessels to hook gear, there may be less bycatch of skates and some other species. It is not clear whether any vessels will take advantage of this opportunity and join the sector.

This measure would also allow vessels to bring in their entire cod history into the sector regardless of how caught. This would not be expected to affect bycatch unless this change encourages more vessels that used trawl or gillnet gear to join the sector.

Change to DAS Effective Effort Baseline Calculation (Measure F)

The impacts of the options in this measure on bycatch are uncertain. Option 1 (No Action) would not have any impacts beyond those analyzed in previous document. Options 2 and 3 would change the distribution of DAS – in particular, Category A DAS. While the total number of allocated Category A DAS would remain roughly the same, DAS would be transferred to about 200 vessels and removed form about 800 vessels. How these changes will impact bycatch depends on the fishing practices of these vessels, and whether practices change as a result of the redistribution of DAS. It is not possible to predict these changes with any certainty.

7.4.2 Habitat Impacts

7.4.2.1 DAS Leasing/DAS Transfer Provisions Alternatives (Measure A)

This measure considers options for changing the conservation tax scheme for both the DAS leasing and the DAS transfer programs. Creating incentives for permit holders to participate in these programs will increase the rate at which latent DAS and permits will be removed from the fishery. While this may increase active fishing effort over the short-term, it will potentially reduce the amount of latent effort that could be re-applied to the fishery in the long-term as stocks rebuild. Effort reduction was an important tool employed by the Council under Amendment 13 to minimize the adverse effects of bottom-tending gear on EFH. Significant effort reductions and DAS categorizations assisted in, not only rebuilding stocks, but also in reducing the number of DAS that a vessel can use. However, the main mitigation tool employed by the Council to minimize the effects of bottom-tending mobile gear on EFH was the creation of the Habitat Closed Areas. Under this measure, these areas will remain closed and any additional short-term effort resulting from this alternative will be applied outside the Habitat Closed Areas, in areas that are currently being fished. Therefore, the essential fish habitat impacts of this measure will be minimal.

7.4.2.2 Incidental Catch TACs (Measure B)

This measure increased the incidental TACs for stocks of concern to accommodate the two new proposed SAPs in this framework action. This measure will not increase habitat impacts as it is largely administrative.

7.4.2.3 Georges Bank Fishery North of Closed Area I SAP (Measure C.1)

The proposed SAP area is located just north of the CAI Habitat Closed Area's northern boundary and would allow the use of a haddock separator trawl or similarly designed gear to fish for haddock in this area while minimizing the catch of codfish. While it is important to note that the haddock separator trawl is a bottom-tending mobile gear, it would not be used in the adjacent Habitat Closed Area. The Habitat Closed Area is the primary tool employed by the Council in Amendment 13 to avoid, minimize or mitigate the adverse impacts of the groundfish fishery within the CAI SAP area. This measure would not compromise this baseline level of protection for essential fish habitat.

7.4.2.4 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

The proposed SAP area is located entirely within the WGOM Habitat Closed Area. However, because rod and reel gear was determined not to impact EFH in a manner that is more than minimal and less than temporary in nature in Amendment 13 (See section 9.3 of the Amendment 13 FSEIS), there are no habitat impacts of this measure.

7.4.2.5 Closed Area II Yellowtail Flounder SAP (Measure C.3)

This measure proposes to reduce the SAP approved in Amendment 13 by one month, from June 1 – December 31 to July 1 – December 31, to avoid spawning fish and increase fish quality and supply during times of higher demand. The measure also reduces the trip limit to 10,000 pounds of yellowtail flounder. Although this measure does take place inside a groundfish mortality closure and does use bottom-tending mobile gear, it does not take place in the Habitat Closed Area, which occurs in the northern portion of CAII. Additionally, the CAII Habitat Closed Area was the primary tool employed by the Council to avoid, minimize or mitigate the adverse impacts of the groundfish fishery. The use of the other of groundfish mortality closures for SAPs will not cancel the habitat protections that continue to be afforded to EFH within the Habitat Closed Areas. As such, this measure would not compromise the baseline level of protection for essential fish habitat.

7.4.2.6 Minimum Effective Effort Allocation (Measure D)

The proposed measure will re-allocate 10 category C DAS as category B DAS for those vessels not receiving a minimum effective effort allocation above 0 under Amendment 13. Additionally, these category B DAS could only be used in the CAI Hook Gear Haddock SAP and/or the WGOM CA Rod/Reel Haddock SAP. Because these DAS can only be used by hook gear and rod/reel gear, which have been determined not to adversely impact EFH (See Section 9.3 in Amendment 13), this measure will not produce any discernible habitat impacts.

7.4.2.7 GB Cod Hook Sector Revisions (Measure E)

The proposed measure will enable the hook gear sector to use member's GB cod landings, regardless of gear used, to qualify for their TAC share. The method of qualification, as it relates to habitat impacts, is moot because the TAC will be fished using hook gear which has been shown not to impact habitat in a manner that is more than minimal and less than temporary in nature. The proposal to take a larger portion of the TAC with a gear that has no adverse habitat is an approach that is supported by current Council EFH policy to: *Modify fishing methods and create incentives to reduce the impacts on habitat associated with fishing.* Therefore, the measure will not produce any discernible habitat impacts.

7.4.2.8 Change to DAS Effective Effort Calculation (Measure F)

The proposed measure intends to clarify and correct the confusion created by the initial Amendment 13 effective effort equations. While this measure may increase the number of DAS allocated as effective effort (A DAS), the split between A DAS and B DAS will be corrected to ensure that the Council will meet the mortality objectives of Amendment 13. As long as these additional B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.

7.4.3 Impacts on Endangered and Other Protected Species

7.4.3.1 DAS Leasing and DAS Transfer Provision (Measure A)

While DAS leasing is occurring under Amendment 13 provisions, very few, if any DAS transfers have occurred, at least in part because of the 40 percent conservation tax levied on the transferred days. To make both of these measures more appealing to vessel owners as options to

mitigate some of the adverse economic impacts of Amendment 13, the Council now is proposing several changes, including a reduction in the conservation tax on transferred days, to make both mechanisms more viable alternatives for vessels owners. The measure and options are described in section 5.2.

DAS leasing and transfers are likely to result in short-term increases in effort because vessels owners that make such arrangements are presumably doing so in anticipation of using their days. This could activate DAS that, without the option of leasing or transfer, might otherwise go unused for a variety of reasons.

Conventional wisdom has held that effort increases represent potential negative impacts if the fishery overlaps with the distribution of protected species, especially in marine mammal high use areas. It is very difficult to make a determination at this writing as to whether this confluence would occur given all the variables that affect fishing patterns in the Northeast. At best, it can be concluded that a short-term effort increase could very well occur if any of the measures and options proposed are adopted, exclusive of No Action. Specifically, analyses in this document suggest that DAS leasing and/or transfers will probably increase DAS use unless a conservation tax of 20 percent or more is adopted for all leases and transfers.

Increased use of the vessel transfer option, however, should generally result in an overall decrease in DAS over the long term and should not result in impacts beyond those analyzed and discussed in the Amendment 13 Final Environmental Impact Statement. As such, all the measures proposed (including the DAS transfer program modification measures under consideration), as well as the No Action Alternative, appear to have impacts that are negligible with respect to threatened and endangered species and other marine mammals that inhabit the multispecies management unit.

7.4.3.2 Incidental Catch TACS (Measure B)

Hard incidental catch TACs for stocks of concern are conservation measures developed to minimize the risk of exceeding the Amendment 13 fishing mortality objectives during the use of Category B DAS in defined circumstances. They should not affect protected species other than they could result in the curtailment of B DAS fishing activities in certain areas. Fishing on A DAS could still take place, resulting in little change to the impacts discussed in Amendment 13. Neither this proposal nor the No Action Alternative are likely to either positively or negatively affect protected species in any predictable or quantifiable manner. This assessment is also true if the Georges Bank cod incidental catch TAC is reduced by up to 10 percent to allow for the conduct of experiments. Experiments would also be subject to further evaluation for impacts on protected resources by NOAA Fisheries through its experimental fishery permit process.

As background, a six percent effort increase is expected as a result of the B DAS pilot program itself, according to the analysis developed for the impacts on groundfish stocks, although it appears likely to occur across areas and will not concentrate on any single stock. As a result of this conclusion, the inference is that concentrations of effort should not occur as the result of the B DAS pilot program, except as discussed below relative to SAPs. The increase in effort itself could affect protected species, but the impact will likely be negligible given the overall reduction in effort, as well as the possession limits and gear restrictions on B DAS use that also will curtail effort.

At this writing, the No Action Alternative provides for Category B incidental catch TACs to protect groundfish stocks of concern during Category B DAS activities. With no allocations of the TAC to the proposed SAPs in Framework 40B, diminished opportunities in the SAPS could result in effort shifts, possibly to inshore areas of the Gulf of Maine where stocks of threatened, endangered and other marine mammals are seasonally more abundant than the areas proposed for SAPs. Without an associated shift to gillnet gear, however, the potential negative impacts of the No Action alternative are likely to result in few negative impacts to any protected species.

7.4.3.3 GB Haddock Fishery North of CAI SAP (Measure C.1)

The December through April haddock SAP north of Area I does not allow fishing with gillnet gear (although the list of authorized gear could be changed by the Regional Administrator), most likely resulting in few changes to fishing patterns for this gear type beyond what was analyzed and approved in Amendment 13. Accordingly, impacts to cetaceans and pinnipeds are not likely to change upon implementation of the SAP, which is controlled by a 1,000 mt TAC and requires use of a haddock separator trawl.

Although bottom trawl gear has been implicated in turtle entanglements in other areas of the country, takes have not been documented in this gear type in New England waters. Further, the SAP is scheduled to operate from December through April, a period in which endangered turtles do not occur because of their warm water temperature preferences. While there is some overlap with northern right whale critical habitat, trawl gear is not implicated in entanglements with this species, which is most abundant in the area from April through June.

The SAP provides additional economic opportunities for groundfish vessels, but its operation will not affect overall Amendment 13 fishing effort reductions that could benefit protected species. Therefore, with or without implementation (No Action) of this SAP, negative impacts should be similar to those described in Amendment 13 and likely negligible for any protected species that might be affected.

7.4.3.4 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2)

With the exception of sea turtles, hand-tended rod and reel gear is not implicated in protected species interactions. Given their preference for warm temperatures and the March and April timeframe for this SAP, any encounters with the species of sea turtles that may seasonally occur the Gulf of Maine is highly unlikely. If limited access DAS permit holders that ordinarily fish for groundfish with sink gillnets determine that fishing in the SAP with hook gear is economically feasible, there could be a reduction in gillnet effort outside of the WOM area. Any benefits are likely to be short-lived though, given the 50 mt cap on the catch of haddock in this SAP.

The No Action alternative would not change the overall Amendment 13 determination that impacts to most protected species are negligible and that the action could have benefits as a result of the effort reductions implemented.

7.4.3.5 CAII Yellowtail Flounder SAP (Measure C.3)

As discussed in Amendment 13, this SAP is expected to have few, if any negligible impacts on protected species. An adjustment of the start date, July 1 rather than June 1, a limit of

one trip per month per vessel, and a mechanism to calculate the number of trips based on the size of the available GB yellowtail flounder TAC should not change that conclusion.

No action would mean that the measure would remain in place as approved in Amendment 13 and as it operated in 2004.

7.4.3.6 Minimum Effective Effort Allocation (Measure D)

This measure will allow a small increase in effort to occur by allocating ten Category B days to about 350 groundfish vessels who received no DAS in Amendment 13. If the measures in this document were approved, the affected vessels would be able to fish in some existing SAPs at very low effort levels. Impacts to protected species should be negligible since these boats could only participate in the SAPs that do not have a DAS flip provision --- the CAI Hook Gear Haddock SAP and the WGOM Rod-Reel SAP. It was concluded earlier in this document that the neither SAP is likely to have negative impacts on protected species.

7.4.3.7 GB Hook Sector Revisions (Measure E)

By broadening the qualification criteria for the GB hook sector, this measure has the potential to shift effort from other gear types, including gillnet gear, to one that has little likelihood of interactions with protected species. The hook sector's overall share remains capped at 20 percent of the overall target TAC so if problems do surface, they will not proliferate across the groundfish fishery. To date the hook fishery in the Northeast has had few if any interactions with protected species, despite takes in similar gear in other regions of the U.S.

Under No Action, effort would remain as projected in Amendment 13, again with few negative impacts and possibly a number of positive benefits to protected species.

7.4.3.8 Change to DAS Effective Effort Calculation (Measure F)

This measure changes the split in Amendment 13 between A and B DAS, presumably resulting in the same estimate of DAS used. As outlined in section 7.4.1.1, however, adoption of Option 2, the proposed change, could result in increased groundfish catches under certain scenarios. As such, there is a risk to protected resources, but given that it is not clear what stocks may be affected, it is equally as problematic to determine the impact on protected species.

7.4.4 Economic Impacts

7.4.4.1 Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

This measure would reduce the conservation tax on the DAS transfer program to 20% while leaving DAS leasing with no conservation tax. The potential value of a DAS transfer would be increased with a lower conservation tax but is not likely to be sufficient to encourage a larger trading market unless the selling vessel held no other limited access permits. That is, because the seller must give up all Federal permits and would be prohibited from obtaining any other State or Federal permits, the opportunity cost to the seller may be quite high. Without the ability to recover these costs (i.e. the value of these other permits to a buyer is effectively zero),

the value from the sale of groundfish DAS alone is not likely to compensate the seller for surrendering all future income streams from fishing. Vessels may be better off leasing groundfish DAS or simply selling their vessel and permits outright rather than going through the DAS transfer program. Nevertheless, reducing the conservation tax would improve the value of the DAS transfer would be expected to have some positive albeit small economic benefit.

7.4.4.2 DAS Transfer Program Modifications (Measure A.2)

Transfer of DAS was intended to permit consolidation of groundfish vessels through market incentives. Unfortunately, existing requirements impose a conservation tax on transferred DAS and requires that the selling vessel surrender all other fishing permits. The combination of these two conditions has effectively prevented a transfer market from developing. In effect, the current transfer program limits the value (or willingness to pay) to a buyer to only the groundfish DAS less the conservation tax when the value to the seller includes the value of the groundfish DAS plus all other limited access permits. In this context, the total value of the vessel and all associated permits will exceed the value of the groundfish permit and associated DAS alone so the seller's asking price will exceed the buyer's willingness to pay. The proposed options for changing the transfer program would increase the potential value of the transfer to the buyer using several different possible modifications.

Accepting Non-Groundfish Permits

Under present conditions the only thing that could be transferred is groundfish DAS. Allowing selling vessels to transfer any non-groundfish limited access permits along with the groundfish DAS would increase the potential value of the transferable asset to the buyer. This option would have no effect on potential trades among vessels with identical suites of limited access permits or if the seller only holds a groundfish permit. Conversely, the ability to accept non-groundfish permits would be much greater to vessels that only have a groundfish permit or to a vessel where there were fewer duplicate permits. While this option would undoubtedly increase the potential value of the trade to both buyer and seller, the realized economic benefit of such a change is not known.

Refusing Non-Groundfish Permits

As noted above the ability to waive the conservation tax on transferred groundfish DAS would increase the value of the potential trade to the buyer. If the seller has multiple non-groundfish limited access permits then the value of the groundfish DAS without a transfer tax may still be insufficient compensation to the seller to make a trade worthwhile. This option would have no impact on vessels with identical suites of limited access permits since the buyer would have no limited access permit that could be "refused." The condition that would make a trade favorable to both buyer and seller would require that the value of the DAS without the transfer tax would have to exceed the combined value to both buyer and seller of the limited access permits held by the seller that are not held by the buyer. The realized effect of this option is not known but would likely be positive compared to current limitations on DAS transfer.

Removal of Proxy Vessel

The economic effect of this option is uncertain but would likely to be positive. Evaluation of the effect of the option is complicated by the fact that it is unclear as to whether the transfer tax would still apply. The option also only indicates that a vessel with a comparable permit baseline could be removed but does not indicate whether the proxy vessel would even have to have a limited access groundfish permit or whether the proxy vessel would have to have a

comparable suite of limited access permits. The option also does not indicate whether the proxy vessel has to exist (i.e. in the CPH program) or has to be in a fishable condition.

7.4.4.3 Incidental Catch TACs (Measures B)

Incidental catch TACs ensure that catches from any SAP or other use of Category B DAS do not compromise the biological objectives and the economic opportunities for available Category A DAS. The latter is of particular importance since current opportunities to use B DAS are not equal across the groundfish fleet. The proposed action would not change the method for creating a total set-aside for incidental catch TACs but would change the allocation of the share of incidental TACs to accommodate anticipated demand for fishery experiments that would take Georges Bank cod and one new SAP (the WGOM Closed Area Rod/Reel Haddock SAP). Specifically, 5% of the GOM cod TAC that would have gone to the regular B DAS pilot program would be allocated to the WGOM rod and reel SAP. Similarly, 10% of the Georges Bank cod incidental catch TAC that have been allocated to either the pilot B DAS program or the CAII haddock SAP would be allocated to experiments. However, since the target TACs for FY2005 will be higher for both cod stocks than they were in FY2004, the nominal incidental catch TACs allocated to any given SAP or experiment will actually increase. As long as catch rates remain constant in either of the two existing programs then any nominal increase in TAC would result in increased fishing opportunities, hence improved economic returns. By contrast, if catch rates improve then fishing opportunities in existing programs could increase, stay the same, or be reduced depending upon the magnitude of any such improvement, the amount by which the TAC is raised, and how much of that TAC has been reallocated to new programs.

7.4.4.4 Georges Bank Haddock Fishery SAP

This Georges Bank haddock SAP would provide vessels with the opportunity to fish for haddock in a designated area north of Closed Area I on a Category B DAS. Participation in the SAP would be limited to vessel using approved gear with a demonstrated low bycatch of cod which at present is limited to trawl gear using a haddock separator trawl. Vessels would also be required to use a VMS and report when they have entered the SAP, the category DAS they will be using, and must provide daily catch reports for selected species. Note that vessels may also choose to fish inside the SAP area on a Category A DAS without being subject to the gear requirement.

Although any vessel with a limited access groundfish permit and a DAS allocation may be eligible to participate in the SAP, the number of likely participants may be limited to vessels with a history of having actually fished in the area. Data from FY2002 VTR records were queried to identify how many vessels reported using trawl gear inside the proposed SAP. Since VTR data report only a single location for any given trip, reliance on position information alone may not provide a reliable indicator of potential participation. Therefore, the data query was expanded to include any vessel that fished in either statistical area 521 or 522 (areas that may be considered within the general vicinity of the proposed SAP). Based on these data there were a total of 48 vessels that took at least one trip using trawl gear inside the proposed SAP and an additional 195 vessels that took at least one trip using trawl gear inside areas 521 or 522 but did not report any trip location within the proposed SAP boundary. Thus, a total of 243 vessels have reported otter trawl activity either inside of the proposed SAP or at least within an area in close proximity to the proposed SAP.

Nearly all of the vessels reporting trips inside the proposed SAP were either from Massachusetts (30) or Rhode Island (16) home ports (Table 108). Similarly, the majority of vessels reporting trips inside statistical areas 521 or 522 but not inside the SAP were from Massachusetts (121) and Rhode Island (21), but there were a substantial number of vessels from both Maine (20) and New York (16). There were only 20 vessels less than 50 feet LOA that reported otter trawl trips either in areas 521 or 522 or inside the proposed SAP (Table 109). By contrast, 62% of all vessels that took at least one trip inside the proposed SAP and 58% of total vessels that may be classified as potential SAP participants were greater than 70 feet LOA. Thus, the primary beneficiaries of the proposed SAP would likely be larger vessels from either Massachusetts or Rhode Island.

Since the proposed SAP will require use of a haddock separator trawl the realized economic benefits to participating vessels cannot be estimated with precision, because available performance data using this gear is not yet available. Nevertheless, past performance by vessels fishing inside the proposed SAP area provides some indication of the economic potential that may be derived from the SAP. This estimate of potential economic benefit from the proposed SAP was obtained by applying average annual revenue by species from dealer data to the reported retained catch in the VTRs. The average revenue per day was calculated by dividing total trip revenues by days absent (elapsed time between the date sailed and landed date in the VTR).

Across all trawl trips taken inside the proposed SAP revenue per day averaged $5,700 inside the proposed SAP and $4,600 within statistical areas 521 and 522 but outside the proposed SAP. Thus, on average, the proposed SAP was more productive in terms of revenue than areas outside the SAP. For a TAC of 1,000 MT the estimated number of regular B DAS that could be fished in the proposed SAP would be 238 (see section 7.4.1.1.1) and an additional 90 category B DAS for each additional 500 MT of haddock quota. Therefore, using the estimated average revenue per day ($5,700) from inside the proposed SAP, the potential revenue from a 1,000 MT TAC would be $1.4 million. Each 500 MT increment in haddock TAC would be worth an additional $0.5 million such that a 2,000 MT TAC would generate potential revenues of $2.4 million. Note that this estimate is relatively crude and realized impacts may be higher or lower depending on prices, catch rates, and biological conditions.

The provisions requiring participating vessels to have VMS and reporting through the VMS are not likely to have any added economic burden since nearly every likely participant fishes inside the boundary of the US-Canada resource sharing agreement. That is, participation in the Eastern or Western resource sharing areas already requires VMS and carries with it the same reporting requirements as that of the proposed SAP.

Home Port State	At Least One Trip Inside SAP	At Least One Trip Inside 521 or 522 but not Inside SAP	Total
CT	0	2	2
DE	0	2	2
MA	30	121	151
MD	0	1	1
ME	0	20	20
NC	0	6	6
NH	1	2	3
NJ	0	3	3
NY	1	16	17
PA	0	1	1
RI	16	21	37
Total	48	195	243

Table 108 - Number of Potential SAP Participants by Home Port State

Vessel Length	At Least One Trip Inside SAP	At Least One Trip Inside 521 or 522 but not Inside SAP	Totals
Less than 50 feet	1	19	20
50 to 70 feet	17	65	82
More then 70 feet	30	111	141
Total	48	195	243

Table 109 - Number of Potential SAP Participants by Vessel Length Class

7.4.4.5 Western GOM Rod/Reel SAP

This SAP would permit use of hand-tended rod and reel commercial fishing gear inside the WGOM closed area during March and April. SAP participants would not be able to retain any cod, although any cod catch would be counted against an incidental catch TAC of 6.3 MT for FY2005. Given a haddock TAC of 50 mt the economic benefits of the SAP would be limited to about $140 thousand valued $1.27 per pound, the average price for FY2003. Given that hook gear primarily takes cod or haddock there is unlikely to be sufficient component catch that would contribute appreciably to potential trip income.

Available data make it very difficult to ascertain the likelihood that the potential benefit from the SAP will be realized. Specifically, the only available data on catch rates of cod relative to haddock inside the proposed area come from party/charter VTR records. These data suggest that the cod to haddock ratio using the same gear as that proposed for the SAP would not meet the 1:2 requirement. Similarly, available commercial data from FY2002 and FY2003 VTR ‘s on trips that took place outside the proposed SAP indicate that on trips where haddock was landed, the daily catch ratio exceeded 1:2 on more than 90% of reported trips. However, it is notable that the party/charter data reflects a fishery that generally targets cod and has no incentive to avoid catching cod. Similarly, available commercial hand gear data does not reflect a targeted haddock fishery and does not provide any information on what expected catch rates may be inside the SAP.

Assuming that haddock can be successfully targeted inside the SAP, given the relatively short duration of the SAP and the relatively low TAC, the likely participants would still be individuals with a recent or previous history of using hand gear in the Gulf of Maine. Based on

FY2004 permit categories there were a total of 91 vessels that fished with hand gear on at least one occasion in the Gulf of Maine during FY2003 (Table 110). Of these vessels, all listed a homeport state bordering the Gulf of Maine with the exception of on vessel with a Rhode Island home state. The majority of vessels were from Massachusetts home ports (71) followed by New Hampshire (12) and Maine (6). Dependence on hand gear hook fishing was highest for New Hampshire vessels (84%) and was lowest for Maine vessels (34%). The latter depended on lobster for one-third of total fishing revenue so Maine vessels relied on either hook fishing or lobster for over two-thirds of total fishing revenue.

Total revenue from hook trips where haddock was landed in the Gulf of Maine averaged approximately $300 for Maine and Massachusetts vessels but was less than $200 for New Hampshire vessels. The expected revenue from the proposed SAP is likely to be higher than available data indicate because hand gear has typically targeted cod not haddock and a substantial number of participants (42 of 91) were fishing under an open access hand gear permit which was subject to trip limits on combined cod, haddock and yellowtail founder. For these reasons the number of trips and their contribution to participant's fishing revenue cannot be reliable estimated.

Home Port State	Number of Participating Vessels	Average Dependence on Hook Fishing	Average Dependence on Lobster	Average Trip Revenue on Trips Landing Haddock
ME	6	34%	33%	312
NH	12	84%	8%	166
MA[a]	73	68%	11%	297
a Includes one vessel from Rhode Island				

Table 110 – Vessels using handgear in the Gulf of Maine, FY 2003

7.4.4.6 Closed Area II Yellowtail Flounder SAP

The Closed Area II Yellowtail SAP was implemented with Amendment 13. At implementation there was no clear provision to change the number of allowable trips in response to changing stock conditions. The proposed change in the SAP would change the season, adjust the trip limit, limit the number of trips that could be taken, and would more clearly link the SAP with management objectives outside the SAP.

In general, most of the proposed changes to the SAP would mitigate the derby effects that resulted in depressed prices received by fishermen as large quantities of yellowtail flounder landed at one time could not be absorbed in the market. Adjusting the SAP season to begin in July instead of June would better align fishing opportunities with biological concerns as June is both an important month for Georges Bank yellowtail flounder spawning. June also happens to be a month where yellowtail flounder prices have been lowest in the past (June prices in New Bedford for yellowtail flounder averaged $0.67 per pound as compared to between $0.90 and $1.46 from July to December, 2003). Limiting vessels to one trip a month to the SAP would also spread out landings. The 10,000-pound trip limit would reduce the size of spikes of yellowtail flounder brought to market. All of these changes would likely result in improved average prices

received for yellowtail flounder for all vessels whether they participate in the SAP or not. However, these changes come at some cost. The change in trip limit effectively increases the overall cost of catching the available TAC by increasing the number of trips needed to take the quota assuming that the SAP can be profitably prosecuted (see below) at all. Imposing a limit on number of trips per month interferes with trip planning and may prevent vessels from optimizing business plans to take into account either unexpected market or weather conditions.

Impact of the 10,000 Pound Trip Limit

During FY2004 there were a number of anecdotal reports of lower yellowtail flounder price caused by spikes in landings associated with the SAP. The lowering of the trip limit would reduce this effect but raises issues as to whether the proposed 10,000 pound trip limit would be sufficient to justifying the expense of taking a trip given current fuel prices and potential low prices for yellowtail flounder. In part, the 30,000-pound trip limit implemented for FY2004 based on industry recommendations as being what would be needed in order to justify making a trip. Data used to justify the SAP in the first place indicated that bycatch rates of species of concern were low. This means that trip revenue is effectively capped by the yellowtail flounder trip limit unless vessels are able to fish inside and outside of the SAP on the same trip. To evaluate the potential impact of the proposed change in trip limit VTR records for FY2004 were queried to identify potential trips that may have been taken inside the SAP. Specifically, trips that were taken in statistical area 562 and that landed between 15 and 30 thousand pounds of yellowtail flounder were selected for further analysis. These trips were selected because they would have been taken, if not inside the SAP in close proximity to it, and reported landings were within trip limit requirements in effect for the SAP.

A total of 95 trips met the selection criteria. The average trip duration was between 6 and 6.5 days and carried between 4 and 5 crew (Table 111). Note that data are reported by horsepower classes instead of length classes because, as will be seen, fuel consumption hence fuel costs, was calculated based on reported specifications for marine engines.[1] The specific horsepower classes reflect the horsepower intervals for the vessels in the data set. Retained yellowtail per day was estimated by dividing total reported yellowtail flounder by days in the SAP where days in the SAP was determined by subtracting steaming time from the total days absent. Note that while the VTR records includes information regarding number of tows and average tow duration this estimate does not take into account time spent in transit from one fishing location to another. To isolate steaming time to the SAP from time spent in the SAP VMS data were used for trips to the Eastern U.S./Canada resource sharing area. These data indicate that the average trip duration was 6.4 days (nearly identical to the VTR average) and average time spent in the resource sharing area was 4.2 days. This leaves an estimate of 2.2 days of steaming time to and from the SAP. Based on these data, the average retention rate ranged between 6.8 to 7.8 thousand pounds across horsepower classes. This means that, on average, a 10,000 pound trip limit would be met in less than 1.5 days.

Although yellowtail flounder generally comprised the majority of landings, a variety of other species were also landed on the selected trips. These species included monkfish, lobster, skates, a variety of flounder species as well as small quantities of cod and haddock. The ratio of revenue from these other species to yellowtail flounder revenue was less than 0.5:1 for vessels below 672 in main engine horsepower. By contrast, vessels with larger horsepower obtained more revenue from other species than they did from yellowtail flounder. Note that prices were

[1] Marine Engine Selection Guide. CAT Marine Power (www.CAT-marine.com) LED3457-00. 2004.

estimated based on monthly average price by species in the port of New Bedford from June to December, 2003. New Bedford prices were used because nearly every selected trip was landed there. Price data from 2003 were used because 2004 data are not yet available due to the changeover to electronic dealer reporting.

Since fuel costs represent such a significant portion of trip costs (paid for by crew), estimation of the impact of the trip limit change required an estimate of how the trip limit might affect trip duration and overall revenues to the boat and to crew. This was accomplished by regressing fuel consumption data in gallons per hour against the brake horsepower for diesel marine engines manufactured by Caterpillar for fishing vessel applications (Figure 26). The resulting regression parameters were used to calculate hourly fuel use for each vessel based on the main engine horsepower reported in the FY2004 permit application. Total fuel costs were estimated by multiplying the resulting fuel consumption rate by total fishing plus steaming time in hours and an average price of $1.65 per gallon.

Given the trip information described in Table 111, the change in potential revenue associated with a reduction in the trip limit to both vessels and to crew was calculated assuming a straight 60/40 lay. Specifically, total trip duration was estimated by dividing the trip limit (10,000) by yellowtail flounder landings per day and adding 2.2 days to account for steaming time. Fuel costs were then calculated as described above. Revenue from yellowtail flounder were calculated by multiplying the trip limit, (i.e. every trip in the data set landed at least 15,000 pounds) by the monthly average yellowtail price. Revenue from all other species was obtained by multiplying yellowtail revenues by the ratio of other species to yellowtail value. Summing the two sources of revenue provided an estimate of total trip revenue from which boat and crew shares were calculated. Subtracting the fuel cost from crew share yields an estimate of crew income net of fuel costs and dividing by total crew on board provides an estimate of average income paid to each crew member. Note that this share is only a gross average and does not take into account that fact that differential shares may be paid based on different responsibilities. Also, the estimated crew payments do not include a variety of other expenses (ice, food, etc.) that crew normally pay.

Under FY2004 conditions, the estimated median gross revenue per trip ranged across horsepower classes from $25 to $35 thousand of which 40% goes to the boat and 60% to crew (Table 112). For vessels in the lowest horsepower class boat share ranged from a high of $25 thousand to a low of $8 thousand. Note that this range corresponds to the 90th and 10th percentile of the distribution of the 26 trips taken by vessels in this horsepower class. Gross revenue, hence boat and crew shares for vessels in the middle horsepower class (450 to 672) were generally lower than that of vessels in either of the other two horsepower classes.

The effect of fuel costs on returns to crew is evident as net payment per crew member was highest for the vessels in the lowest horsepower class with the sole exception of the high end of the range of performance for the largest horsepower class (more than 672). That is, lower horsepower engines consume less fuel lowering fuel costs and raising potential crew payments net of trip costs. On the high end of trips taken by vessels in the highest horsepower the higher fuel costs were more than offset by higher trip revenues resulting in an increase in payment per crew member.

Under a 10,000 pound trip limit trip duration, median boat share, crew share, and net payment per crew all fell although in different proportions. Depending on horsepower class, total days absent fell between 40% and 43%. However, time spent fishing fell by at least 60% since vessels must still steam to and from the SAP. The reduction in boat share and crew share was

similar to that of the reduced fishing time (63-64%) while net payments to crew generally fell between 52 and 54%. Crew payments fell less than that of boat payments because the costs savings associated with fuel payments were proportionally greater than the change in gross revenue. Note that total share net of fuel costs fell by 43% for crew on vessels in the highest horsepower class, but since these vessels typically carry more crew the reduction in net payment per crew member was similar to that of crew on vessels in lower horsepower classes.

While the above analysis was based on observed trips whether they actually took place inside the SAP is not certain although they were selected because they met criteria that likely reflected the type of fishing that did take place inside the SAP. The estimated economic performance for these trips may not reflect actual experience since revenues had to be estimated from 2003 data which would not necessarily reflect the depressed price effects reported by fishermen. Actual economic performance would also be likely to differ from that estimated herein, because not all trip costs were included and fuel costs had to be engineered from secondary sources. In spite of these limitations, the analysis does provide some indication of the relative change in potential economic return to participation in the SAP under a 10,000 pound trip limit. That is, unless vessels redirect effort inside the SAP on species other than yellowtail flounder or are able to fish inside and outside the area on the same trip, the potential economic return may not be sufficient for vessels to participate in the SAP.

	Horsepower Class		
Descriptive Statistics for Selected Trips (FY2004)	Less than 450	450 to 672	More than 672
Number of Trips	26	45	24
Average Horsepower	408	564	846
Average Crew (rounded to whole number)	4	4	5
Average Retained Yellowtail per Day (pounds)	6,876	7,851	7,250
Average Ratio of Yellowtail Revenue to Other Revenue	0.47	0.37	1.20
Average Yellowtail Price	0.76	0.73	0.73
Average Days Absent	6.6	6.1	6.5

Table 111 - Descriptive Statistics for Selected Trips in Statistical Area 562 (FY2004 YTD)

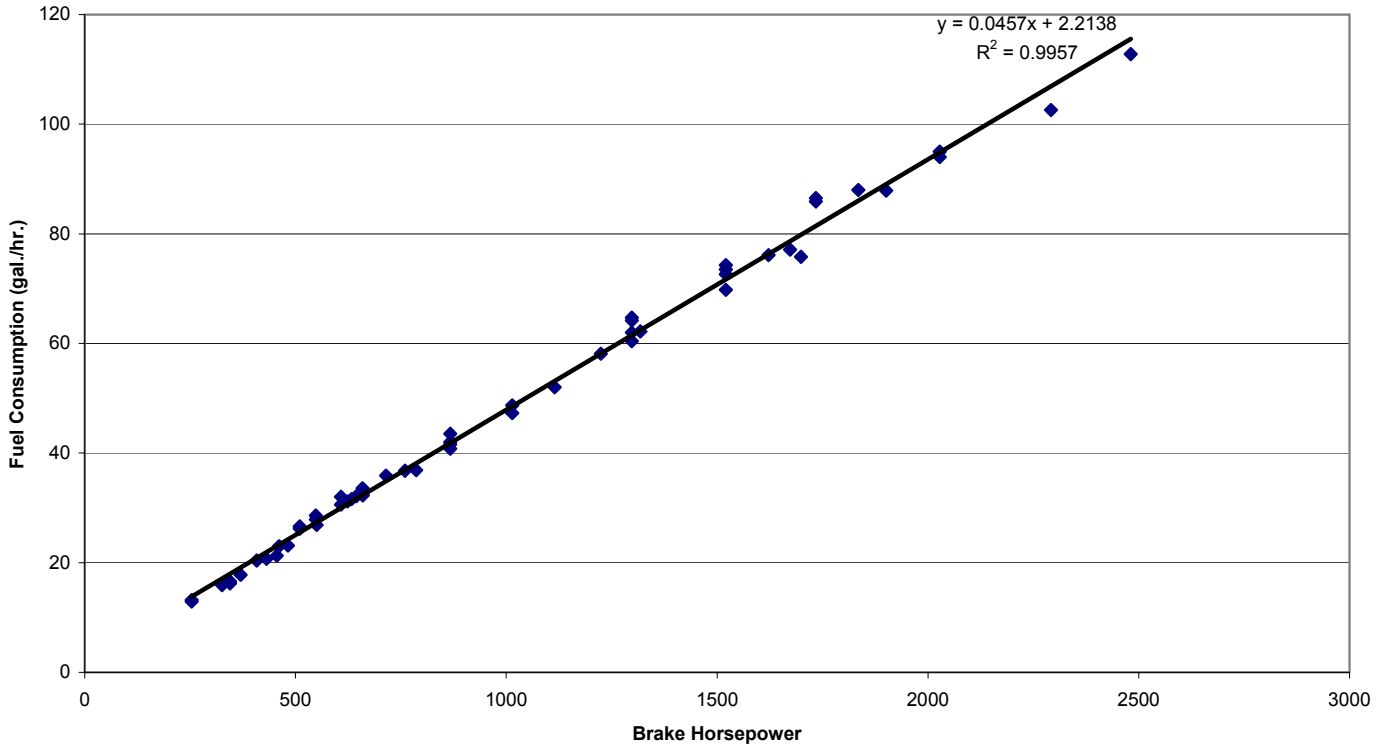


Figure 26 – Fuel consumption vs. horsepower (Source: Marine Engine Selection Guide. CAT Marine Power (www.CAT-marine.com) LED3457-00. 2004)

	FY2004			Preferred Alternative			
Horsepower Class Less than 450	Low	Median	High	Low	Median	High	Change at Median
Days Absent	4.9	6.7	8.7	3.1	3.8	4.8	-43.1%
Days Fished	2.7	4.5	6.5	0.9	1.6	2.6	-64.2%
Boat Share $ (40% of gross)	$8,188	$10,702	$16,839	$3,257	$3,959	$6,221	-63.0%
Crew Share $ (60% of gross)	$12,282	$16,053	$25,259	$4,886	$5,938	$9,331	-63.0%
Crew Share Net of Fuel Costs $	$7,043	$10,534	$19,749	$3,674	$4,782	$7,848	-54.6%
Net Share per Crew $	$2,030	$2,633	$4,480	$927	$1,205	$1,796	-54.3%
Horsepower Class 450 to 672							
Days Absent	4.4	6.1	7.8	3.1	3.6	4.2	-41.0%
Days Fished	2.2	3.9	5.6	0.9	1.4	2.0	-63.8%
Boat Share $ (40% of gross)	$7,966	$10,209	$14,883	$3,181	$3,651	$5,211	-64.2%
Crew Share $ (60% of gross)	$11,949	$15,313	$22,324	$4,771	$5,477	$7,817	-64.2%
Crew Share Net of Fuel Costs $	$5,124	$8,645	$15,448	$3,200	$4,114	$6,350	-52.4%
Net Share per Crew $	$1,252	$1,926	$4,018	$664	$912	$1,588	-52.6%
Horsepower Class More than 672							
Days Absent	4.8	6.3	8.4	3.1	3.8	4.5	-39.6%
Days Fished	2.6	4.1	6.2	0.9	1.6	2.3	-61.0%
Boat Share $ (40% of gross)	$9,628	$13,880	$26,258	$3,418	$5,047	$12,364	-63.6%
Crew Share $ (60% of gross)	$14,442	$20,819	$39,386	$5,127	$7,571	$18,546	-63.6%
Crew Share Net of Fuel Costs $	$5,626	$9,159	$24,686	$3,103	$5,223	$11,315	-43.0%
Net Share per Crew $	$1,125	$2,148	$6,046	$704	$1,045	$2,829	-51.4%

Table 112 - Estimated Impact of the Proposed Change in Georges Bank Yellowtail Flounder SAP Trip Limit

7.4.4.7 Minimum Effective Effort Allocation

This measure would provide an opportunity for vessels that received a zero DAS baseline under the criteria implemented for Amendment 13 to qualify for a minimum allocation of 10 reserve B DAS. This allocation would only enable these vessels to participate in established SAPs and would not be eligible to participate in any regular B DAS fisheries. The economic impact of this measure is expected to be positive for vessels that would receive a minimum allocation but could adversely affect other vessels did receive a non-zero DAS baseline. That is, since the economic benefit of any given SAP is effectively limited by TACs for both target species and incidental TACs for stocks of concern, any increase in the potential number of participants will spread the potential benefits across more vessels. In essence, granting increased access to SAPs represents an implicit tradeoff between vessels that have only been peripherally involved in the groundfish fishery since 1996 and vessels that have been comparatively more active.

For FY2004 there were a total of 448 vessels that received a zero DAS baseline, of which, 44 were enrolled in the CPH program as of September, 2004. The majority of vessels that were not in CPH were from Massachusetts home ports (173) with no other state having more then 50 (Table 113). Based on vessel size more than 75% of vessels that received a zero baseline for FY2004 were less than 50 feet LOA (Table 114).

Half of all vessels with a zero baseline reported some fishing activity through FY2003 dealer records. However, this percentage differed substantially across states and vessel size class. For example, from Rhode Island southward at least two-thirds of all vessels reported some fishing activity. Also, about the same percentage of vessels 50-feet and upward, reported activity in FY2003. By contrast, only 22% of Maine home port state vessels with a zero baseline reported any activity. Similarly, less than half of all vessels from both New Hampshire and Massachusetts reported fishing activity.

Among vessels that did report fishing activity in FY2003 almost all of them depended on a single species for the majority of their reported fishing revenue. For example, there were 30 vessels for which scallops represented the majority of fishing income of which, over half (16) were from Massachusetts (Table 115). The average dependence on scallops across all 30 vessels was 96%. The average dependence for active vessels on summer flounder, monkfish, groundfish (10 large mesh species combined), lobster, surfclam, jonah crab, mackerel, tilefish, hagfish, and menhaden all exceeded 80%. These data indicate that the majority of active vessels were heavily engaged in fisheries other than groundfish. Whether this level of activity represents a shift away from groundfish to these other fisheries is not known. Certainly, such a shift would have occurred prior to 1996, otherwise their baseline allocation would not have been zero.

The economic effect of providing a minimum of 10 reserve B DAS is uncertain. During FY2003 all of these vessels would have had a total of 8 DAS during which they would have been able to target groundfish. Of the 26 vessels which relied on groundfish for the majority of fishing revenue the average gross revenue from all species was about $8 thousand of which $5.2 thousand was groundfish. Although fishing revenues of this magnitude probably represent part-time or supplemental income, removal of the ability to target groundfish would have a significant affect on these vessel owners, and their crew, unless they were able to seek out alternative

fisheries or other sources of income. Providing a minimum baseline of 10 reserve B DAS would not be equivalent to restoring fishing opportunities that were available in FY2003 since the DAS would only be able to be used inside an SAP. At present, most vessels (if they are like the 26 noted herein) may not be able to take immediate advantage of either existing SAPs or those approved under Framework 40A and for the present action (40B) with the possible exception of the proposed rod and reel SAP in the WGOM. This does not mean that the proposed measure will have no beneficial economic effect since at least some vessels will be able to participate in any one or more of these SAPs. However, the realized economic gains from granting a minimum allocation of 10 reserve B DAS may not be expected to be large in magnitude or broad-based but would certainly be positive for some vessels.

The previous discussion was based on the perspective of an individual vessel or fishing business. Treated from a more broad perspective, management of SAPs and other programs prescribing ways in which B DAS has been based on TAC set-asides that limit the economic benefits that may be derived. This also means that increasing the potential number of individuals that may be eligible to participate in an SAP has allocative effects. That is, the proposed measure represents a potential transfer of income from vessels with more recent groundfish activity to vessels that do not have a recent history of groundfish.

Home Port State	Total Vessels	Number of Inactive Vessels	Number of Active Vessels	Percent Active
ME	49	38	11	22%
NH	12	7	5	42%
MA	173	96	77	45%
RI	32	11	21	66%
CT	2	2	0	0%
NY	45	13	32	71%
NJ	37	11	26	70%
DE	2	0	2	100%
MD	4	0	4	100%
VA	4	0	4	100%
NC	10	0	10	100%
Other or Missing	34	25	9	26%
Total	404	203	201	50%

Table 113 - Summary of Vessels with Zero Baseline and Activity by Home Port State

Length Class	Total Vessels	Number of Inactive Vessels	Number of Active Vessels	Percent Active
Less than 50 Feet LOA	309	176	133	43%
50 to 70 Feet LOA	48	17	31	65%
More than 70 Feet LOA	47	10	37	79%
Total	404	203	201	50%

Table 114 - Summary of Vessels with Zero Baseline and Activity by Home Length Class

		Number of Vessels With Majority of Fishing Income from a Single Species											
	Average Dependence	DE	MA	MD	ME	NC	NH	NJ	NY	RI	VA	Other	Total Vessels
Scallops	96%	0	16	0	2	3	0	4	0	0	3	2	30
Summer Flounder	72%	0	5	3	0	4	0	5	8	3	0	2	30
Monkfish	88%	1	10	0	0	0	0	5	2	5	1	2	26
Groundfish	86%	0	15	0	3	0	2	0	3	1	0	2	26
Lobster	89%	0	7	0	0	0	1	2	4	5	0	0	19
Tunas	94%	0	9	0	3	1	1	1	0	0	0	0	15
Black Sea Bass	78%	0	4	1	0	0	0	4	2	4	0	0	15
Bluefish	77%	0	3	0	0	0	0	1	3	0	0	0	7
Clams	100%	1	0	0	2	0	0	0	1	0	0	0	4
Jonah Crab	80%	0	2	0	0	0	0	1	0	0	0	0	3
Tautog	77%	0	1	0	0	0	0	1	1	0	0	0	3
Mackerel, Tilefish, Hagfish, Menhaden	99%	0	3	0	1	0	0	1	2	0	0	0	7
Squid, Red Crab, Herring, Shrimp, Whiting	63%	0	2	0	0	1	1	0	1	0	0	1	6
Other Species	74%	0	0	0	0	1	0	1	5	3	0	0	10

Table 115 - Summary of Zero Baseline Vessels With FY2003 Fishing Activity by Species Dependence and Home Port State

7.4.4.8 Georges Bank Cod Hook Sector Allocation

Initial history for purposes of establishing a quota share for the GB Cod Hook Sector was limited to cod landings using hook gear even though sector participants may have had documented landings of GB cod using any number of different gears. This alternative would revise the sector share by recalculating landings history including all Georges Bank cod landings regardless of gear type. Presumably, any additional cod that may be attributable to sector participants will increase the overall cod TAC that will be available to the membership.

The economic impact of this measure would be two-fold. Most obviously, the hook sector will be able to increase overall fishing revenues (although how these benefits may be distributed among the membership is not known) as its allocation of GB cod may increase. The second impact is less obvious. Specifically, an increase in GB cod TAC may be more valuable as a bycatch in other directed fisheries; either as regular B DAS or in SAPs. For example, a higher GB cod TAC would provide greater assurance that the economic benefits of the Closed Area I haddock hook SAP would be fully realized since sector participants would be less likely to have to stop fishing because a cod TAC may be reached. The relative importance of higher TAC levels to enhance directed cod or cod bycatch fisheries is not known at this time.

While changing the qualification criteria for the GB Cod Hook Sector would undoubtedly benefit the sector and its membership, the resulting increase in TAC share would be accompanied by a corresponding decrease in TAC share to everyone else. Even though the TAC to non-sector participants is a target which would not result in an in-season closure it does increases the probability (by some unknown small amount) that the target TAC would be exceeded unless some type of compensatory action is taken to account for the lowered target TAC. In essence, this is a zero-sum game and any change in TAC allocation means that enhanced income opportunities to one group will have to be offset by a reduction in income opportunities to others.

7.4.4.9 Change to DAS Baseline Calculation

This measure includes three options for changes to the DAS baseline calculation. Option 1 is No Action – DAS allocations would remain as implemented by Amendment13. Adopting this option would not result in any changes to the economic impacts as analyzed by Amendment 13, and allocations would remain as shown in the Affected Environment section (see section 6.4.2.1).

Option 2

This measure would retain the qualification period and the poundage criterion for establishing a baseline DAS allocation under Amendment 13 but would remove the criterion capping baseline allocations at their Fishing Year 2001 base allocation. This change would have no impact on any vessel (a total of 448 vessels of which 44 were CPH vessels as of September, 2004) that received a zero baseline allocation in FY2004 since these vessels either called-in no DAS at all or could not meet the poundage requirement. In these instances, removing the cap would not change the current baseline. For the 1,005 vessels that did receive a non-zero baseline allocation in FY2004 a total of 390 would receive a higher baseline allocation while baseline allocations for the remaining 615 vessels would remain unchanged. That is, the latter never called in more DAS over the qualification period than their FY2001 DAS allocation.

Throughout the discussion to follow the focus is on how vessels may be affected by a change in Category A DAS. Emphasis is placed on this aspect of DAS allocations because under current conditions only Category A DAS may be used with maximum flexibility in terms of gear, season, and fishing location. At this time there are only limited opportunities to use Category B DAS and many vessels particularly those fishing in the Gulf of Maine and/or with limited range may not be able to take advantage of existing programs for Category B DAS. For these vessels Category A DAS represent the sole avenue for participation in the groundfish fishery. Note also that marginal vessels may be finding that they can increase profitability by leasing DAS to other vessels. A reduction in Category A DAS would reduce this source of income.

Overall, this measure would result in an increase in baseline allocations of 6,728 DAS or an average of 17.4 DAS for the 386 vessels that would receive a higher baseline than what they received in FY2004. However, regardless of how DAS baseline allocations are assigned, the conservation objectives of Amendment 13 do not change. Based on FY2004 implementation and assuming that CPH vessels would remain in the CPH program and an 85% use rate results in an expected use of Category A DAS of 35,919 days. This level of Category A DAS use was estimated to be meet the conservation objectives of Amendment 13. Any change in the baseline allocation would result in a different expected use of Category A DAS. Specifically, this measure would result in an expected use of Category A DAS of almost 40,000 days which would not meet the conservation objectives of Amendment 13. In order to meet these conservation objectives the split between Category A and B DAS would need to be adjusted such that the expected use of A DAS would remain at 35,919 DAS. Note that this effect was anticipated in the DSEIS for Amendment 13 (see Section 4.4.9.4.6 "It also indicates that more Category A DAS allowed at the start of Amendment 13 will lead to greater reductions for the fleet as a whole to meet mortality reductions.").

Maintaining the assumption that CPH vessels would remain in CPH and the 85% use rate means that the split between Category A and B DAS would have to be changed from 60/40 to 55/45 percent in order for expected use of Category A DAS to be kept at 35,919 days. This means that compared to No Action, allocations of available Category A DAS would be lower for at least the 575 vessels whose DAS baseline would not change under the proposed change. Of the 386 that would receive a higher DAS baseline, their Category A DAS would only increase if the relative change from FY2004 and the proposed change in allocation qualification was greater than 5%.

Summing lost (-2094) and gained (2246) category A DAS results in an accumulated gain of 152 DAS (Table F1 Option 1). That is, even though only 20% of vessels would end up with a higher allocation of category A DAS than they had in FY2004, if this measure were implemented, because the average increase was more than three times as great as the average loss the net aggregate change would increase total A DAS by only 152 days. In effect, these data indicate that the proposed change in baseline allocations would result in a net transfer of Category A DAS to vessels with a Massachusetts or Maine home port from vessels in all other states.

Overall, 195 vessels would receive a net increase in Category A DAS even after reducing the split between A and B DAS while 766 (80%) of vessels would receive fewer Category A DAS. Note that the 766 vessels includes 191 of the 386 vessels whose baseline allocation would increase under this measure meaning that even though their baseline would increase, they would receive fewer Category A DAS due to the adjusted A and B DAS split. Across all states, the net change in Category A DAS was positive in only Maine and Massachusetts and in both Connecticut and Virginia no vessel would benefit from the change in baseline allocation.

Based on vessel size, 42% of vessels in excess of 70 feet LOA would receive a net increase in Category A DAS compared to FY2004 allocations as compared to only 11% of smaller vessels (less than 50 feet) (Table 116). These data indicate that this measure would result in a net transfer of Category A DAS from small vessels to large ones as the net reduction in Category A DAS would decline by 698 DAS while allocations to vessels in excess of 70 feet would increase by 668 DAS.

The economic effect of the change in baseline allocations was estimated by calculating the average revenue per DAS for FY2003 by homeport state and vessel size class by the change in category A DAS. Specifically, dealer data were used to compute an average price by species for FY2003. These estimated prices were then merged with the VTR data to obtain an estimate of total value of reported landings. The VTR data were then converted to a trip record to identify trips that landed regulated groundfish. These groundfish trips were then summarized by home port state and vessel length to compute average revenue per day (Table 118). In general, average revenue per day increases with vessel size with a relatively modest difference between vessels less than 50 feet LOA and vessels from 50 to 70 feet. However, with the exception of Virginia, average revenue for vessels greater than 70 was at least twice that of medium sized vessels and in some cases three times greater.

Summing total revenue gains and revenue losses results in a potential net gain in groundfish value of $2.8 million (Table 119). Note that a detailed reporting of these results by home port state and vessel length is not possible to protect confidentiality. Massachusetts vessels would garner 76% of total gains but would also account for 51% of the aggregate losses. As noted previously, the only states where the net change in total groundfish value was positive were Massachusetts and Maine. In other words, the proposed change in baseline allocation represents a transfer of potential groundfish value to Maine and Massachusetts from vessels in all other states. Relative to average total estimated groundfish value the magnitude of this transfer averages 6% for vessels that would lose Category A DAS. That is, even though the average monetary gain to vessels that would receive a net increase in Category A DAS was more than three times that of losing vessels, about two-thirds of this gain would be attributable to the increased baseline and one-third to an income transfer.

Vessels in excess of 70 feet LOA ($4.5 million) would account for 66 % of the gain in potential groundfish value (Table 120). By contrast, revenue losses would be more evenly distributed across vessel size classes although vessels less than 50 feet LOA would incur the largest total loss (-$1.6 million), and would be the only vessel size class with a negative net change in groundfish value (-$0.9 million). The net change in groundfish value for medium size vessels would be nearly neutral ($0.5 million) but large vessels would net an increase of $3.1 million. This means that the proposed change in baseline allocation represents a transfer of potential groundfish value from small to large vessels although the majority of the large vessel increase (about 70%) is associated with the higher revenue per day. As noted above, average revenue loss as a percent of total fishing revenue was about 6% for vessels that would lose Category A DAS. Although not a large portion of total revenue, depressed fish prices and rising fuel squeezes profit margins and even small changes in fishing income could place any give fishing business at financial risk.

In addition to the potential revenue effects, any change in baseline allocation would affect the number of DAS that any given vessel may have available to lease to another vessel. Conversely, a reduction in Category A DAS would force losing vessels to lease DAS from another vessel in order to maintain a desired level of business activity in groundfish. This means

that a losing vessel may be doubly affected; first by the loss in potential fishing revenue and again by the increased costs it would have to incur to lease DAS to regain any lost days.

Home Port State	Number of Vessels with Increased Category A DAS	Number of Vessels with Reduced Category A DAS	Percent of Vessels with Increased Category A DAS	Cumulative Increase in Category A DAS	Average Category A DAS Gain	Cumulative Decrease in Category A DAS	Average Category A DAS Loss	Net Change in Category A DAS
CT	0	13	0%	0	0	-35	-3	-35
MA	129	404	24%	1,586	12	-1,142	-3	444
ME	33	108	23%	343	10	-302	-3	41
NH	13	46	22%	144	11	-152	-3	-9
NJ[a]	6	113	5%	58	10	-246	-2	-188
RI	11	64	15%	113	10	-177	-3	-64
VA	0	4	0%	0	0	-6	-1	-6
Other[b]	3	14	18%	4	1	-34	-2	-31
Totals	195	766	20%	2,246	12	-2,094	-3	152
a Delaware and New York combined with New Jersey to protect confidentiality.								
b Includes vessels from North Carolina, vessels with missing data, and vessels with home ports outside the Northeast region.								

Table 116 - Summary of Changes in Category A DAS Allocations by Home Port State

Length Class	Number of Vessels with Increased Category A DAS	Number of Vessels with Reduced Category A DAS	Percent of Vessels with Increased Category A DAS	Cumulative Increase in Category A DAS	Average Category A DAS Gain	Cumulative Decrease in Category A DAS	Average Category A DAS Loss	Net Change in Category A DAS
Less than 50 Feet LOA	60	488	11%	625	10	-1,323	-3	-698
50 to 70 Feet LOA	56	169	25%	662	12	-479	-3	183
More than 70 Feet LOA	79	109	42%	960	12	-292	-3	668
Totals	195	766	20%	2,246	12	-2,094	-3	152

Table 117 - Summary of Changes in Category A DAS Allocations by Vessel Length Class

	Average Total Revenue per Day on Groundfish Trips by Vessel Size		
Home Port State	Less than 50 Feet LOA	50 to 70 Feet LOA	More than 70 Feet LOA
CT	1,674	978	2,922
MA	1,225	2,342	4,687
ME	1,368	2,344	4,168
NH	1,158	1,530	3,217
NJ[a]	819	1,336	3,834
RI	1,630	2,204	5,522
VA	0	3,080	3,564
Other[b]	1,487	2,139	4,602

Table 118 - Estimated Average Revenue on Groundfish Trips for FY2003

Home Port State	Groundfish Value for Vessels that Gain Category A DAS	Groundfish Value for Vessels that Lose Category A DAS	Total Net Change in Revenue	Average Gain in Groundfish Value	Revenue Gain as a Percent of Total Fishing Revenue	Average Loss in Groundfish Value	Revenue Loss as a Percent of Total Fishing Revenue
CT	$0	-$57,713	-$57,713	$0	0%	-4,439	-7%
MA	$5,146,667	-$2,020,480	$3,126,187	$39,897	19%	-5,001	-7%
ME	$787,957	-$522,113	$265,844	$23,877	17%	-4,834	-5%
NH	$167,836	-$185,452	-$17,616	$12,910	19%	-4,032	-7%
NJ[a]	$167,711	-$432,871	-$265,160	$27,952	15%	-3,831	-7%
RI	$510,865	-$634,109	-$123,244	$46,442	21%	-9,908	-7%
VA	$0	-$19,425	-$19,425	$0	0%	-4,856	-4%
Other[b]	$17,495	-$100,325	-$82,831	$5,832	5%	-7,166	-7%
Total	$6,798,531	-$3,972,488	$2,826,043	$34,864	12%	-5,186	-6%

Table 119 - Summary of Potential Value of Groundfish Revenue Change on Category A DAS by Home Port State

Length Class	Groundfish Value for Vessels that Gain Category A DAS	Groundfish Value for Vessels that Lose Category A DAS	Total Net Change in Revenue	Average Gain in Groundfish Value	Revenue Gain as a Percent of Total Fishing Revenue	Average Loss in Groundfish Value	Revenue Loss as a Percent of Total Fishing Revenue
Less than 50 Feet LOA	$773,070	-$1,630,423	-$857,354	$12,884	19%	-3,341	-7%
50 to 70 Feet LOA	$1,526,237	-$986,770	$539,467	$27,254	20%	-5,839	-6%
More than 70 Feet LOA	$4,499,224	-$1,355,295	$3,143,929	$56,952	18%	-12,434	-6%
Total	$6,798,531	-$3,972,488	$2,826,042	$34,864	19%	-5,186	-6%

Table 120 - Summary of Potential Value of Groundfish Revenue Change on Category A DAS by Vessel Size

Option 3

Like Option 2 this measure would retain the qualification period and the poundage criterion for establishing a baseline DAS allocation under Amendment 13 but would remove the criterion capping baseline allocations at their Fishing Year 2001 base allocation. However, unlike Option 2, use of carryover days would not count. As noted previously, this change would have no impact on any vessel (a total of 448 vessels of which 44 were CPH vessels as of September, 2004) that received a zero baseline allocation in FY2004 since these vessels either called-in no DAS at all or could not meet the poundage requirement. As of November 4, 2004 there were a total of 961 vessels holding a valid limited access permit, had a non-zero baseline. For these vessels a total of 145 would receive a higher baseline allocation while baseline allocations for the remaining 816 vessels would remain unchanged. That is, exclusive of carry-over, the latter never called in more DAS over the qualification period than their FY2001 DAS allocation.

Overall, this measure would result in an increase in baseline allocations of 4,557 DAS or an average of 31.4 DAS for the 145 vessels that would receive a higher baseline than what they received in FY2004. However, regardless of how DAS baseline allocations are assigned, the conservation objectives of Amendment 13 do not change. Based on FY2004 implementation and assuming that CPH vessels would remain in the CPH program and an 85% use rate results in an expected use of Category A DAS of 35,919 days. This level of Category A DAS use was estimated to be meet the conservation objectives of Amendment 13. Any change in the baseline allocation would result in a different expected use of Category A DAS. In order to meet these conservation objectives the split between Category A and B DAS would need to be adjusted such that the expected use of A DAS would remain at 35,919 DAS. Note that this effect was anticipated in the DSEIS for Amendment 13 (see Section 4.4.9.4.6 "It also indicates that more Category A DAS allowed at the start of Amendment 13 will lead to greater reductions for the fleet as a whole to meet mortality reductions.").

Maintaining the assumption that CPH vessels would remain in CPH and the 85% use rate means that the split between Category A and B DAS would have to be changed from 60/40 to 56/44 percent in order for expected use of Category A DAS to be kept at 35,919 days. This means that compared to No Action, allocations of available Category A DAS would be lower for at least the 816 vessels whose DAS baseline would not change under the proposed change. Of the 145 that would receive a higher DAS baseline, their Category A DAS would only increase if the relative change from FY2004 and the proposed change in allocation qualification was greater than 4%.

Summing lost (-2206) and gained (1919) category A DAS results in an accumulated loss of 287 DAS (Table 121). That is, since only 14% of vessels would end up with a higher allocation of category A DAS than they had in FY2004, even though their average gain in Category A DAS would be more than three times as great as average losses the net aggregate change would reduce total A DAS by 287 days. In effect, these data indicate that the proposed change in baseline allocations would result in a net transfer of Category A DAS to vessels with a Massachusetts or Maine home port from vessels in all other states but the accumulated gains would not exceed losses.

Overall, 136 vessels would receive a net increase in Category A DAS even after reducing the split between A and B DAS while 825 (86%) of vessels would receive fewer Category A DAS. Note that the 825 vessels includes 9 of the 145 vessels whose baseline allocation would increase under this measure meaning that even though their baseline would increase, they would receive fewer Category A DAS due to the adjusted A and B DAS split. Across all states, the net

change in Category A DAS was negative meaning that no state would receive a net gain in Category A DAS.

Based on vessel size, 38% of vessels in excess of 70 feet LOA would receive a net increase in Category A DAS compared to FY2004 allocations as compared to only 5% of smaller vessels (less than 50 feet) (Table 122). These data indicate that this measure would result in a net transfer of Category A DAS from small vessels to large ones as the net reduction in Category A DAS would decline by 698 DAS while allocations to vessels in excess of 70 feet would increase by 668 DAS.

Summing total revenue gains and revenue losses results in a potential net gain in groundfish value of $2.2 million (Table 123). Note that a detailed reporting of these results by home port state and vessel length is not possible to protect confidentiality. Massachusetts vessels would garner 76% of total gains but would also account for 50% of the aggregate losses. The only states where the net change in total groundfish value was positive were Massachusetts and Maine. In other words, the proposed change in baseline allocation represents a transfer of potential groundfish value to Maine and Massachusetts from vessels in all other states. Relative to average total estimated groundfish value the magnitude of this transfer averages 7% for vessels that would lose Category A DAS. That is, even though the average monetary gain to vessels that would receive a net increase in Category A DAS was more than three times that of losing vessels, about two-thirds of this gain would be attributable to the increased baseline and one-third to an income transfer.

Vessels in excess of 70 feet LOA ($4.9 million) would account for 75 % of the gain in potential groundfish value (Table 124). By contrast, revenue losses would be more evenly distributed across vessel size classes although vessels less than 50 feet LOA would incur the largest total loss (-$1.6 million), and would be the only vessel size class with a negative net change in groundfish value (-$1.2 million). The net change in groundfish value for medium size vessels would be nearly neutral ($87 thousand) but large vessels would net an increase of $3.4 million. This means that the proposed change in baseline allocation represents a transfer of potential groundfish value from small to large vessels although the majority of the large vessel increase is associated with the higher revenue per day. As noted above, average revenue loss as a percent of total fishing revenue was about 6% for vessels that would lose Category A DAS

In addition to the potential revenue effects, any change in baseline allocation would affect the number of DAS that any given vessel may have available to lease to another vessel. Conversely, a reduction in Category A DAS would force losing vessels to lease DAS from another vessel in order to maintain a desired level of business activity in groundfish. This means that a losing vessel may be doubly affected; first by the loss in potential fishing revenue and again by the increased costs it would have to incur to lease DAS to regain any lost days.

Home Port State	Number of Vessels with Increased Category A DAS	Number of Vessels with Reduced Category A DAS	Percent of Vessels with Increased Category A DAS	Cumulative Increase in Category A DAS	Average Category A DAS Gain	Cumulative Decrease in Category A DAS	Average Category A DAS Loss	Net Change in Category A DAS
CT	0	13	0%	0	0	-30	-2	-30
MA	95	438	18%	1,329	14	-1,195	-3	134
ME	25	116	18%	359	14	-374	-3	-15
NH	5	54	8%	54	11	-166	-3	-112
NJ[a]	5	114	4%	61	12	-211	-2	-150
RI	6	69	8%	117	19	-185	-3	-68
VA	0	4	0%	0	0	-10	-2	-10
Other[b]	0	17	0%	0	0	-35	-2	-35
Totals	136	825	14%	1,919	14	-2,206	-3	-287
a Delaware and New York combined with New Jersey to protect confidentiality.								
b Includes vessels from North Carolina, vessels with missing data, and vessels with home ports outside the Northeast region.								

Table 121 - Summary of Changes in Category A DAS Allocations by Home Port State

Length Class	Number of Vessels with Increased Category A DAS	Number of Vessels with Reduced Category A DAS	Percent of Vessels with Increased Category A DAS	Cumulative Increase in Category A DAS	Average Category A DAS Gain	Cumulative Decrease in Category A DAS	Average Category A DAS Loss	Net Change in Category A DAS
Less than 50 Feet LOA	27	521	5%	334	12	-1,329	-3	-995
50 to 70 Feet LOA	38	187	17%	537	14	-540	-3	-3
More than 70 Feet LOA	71	117	38%	1,048	15	-336	-3	711
Totals	136	825	14%	1,919	14	-2,206	-3	-287

Table 122 - Summary of Changes in Category A DAS Allocations by Vessel Length Class

Home Port State	Groundfish Value for Vessels that Gain Category A DAS	Groundfish Value for Vessels that Lose Category A DAS	Total Net Change in Revenue	Average Gain in Groundfish Value	Revenue Gain as a Percent of Total Fishing Revenue	Average Loss in Groundfish Value	Revenue Loss as a Percent of Total Fishing Revenue
CT	$0	-$52,381	-$52,381	$0	0%	-4,029	-7%
MA	$4,955,631	-$2,187,596	$2,768,035	$52,165	20%	-4,995	-7%
ME	$839,446	-$700,734	$138,712	$33,578	21%	-6,041	-7%
NH	$63,980	-$205,309	-$141,329	$12,796	18%	-3,802	-7%
NJ[a]	$172,897	-$385,680	-$212,783	$34,579	17%	-3,383	-6%
RI	$536,582	-$661,943	-$125,361	$89,430	32%	-9,593	-7%
VA	$0	-$32,722	-$32,722	$0	0%	-8,180	-7%
Other[b]	$0	-$115,429	-$115,429	$0	0%	-6,790	-7%
Total	$6,568,536	-$4,341,792	$2,226,744	$48,298	13.5%	-5,263	-7%

Table 123 - Summary of Potential Value of Groundfish Revenue Change on Category A DAS by Home Port State

Length Class	Groundfish Value for Vessels that Gain Category A DAS	Groundfish Value for Vessels that Lose Category A DAS	Total Net Change in Revenue	Average Gain in Groundfish Value	Revenue Gain as a Percent of Total Fishing Revenue	Average Loss in Groundfish Value	Revenue Loss as a Percent of Total Fishing Revenue
Less than 50 Feet LOA	$422,029	-$1,641,936	-$1,219,907	$15,631	21%	-3,152	-7%
50 to 70 Feet LOA	$1,233,801	-$1,147,162	$86,639	$32,468	23%	-6,135	-7%
More than 70 Feet LOA	$4,912,706	-$1,552,693	$3,360,012	$69,193	20%	-13,271	-7%
Total	$6,568,536	-$4,341,792	$2,226,744	$48,298	21%	-5,263	-7%

Table 124 - Summary of Potential Value of Groundfish Revenue Change on Category A DAS by Vessel Size

7.4.4.10 Impact of the Combined Alternative 1 Measures

The proposed change to baseline DAS allocations would affect every vessel with a non-zero effective effort baseline. Given the need to maintain expected DAS use constant to achieve the mortality requirements of Amendment 13 at least 80% of vessels would receive lower allocations of Category A DAS for FY2005. This would put a greater premium on the ability to use Category B DAS, and DAS leasing or DAS transfer in order to make up for the lost fishing opportunities on Category A DAS. While Alternative 1 would not change DAS leasing it would reduce the conservation tax on DAS transfers and would adopt several other potential changes to the DAS transfer program. To the extent these changes make DAS transfer more attractive it would provide some relief. Alternative 1 would also implement two new SAPs and would modify the existing Closed Area II Yellowtail SAP. The two new SAPs (WGOM Rod and Reel SAP and GB Haddock Fishery SAP) would provide some opportunity to make up for lost A DAS. However, given haddock and incidental catch TACs neither SAP would offer sufficient fishing opportunities to make up for an estimated $4.0 million in potential losses of Category A DAS. Note also that these vessels would also be competing for limited TACs with the 448 vessels that would only be able to fish in an SAP.

Just as most vessels would lose Category A DAS, depending on the selected option, between 136 and 195 vessels would receive higher allocations of Category A DAS in FY2005. The estimated potential gain in fishing revenue for these vessels would be $6.5 – $6.7 million. These vessels would also be able to take advantage of the change in conservation tax as well as any of the new SAPs.

Other than the change in baseline allocation, the majority of the proposed Alternative 1 measures would have limited synergistic effects. Given the experience from FY2004 the change to the CAII Yellowtail Founder SAP may have the most broad-based economic effects. The proposed action would create a more explicit link between the total available TAC and expected catches of yellowtail flounder on Category A DAS outside of the SAP. In effect, this action provides a higher level of assurance that the full economic benefits from fishing on Category A DAS would be realized. Note that this is of particular importance since vessels that may not choose to participate in any particular SAP would be disproportionately affected by a closure caused by meeting the TAC in an SAP.

In addition to the potential impact on Category A DAS, the proposed action would implement two measures that could have an impact on the use of Category A DAS. The change in the GB Cod Hook Sector Allocation would likely result in an increased allocation of GB cod to the sector. The direct effect of this action would be to provide sector participants with increased fishing opportunities in directed cod fishing or in improving opportunities in SAPs where cod is an incidental catch. However, a reallocation of cod to sector participants means the target TAC that the remaining vessels would have to meet would have to be reduced by a corresponding amount. Whether this effect would actually result in non-sector vessels exceeding the target TAC is not known, but would depend on magnitude of the reallocation.

The second measure that would have an affect on Category A DAS is the removal of the net limit for trip gillnet vessels. This action would improve economic performance of trip gillnet vessels by restoring their operational options to pre-Amendment 13 conditions. Past performance

indicates that at least on Georges Bank the number of nets used by gillnet vessels was similar to no action limits (150 nets). These vessels may not realize any measurable affect on fishing revenues but would be relived form the requirement to change gillnet tags while at sea. Past practice suggests that trip gillnet vessels fishing in the Gulf of Maine may choose to significantly increase the number of nets fished. This likelihood that this increase in nets would be realized is not known but would at least be partially offset by trip limits on Gulf of Maine cod.

In addition to these impacts, this alternative would introduce three new programs that would place additional demands on the NMFS observer program. The cost of these added programs has two dimensions; a budgetary and an economic cost. The budgetary dimension is simply the cost (including observer salary, overhead, data entry etc.) of placing an observer on a vessel multiplied by the expected effort and desired coverage rate. The economic cost of expanded demand on the observer program is measured by the opportunity cost of diverting resources away from current activities to meet the expanded demand for observers. Assuming no additional funding is forthcoming, observer resources would have to be diverted away from current programs in order to meet the demand of these new programs. Such a change would only be possible by dropping coverage or scaling back the rate of coverage for certain fisheries. Since these existing programs provide valued services (monitoring of catch rates, takes of protected species, and bycatch monitoring) the economic cost of the proposed action would be the cost of losing the information that would otherwise have been collected in those fisheries. Assuming additional funds were made available the following provides and approximation of the needed resources.

Closed Area I Haddock SAP – According to data provided in section 7.4.1.1 the estimated catch rate in the SAP would be 12,367 pounds per day fished. For a 1,000 mt haddock TAC this catch rate would result in approximately 178 days fished in the SAP. Logbook data for trips taken inside the proposed SAP averaged about 4.5 days absent. Assuming steaming time of between 1 and 1.5 days, results in a rough estimate of 3 days fished per trip or about 60 trips. If the fishery is extended to the authorized limit of 2,000 mt then the total number of trips would be 120. Adding steaming time results in an estimate of about 240 days for a 1,000 mt TAC and an additional 240 days if the TAC is 2,000 mt. Based on observed activity (see section 7.4.4.5) there were 243 vessels that may be likely participants in the SAP.

WGOM Rod and Reel SAP – Evaluation of the biological or economic impacts of this SAP was hampered by a lack of data inside the SAP that would reflect the type of fishing anticipated to take place. Available data indicate that there were a total of 91 limited access vessels (including category 'HA') that took at least one trip using handgear in the Gulf of Maine during fishing year 2003. These vessels took a total of 492 trips where either cod or haddock were landed of which only 64 landed any haddock. A significant number of these trips were made by category 'HA' permit holders. Since regulations imposed trip limits on combined cod haddock and yellowtail flounder on these particular vessels data from these trips may not reflect expected catch rates inside the SAP. Selecting only trips by limited access DAS permit holders for FY2003 results in a total of 26 trips that landed haddock, of which, 6 landed more haddock than cod. Average haddock landings on these 6 trips (an average of 1.4 days absent) were 266 pounds and average cod landings were 78 pounds. Assuming approximately 24 hours fished and a 50 mt haddock TAC results in 414 trips as long as the GOM cod incidental catch TAC is not reached first. At an average cod catch of 78 pounds and a TAC of 6.3 mt, the GOM cod catch would limit the number of trips to 178 trips.

Herring Vessel Interactions – Since May, 2004 the observer program has increased its coverage of the herring fishery (purse seine and mid-water trawl including pair trawls). This

coverage has resulted in an approximate coverage of 15 to 20% of herring trips; a coverage rate that is expected to be maintained at least through December, 2005. Unless otherwise specified, this option would not effect a change in current and planned coverage rate. That is, Option 4 would have no near-term affect on observer program costs. If anything, the notification requirement would facilitate observer program scheduling since observers would be notified rather than having to bear the search cost associated with finding a vessel that is scheduled to take a trip. During calendar year 2003 (note the herring fishing year is a calendar year) there were a total of 107 category A herring vessels of which 28 permitted herring vessels that used either purse seine or mid-water trawl (including pair trawl) gear. These vessels took a total of 1221 trips using purse seine of mid-water trawl gear at an average of 1.7 days absent.

Depending on the desired rate observer coverage and SAP performance, the cost of observer coverage would range between $0.3 and $1.8 million (Table 125). The low end of this range assumes 10% observer coverage across the board, a 1,000 mt TAC for the Closed Area 1 Haddock SAP, and that the GOM cod TAC binds potential trips in the WGOM Rod and Reel Haddock SAP. Note that the majority of these costs ($224 thousand) are attributable to herring coverage which does not represent an increase in program costs. Deducting the cost of herring coverage, the additional cost for 10% coverage for the Closed Area I and WGOM SAPs would range between $61 thousand and $131 thousand. The upper and of the range assumes a 50% coverage for all trips, a 2,000 pound haddock TAC in the Closed Area I SAP, and that cod catches in the WGOM SAP do not prevent the full haddock TAC from being taken. Deducting herring coverage at the 20% rate from the upper bound estimate results in a net increase in observer coverage of $1.3 million, of which 52% represents an increase in herring coverage from 20% to 50%. As noted above, if no additional funds become available to cover the cost of these added measures the indicated coverage rates would not be achievable or existing resources would have to be diverted from other programs which would compromise monitoring requirements for those fisheries.

	Closed Area I Haddock SAP		WGOM Rod and Reel SAP			Total	
	1,000 MT TAC	2,000 MT TAC	WGOM Cod not Binding	WGOM Cod Binding	Herring	Minimum	Maximum
Number of Participating Vessels	243	486	91	91	28	366	605
Number of Trips	60	120	414	178	1221	1459	1755
Number of Days	280	560	580	249	1954	2483	3093
Cost per Observer Day	$1,150	$1,150	$1,150	$1,150	$1,150	$1,150	$1,150
Observed Trips at 50% Coverage	30	60	207	89	611	730	878
Observer Cost at 50% Coverage	$161,000	$322,000	$333,270	$143,290	$1,123,320	$1,427,610	$1,778,590
Observed Trips at 20% Coverage	12	24	83	36	244	292	351
Observer Cost at 20% Coverage	$64,400	$128,800	$133,308	$57,316	$449,328	$571,044	$711,436
Observed Trips at 10% Coverage	6	12	41	18	122	292	176
Observer Cost at 10% Coverage	$32,200	$64,400	$66,654	$28,658	$224,664	$285,522	$355,718

Table 125 - Summary of Estimated Observer Costs by Proposed Program

7.4.5 Social Impacts

7.4.5.1 Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

Option 1 – 20/0

Option 1 would reduce the conservation tax to 20% for the transfer of category A and B DAS. Category C DAS would remain at a 90% conservation tax. The reduction in conservation tax for category A and B DAS transfer is in response to the underutilization of this program. The reduction in conservation tax is an incentive to participate. The transfer program allows for the transfer of permits between vessels resulting in the permanent departure from the fishery of the vessel relinquishing DAS. There is currently no conservation tax for DAS leasing. Reduction in the DAS transfer conservation tax may result in positive social benefits to recipient vessels. The permanent addition of DAS may improve the overall viability of acquiring vessels while resulting in the potential financial and social instability of those exiting the fishery. Those vessels for whom this represents a complete exit from the fishing industry may be the most vulnerable to social instability unless they possess skills that are transferable to other industries. (This option was selected for the proposed action).

Option 2 – 20/20

Option 2 would reduce the conservation tax to 20% for the transfer of category A and B DAS. Category C DAS would remain at a 90% conservation tax. The DAS transfer component of this option, and hence social outcome, is the same as in Option 1. The DAS leasing component, however, is increased from zero to 20%. Given the addition of conservation tax, this option may encourage some that would lease DAS to increase participation in the transfer program.

Option 3 – 10/10

Option 3 would reduce DAS transfer conservation tax to 10% while imposing a 10% tax on DAS transfer. This option would have similar potential consequences to Option 2 though as a reduced conservation tax level.

7.4.5.2 DAS Transfer Program Modifications (Measure A.2)

The current transfer program limits the value of the DAS transfer. The buyer will receive the selling price minus the conservation tax for groundfish permits. This is in contrast to the seller's valuation of the permit which includes groundfish DAS and all other limited access permits. This disjuncture has limited the value of the transfer of DAS.

Option 1 – Accepting Non-Groundfish Permits

DAS transfer presently only applies to groundfish DAS. This may have been a limiting factor to the utilization of this program. This option may not benefit vessels that have similarly varied suite of permits e.g., both vessels having groundfish, monkfish, and scallop permits. Vessels that may benefit are buying vessels that only have groundfish DAS or where both buying and selling vessels have limited overlapping permits.

Option 2 – Refusing Non-Groundfish Permits

Conservation tax may be reduced to zero when a buyer waives acceptance of all limited access permits. This option may not benefit the seller, for whom the lost value of limited access permits may not be beneficial. For those vessel owners that this represents a complete exit from all state and federal fisheries, concern remains over the successful transition to non-harvest sector employment.

Option 3 – Removal of Proxy Vessel

The DAS transfer program requires that a vessel be removed from state and federal fisheries. A proxy vessel with similar permit baseline may be identified by the vessel owner for removal from all fisheries in place of vessel selling DAS.

7.4.5.3 Incidental Catch TACs (Measure B)

Catches of those stocks taken with a Category B DAS are constrained by a "hard" incidental catch TAC adopted in FW 40A so that the conservation objectives of Amendment 13 will not be compromised. These TACs are allocated to programs using, regular or reserve, Category B DAS. This measure proposes to adopt two additional SAPs over the two previously adopted in FW 40A. As this action proposes to adopt two additional SAPs, FW 40 A will need to be modified to account for these changes. Management measures in Amendment 13 were designed to meet the mortality objectives of the amendment using Category A DAS. The use of Category B DAS would result in an increase in effort which, if not constrained, may compromise mortality objectives. Research set aside, e.g., 10% of total incidental catch TAC for GB cod, for which no application has been made will be released to category B DAS programs on May 1. Social impacts, while positive, are likely to be limited by incidental catch TACs that restrict the degree of benefit. Social benefits will accrue most to those that qualify to participate in either a SAP or the regular B DAS program.

7.4.5.4 Georges Bank Haddock Fishery SAP (Measure C.1)

This SAP allows vessels to fish in an area north of Closed Area I on a category B DAS. The only authorized gear for use in this SAP is trawl gear using a haddock separator trawl, though other gear could be approved in the future. VMS is required equipment for entry into the SAP. The most likely participants for this program are those with recent history of fishing in or near this area. VTR data for 2002 show the greatest activity, in terms of the number of crew days absent from port. Crew days absent is a summary value derived from logbook data comprised of average crew days absent x the average number of crew x the average number of trips x the number of vessels per port. This value indicates the amount of human effort that may potentially be impacted, either positively or negatively, by this measure. This analysis focuses on vessels that fished within the SAP area or within statistical areas 521 or 522 during 2002.

Vessels that fished within the SAP, including total crew days absent, were primarily from Massachusetts followed by Rhode Island, New Hampshire, and New York. RI had the greatest state level crew days absent. Due to confidentiality and the small number of vessels per port that were recorded as active in these areas, it is not possible to report port level information. However, there were 11 vessels with a total of 770 crew days absent for this area.

Vessels that fished within statistical areas 512 or 522, but not within the SAP, had greater historical crew participation. Vessels were primarily from Massachusetts followed by New York, New Jersey, Rhode Island and Maine were most active. Due to confidentiality and the small number of vessels per port that were recorded as active in these areas, it is not possible to report

port level information. However, there were 46 vessels with a total of 24, 959 crew days absent for this area.

7.4.5.5 Western GOM Rod/Reel SAP (Measure C.2)

This SAP will permit the use of commercial hand-tended rod and reel fishing gear inside the gulf of WGOM closed area. This program is limited to the months of March and April and constrained by a relatively low TAC. The most likely participants for this program are those with recent history of fishing in this area. VTR data for 2003 show the greatest activity, in terms of the number of crew days absent from port on a hand gear trip, originating from communities in Massachusetts located between Cape Ann and mid to outer Cape Cod. Gloucester (338) had the highest total crew days absent rate followed by Boston (99), and Scituate (84). Additional communities can be viewed in Table 75. Total crew days absent rate is an indicator of both present and future potential involvement in this SAP. Based on available information, the likely consequences of this measure are not clear. However, the data used for this analysis suggest that participants from the above communities as well as additional ones mentioned in Table 75 may benefit from improved access to this SAP as a means to mitigate the effects of other Amendment 13 measures. Improved or maintained access to fishery resources is likely to have positive social outcomes though given restrictions on time and catch these benefits may be minimal.

7.4.5.6 Closed Area II Yellowtail Flounder SAP (Measure C.3)

The season for CAII Yellowtail Flounder SAP is revised from a June 1 start date to a July 1 through December 31 season. Additional proposed changes include adjustments to the trip limit and limitations on the number of trips that could be taken.

Impact of the 10,000 lb. Trip Limit

As described in the economic analysis of this measure (see section 7.2.4.4) the potential impact of the 10,000 pound trip limit depends on a variety of factors which have the potential to affect financial returns to crew including vessel horsepower class and the ability of vessels to fish both in and outside of the SAP. For example, because lower horsepower engines, in general, consume less fuel it is possible that crew shares will be greater than with higher horsepower engines. An exception is vessels with the highest horsepower engines for which higher fuel costs are more easily offset by increased revenue. Nevertheless, the 10,000 pound trip limit boat share, crew share, and net payments to crew all fell. Total days absent decreased between 40% and 43% depending on horsepower. Reduction in boat and crew shares ranged from 63% to 64% and net payments to crew fell by 52% to 54%. While overall lower horsepower vessels and select higher horsepower vessels will potentially be impacted less, there may be insufficient gains from this SAP for it to be broadly attractive to those vessels seeking to mitigate the effects of Amendment 13. The desired positive social impacts of this SAP may be inadequate for vessels to participate in this program.

7.4.5.7 Minimum Effective Effort Allocation (Measure D)

This measure provides an opportunity to vessels that received 0 DAS under the provision of Amendment 13. Qualifying vessels would have ten Category C DAS re-categorized as 10 Category B (reserve) B DAS. A limiting factor to this measure is the requirement that these DAS be used in a SAP program. While this measure allows additional participants to take advantage of SAP programs, it has the potential to reduce overall per vessel harvest. Of the 404 permitted vessels taken from dealer records for FY 2003, only 50% were considered active vessels that may

seek participation in this program. Port communities with three or more permitted vessels are found in Table 76. Of these, Montauk, NY (90%, 12); New Bedford, MA (13, 80%); New York, NY (70%, 11); Point Judith, RI (60%, 6); Gloucester, MA (50%, 7); Boston, MA (30%, 10); and Scituate, MA , reported 10 or more permitted vessels per community. The first value reported above is the percent active vessels and the second value represents the number of active vessels. Many of the vessels likely to participate in this program may fall into the small vessel size class as discussed above in the economic analysis.

7.4.5.8 Georges Bank Cod Hook Sector Allocation (Measure E)

This alternative would recalculate the sector share based on landings history and would include Georges Bank cod landings for all gear types. As discussed in the economic analysis for this measure, it will allow the hook sector the opportunity to increase revenue through a potential increase in allocation of Georges Bank cod. While this is likely to improve revenue to the hook sector, it will in turn result in a reduction in income opportunities to those not in the sector.

7.4.5.9 Change to DAS Baseline Calculation (Measure F)

Option 1 – No Action

This option leaves the related Amendment 13 measures intact. DAS allocations as implemented for FY 2004 and future default DAS reductions remain the same. Additional social impacts for this measure are unlikely. This option was selected for the proposed action.

Option 2

This option provides the opportunity overall for a net gain of $3,127,121 (Table 126). Port communities that would experience a net gain greater than $200,000 include New Bedford, MA; Portland, ME; Gloucester, MA; Boston, MA; and Newport, RI. Net losses greater than $100,000 were found in Chatham, MA and Point Judith, RI. As discussed in the economic analysis, within port losses tend to accrue to vessels in the smaller size class categories.

Principle Port	State	Allocated	Gainer	Gain Revenue	Loser	Lose Revenue	Total Port Gains or Losses
NEW BEDFORD	MA	103	55	2,910,524	48	-424,122	2,486,402
PORTLAND	ME	69	21	1,016,109	48	-440,383	575,726
BOSTON	MA	26	10	600,976	16	-137,712	463,264
NEWPORT	RI	12	3	382,343	9	-94,138	288,206
GLOUCESTER	MA	129	19	755,168	110	-532,833	222,335
PORT CLYDE	ME	17	3	96,887	14	-73,987	22,900
PORTSMOUTH	NH	27	3	58,839	24	-105,673	-46,835
POINT JUDITH	RI	58	3	154,238	55	-578,172	-423,933
Principle Port	**State**	**Allocated**	**Gainer**	**Gain Revenue**	**Loser**	**Lose Revenue**	**Total Port Gains or Losses**
COMBINED	LA	na	na	109,488	na	na	109,488
COMBINED	RI	18	na	92,690	17	-88,384	4,307
COMBINED	FL	na	na	na	na	na	na
Not available	NA	na	na	na	na	na	na
COMBINED	VA	3	na	na	3	-24,324	-24,324
COMBINED	CT	17	na	na	17	-64,586	-64,586
COMBINED	NC	14	na	na	14	-107,175	-107,175
COMBINED	NJ	46	na	27,082	44	-136,643	-109,561
COMBINED	NH	34	na	na	34	-127,948	-127,948
COMBINED	ME	79	9	170,703	70	-299,926	-129,222
COMBINED	NY	66	na	3,037	65	-213,241	-210,204
COMBINED	MA	239	5	190,451	234	-883,197	-692,746
TOTAL		**957**	**131**	**$ 6,568,536**	**822**	**$ (4,332,443)**	**$2,226,744**

Table 126 - Option 2: Change to DAS Baseline Allocation

Date Source: DAS, dealer weighout, and permit data bases. , na = supressed due to confidentiality.

Option 3

Port communities that would experience a net gain greater than $200,000 include New Bedford, MA; Portland, ME; Boston, MA; Newport, RI; and Gloucester, MA. Net losses greater than $100,000 were found in Point Judith, RI. As discussed in the economic analysis, within port losses tend to accrue to vessels in the smaller size class categories (Table 127).

Principle Port	State	Allocated	Gainer	Gain Revenue	Loser	Lose Revenue	Total Port Gains or Losses
NEW BEDFORD	MA	103	60	2,840,437	43	-316,283	2,524,153
PORTLAND	ME	69	24	916,269	45	-287,460	628,808
GLOUCESTER	MA	129	28	902,603	101	-452,087	450,516
BOSTON	MA	26	10	546,602	16	-138,242	408,360
NEWPORT	RI	12	4	356,214	8	-72,778	283,436
HARPSWELL	ME	9	3	52,288	6	-18,466	33,822
PORT CLYDE	ME	17	5	89,773	12	-66,558	23,216
PORTSMOUTH	NH	27	8	90,469	19	-79,031	11,438
SCITUATE	MA	20	6	57,363	14	-96,346	-38,983
CHATHAM	MA	62	4	67,396	58	-198,729	-131,333
POINT JUDITH	RI	58	7	154,651	51	-600,044	-445,393
Principle Port	**State**	**Allocated**	**Gainer**	**Gain Revenue**	**Loser**	**Lose Revenue**	**Total Port Gains or Losses**
COMBINED	LA	na	na	103,114	0	0	103,114
COMBINED	VA	3	na	na	na	-11,180	-5,085
COMBINED	FL	na	na	na	na	na	na
COMBINED	RI	18	na	86,616	17	-106,793	-20,177
COMBINED	NH	34	5	74,110	29	-122,249	-48,140
COMBINED	CT	17	na	9,292	16	-63,768	-54,476
COMBINED	NC	14	2	11,399	12	-87,756	-76,356
COMBINED	NJ	46	2	24,567	44	-163,955	-139,389
COMBINED	ME	70	9	127,428	61	-277,730	-150,302
COMBINED	NY	66	na	5,989	65	-230,381	-224,392
COMBINED	MA	157	13	275,858	144	-570,966	-295,107
Not available	NA	na	na	na	na	na	na
TOTAL		**800**	**177**	**$6,516,577**	**617**	**($3,389,836)**	**$3,132,836**

Table 127 - Option 3: Change to DAS Baseline Allocation

Date Source: DAS, dealer weighout, and permit data bases. na = confidential.

7.4.5.10 Social Impacts of Alternative 1 Combined Measures

All vessels with a non-zero effective effort baseline would be affected. A minimum of 80% of vessels would receive lower allocations of Category A DAS for FY 2005. Alternative 1 would reduce the conservation tax and other changes to the DAS transfer program. The opportunity to recover some lost A DAS was created with the addition of two additional SAPs (WGOM Rod and Reel SAP and GB Haddock Fishery SAP). There would be minor beneficial synergistic social impacts, as there would be little overlap between vessels and measures.

Changes in the GB Cod Hook Sector Allocation may increase allocation of GB cod to the sector. The removal of the net limit would affect Category A DAS by restoring operational options to pre-Amendment 13 options. There may be some interactive effect of the WGOM rod and reel SAP and the minimum effective effort allocation if those receiving the 10 Reserve B DAS may also use them inside the rod and reel SAP.

7.4.6 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 alternative are for:

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

One fishery managed by the NEFMC – skates – may also be affected by this alternative.

A primary concern of participants in MAFMC fisheries is that as a result of the reduction in DAS adopted by Amendment 13, groundfish vessels will become more active participants in MAFMC-managed fisheries for which they hold permits. Since many of these fisheries are managed through quotas, an increased number of participants could lead to shorter openings and depressed prices as landings flood into the market. Amendment 13 included an analysis of the permits held by multispecies permit holders and described, in qualitative terms, the ability of groundfish vessels to shift into these other fisheries. Amendment 13 concluded that the ability to shift effort was primarily limited to trawl vessels. Amendment 13 also noted the ability to shift into other fisheries was not as great for those vessels that are heavily dependent on groundfish since many of these vessels do not hold additional limited access permits. These vessels are the ones most likely to be affected by Amendment 13's effort reductions. The ability to shift into other fisheries was greatest for those vessels that are only partially dependent on groundfish and that will have lower revenue losses as a result.

Since the proposed action provides two additional SAPs for groundfish vessels to use Category B DAS to target healthy groundfish stocks, it will reduce the need for vessels to enter other fisheries in order to replace lost groundfish revenues. This will mitigate, to some extent, the possibility that Amendment 13 restrictions will force effort into other fisheries. Some of these opportunities may actually draw effort out of the other fisheries since there is a limited time opportunity to participate. For example, vessels may choose to fish in the GB Haddock Fishery North of CAI SAP at the beginning of a fishing quarter because of concerns that they will lose the opportunity if they wait since the number of DAS that can be used is limited. This could actually extend the fishing season for some MAFMC fisheries if this effort is diverted away from quota

managed fisheries. The WGOM Rod/Reel SAP will likely be used by smaller vessels and will not have any impacts on other fisheries.

Some of the changes proposed for the DAS transfer program may increase effort in other fisheries, including those managed by the MAFMC, as compared to the No Action alternative. The modifications to the transfer program (Measure C.2) would, under certain circumstances remove the requirement that a vessel selling DAS exit all state and federal fisheries. One possible result is that permits in other fisheries that are on vessels selling groundfish DAS will remain active. Since those vessels will no longer have a groundfish permit, they may use more effort in the fisheries for which they are permitted. Another possibility is that groundfish boats obtaining permits in other fisheries may become more active in all fisheries than the selling vessel. It is not possible to determine these impacts with any certainty, as there is no empirical data with which to evaluate the transfer program.

Effort could also shift into or out of other fisheries as a result of changes to the DAS baseline calculation. If either Option 2 or Option 3 is selected, about 800 groundfish boats will receive fewer DAS and 200 groundfish boats will receive more DAS than allocated under the No Action alternative. The 800 boats may increase effort in other permitted fisheries to make up for lost groundfish revenue. At the same time, the 200 boats that gain DAS may reduce effort in other fisheries because they have additional DAS.

This alternative proposed action might also impact skate fisheries. Section 8.1.4.8 concludes the proposed action is unlikely to have substantial effects on the skate fishery.

7.5 Alternative 2

This alternative includes the following measures:

- Measure A.1: Changes to the DAS leasing and transfer conservation tax.
    - Option 1 (Measure A.1.a) – 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. No conservation tax for leased DAS.
    - Option 2 (Measure A.1.b) - 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 20 percent conservation tax for DAS transferred under the leasing program.
    - Option 3 (Measure A.1.c) - 10 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 10 percent conservation tax for DAS transferred under the leasing program.
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
    - Western Gulf of Maine Closed Area Rod/Reel SAP (Measure C.2)
        - Participants Option 1 – vessel with limited access multispecies permits (including Handgear A permits)
        - Participants Option 2: Vessel with limited access DAS permits
    - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure D: Minimum effective effort allocation

- Measure E: GB cod hook sector allocation
- Measure F: Change to DAS baseline calculation
    - Option 1 (Measure F.1) – No action
    - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
    - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

Each of these measures was analyzed in detail in the analysis of Alternative 1 (see section 7.4). These detailed discussions are not repeated in this section; only the summary conclusions are discussed.

7.5.1 Biological Impacts

7.5.1.1 Impacts on Groundfish

The biological impacts on regulated groundfish of the measures in this alternative are discussed in detail in sections 7.4.1.1.1 and 7.4.1.1.2. This alternative would not adopt the DAS Transfer Program Modifications (Measures A.2) nor the GB Haddock Fishery North of CAI SAP (Measure C.1). The measures in this alternative can be divided into specific programs that are designed to harvest healthy stocks (the two Special Access Programs being considered in Measure C.2 and C.3 and the resulting re-allocation of incidental catch TACs in Measure B) and measures that may have impacts across a range of groundfish species. Overall, this alternative is not expected to have significant impacts on any regulated groundfish stock but some provisions increase the uncertainty over the biological impacts of Amendment 13.

The WGOM Closed Area Rod/Reel SAP will result in a very slight increase in GOM haddock mortality but is also not expected to threaten Amendment 13 mortality targets. Cod may be caught in both of these SAPs, but is limited by an incidental catch TAC so that it does not threaten Amendment 13 targets. The changes to the Closed Area II yellowtail flounder SAP will not increase mortality on yellowtail flounder. The adjustment to the number of trips may actually help reduce mortality since the number of trips in the SAP will be adjusted annually in order to more closely match the TAC established for this stock.

Of the remaining measures, Measure F (changes to the DAS baseline calculation) is likely to have the most impact. There are three options. If options 2 or 3 are selected, there will be increased uncertainty over the biological impacts of the DAS reductions in Amendment 13 as effort will be redistributed. It is not possible to predict with any certainty how this redistribution

will affect mortality. Measure D allocates a minimum amount of effective effort to permits that did not receive any DAS in Amendment 13. While this will increase the pool of effort, these DAS can only be used in specific SAPS. As long as SAPs continue to be strictly limited so that the catch of target and incidental catch species is controlled, this allocation of effort will not have any biological impacts in the short-term.

Measure A.1 would adopt changes to the conservation tax in the DAS leasing and transfer programs. In general, the options that reduce the tax in the transfer program are designed to facilitate the use of that program and would be expected to increase the number of DAS used in the short-term. If a conservation tax is applied (as is currently the case for the transfer program and is proposed in some options for the leasing program) the likely increase in effort is reduced. In addition, any conservation tax applied to the transfer program will reduce potential effort over the long-term. The biological impacts of DAS exchanges (either through the leasing or transfer programs) will depend on how effort is re-distributed. Absent empirical data, it is not possible to estimate these impacts with any certainty.

The proposed changes to the GB Cod Hook Sector are not expected to increase mortality for groundfish. It is possible that there may be a reduction in discards that results from these measures if vessels using non-selective gear enter the sector and fish with more selective hooks.

7.5.1.2 Impacts on Other Species/Bycatch

The impacts on other species of Alternative 2 are similar to those for the Proposed Action.

7.5.2 Habitat Impacts

Section 7.4.2, includes an analysis of the habitat measures under consideration. To summarize the habitat impacts of the measures in this alternative:

- DAS Leasing and Transfer Program Measures (Measure A): Impacts on essential fish habitat are minimal
- Incidental Catch TACs (Measure B): Will not increase habitat impacts.
- WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2): This measure will not have any habitat impacts.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): This measure will not compromise the baseline level of protection for essential fish habitat.
- Minimum Effective Effort Allocation (Measure D): This measure will not produce any discernible habitat impacts.
- GB Cod Hook Sector Revisions (Measure E): This measure will not produce any discernible habitat impacts.
- Changes to DAS Effective Effort Calculation (Measure F): As long as additional Category B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.

7.5.3 Impacts on Endangered and Other Protected Species

Alternative 2 contains all of the measures described in Alternative 1, but omits modifications to the DAS transfer program and the GB haddock fishery SAP. All other measures in Section 7.4.3 - Alternative 1. Given that negligible impacts are not likely to occur as a result of implementation of any of these measures, their absence from the Framework 40B package will likewise produce few if any discernable impacts to protected species.

7.5.4 Economic Impacts

7.5.4.1 Changes to the DAS Leasing and Transfer Conservation Tax

See section 7.4.4.1.

7.5.4.2 Western GOM Rod/Reel SAP

See section 7.4.4.5.

7.5.4.3 Closed Area II Yellowtail Flounder SAP

See section 7.4.4.6.

7.5.4.4 Minimum Effective Effort Allocation

See section 7.4.4.7.

7.5.4.5 Georges Bank Cod Hook Sector Allocation

See section 7.4.4.8.

7.5.4.6 Change to DAS Baseline Calculation

See section 7.4.4.9.

7.5.4.7 Impact of the Combined Alternative 2 Measures

The combined impact of Alternative 2 would be greatest on vessels that would lose Category A DAS. These vessels would need to be able to obtain additional A DAS through leasing or DAS transfer in order to maintain the same level of fishing opportunity they had during FY2004. To this end the proposed changes to DAS leasing and transfer would enhance the ability to acquire the needed A DAS for any option that does not change the existing leasing program and any option that reduces the DAS conservation tax. Of the three options under consideration Option 1 would best fit this criterion. The proposed WGOM Rod and Reel SAP would provide some opportunity to use B DAS but the requirement to use hand line only, the limited season, and the low haddock TAC mean that this SAP would provide only limited relief. The change in the Closed Area II Yellowtail SAP would effectively reduce fishing opportunities, at least in the near term, but would provide greater assurance that the SAP would be the residual

claimant to the GB Yellowtail TAC making it less likely that the SAP would result in a closure of the Eastern GB resource sharing area as happened in FY2004.

The proposed measure to allocate a minimum of 10 reserve B DAS to vessels that received a zero baseline effective effort allocation in FY2004 would provide these vessels with additional groundfish fishing opportunities. However, existing SAP's as well as the WGOM Rod and Reel SAP proposed herein would provide only limited fishing opportunities. Further, these vessels would be competing with vessels that received non-zero baselines resulting in a potential dilution of economic benefit derivable from existing or proposed SAP.

The change in the GB Cod Hook Sector Allocation would likely result in an increased allocation of GB cod to the sector. The direct effect of this action would be to provide sector participants with increased fishing opportunities in directed cod fishing or in improving opportunities in SAPs where cod is an incidental catch. However, a reallocation of cod to sector participants means the target TAC that the remaining vessels would have to meet would have to be reduced by a corresponding amount. Whether this effect would actually result in non-sector vessels exceeding the target TAC is not known, but would depend on magnitude of the reallocation.

In addition to these impacts, the proposed action would affect NMFS costs for the observer program. The WGOM Closed Area Rod/Reel Haddock SAP would impose additional costs on the observer program. While the notification requirements for Category 1 herring vessels does not change the observer requirements, it suggests the current level of coverage will continue. A complete discussion of these issues, including an analysis of the costs that apply, is in section 7.4.4.10. Costs depend in part on the level of coverage that is determined to be necessary to insure the management objectives of each program are met. For the WGOM Closed Area Rod/Reel SAP, the estimated costs range from $28,658 to $333,270. The cost to provide observers to the herring fishery ranges from $224,664 (at ten percent of trips covered) to $1,123,320 (if fifty percent of trips are covered). There is a possibility that the changes to the CAII Yellowtail Flounder SAP may reduce costs to the observer program, since it is likely that there will not be any trips authorized in this SAP for FY 2005. This may only be a short-term change, however. These changes in the observer program costs are identical to those for the proposed action.

7.5.5 Social Impacts

The detailed analyses of the measures proposed in this alternative can be found in section 7.4.5. To summarize the expected impacts of the individual measures:

- Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1): Any reduction in the conservation tax associated with DAS transfers will encourage participation. Imposing a tax on leases may encourage permit holders to use the DAS transfer program vice leasing.

- Incidental Catch TACs (Measure B): These TACs allow the use of Category B DAS and control mortality on stocks of concern. Social impacts are likely to be positive, since these TACs make it less likely the increased effort resulting from Category B DAS will affect Category A DAS.

- Western GOM Rod/Reel SAP (Measure C.2): This SAP will permit a small-scale fishery targeting haddock with rod and reel in the WGOM closed area. Improved access to the fishery is likely to have positive benefits though given the restrictions of this SAP the benefits may be minimal.

- Closed Area II Yellowtail Flounder SAP (Measure C.3): Changing the total number of trips, number of trips per month, trip limit, and starting date of this SAP may have positive social benefits. The desired benefits, however, may not be sufficient to attract vessels to this program.

- Minimum Effective Effort Allocation (Measure D): This measure will have positive benefits as it will provide a limited opportunity for vessels that did not receive any effective effort under Amendment 13 participate in the fishery.

- Georges Bank Cod Hook Sector Allocation (Measure E): These changes may benefit vessels in the hook sector, but may reduce incomes of those vessels not in the sector.

- Change to DAS Baseline Calculation (Measure F): Some of the options in this measure would change the calculation of the DAS baselines. In general, it would provide benefits to large ports at the expense of smaller ports.

7.5.5.1 Social Impacts of Alternative 2 Combined Measures

Social impacts for vessels with Category A DAS may be most affected by this alternative. These vessels will need to obtain DAS in order to maintain their same level of activity as in FY2004. The changes proposed to DAS leasing and transfer conservation tax improve the opportunities for acquiring DAS. The WGOM Rod and Reel SAP require the use of hand line only, a limited season, and a low haddock TAC. These specifications may result in more restrictive opportunities to fish in the present with the possibility of future claims to the GB Yellowtail TAC. Additional groundfish opportunities to fish would be provided to vessels that received a zero baseline effective effort allocation in FY2004. This measure would allocate a minimum of 10 reserve D DAS. Changes to the GB Sector Allocation may provide participants with improved opportunities to fish.

7.5.6 Impacts on Other Fisheries

Section 7.4.5.1 summarizes the possible Amendment 13 impacts on other fisheries managed by the NEFMC and the MAFMC. As noted in that section, opportunities to fish in SAPs may help mitigate effort shifts into other fisheries, while changes to the DAS transfer program could exacerbate effort concerns in other fisheries. Alternative 2 is likely to have fewer impacts on other fisheries than Alternative 1. This alternative does not include the GB Haddock Fishery North of CAI SAP so it does not provide an additional opportunity to target groundfish that might draw effort away from other fisheries. It also does not include the modifications to the DAS transfer program that may exacerbate effort concerns in other fisheries. Any changes to the DAS baseline calculation could also affect the effort in other fisheries in a manner similar to Alternative 1. The impacts of this alternative on other fisheries is likely to be similar to the No Action alternative.

7.6 Alternative 3

This alternative includes the following measures:

- Measure A.2: DAS transfer program modifications
  - Option 1 (Measure A.4.1) – Accepting non-groundfish permits
  - Option 2 (Measure A.4.2) – Refusing non-groundfish permits
  - Option 3 (Measure A.4.3) – Removal of proxy vessel
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
  - GB Haddock Fishery SAP North of CA I (Measure C.1)
  - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure F: Change to DAS baseline calculation
  - Option 1 (Measure F.1) – No action
  - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
  - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

Each of these measures was analyzed in detail in the analysis of Alternative 1 (see section 7.4). These detailed discussions are not repeated in this section; only the summary conclusions are discussed.

7.6.1 Biological Impacts

7.6.1.1 Impacts on Groundfish

The biological impacts on regulated groundfish of the measures in this alternative are discussed in detail in sections 7.4.1.1.1 and 7.4.1.1.2. This alternative would not adopt Measure A.1 (changes to the DAS leasing and transfer program conservation tax), Measure C.2 (the WGOM Closed Area Rod/Reel Haddock SAP), Measure D (minimum effective effort allocation), or Measure E (Changes to the GB Cod Hook Sector Allocation).

The GB haddock fishery north of CAI SAP will result in an increase in fishing effort of between 238 and 478 days fished in order to harvest an additional 1,000 to 2,000 mt of GB haddock. This will result in an increase in GB haddock mortality compared to the No Action

alternative, but is not expected to cause mortality to exceed Amendment 13 targets. The changes to the Closed Area II yellowtail flounder SAP will not increase mortality on yellowtail flounder. The adjustment to the number of trips may actually help reduce mortality since the number of trips in the SAP will be adjusted annually in order to more closely match the TAC established for this stock.

Of the remaining measures, Measure F (changes to the DAS baseline calculation) is likely to have the most impact. There are three options. If options 2 or 3 are selected, there will be increased uncertainty over the biological impacts of the DAS reductions in Amendment 13 as effort will be redistributed. It is not possible to predict with any certainty how this redistribution will affect mortality. Measure D allocates a minimum amount of effective effort to permits that did not receive any DAS in Amendment 13. While this will increase the pool of effort, these DAS can only be used in specific SAPS. As long as SAPs continue to be strictly limited so that the catch of target and incidental catch species is controlled, this allocation of effort will not have any biological impacts in the short-term.

Measure A.2 (DAS Transfer Program Modifications) includes several options designed to facilitate use of the DAS transfer program. In general, the analysis suggests that increased use of the transfer program will increase effort in the short-term and will increase fishing mortality as a result. The impacts on specific stocks cannot be estimated since it is not clear how effort will be redistributed. Over the long-term, the application of a conservation tax will reduce the potential fishing effort. Option 2, however, would remove the conservation tax under certain conditions and thus would not realize this reduction in potential effort.

The proposed changes to the GB Cod Hook Sector are not expected to increase mortality for groundfish. It is possible that there may be a reduction in discards that results from these measures if vessels using non-selective gear enter the sector and fish with more selective hooks.

7.6.1.2 Impacts on Other Species/Bycatch

This alternative may have impacts on other species. The most probable impact is the result of catches of other species that result from groundfish fishing activity. The following section discusses the catch of non-groundfish species that may result from each proposed measure. Part of this catch may be discarded, generally described as bycatch by the M-S Act. For regulated groundfish species, bycatch is discussed in the previous section.

DAS Transfer Program Modifications (Measure A.2)

The impacts of the options in this measure on bycatch are uncertain. The three options are designed to facilitate more DAS transfers and, if successful, would be expected to increase effort in the short-term. An increase in effort would increase bycatch if discard rates remain the same. If these options facilitate transfers and a conservation tax is applied, however, over the long-term effort – and thus bycatch – would be expected to be reduced. This would not be the case if Option 2 is adopted, since under certain circumstances DAS transfers would not be subject to a conservation tax. Option 3 also complicates the analysis, as it may allow for more effort in other fisheries since a proxy vessel that is removed from all fisheries may not be currently fishing.

Incidental Catch TACs (Measure B)

Changing the allocation of the incidental catch TACs for groundfish caught by vessels using Category B DAS programs does not affect bycatch. The programs using these TACs,

however, could change fishermen's behavior and could affect bycatch. These impacts will be discussed for each specific program.

GB Haddock Fishery North of CAI SAP

This program will allow for a small increase in fishing effort through the use of Category B DAS in an area north of CAI. The number of days fished in the program is likely to be no more than 270 (see section 7.4.1.1.1).

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips for the proposed season and area were interpreted in light of the results of several haddock separator trawl experiments. The catch for the top twenty-five species caught on observed trawl tows in FY 2000 through 2003 is shown in Table 90. Haddock accounted for over seventy percent of the catch. Various species of skates accounted for 8.5 percent of the catch, monkfish (angler) for 5.8 percent, and spiny dogfish for 1.3 percent.

Many of the species in Table 90 are not likely to be caught by vessels using a haddock separator trawl to target haddock, as required by this SAP. DFO (1992) noted an almost complete absence of skate species in the top cod end during an experiment in 1992. Raymond and Manomet (2004) found a highly significant difference between skates caught in the top and bottom cod ends, with only six percent of the skate catch for the entire experiment caught in the top cod end. This same experiment demonstrated that most monkfish, sculpins, and sea ravens, and all lobster, were caught in the bottom cod end. While neither experiment document scallop catches, it is likely that scallop catches will mimic other sessile species and will also be caught by the bottom cod end.

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter skates and other species. While the high-value species (monkfish, etc.) may be retained (if caught) consistent with regulatory limits, most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches of most of these species, including the skates. Because this net has been proven to be so effective in reducing catches of these species, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

Closed Area II Yellowtail Flounder SAP (Measure C.3)

Two of the proposed changes to this program are not expected to have any impacts on bycatch of other species. Information on catches in the SAP in FY 2004 is not available to determine if discard rates differed during different months. As a result, it is not possible to predict if moving the starting date to July 1, or limiting vessels to one trip per month, will affect bycatch.

This measure also provides a mechanism to change the number of trips in the SAP. An increase in the number of trips will increase effort in the program and in general would be expected to increase bycatch if discard rates remain constant. The overall catch of GB yellowtail flounder, however, is set by a TAC and is not affected by the number of trips in this SAP. It is not yet clear how overall fishing effort is affected by fishing in the SAP and other fishing in for GB yellowtail flounder. Area and season specific discard information is not available to determine whether discards will increase or decrease as the number of trips in the SAP is changed.

Change to DAS Effective Effort Baseline Calculation (Measure F)

The impacts of the options in this measure on bycatch are uncertain. Option 1 (No Action) would not have any impacts beyond those analyzed in previous document. Options 2 and 3 would change the distribution of DAS – in particular, Category A DAS. While the total number of allocated Category A DAS would remain roughly the same, DAS would be transferred to about 200 vessels and removed form about 800 vessels. How these changes will impact bycatch depends on the fishing practices of these vessels, and whether practices change as a result of the redistribution of DAS. It is not possible to predict these changes with any certainty.

7.6.2 Habitat Impacts

Section 7.4.2, includes an analysis of the habitat measures under consideration. To summarize the habitat impacts of the measures in this alternative:

- DAS Leasing and Transfer Program Measures (Measure A): Impacts on essential fish habitat are minimal
- Incidental Catch TACs (Measure B): Will not increase habitat impacts.
- GB Haddock Fishery North of CAI SAPAP (Measure C.1): This measure will not compromise the baseline level of protection for essential fish habitat.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): This measure will not compromise the baseline level of protection for essential fish habitat.
- Changes to DAS Effective Effort Calculation (Measure F): As long as additional Category B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.

7.6.3 Impacts on Endangered and Other Protected Species

A description of impacts relative to threatened, endangered and other protected species is described in Alternative 1, Section 7.4.3. As in Alternative 2, the omission of some measures, in this case the DAS leasing and conservation tax options, the WGOM rod and reel SAP, the minimum effective effort allocation measure and the GB cod hook sector allocation, will not change the conclusion that the overall Framework 40B measures will account for few if any impacts on protected species beyond those already identified in Amendment 13. While not quantifiable, that impacts of that action are most likely to be beneficial as a result of overall effort reductions in groundfish fishing effort, and a general decline in gillnet fishing effort.

7.6.4 Economic Impacts

7.6.4.1 DAS Transfer Program Modifications

See section 7.4.4.2.

7.6.4.2 GB Haddock Fishery SAP

See section 7.4.4.4./

7.6.4.3 Closed Area II Yellowtail Flounder SAP

See section 7.4.4.6.

7.6.4.4 Change to DAS Baseline Calculation

See section 7.4.4.9.

7.6.4.2 Economic Impacts of Combined Alternative 3 Measure

Alternative 3 would have broad-based impacts on all vessels that received a non-zero baseline allocation in FY2004. The proposed change in DAS allocation would adversely affect between 80% and 86% of these vessels depending on the selected alternative. Conversely, a change in baseline allocation would have a positive affect on between 20% and 14% of affected vessels. The proposed changes in the DAS transfer program and SAPs would affect all vessels although they would be more important to vessels adversely affected by the change in DAS baseline. Specifically, vessels that would lose Category A DAS would need to be able to acquire more A DAS or increase the use of Category B DAS to compensate for the loss of Category A DAS fishing opportunities.

Existing provisions of the DAS transfer program have thus far been too prohibitive for an active DAS transfer market to emerge. The proposed changes in DAS transfer would increase the value of a DAS transfer to both buyer and seller increasing the possibility increased trading would result. Whether the proposed changes (permit absorption, refusal of non-groundfish permits, or removal of a proxy vessel) would be sufficient to promote a more active consolidation market is not known.

The proposed GB Haddock SAP would provide vessels with additional opportunities to use Category B DAS. Assuming the GB cod incidental catch TAC is not exceeded, this SAP would generate between $1.4 and $2.8 million depending on the haddock TAC. Participating vessels would be required to use a haddock separator trawl and would be required to have VMS. Given these requirements the potential benefits from the proposed SAP would be limited to vessels that use trawl gear.

The change in the Closed Area II Yellowtail SAP would effectively reduce fishing opportunities, at least in the near term, but would provide greater assurance that the SAP would be the residual claimant to the GB Yellowtail TAC making it less likely that the SAP would result in a closure of the Eastern GB resource sharing area as happened in FY2004. The proposed 10,000 pound trip limit may not be sufficient to attract many participants to the SAP.

In addition to these impacts, the proposed action would affect NMFS costs for the observer program. The GB Haddock Fishery SAP would impose additional costs on the observer program. While the notification requirements for Category 1 herring vessels does not change the observer requirements, it suggests the current level of coverage will continue. A complete discussion of these issues, including an analysis of the costs that apply, is in section 7.4.4.10. Costs depend in part on the level of coverage that is determined to be necessary to insure the management objectives of each program are met and the size of the haddock TAC. For the GB Haddock Fishery SAP, the estimated costs range from $32,200 to $322,000. The cost to provide observers to the herring fishery ranges from $224,664 (at ten percent of trips covered) to $1,123,320 (if fifty percent of trips are covered). There is a possibility that the changes to the CAII Yellowtail Flounder SAP may reduce costs to the observer program, since it is likely that

there will not be any trips authorized in this SAP for FY 2005. This may only be a short-term change, however.

7.6.5 Social Impacts

The detailed analyses of the measures proposed in this alternative can be found in section 7.4.5. To summarize the expected impacts of the individual measures:

- DAS Transfer Program Modifications (Measure A.2): The options in this measure could facilitate use of the DAS transfer program. Option 1 may not benefit vessels that have a similar suite of permits. Option 2 may not benefit the sellers since the value of a permit is reduced since non-groundfish permits cannot be transferred.

- Incidental Catch TACs (Measure B): These TACs allow the use of Category B DAS and control mortality on stocks of concern. Social impacts are likely to be positive, since these TACs make it less likely the increased effort resulting from Category B DAS will affect Category A DAS.

- Georges Bank Haddock Fishery SAP (Measure C.1): This SAP would provide benefits to those vessels and communities that have traditionally fished in this area. Vessels that fished within the SAP area, including total crew days absent, were primarily from Massachusetts followed by Rhode Island, New Hampshire, and New York. RI had the greatest state level crew days absent.

- Closed Area II Yellowtail Flounder SAP (Measure C.3): Changing the total number of trips, number of trips per month, trip limit, and starting date of this SAP may have positive social benefits. The desired benefits, however, may not be sufficient to attract vessels to this program.

- Change to DAS Baseline Calculation – (Measure F): Some of the options in this measure would change the calculation of the DAS baselines. In general, it would provide benefits to large ports at the expense of smaller ports.

7.6.5.1 Social Impacts of Alternative 3 Combined Measures

Social impacts for this alternative would be greatest for vessels with Category A DAS. The DAS transfer program would affect all vessels, however vessels that would experience the most impacts are those negatively impacted by the change in DAS baseline. Changes in the DAS transfer program would improve the value of a transfer to both the buyer and the seller improving the likelihood that this program may be exercised. Opportunities to use Category B DAS would increase with the use of the GB Haddock SAP while fishing opportunities, in the short term, would decline with the use of the Closed Area II Yellowtail SAP.

7.6.6 Impacts on Other Fisheries

Section 7.4.5.1 summarizes the possible Amendment 13 impacts on other fisheries managed by the NEFMC and the MAFMC. As noted in that section, opportunities to fish in SAPs

may help mitigate effort shifts into other fisheries, while changes to the DAS transfer program could exacerbate effort concerns in other fisheries. Alternative 3 is likely to have impacts similar to Alternative 1 (see section 7.4.5.1).

7.7 Alternative 4

This alternative includes the following measures:

- Measure A.1: Changes to the DAS leasing and transfer conservation tax.
  - Option 1 (Measure A.1.a) – 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. No conservation tax for leased DAS.
  - Option 2 (Measure A.1.b) - 20 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 20 percent conservation tax for DAS transferred under the leasing program.
  - Option 3 (Measure A.1.c) - 10 percent conservation tax for Category A and B DAS, 90 percent conservation tax for Category C DAS under the DAS transfer program. 10 percent conservation tax for DAS transferred under the leasing program.
- Measure B: Incidental catch TACs. The specifics of this measure are described below.
- Measure C: Special Access Programs
  - GB Haddock Fishery SAP North of CA I (Measure C.1)
  - Western Gulf of Maine Closed Area Rod/Reel SAP (Measure C.2)
    - Participants Option 1 – vessel with limited access multispecies permits (including Handgear A permits)
    - Participants Option 2: Vessel with limited access DAS permits
  - CAII Yellowtail Flounder SAP (Measure C.3)
- Measure F: Change to DAS baseline calculation
  - Option 1 (Measure F.1) – No action
  - Option 2 (Measure F.2) – A vessel's permit baseline is based on the maximum number of DAS used (without regard to the annual allocation or carry-over DAS) in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five percent are defined as Category A DAS, and forty-five percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.
  - Option 3 (Measure F.3) - A vessel's permit baseline is based on the maximum number of DAS used in any fishing year between FY 1996 and FY 2001. Only years in which at least 5,000 pounds of regulated groundfish were landed are considered in this calculation. Fifty-five and a half (55.5%) percent are defined as Category A DAS, and forty-five and a half (45.5%) percent are defined as Category B DAS. The percentage of Category A DAS are reduced in FY 2006 and FY 2009.

Each of these measures was analyzed in detail in the analysis of Alternative 1 (see section 7.4). These detailed discussions are not repeated in this section; only the summary conclusions are discussed.

7.7.1 Biological Impacts

7.7.1.1 Impacts on Groundfish

This alternative would not adopt the DAS Transfer Program Modifications (Measures A.2), the Minimum Effective Effort Allocation (Measure D), or the Changes to the GB Cod Hook Sector (Measure E). The measures in this alternative can be divided into specific programs that are designed to harvest healthy stocks (the three Special Access Programs being considered in Measure s C.1, C.2, and C.3 and the resulting re-allocation of incidental catch TACs in Measure B) and measures that may have impacts across a range of groundfish species. Overall, this alternative is not expected to have significant impacts on any regulated groundfish stock but some provisions increase the uncertainty over the biological impacts of Amendment 13.

The GB haddock fishery north of CAI SAP will result in an increase in fishing effort of between 238 and 478 days fished in order to harvest an additional 1,000 to 2,000 mt of GB haddock. This will result in an increase in GB haddock mortality compared to the No Action alternative, but is not expected to cause mortality to exceed Amendment 13 targets. The WGOM Closed Area Rod/Reel SAP will result in a very slight increase in GOM haddock mortality but is also not expected to threaten Amendment 13 mortality targets. Cod may be caught in both of these SAPs, but is limited by an incidental catch TAC so that it does not threaten Amendment 13 targets. The changes to the Closed Area II yellowtail flounder SAP will not increase mortality on yellowtail flounder. The adjustment to the number of trips may actually help reduce mortality since the number of trips in the SAP will be adjusted annually in order to more closely match the TAC established for this stock.

Of the remaining measures, Measure F (changes to the DAS baseline calculation) is likely to have the most impact. There are three options. If options 2 or 3 are selected, there will be increased uncertainty over the biological impacts of the DAS reductions in Amendment 13 as effort will be redistributed. It is not possible to predict with any certainty how this redistribution will affect mortality.

Measure A.1 would adopt changes to the conservation tax in the DAS leasing and transfer programs. In general, the options that reduce the tax in the transfer program are designed to facilitate the use of that program and would be expected to increase the number of DAS used in the short-term. If a conservation tax is applied (as is currently the case for the transfer program and is proposed in some options for the leasing program) the likely increase in effort is reduced. In addition, any conservation tax applied to the transfer program will reduce potential effort over the long-term. The biological impacts of DAS exchanges (either through the leasing or transfer programs) will depend on how effort is re-distributed. Absent empirical data, it is not possible to estimate these impacts with any certainty.

7.7.1.2 Impacts on Other Species/Bycatch

This alternative may have impacts on other species. The most probable impact is the result of catches of other species that result from groundfish fishing activity. The following section discusses the catch of non-groundfish species that may result from each proposed measure. Part of this catch may be discarded, generally described as bycatch by the M-S Act. For regulated groundfish species, bycatch is discussed in the previous section.

Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1)

The impacts of this measure on bycatch are uncertain. In general, the DAS leasing program and transfer programs are expected to increase fishing effort in the short term. An increase in effort will increase bycatch if discard rates remain constant. Nothing specific to this individual measure would be expected to change discard rates. The application of a conservation tax, however, reduces the likely increase in effort, with analysis in section 7.4.1.1 noting that a tax of at least twenty percent may be necessary to avoid an effort increase. Complicating this evaluation is that as long as a transfer program is subject to a tax, over the long-term it will reduce available effort and thus may contribute to a long-term reduction in bycatch.

Incidental Catch TACs (Measure B)

Changing the allocation of the incidental catch TACs for groundfish caught by vessels using Category B DAS programs does not affect bycatch. The programs using these TACs, however, could change fishermen's behavior and could affect bycatch. These impacts will be discussed for each specific program.

GB Haddock Fishery North of CAI SAP

This program will allow for a small increase in fishing effort through the use of Category B DAS in an area north of CAI. The number of days fished in the program is likely to be no more than 270 (see section 7.4.1.1.1).

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips for the proposed season and area were interpreted in light of the results of several haddock separator trawl experiments. The catch for the top twenty-five species caught on observed trawl tows in FY 2000 through 2003 is shown in Table 90. Haddock accounted for over seventy percent of the catch. Various species of skates accounted for 8.5 percent of the catch, monkfish (angler) for 5.8 percent, and spiny dogfish for 1.3 percent.

Many of the species in Table 90 are not likely to be caught by vessels using a haddock separator trawl to target haddock, as required by this SAP. DFO (1992) noted an almost complete absence of skate species in the top cod end during an experiment in 1992. Raymond and Manomet (2004) found a highly significant difference between skates caught in the top and bottom cod ends, with only six percent of the skate catch for the entire experiment caught in the top cod end. This same experiment demonstrated that most monkfish, sculpins, and sea ravens, and all lobster, were caught in the bottom cod end. While neither experiment document scallop catches, it is likely that scallop catches will mimic other sessile species and will also be caught by the bottom cod end.

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter skates and other species. While the high-value species (monkfish, etc.) may be retained (if caught) consistent with regulatory limits, most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches

of most of these species, including the skates. Because this net has been proven to be so effective in reducing catches of these species, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

WGOM Closed Area Rod/Reel Haddock SAP

As noted previously, an experiment has not been conducted that would provide information on the catch of non-groundfish species that may result from this proposed SAP. Recreational fishermen in this area often encounter dogfish while attempting to target cod, so it is likely that this fishery will also catch an unknown amount of dogfish. It is possible that the proposed season may reduce these encounters, but recent angler complaints of the ubiquitous, year round presence of spiny dogfish make this unlikely. The small size of this fishery, requirement to use hand-gear, and limited season make it unlikely catches of dogfish will be significant.

Closed Area II Yellowtail Flounder SAP (Measure C.3)

Two of the proposed changes to this program are not expected to have any impacts on bycatch of other species. Information on catches in the SAP in FY 2004 is not available to determine if discard rates differed during different months. As a result, it is not possible to predict if moving the starting date to July 1, or limiting vessels to one trip per month, will affect bycatch.

This measure also provides a mechanism to change the number of trips in the SAP. An increase in the number of trips will increase effort in the program and in general would be expected to increase bycatch if discard rates remain constant. The overall catch of GB yellowtail flounder, however, is set by a TAC and is not affected by the number of trips in this SAP. It is not yet clear how overall fishing effort is affected by fishing in the SAP and other fishing in for GB yellowtail flounder. Area and season specific discard information is not available to determine whether discards will increase or decrease as the number of trips in the SAP is changed.

Change to DAS Effective Effort Baseline Calculation (Measure F)

The impacts of the options in this measure on bycatch are uncertain. Option 1 (No Action) would not have any impacts beyond those analyzed in previous document. Options 2 and 3 would change the distribution of DAS – in particular, Category A DAS. While the total number of allocated Category A DAS would remain roughly the same, DAS would be transferred to about 200 vessels and removed form about 800 vessels. How these changes will impact bycatch depends on the fishing practices of these vessels, and whether practices change as a result of the redistribution of DAS. It is not possible to predict these changes with any certainty.

7.7.2 Habitat Impacts

Section 7.4.2, includes an analysis of the habitat measures under consideration. To summarize the habitat impacts of the measures in this alternative:

- DAS Leasing and Transfer Program Measures (Measure A.1): Impacts on essential fish habitat are minimal
- Incidental Catch TACs (Measure B): Will not increase habitat impacts.
- GB Haddock Fishery North of CAI SAPAP (Measure C.1): This measure will not compromise the baseline level of protection for essential fish habitat.

- WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2): This measure will not have any habitat impacts.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): This measure will not compromise the baseline level of protection for essential fish habitat.
- Changes to DAS Effective Effort Calculation (Measure F): As long as additional Category B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.

7.7.3 Impacts on Endangered and Other Protected Species

None of the measures proposed in Framework 40B are likely to produce any discernable impacts to protected species beyond those described in Amendment 13. Accordingly, the omission of several measures --- DAS transfer modifications, the minimum effective effort allocation measure and the GB cod hook sector allocation, will not change the conclusion that the overall Framework 40B package and the specific measures adopted will account for few if any impacts on protected species beyond those already identified in Amendment 13. While not quantifiable, that impacts of that action are most likely to be beneficial as a result of overall effort reductions in groundfish fishing effort, and a general decline in gillnet fishing effort.

7.7.4 Economic Impacts

7.7.4.1 Changes to the DAS Leasing and Transfer Conservation Tax

See section 7.4.4.1.

7.7.4.2 GB Haddock Fishery SAP

See section 7.4.4.4.

7.7.4.3 Western GOM Rod/Reel SAP

See section 7.4.4.5.

7.7.4.4 Closed Area II Yellowtail Flounder SAP

See section 7.4.4.6.

7.7.4.5 Change to DAS Baseline Calculation

See section 7.4.4.9.

7.7.4.6 Economic Impacts of Combined Alternative 4 Measures

Alternative 4 would have broad-based impacts on all vessels that received a non-zero baseline allocation in FY2004. The proposed change in DAS allocation would adversely affect

between 80% and 86% of these vessels depending on the selected alternative. Conversely, a change in baseline allocation would have a positive affect on between 20% and 14% of affected vessels. The proposed changes in the DAS transfer program and SAPs would affect all vessels although they would be more important to vessels adversely affected by the change in DAS baseline. Specifically, vessels that would lose Category A DAS would need to be able to acquire more A DAS or increase the use of Category B DAS to compensate for the loss of Category A DAS fishing opportunities.

The proposed WGOM Rod and Reel SAP would provide some limited fishing opportunity to all limited access vessels. However, the requirement to use on hand tended rod and reel gear, the short duration, and low haddock and incidental catch TAC is likely to limit the potential participants.

The proposed GB Haddock SAP would provide vessels with additional opportunities to use Category B DAS. Assuming the GB cod incidental catch TAC is not exceeded, this SAP would generate between $1.4 and $2.8 million depending on the haddock TAC. Participating vessels would be required to use a haddock separator trawl and would be required to have VMS. Given these requirements the potential benefits from the proposed SAP would be limited to vessels that use trawl gear.

The change in the Closed Area II Yellowtail SAP would effectively reduce fishing opportunities, at least in the near term, but would provide greater assurance that the SAP would be the residual claimant to the GB Yellowtail TAC making it less likely that the SAP would result in a closure of the Eastern GB resource sharing area as happened in FY2004. The proposed 10,000-pound trip limit may not be sufficient to attract many participants to the SAP.

In addition to these impacts, the proposed action would affect NMFS costs for the observer program. These changes in the observer program costs are identical to those for the Alternative 1 (see section 7.4.4.10). There is a possibility that the changes to the CAII Yellowtail Flounder SAP may reduce costs to the observer program, since it is likely that there will not be any trips authorized in this SAP for FY 2005. This may only be a short-term change, however.

7.7.5 Social Impacts

The detailed analyses of the measures proposed in this alternative can be found in section 7.4.5. To summarize the expected impacts of the individual measures:

- Changes to the DAS Leasing and Transfer Conservation Tax (Measure A.1): Any reduction in the conservation tax associated with DAS transfers will encourage participation. Imposing a tax on leases may encourage permit holders to use the DAS transfer program vice leasing.

- Incidental Catch TACs (Measure B): These TACs allow the use of Category B DAS and control mortality on stocks of concern. Social impacts are likely to be positive, since these TACs make it less likely the increased effort resulting from Category B DAS will affect Category A DAS.

- Georges Bank Haddock Fishery SAP (Measure C.1): This SAP would provide benefits to those vessels and communities that have traditionally fished in this area.

Vessels that fished within the SAP area, including total crew days absent, were primarily from Massachusetts followed by Rhode Island, New Hampshire, and New York. RI had the greatest state level crew days absent.

- Western GOM Rod/Reel SAP (Measure C.2): This SAP will permit a small-scale fishery targeting haddock with rod and reel in the WGOM closed area. Improved access to the fishery is likely to have positive benefits though given the restrictions of this SAP the benefits may be minimal.

- Closed Area II Yellowtail Flounder SAP (Measure C.3): Changing the total number of trips, number of trips per month, trip limit, and starting date of this SAP may have positive social benefits. The desired benefits, however, may not be sufficient to attract vessels to this program.

- Change to DAS Baseline Calculation (Measure F): Some of the options in this measure would change the calculation of the DAS baselines. In general, it would provide benefits to large ports at the expense of smaller ports.

7.7.5.1 Social Impacts of Alternative 4 Combined Measures

This alternative would have significant impacts for those vessels that received a non-zero baseline allocation in FY2004. Unless the No Action option were selected, minimum of 80% would be negatively impacted while a minimum of 14% would be positively affected. Vessels most affected are those that stand to loose DAS. Changes in the DAS transfer program would improve the value of a transfer to both the buyer and the seller improving the likelihood that this program may be exercised. Limited access vessels may experience some improvement in fishing opportunities in the WGOM Rod and Reel SAP. The GB Haddock SAP would increase opportunities to use Category B DAS. Participating vessels would be limited to vessels that use trawl gear. Fishing opportunities, in the short term, would decline with the use of the Closed Area II Yellowtail SAP.

7.7.6 Impacts on Other Fisheries

Section 7.4.5.1 summarizes the possible Amendment 13 impacts on other fisheries managed by the NEFMC and the MAFMC. Alternative 4 includes the GB Haddock Fishery North of CAI SAP, which may draw effort away from other fisheries. It also includes a possible change to the DAS baseline which could force more effort into other fisheries. Overall, Alternative 4 is likely to have similar impacts on other fisheries as Alternative 2 (see section 7.5.6).

7.8 Independent Measures

As this action was developed, management measures were grouped into distinct alternatives if they were expected to interact with each other and influence the analysis of the impacts (see section 4.1 for a more detailed explanation of this approach). Several measures were identified as independent measures because their impacts were not expected to interact with other measures. This section discusses the impacts of the independent measures that are not included in the proposed action.

7.8.1 Herring Vessel Interactions with Regulated Groundfish (Measure J)

This measure considered four options to address interactions between herring fishing and regulated groundfish. Herring fishing is prosecuted primarily by purse seine and mid-water trawl vessels (including paired mid-water trawl) vessels (NEFMC 1997). Under current regulations, mid-water trawl vessels are allowed to fish for herring in all groundfish year round and seasonal closed areas, while purse seine vessels are allowed to fish for herring in the seasonal closed areas, the WGOM closed area, and the Cashes Ledge Closed Area. Three of the options would prohibit fishing for herring with mid-water (including paired mid-water) trawls and/or purse seines in the year round groundfish mortality closures. A fourth option that would improve the monitoring of the herring fishery to collect additional data was adopted as the proposed action.

7.8.1.1 Biological Impacts

7.8.1.1.1 Impacts on Groundfish

This section is structured differently than the sections that describe groundfish impacts of the packaged alternatives. Since the independent measures do not result in targeting of specific groundfish species, the impacts are not separated into impacts on target or incidental catch groundfish. Possible biological impacts on regulated groundfish from herring fishing vessels include include:

- Catch of groundfish in herring fishing operations. Since purse seine and mid-water trawls use small mesh nets, there is a possibility that the catch could include both juvenile and adult groundfish. Under current regulations, purse seine and mid-water trawls are considered exempted gear. Exempted gear is gear that is deemed to be not capable of catching NE multispecies. Vessels using exempted gear are not allowed to fish for, possess, or retain regulated groundfish and any groundfish caught must be discarded.
- Interference with groundfish spawning activity.
- Removal of groundfish forage. Herring is an important prey item for Atlantic cod (Link and Garrison 2002). Most piscivorous groundfish feed on herring, including cod, haddock, pollock, white hake, and halibut (Colette and Klien-MacPhee 2002).
- Impacts on groundfish habitat. Gear effects evaluations in Amendment 13 concluded that purse seine and mid-water trawl gears do not have impacts on groundfish essential fish habitat. Since there is no new information to challenge this conclusion, these possible impacts will not be discussed further.

In evaluating the options in this measure, it is necessary to consider both the possible impacts that may result from herring fishing as well as whether there are differences on those impacts if herring fishing takes place inside or outside of the closed areas.

Distribution of herring and regulated groundfish

Vessels fishing for herring can only impact regulated groundfish if the species distribution overlaps. Atlantic herring is a schooling, coastal pelagic resource that ranges from Labrador to Cape Hatteras. Juveniles and adults show complex north-south and inshore-offshore migrations for feeding, spawning, and overwintering. Distribution charts of adult herring caught in the NMFS fall bottom surveys show concentrations in the Massachusetts Bay and Ipswich Bay area, Jeffreys Ledge, and along the 50 fathom curve on the northern side of Georges Bank, extending into the Great South Channel and along the east side of Cape Cod. Spring surveys

show a different distribution, with concentrations in Massachusetts Bay, Cape Cod Bay, Jeffreys Ledge, but lower concentrations in the Great South Channel. (Reid et al. 1999).

Regulated groundfish species are widely distributed throughout the Gulf of Maine, Georges Bank, and Southern New England. The different groundfish species do not have identical distribution patterns for juveniles and adults. For example, adult yellowtail flounder are rarely found deeper than 50 fathoms, while this is a common occurrence for redfish. NOAA Essential Fish Habitat Source Documents (Reid et al, series) summarize available distribution and life history characteristics.

Comparing these source documents clearly show that the spatial distribution of herring and various groundfish species overlaps at various times of the year. For example, distribution charts of juvenile haddock caught in the NMFS fall trawl survey show that these fish are found along the fifty fathom curve on the north side of Georges Bank, extending into the Great South Channel, and in Massachusetts Bay – a distribution similar to that for adult herring caught in the same surveys. Garrison (2000) more rigorously analyzed the spatial distribution of various species in the NMFS autumn and spring trawl surveys, and found that medium and large haddock, medium and large cod, dogfish, and Atlantic herring dominated the species assemblages along the northern flank of Georges Bank and Stellwagen Bank in the fall survey from 1991 through 1997. During the spring, the same area was dominated by cod, dogfish, and haddock with less herring caught in the surveys.

Further evidence of the overlap between herring and regulated groundfish can be found in the literature on predator/prey relationships. Herring is an important prey species whose consumption by predators seems to increase during periods of abundance (Tsou and Collie 2001). Stomach contents from the NMFS bottom trawl surveys during 1969-1972 showed herring to be an important prey item for cod, pollock, haddock and silver hake (Langton and Bowman 1980, 1981). Garrison (2000) found that Atlantic cod had a broad diet that included herring. Atlantic herring were one of the more frequent identifiable elements of stomach contents for a feeding guild that included cod, but not for a guild that included haddock (Garrison and Link 2000). Other reports found that cod and pollock feed on herring eggs and/or spawning herring (Tupper et al 1998).

Evidence of groundfish catch in herring fishing operations

The bycatch of regulated groundfish in herring fishing operations was first summarized in FW 18 to the Northeast Multispecies FMP (NEFMC 1997). Seven midwater trawl tows observed in the GOM in 1995 caught small amounts of whiting or other groundfish, but no regulated groundfish. Additional information in the Atlantic Herring FMP (NEFMC 1999) documented that bycatch of small quantities of regulated groundfish occurred in the midwater trawl fishery, and small amounts of other bottom dwelling species were sometimes taken in the purse seine fisher. In February 2004 the Herring PDT summarized available information in a working document during preparation of Amendment 1 to the Herring FMP. This summary included information referenced in the earlier documents.

The summary included information from the following sources:

- National Marine Fisheries Service (NMFS) Sea Sampling (Observer) Database 1994-2003
- Catch Reports from Foreign Vessels Fishing Under Allocations for Total Allowable Level of Foreign Fishing (TALFF) in 2001 and Observer Reports (Raw

Data) from Foreign Processing Vessels Engaged in Joint Venture (JV) Operations in 2001

- ME DMR Observer Data 1997/1998, Collected in Cooperation with Manomet Center for Conservation Sciences
- Results from a Herring Portside Bycatch Survey Conducted by ME DMR

Summary tables from that document are shown below. In general, they show that regulated groundfish and other bottom-dwelling species are caught by herring fishing vessels. This appears to occur more often in mid-water and paired mid-water trawl operations than in purse seine operations. Cod end transfers observed during JV operations in 2001 caught over 10 mt of regulated groundfish. The data are not sufficient to develop overall discard estimates of regulated groundfish in the herring fishery, or even to detect seasonal or spatial patterns.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Purse Seine	0	0	0	0	0	0	3	0	0	3
Pair Trawl	26	32	0	0	0	2	1	0	1	62
Midwater Trawl	0	5	0	0	0	1	12	0	0	18
Total	26	37	0	0	0	3	16	0	1	83

Table 128 - Distribution of NMFS' Sea Sampling Trips by Gear Type and Year

Source: NMFS Sea Sampling (Observer) Database.

Note: 55 of the 58 pair trawl trips observed in 1994 and 1995 occurred in an experimental tuna fishery and documented no catch of herring and/or mackerel. Information from these trips has not been included in this document. Trip records for three additional pair trawl trips were incomplete and are therefore not included in the table.

SPECIES CAUGHT	DISCARD LBS.	KEPT LBS.	TOTAL LBS.
ALEWIFE	1	66,138	66,139
BLUEFISH	1	73	74
COD, ATLANTIC	7	11	18
DOGFISH, SMOOTH	40		40
DOGFISH, SPINY	8,777		8,777
FLOUNDER, SAND DAB (WINDOWPANE)	2		2
FLOUNDER, WINTER (BLACKBACK)	8	2	10
FLOUNDER, YELLOWTAIL	4	1	5
HADDOCK	1		1
HAKE, SILVER (WHITING)	459		459
HERRING, ATLANTIC	202,650	3,450,788	3,653,438
HERRING, BLUEBACK		3,600	3,600
HERRING, NK (SHAD)	700	10,700	11,400
LUMPFISH	5		5
MACKEREL, ATLANTIC	201	111,847	112,048
MONKFISH (ANGLER, GOOSEFISH)		9	9
OCEAN POUT	13		13
POLLOCK		4	4
SCULPIN, LONGHORN	3		3
SCULPIN, NK	1		1
SHAD, AMERICAN	2		2
SQUID, ATL LONG-FIN	5		5
SQUID, NK	1		1
SQUID, SHORT-FIN	17		17
GRAND TOTAL	212,897	3,643,173	3,856,069

Table 129 - Catch and Discards (Lbs.) of All Species on 18 Observed Midwater Trawl Trips from 1994-2002

Source: NMFS Observer Database.

SPECIES CAUGHT	DISCARD LBS.	KEPT LBS.	TOTAL LBS.
ALEWIFE		2,678	2,678
DOGFISH, SPINY	3,100		3,100
HERRING, ATLANTIC		132,208	132,208
HERRING, BLUEBACK		727,526	727,526
HERRING, NK (SHAD)		1,000	1,000
MACKEREL, ATLANTIC		700,000	700,000
GRAND TOTAL	3,100	1,563,412	1,566,512

Table 130 - Catch and Discards (Lbs.) of All Species on Four Observed Midwater Pair Trawl Trips that Documented Catches of Herring and/or Mackerel from 1994-2002

Source: NMFS Observer Database.

SPECIES CAUGHT	DISCARD LBS.	KEPT LBS.	TOTAL LBS.
DOGFISH, SPINY	700		700
HERRING, ATLANTIC	5,000	545,000	550,000
GRAND TOTAL	5,700	545,000	550,700

Table 131 - Catch and Discards (Lbs.) of All Species on Three Observed Purse Seine Trips in 2000

Source: NMFS Observer Database.

23 OBSERVED TRIPS (443 HAULS)			
SPECIES CAUGHT	CATCH MT	BYCATCH MT	TOTAL MT
HERRING, ATLANTIC	10,694.6	23.3	10,717.9
HAKE, SILVER (WHITING)	8.2	119.5	127.7
REDFISH	0.6	2.8	3.4
HAKE, RED (LING)	0.0	12.0	12.0
HADDOCK	0.1	7.7	7.8
OTHER SPECIES	1.2	5.5	6.7
GRAND TOTAL	10,704.7	170.8	10,875.5

Table 132 - Catch and Bycatch (mt) of All Species Reported from Observers During JV Operations in 2001 (Raw Data)

Note: In addition to the data presented above, 14 marine mammals were reported as bycatch during these JV operations – 2 Atlantic white-sided dolphins and 12 pilot whales. One of the pilot whales was reported to be badly decomposed when it was caught.

REPORTED TRANSFER OF 60 CODENDS			
SPECIES CAUGHT	CATCH MT	BYCATCH MT	TOTAL MT
HERRING, ATLANTIC	1,756.8	2.0	1,758.8
HERRING, ATLANTIC (MEAL)	60.5		60.5
MACKEREL, ATLANTIC	0.2		0.2
HADDOCK		7.8	7.8
REDFISH		2.5	2.5
SILVER HAKE (WHITING)		59.5	59.5
RED HAKE		4.7	4.7
FINFISH UNCL.		0.5	0.5
SHARKS		7.0	7.0
GRAND TOTAL	1,817.5	84.0	1,901.5

Table 133 - Catch and Bycatch (mt) of All Species Reported from the Transfer of 60 Codends from TALFF Fishing to Foreign JV Operations in 2001

Note: In addition to the data presented above, one pilot whale was reported as bycatch during foreign fishing under the TALFF allocation in 2001.

SPECIES CAUGHT	PURSE SEINE	MIDWATER TRAWL	COMBINED
MACKEREL, ATLANTIC	1,052	98,171	99,223
DOGFISH, SPINY	75,050	3,837	78,887
HERRING, BLUEBACK		7,319	7,319
TUNA, BLUEFIN	700	2,770	3,470
SILVER HAKE (WHITING)		2,224	2,224
STRIPED BASS		850	850
SQUID	289	497	786
BLUEFISH	250	312	562
BUTTERFISH		427	427
BLUE SHARK		310	310
HARBOR SEAL		300	300
THRESHER SHARK		250	250
MAKO SHARK	25	199	224
POLLOCK		168	168
PORBEAGLE SHARK		70	70
MENHADEN, ATLANTIC		50	50
TORPEDO RAY		40	40
MONKFISH		37	37
LUMPFISH	10	17	27
COD, ATLANTIC		19	19
OCEAN POUT		16	16
WHITE HAKE		11	11
SCULPIN	2	8	10
SEA RAVEN		4	4
SEA ROBIN		3	3
SKATE	2	1	3
SCUP		1	1
WINTER FLOUNDER		1	1
GRAND TOTAL	77,380	117,910	195,290

Table 134 - Total Observed Bycatch (Lbs.) by Species and Gear on 50 Trips 1997-1998 (Excluding Herring Bycatch) (Maine DMR)

Important Note: This project did not differentiate between bycatch and incidental catch. The catch of all non-target species was reported as bycatch during this study; it is therefore not possible to differentiate between bycatch (discards) and incidental catch (retained non-target species). Atlantic herring bycatch, however, is assumed to represent any Atlantic herring that were discarded at-sea.

SPECIES	PURSE SEINE	PAIR TRAWL	MIDWATER TRAWL	TOTAL
ALEWIFE	259	39	9	306
AMERICAN SHAD		1		1
ATLANTIC MACKEREL	447	5,644	4,421	10,512
BUTTERFISH	1	1	<1	2
HADDOCK			19	19
LOBSTER	<1		1	1
LUMPFISH	1	6		7
POLLOCK		<1		<1
SCULPIN		3		3
SEA RAVEN		2		2
SILVER HAKE (WHITING)		397	7	404
SPINY DOGFISH	12	2	1,575	1,589
SQUID, LONG FINNED	<1	2	9	11
WHITE HAKE			<1	<1
TOTAL	720	6,097	6,040	12,856

Table 135 - Observed Bycatch Weight (Lbs.) by Species and Gear Type (Maine DMR)

Observer coverage of the herring fishery was increased in 2002 and 2004. Information on regulated groundfish bycatch from those trips is summarized in Table 136 through Table 139. The NEFSC advised that this information is not sufficient to uphold a robust statistical analysis to determine a groundfish discard/kept ratio. The adequacy of the temporal and spatial coverage has yet to be evaluated and the effects of individual vessel sorting procedures on sampling require a rigorous evaluation. A total of seventy-five trips were observed (twenty in 2003 and fifty-five trips in 2004), which is roughly ten percent of the trips from May 2003 through August 2004.

Catch data collected by at-sea observers aboard purse seine, midwater trawl and paired midwater trawl vessels during 2003-2004 were provided by NMFS. All trips that occurred in the Gulf of Maine (GOM) or on Georges Bank (GB) and reported here were directed at Atlantic herring. Most of the GOM data are from Area 513 (35 trips) and most of the GB data are from Area 522 (9 trips). In 2003, most GOM trips were observed in May, July, September, October, and November. Most of the GOM trips in 2004 were observed in May, June, July, or August. The GB trips were primarily observed in September, October, and November in 2003, and May, June, July, and August in 2004. The total number of observed trips was as follows:

	2003	2004
GOM	11	50
GB	8	5
GOM & GB	1	0

Of the total number of trips above, the following number reported by-catches of groundfish (the remainder reporting no by-catch of groundfish):

	2003	2004
GOM	1	12
GB	3	3
GOM & GB	1	0

Table 136 through summarize reported groundfish by-catch for GOM and GB trips in 2003-04. For GOM in 2003, the only trip that had groundfish by-catch reported 39 lbs. of cod. In 2004 in GOM, the greatest total groundfish by-catch was of pollock (382 lbs.), followed by haddock and silver hake, respectively. The largest single trip of pollock was in May, 2004 in Area 513 (350 lbs.). For GB in 2003, the greatest total multispecies by-catch was of silver hake (3,122 lbs.), followed by very minor catches of monkfish and American plaice. The largest single trip of silver hake by far was in September, 2004 in Area 522 (3,000 lbs.). In 2004 on GB, the greatest total groundfish by-catch was of haddock (6,828 lbs.), followed by redfish and pollock. The largest single trip of haddock by far was on 7/21/04 (6,507 lbs.) in Area 522.

The mean groundfish by-catch (lbs.) per trip (0 trips included) was:

	2003	2004
GOM	3.5	26.3
GB	392.5	628.0

Both the frequency (21% of GOM trips vs. 46% of GB) and amount of groundfish by-catch appear greater on GB than GOM. Following are the rate (lbs./trip) of groundfish by-catch (highest to lowest) by NMFS statistical area (minimum 3 trips, 0 trips included):

Area	By-catch rate
522	1,217.9
513	35.4
561	35.1
514	20.5
512	10.7
511	6.0
521	0

The highest rate of by-catch by far was in Area 522, and this was largely due to the silver hake (2003) and haddock (2004) catches reported above.

Additional evidence that regulated groundfish are caught by herring mid-water trawls is in the enforcement reports summarized in section 7.8.1.7.2. Some of these reports document catches of juvenile groundfish (especially haddock), which differs from the observer reports that only reported adult groundfish.

	Midwater Trawl		Pair Trawl				Purse Seine		Grand Total
Catch	513	512&513	512	513	511&512	513&514	511	512	
Pollock	351		10		12	9			382
Haddock	263					40			303
Silver Hake	78	105	20			30			233
White Hake	75			79		1			155
Cod	100					21			121
Monkfish	8				10	20			38
Redfish			3			13	20		36
Red Hake	26					5.5			31.5
American Plaice	5					6			11
Witch Flounder	2								2
Flounder, NK								1	1
Grand Total	908	105	33	79	22	145.5	20	1	1313.5

Table 136 – Observed groundfish bycatch in herring fishing in the GOM, 2004

	Pair Trawl	Grand Total
Other Catch	514	
Cod	39	39
Grand Total	39	39

Table 137 – Observed groundfish bycatch in herring fishing in the GOM, 2003

	Midwater Trawl	Pair Trawl		Grand Total
Other Catch	522&561	522	522&561	
Silver Hake	2	3000	119.7	3121.7
Monkfish			7	7
American Plaice			6	6
Witch Flounder	1		1.5	2.5
Haddock			2	2
White Hake			1	1
Grand Total	3	3000	137.2	3140.2

Table 138 – Observed groundfish bycatch in herring fishing on GB, 2003

	Pair Trawl
Other Catch	522
Haddock	6827.5
Redfish, nk	924
Pollock	50.5
Monkfish	12.5
Silver Hake	6
Grand Total	7820.5

Table 139 – Observed groundfish bycatch in herring fishing on GB, 2004 (pounds)

Observer data on groundfish catch rates in the herring fishery are insufficient for developing discard estimates or to detect seasonal/ spatial patterns of regulated groundfish discards. This means it is not possible to determine if discard rates are higher inside the closed areas or outside the closed areas, or during specific times of the year. However, the data cited indicate that small amounts of groundfish are caught by gear, more so in mid-water and pair trawling operations than purse seines. Therefore, analysis of biological impacts on groundfish will be qualitative rather than quantitative. Since discard rates between areas inside and outside the areas cannot be estimated, the analysis will consider whether displacement of herring fishing effort from the closed areas will increase herring fishing in areas where groundfish are more aggregated.

The total herring landings occurring within closed areas as a percentage of total herring landings in the area can serve as a proxy for relative distribution of herring effort inside and outside the area. These percentages, derived from VTR data for 2000-2003, are shown in Table 140. Overall, the WGOM closure had the highest herring removals, followed by CAII, and Cashes Ledge. Landings from CAI and NLS were a small percentage of total landings from open area. Overall, 7% of total herring landings were taken from year round closed areas (2000-2003 combined). If landings are proportional to effort during this period, then effort in the closed area is a small percentage of total herring effort.

Closed area	Landings within closed area (mt) 2000-2003	Total landings 2000-2003 Mt	Herring Area	Percentage of total landings in area
WGOM	20,548	231,196	Area 1A	8.9%
Cashes Ledge	4,363	36,462	Area 1B	12.0%
CAI	1,718	87,205	Area 3	2.0%
CAII	5,693	87,205	Area 3	6.5%
NLS	821	70,207	Area 2	1.2%
Total	33143	425,070	All combined	7.8%

Table 140 - Herring landings within year round closed areas as percentage of total herring landings by area, 2000-2003 combined.

7.8.1.1.1.1 Seasonal distribution of herring catches based on VTR

The seasonal distribution of Atlantic herring catches as reported in VTR for 2000-2003 are shown in Figure 44 through Figure 47. More trips are taken in the Western Gulf of Maine closure on top of Jeffrey's Ledge than in the other closed area. These trips appear to be concentrated in May-August with a lesser number of trips occurring September through December. Few trips occur January through April. Herring effort in January-April is concentrated in Southern New England,

<u>May-August</u>

During May-August, trips in the open area appear concentrated west of the WGOM closed area near Ipswich Bay and along the fifty-fathom line paralleling the coast of Maine including Jeffrey's Bank, and Platts Bank. Several trips were reported on Cashes ledge during May-August in 2002 and September-December of 2000. During May-August, effort appears to be distributed along the fifty fathom depth contour on the western edge of Georges Bank with a few of these trips occurring into closed area II during May-August. Effort consistently appears within the WGOM closure during 2000-2003.

Based on these four years of data, a closure of the Western Gulf of Maine would likely redistribute effort to Ipswich Bay and along the fifty-fathom contour across the coast of Maine. The impact of this potential re-distribution on groundfish is not quantifiable. However, if herring effort from WGOM or Cashes closed area is redistributed to similar depth-habitat within the Gulf of Maine, then the probability that the vessels will encounter similar groundfish as found in the closed area is high. If density of groundfish is higher in the year round closed area than the open area during this time, then some reduction in groundfish discards (bycatch) may occur through the redistribution of effort into the open area.

Peak spawning time for groundfish occurs in May-June during this quarter. The Western Gulf of Maine closure includes areas that are important spawning areas for groundfish, but groundfish also spawn outside of this area. One objective of the rolling closures in SA 513-514 in May and in 512 in June was to provide protection to aggregations of spawning cod. Trawling can impact by dispersing spawning aggregations. Since spawning is occurring both inside the Gulf of Maine closure and adjacent open areas, the impact of redistributing herring effort from the year round closed area to adjacent open area on spawning aggregations are unknown.

September-December

Trip distribution for September-December is similar to May-August. More trips occur to the east of Cape Cod and a few more trips appear in CAI during this time period than in May-August. Effort from closed areas would likely be displaced from CAI to the area east of Cape Cod and along the fifty fathom contour on the western edge of Georges Bank Because few trips appear to be taken in either CAI or CAII, excluding herring fishing from these areas would likely be beneficial to groundfish because it would reduce the potential for spawning disruption. These impacts would likely be minor since little herring fishing is taking place in these areas.

January-April

Effort in January-April appears to be concentrated in Southern New England. Trips appear in the WGOMCA and one trip was reported from the NLCA. From 2000-2003 no trips were observed in the Cashes Ledge, CAI, or CAII. Peak spawning activity for groundfish occurs from February-June and CAI and CAII are important spawning areas. Herring effort in the closed areas is low during this time period. The number of trips in these closed areas in January through April is low during 2000-2003. However, herring has been underutilized in Areas 2 and 3. Closing CAI, CAII, and NLS closed areas to herring vessels may prevent increased effort during peak spawning activities if the herring fishery develops in areas 2-3.

Redistribution of herring effort from WGOM closure would likely be redistributed to inshore areas of the GOM (Ipswich Bay, Cape Cod Bay, and along the fifty fathom contour) given the fishing patterns shown in section 7.8.1.1.1.1. These areas are important spawning areas for cod in the spring. The impact of redistributing effort into these areas during this time period will depend on the relative difference in density of spawning fish in the WGOM compared to the open areas in the WGOM.

Closing the groundfish areas to herring fishing could shift herring effort to open areas where there could be greater negative impacts on groundfish. In one study groundfish density was found to be higher in closed areas (Fogarty and Murawski 1998) and preventing herring fishing in those areas should reduce the potential impacts of bycatch or behavioral interactions with groundfish spawners.

Impacts on Groundfish Spawning

For decades, the closed areas on Georges Bank have been recognized as important to groundfish spawning, particularly for cod, haddock, and yellowtail flounder. The two areas were first established as seasonal spawning closures under ICNAF. They continued to be used as spawning closures – primarily to protect cod and haddock - under the groundfish plan until they became year round closed areas in 1994. Prior to their establishment as year round closed areas, however, scallop dredge fishing was allowed in the seasonal spawning closures. Closed area access programs since 1997 limited scallop dredge access to periods outside of peak spawning periods, and a similar restriction was recently submitted by the Council in Scallop Framework Adjustment 16.

The WGOM Closed Area also includes areas that have been recognized as important for spawning and/or juvenile groundfish. Groundfish eggs and larvae were frequently taken on Jeffreys Ledge by the MARMAP surveys, particularly during the spring months. Amendment 5 (NEFMC 1994) required groundfish vessels to use square mesh on Jeffreys Ledge and Stellwagen Bank from March 1 through July 31 each year in order to protect concentrations of juvenile groundfish. A major reason for this measure was because of high discards of juvenile cod that occurred in the area in 1990.

Observed spawning periods are described in the Essential Fish Habitat source documents for each species. For many species, there is a wide range of possible spawning months, but there is also a distinct peak when most spawning activity occurs. The general pattern is for spawning to occur in the southern part of the range for a species earlier in the year, and then move north. For most groundfish species, spawning takes place during the first half of the calendar year. Peak spawning for witch flounder and yellowtail flounder is in the middle of the year. Peak spawning for ocean pout occurs in the fall, while for Atlantic halibut it occurs in November and December.

The seasonal nature of spawning can also be determined by examining distributions of eggs documented by the MARMAP surveys. Table 144 summarizes the distribution of eggs, indicating the periods with the largest observed densities. Charts of egg collections also illustrate the seasonal and geographic distribution of spawning for groundfish stocks (keeping in mind that egg distributions lag actual spawning activity since depending on species and environmental conditions, eggs may require from three days to two weeks to hatch after spawning,). These charts are reproduced in Figure 27 through Figure 33 for major groundfish species. For most groundfish species, eggs are pelagic and thus are dispersed by water currents, so these charts do not precisely indicate the locations of spawning activity. Still, they do give some indication of the general locations of spawning for each species and show that there are high concentrations of eggs – and presumably spawning activity - in the groundfish closed areas. (Winter flounder eggs are demersal and adhesive, though some were collected in the MARMAP surveys. Generally, winter flounder eggs on Georges Bank were collected on sandy bottoms, in depths of one to forty fathoms on Georges Bank and Nantucket Shoals).

In order to provide a subjective summary of the key months for groundfish spawning activity on Georges Bank, the information from Table 143 and Table 144 was used to identify a monthly index of spawning activity and egg distributions. For each groundfish species, a value was assigned for the distribution of eggs or spawning activity: a 1 was assigned for peak activity, a 2 for some activity, and a 3 for no activity. These scores were then averaged, and the months then ranked. A lower score thus means there was more activity observed during that particular month. This ranking suggests that the most important months – taking into account the major groundfish species as a whole - are February through June (Table 142).

Additional indications of the importance of the closed areas to spawning activity can be determined from the spring trawl surveys. While these surveys are not specifically timed to coincide with groundfish spawning, ripe and running fish are caught by the surveys. The number of ripe and running

cod and haddock were plotted to determine if these fish are more common in the Georges Bank closed areas. Plots are shown in Figure 34 and Figure 35. Spawning haddock have been caught throughout Georges Bank during the period 1974 through 2003. The highest distribution of ripe and running haddock caught in the spring survey occurs on the eastern part of Georges Bank, in Canadian waters. Other than this area, there are secondary concentrations within CAI and CAII (primarily along the Hague Line), as well as in the Great South Channel west of CAI. Fewer ripe and running cod have been caught by the NMFS spring survey, particularly on Georges Bank in recent years. The plot of locations for where ripe fish have been caught show once again that the northeastern peak of GB is an important spawning area. Other important areas include CAI and the area north of Cultivator Shoals. These figures show that CAI and CAII are important areas for haddock spawning activity. This examination did not provide as conclusive results for cod, but do indicate that CAI may be an important area for cod spawning.

The Canadian spring groundfish survey samples Georges Bank in February. Data from the surveys on the spawning condition of cod was plotted to determine the impacts of allowing trawling in the northern tip of CAII during January and February (Figure 36 through Figure 38). The Canadian survey has more stations in Canadian waters. In general, the greatest concentration of spawning fish is found by these surveys on the Northeast Peak of Georges Bank. Cod are believed to move from the southwest to the northeast to spawn during the winter months, so pre-spawning fish may be in the northern tip of CAII during January and February. The Canadian survey has caught a few pre-spawning and spawning fish in the northern corner of CAII that will be open to fishing under the proposed SAP.

There is evidence that fishing activity can disrupt spawning of cod due to the nature of spawning and the impacts of fishing gear. Cod have been shown to have distinctive spawning behaviors. Male cod compete for females and display for female individuals through circling behavior. Males also form a dominance hierarchy based on size. Female cod descend to the bottom to spawn, select males, and initiate spawning. The females release eggs about five hours after ovulation. If spawning behavior is disturbed, viable eggs may become non-viable if retained too long in the female ovary (Hutching et al. 1999). Another study has shown that males arrive at spawning areas first and establish territories. Both female and male dominated shoals form. The male dominated shoals tend to be shallower and are where spawning occurs, whereas the female-dominated shoals consist mostly of spent females (Morgan and Trippel 1996). Morgan et al. (1997) reported direct evidence of the disruption of spawning aggregations by bottom trawls. An echosounder transect of a trawl track showed that trawling produced a 300-meter wide hole in spawning aggregations of cod. Densities were very low in an near the trawl track and increased up to a distance of 200-400 meters on each side of the track, with the disturbances observed to last for over an hour. These disturbances extended for a distance greater than the “hole” caused by removal of fish by the net. While these studies do not provide direct evidence that mid-water trawls will disturb spawning aggregations of cod, if fished at depths frequented by spawning cod it is likely the impacts may be similar to those reported.

Month	Mean score Eggs	Mean score Spawning activity	Mean score both
January	2.22	2.33	2.28
February	2.11	2.22	2.17
March	1.89	2.22	2.06
April	1.89	1.78	1.83
May	1.89	1.67	1.78
June	2.11	2.22	2.17
July	2.33	2.44	2.39
August	2.56	2.44	2.50
September	2.56	2.67	2.61
October	2.56	2.78	2.67
November	2.33	2.22	2.28
December	2.22	2.33	2.28

Table 141 - Mean monthly scores for Georges Bank American Plaice, Atlantic cod, Atlantic halibut, Georges Bank haddock, pollock, red hake, Georges Bank windowpane, winter flounder, Georges Bank witch, and yellowtail. 1=peak month, 2=common month, 3=uncommon or none.

Month	Mean score Eggs	Mean score Spawning activity	Mean score both
January	6	7	6
February	4	3	4
March	1	3	3
April	1	2	2
May	1	1	1
June	4	3	4
July	8	9	9
August	10	9	10
September	10	11	11
October	10	12	12
November	8	3	6
December	6	7	6

Table 142 - Ranking of monthly scores for spawning activity (1=highest ranking, 12=lowest).

spawning months

peak spawning months

Species	January	February	March	April	May	June	July	August	September	October	November	December	Notes
American Plaice,GM													Berrien and Sibunka 1999
GB Atlantic Cod													
GOM Atlantic Cod													
Atlantic Halibut													Atlantic Canada waters
GB Atlantic Herring													
GOM Atlantic Herring													
Scotian Shelf Atlantic Herring													
Jefferys Ledge Atlantic Herring													*no peak times evident
Nantucket Shoals Atlantic Herring													
Goosefish													
GB Haddock													
GOM Haddock													
Browns Bank Haddock													
Northern Ocean Pout													
Southern Ocean Pout													
Offshore Hake													*no peak times evident
Pollock													
Redfish													*copulation from Oct-Jan; fertilization from Feb-April; no peak times evident
GB Red Hake													
GOM Red Hake													
NYB Red Hake													
GB Sea Scallop													*no peak times evident
GOM Sea Scallop													*no peak times evident
Penobscot Bay Sea Scallop													
New Jersey Sea Scallop													*no peak times evident
MAB Sea Scallop													*no peak times evident

Table 143 - Spawning periods for North Atlantic finfish. (Source: Essential Fish Habitat source documents)

Species	January	February	March	April	May	June	July	August	September	October	November	December	Notes
GB Silver Hake													
GOM Silver Hake													*no peak times evident
SNE Silver Hake													*no peak times evident
MAB Silver Hake													*no peak times evident
Scotian Shelf White Hake													*no peak times evident
GB-GOM White Hake													*no peak times evident
GB Windowpane													
Northern MAB Windowpane													
Southern MAB Windowpane													*split spawning seasons
GOM Winter Flounder													
SNE Winter Flounder													
GB Winter Flounder													
MAB Winter Flounder													
GB-GOM Witch Flounder													
MAB Witch Flounder													
CC-GOM Yellowtail Flounder													
GB Yellowtail Flounder													
SNE Yellowtail Flounder													
MAB Yellowtail Flounder													
Red Deepsea Crab													*fall - spring; no peak times evident
Barndoor Skate													*no peak times evident
Clearnose Skate													*no peak times evident
Little Skate													
Rosette Skate													*no peak times evident
Smooth Skate													*no peak times evident
Thorny Skate													*no peak times evident
Winter Skate													*no peak times evident

Table 143 - Spawning periods for North Atlantic finfish. (Source: Essential Fish Habitat source documents) (cont.)

hatching months
peak hatching months

Species	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Notes
GB American Plaice													*no peak times evident
GOM American Plaice													*no peak times evident
Atlantic Cod													*peaks winter and spring
Atlantic Halibut													*same info as spawning adults
GB Haddock													
GOM Haddock													
Browns Bank Haddock													
Ocean Pout													*no peak times evident
Pollock													
Redfish													*eggs fertilized internally and released as larvae
White Hake													*no peak times evident
GB Windowpane													*no peak times evident
MAB Windowpane													
Winter Flounder													
GB Witch Flounder													
GOM Witch Flounder													
MAB Witch Flounder													
SNE Yellowtail Flounder													
GOM Yellowtail Flounder													*no peak times evident
Yellowtail Flounder													*no stocks given

Table 144 - Observed hatching months for North Atlantic finfish (Source: Essential Fish Habitat source documents)

Species	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Notes
GB Atlantic Herring													*hatch with 10-15 days of spawning
GOM Atlantic Herring													*hatch with 10-15 days of spawning
Nova Scotia Atlantic Herring													*hatch with 10-15 days of spawning
Jefferys Ledge Atlantic Herring													*hatch with 10-15 days of spawning
Nantucket Shoals Atlantic Herring													*hatch with 10-15 days of spawning
Goosefish													
Offshore Hake													
Red Hake													
GB Silver Hake													
GOM Silver Hake													*no peak times evident
SNE Silver Hake													*no peak times evident
MAB Silver Hake													*no peak times evident
Red Deepsea Crab													*no peak times evident
Barndoor Skate													*no peak times evident
Clearnose Skate													*no peak times evident
Little Skate													*laid in spring; hatched in late fall, winter
Rosette Skate													*no peak times evident
Smooth Skate													*no peak times evident
Thorny Skate													*throughout entire year; highest in summer
Winter Skate													*no peak times evident

Table 144 - Observed hatching months for North Atlantic finfish (Source: Essential Fish Habitat source documents)(cont.)

Figure 27 - Distribution and abundance of Atlantic cod eggs collected during NEFSC MARMAP ichthyoplankton surveys, February through May, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

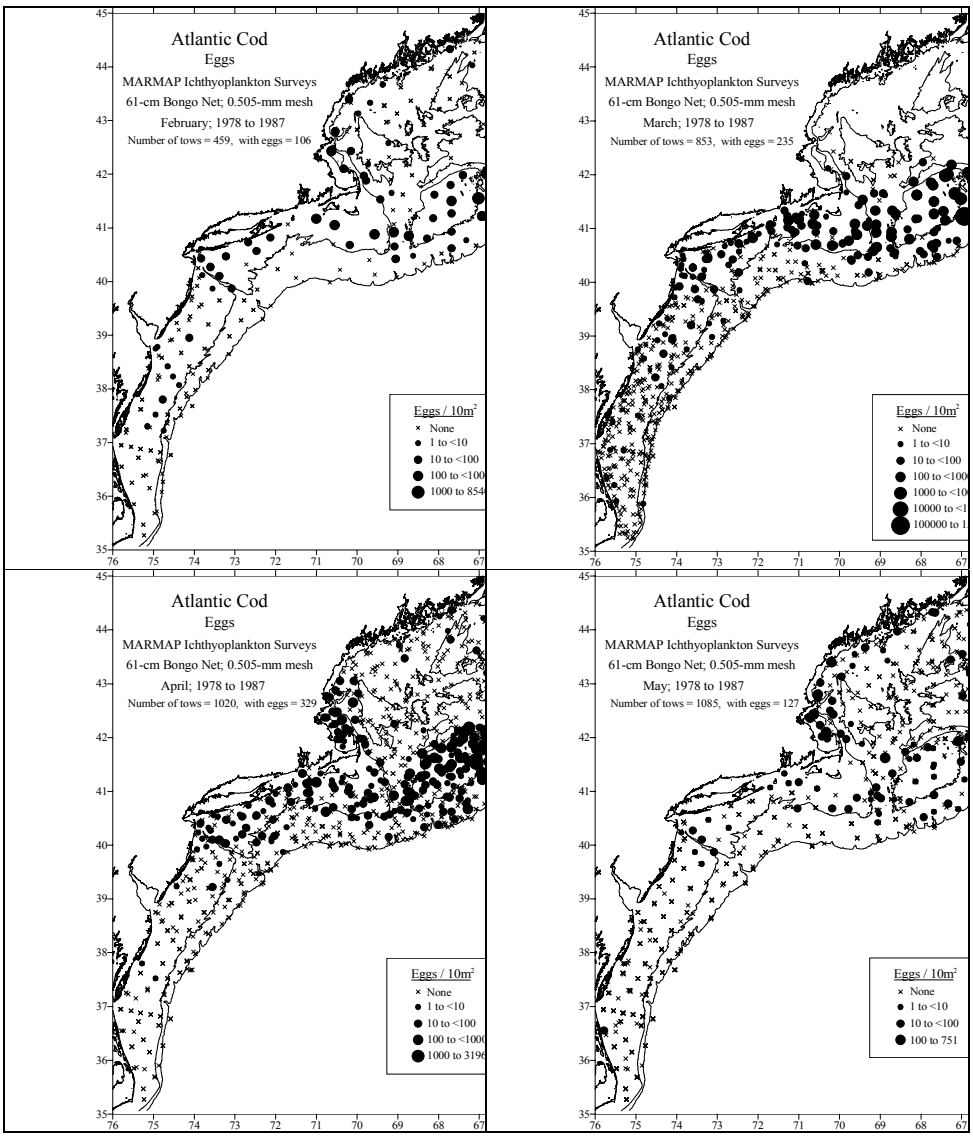


Figure 28 - Distribution and abundance of haddock eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

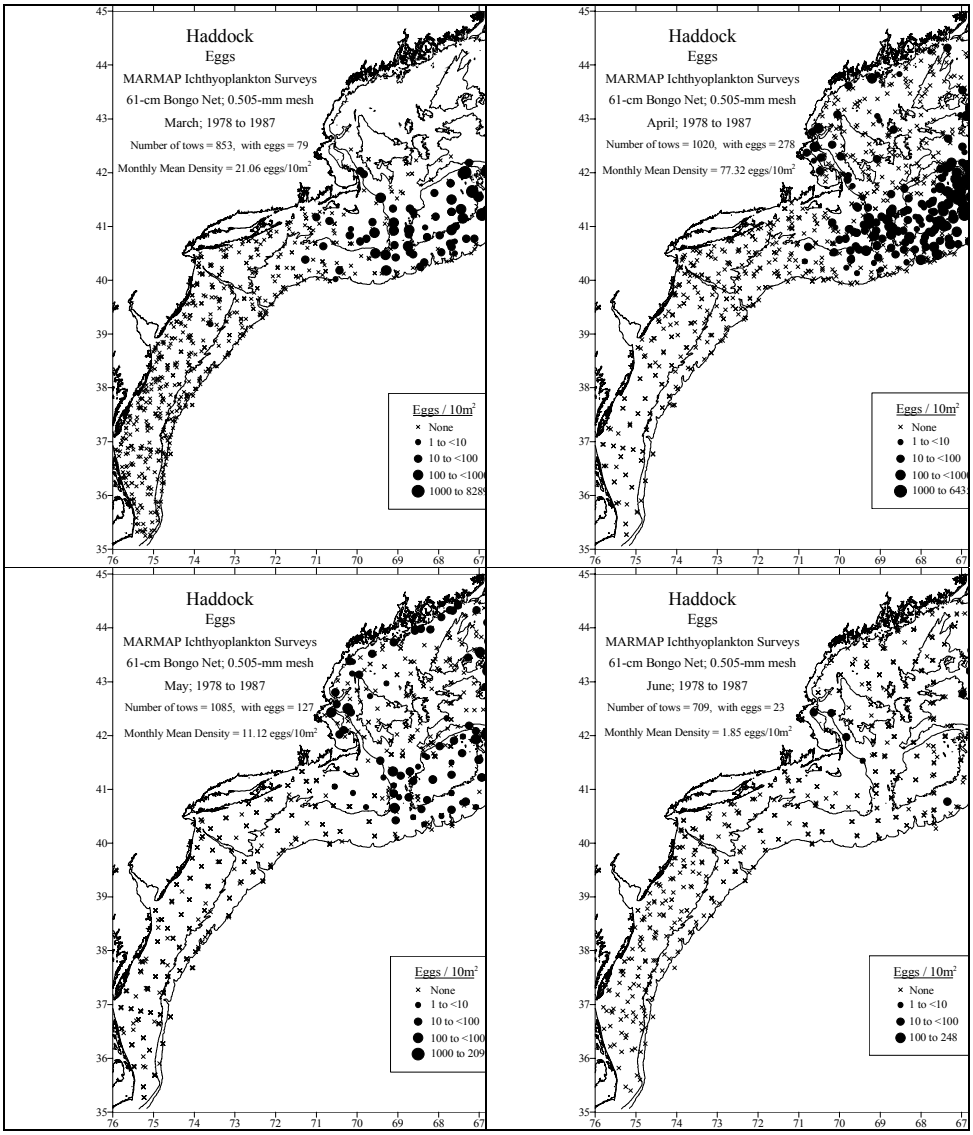


Figure 29 - Distribution and abundance of American plaice eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

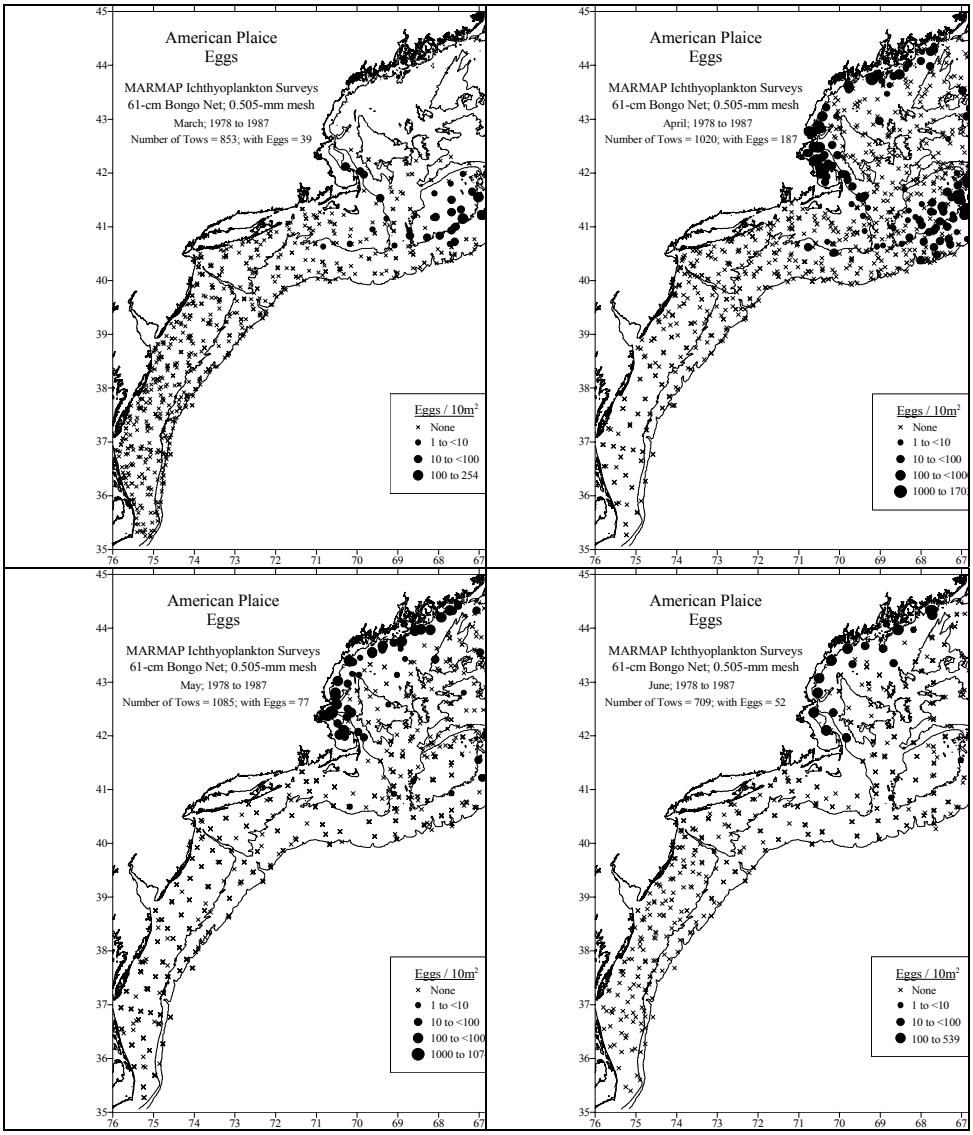


Figure 30 - Distribution and abundance of hake (all spp.) eggs collected during NEFSC MARMAP ichthyoplankton surveys, June through September through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

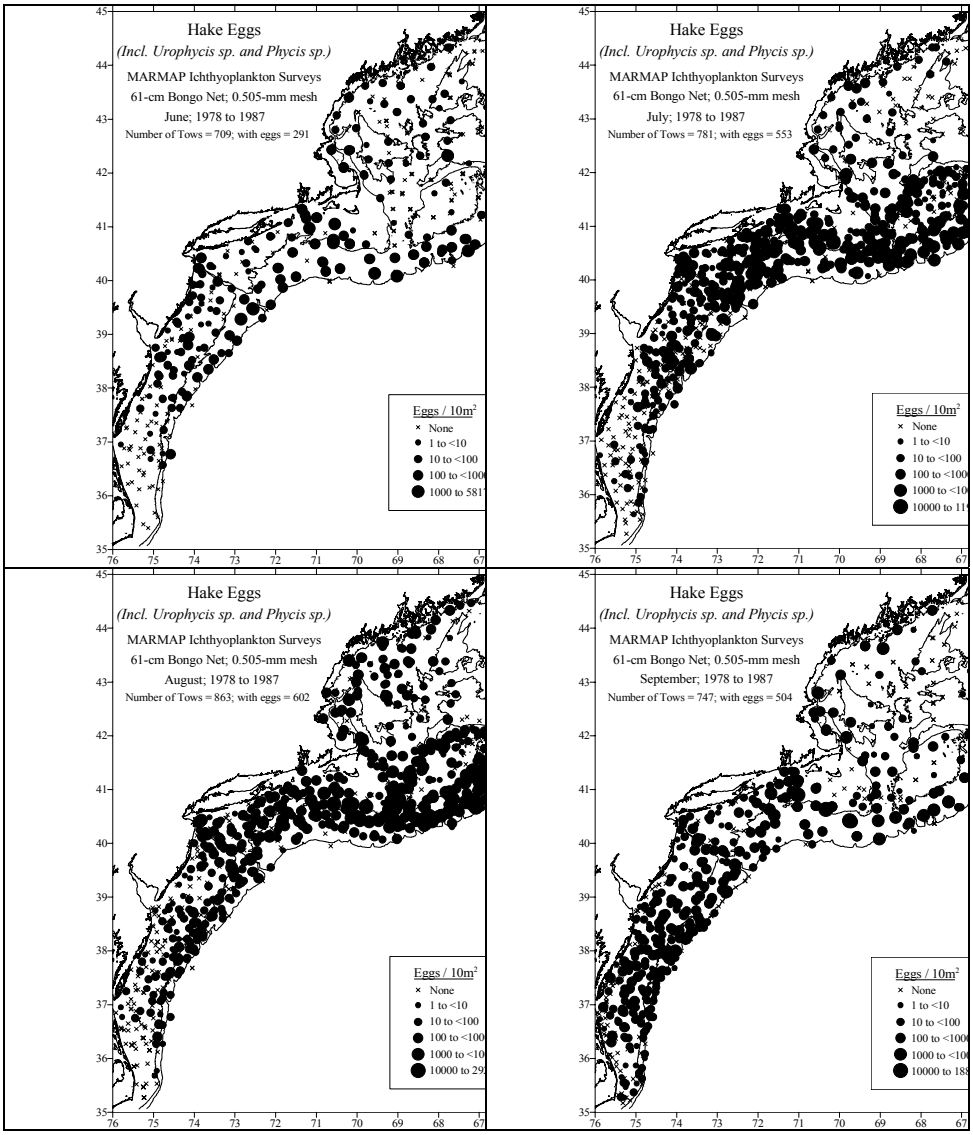


Figure 31 - Distribution and abundance of yellowtail flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

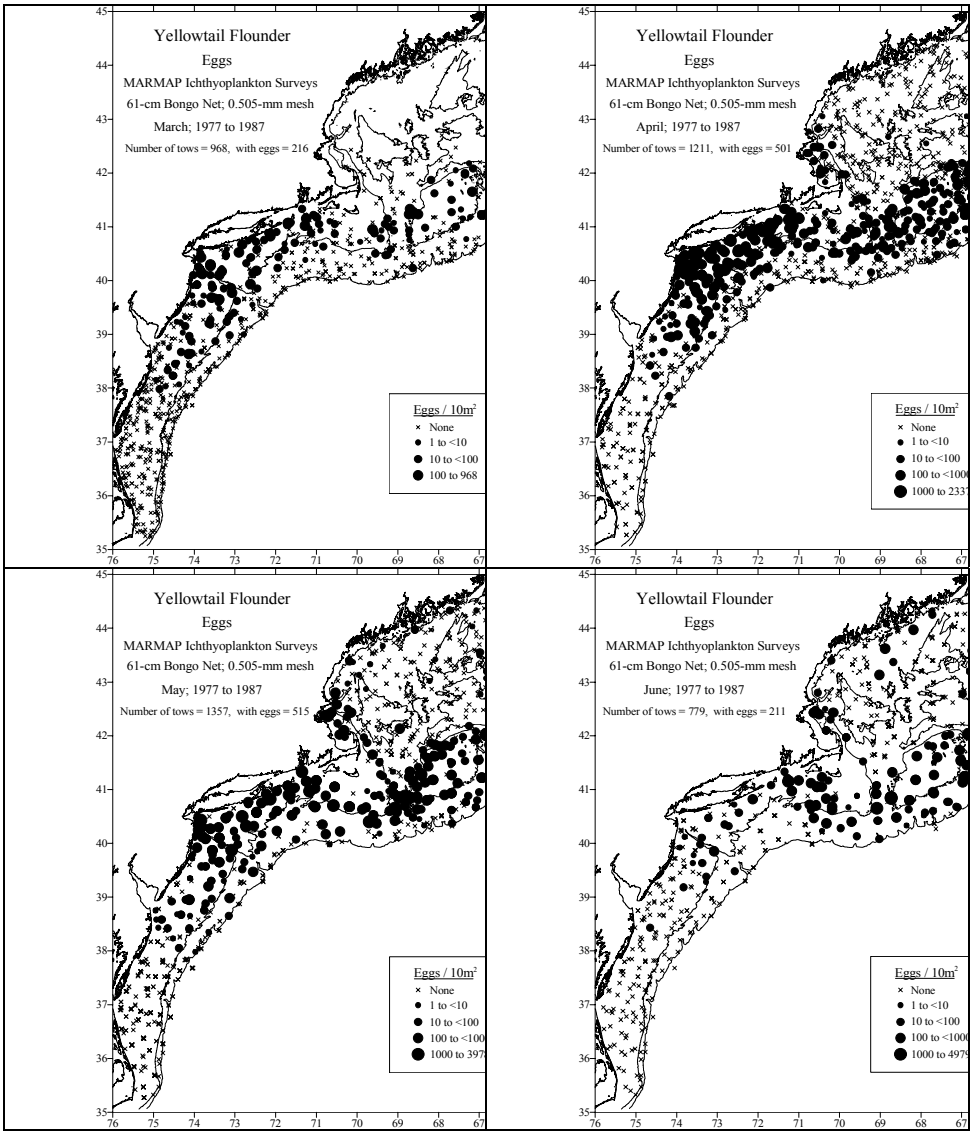


Figure 32 - Distribution and abundance of winter flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

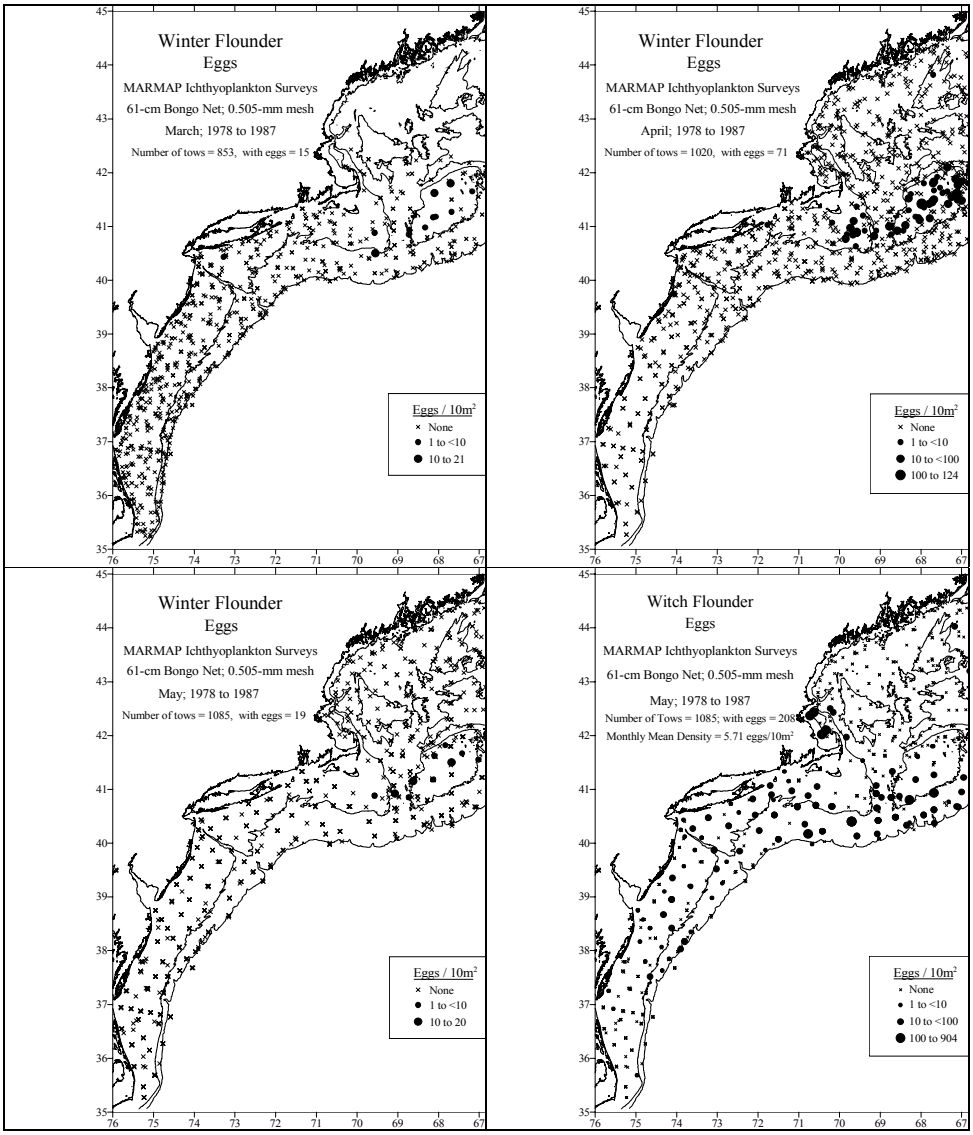
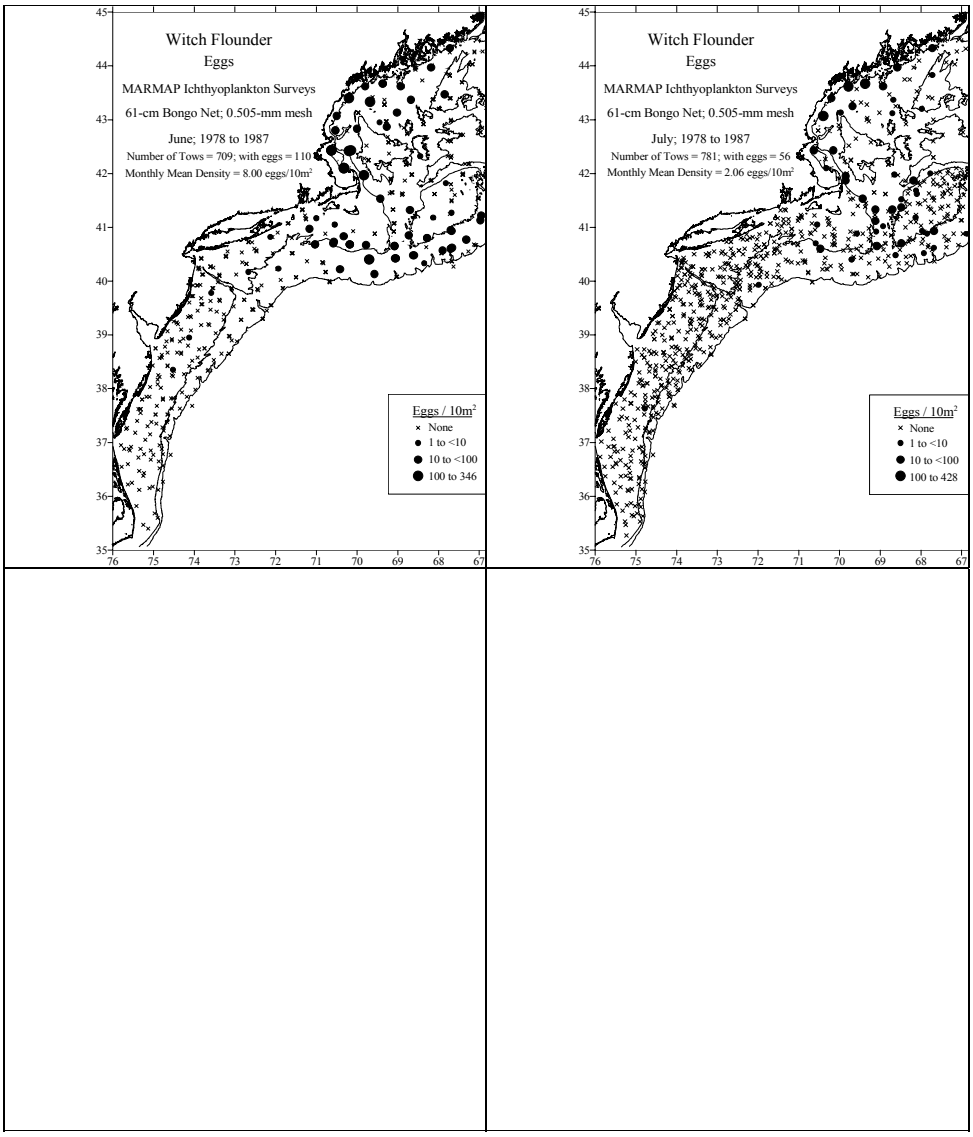


Figure 33 - Distribution and abundance of witch flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, June and July, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.



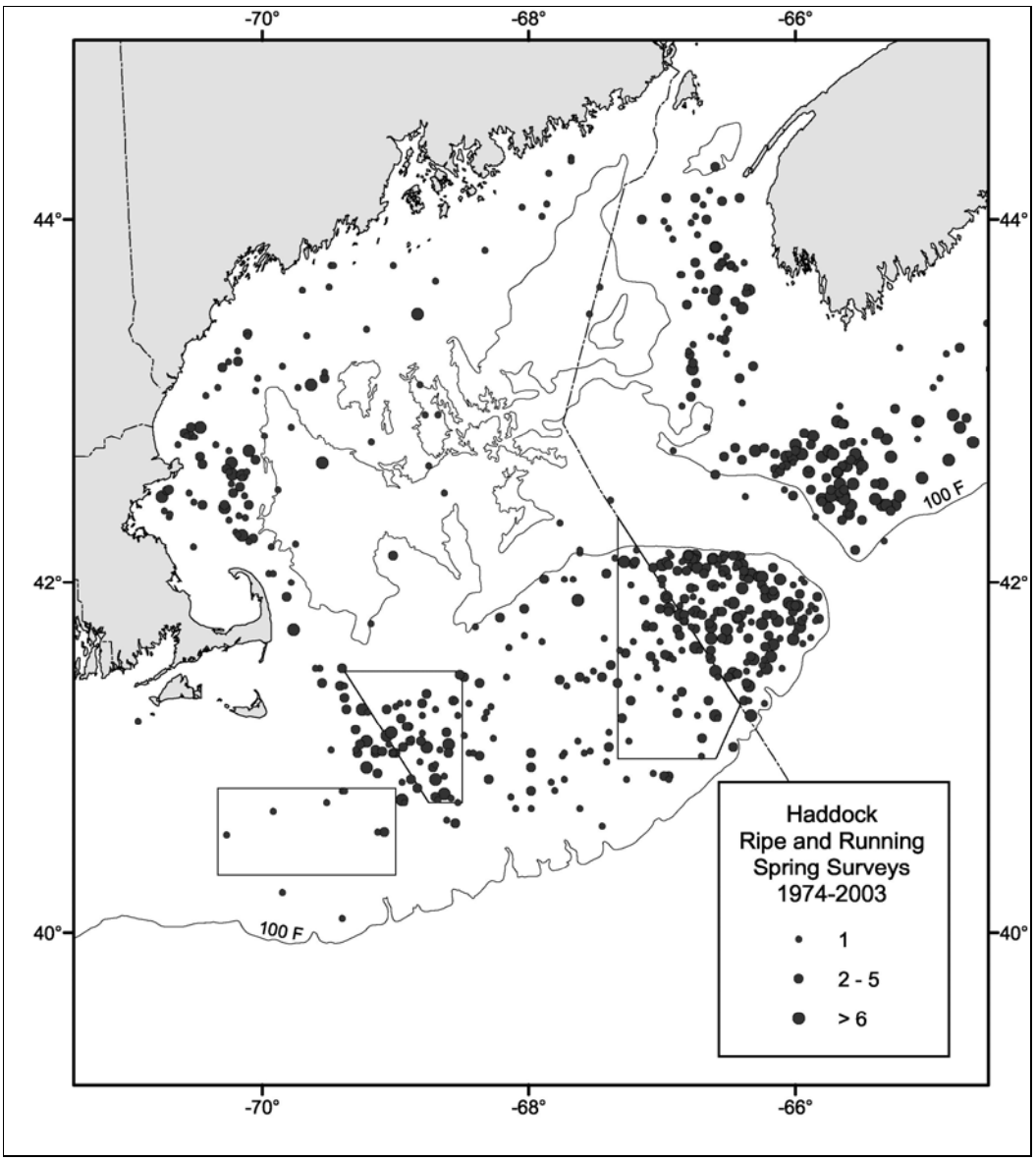


Figure 34 - Catch of ripe and running haddock in the spring trawl survey, 1974-2003

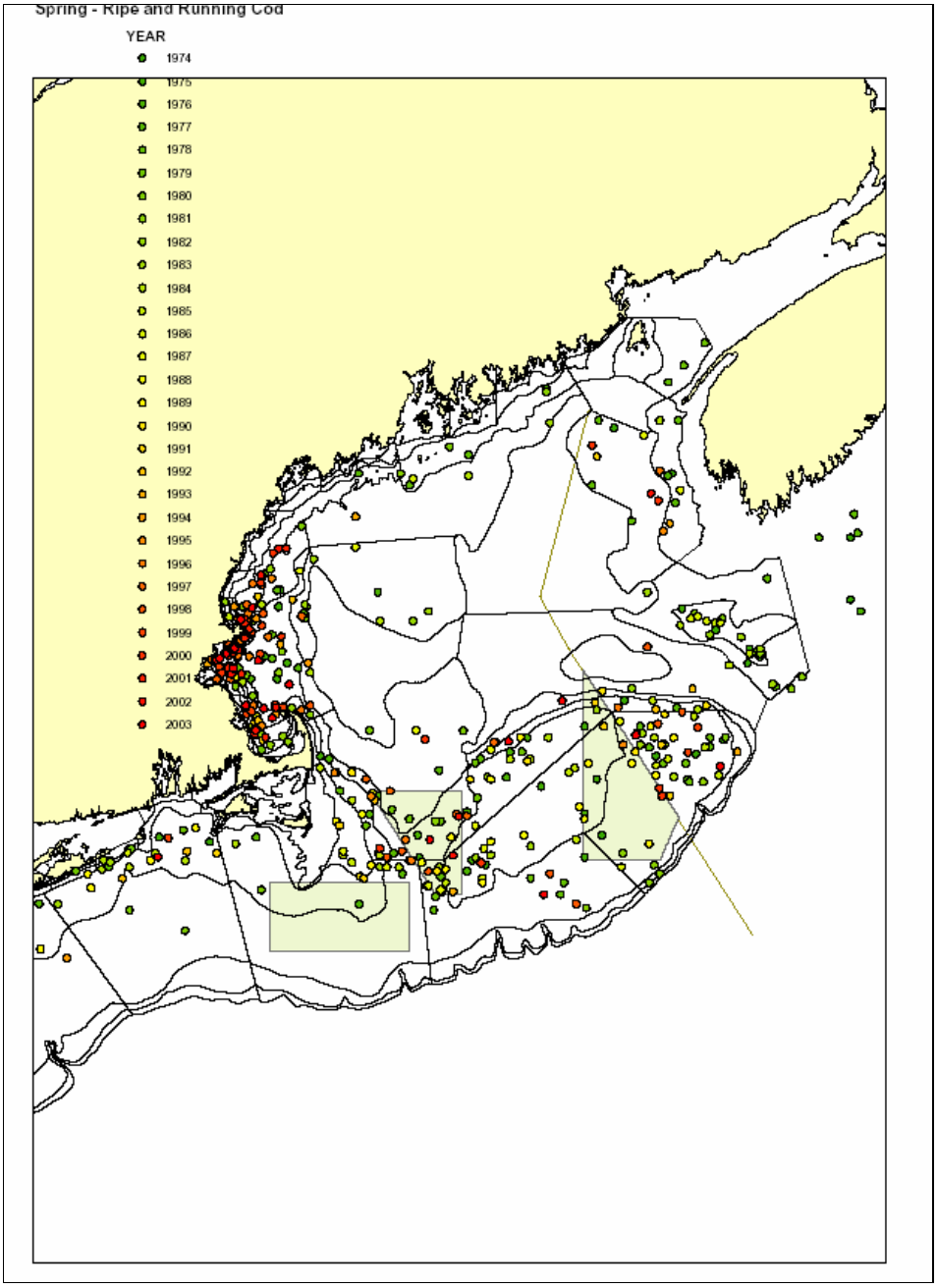


Figure 35 - Ripe and running cod caught by the spring trawl survey

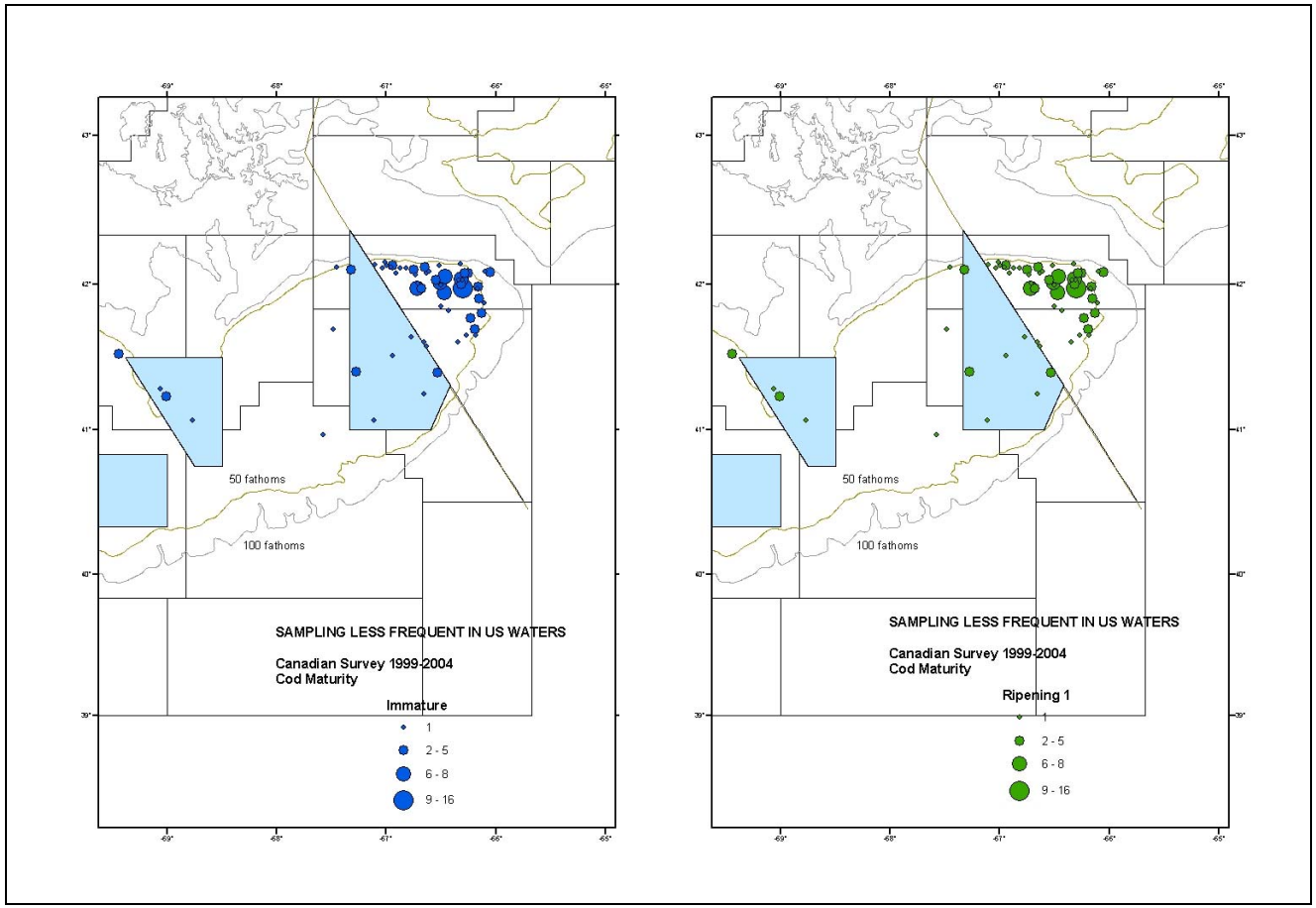


Figure 36 – Immature and ripening cod in Canadian spring trawl survey, 1999-2004

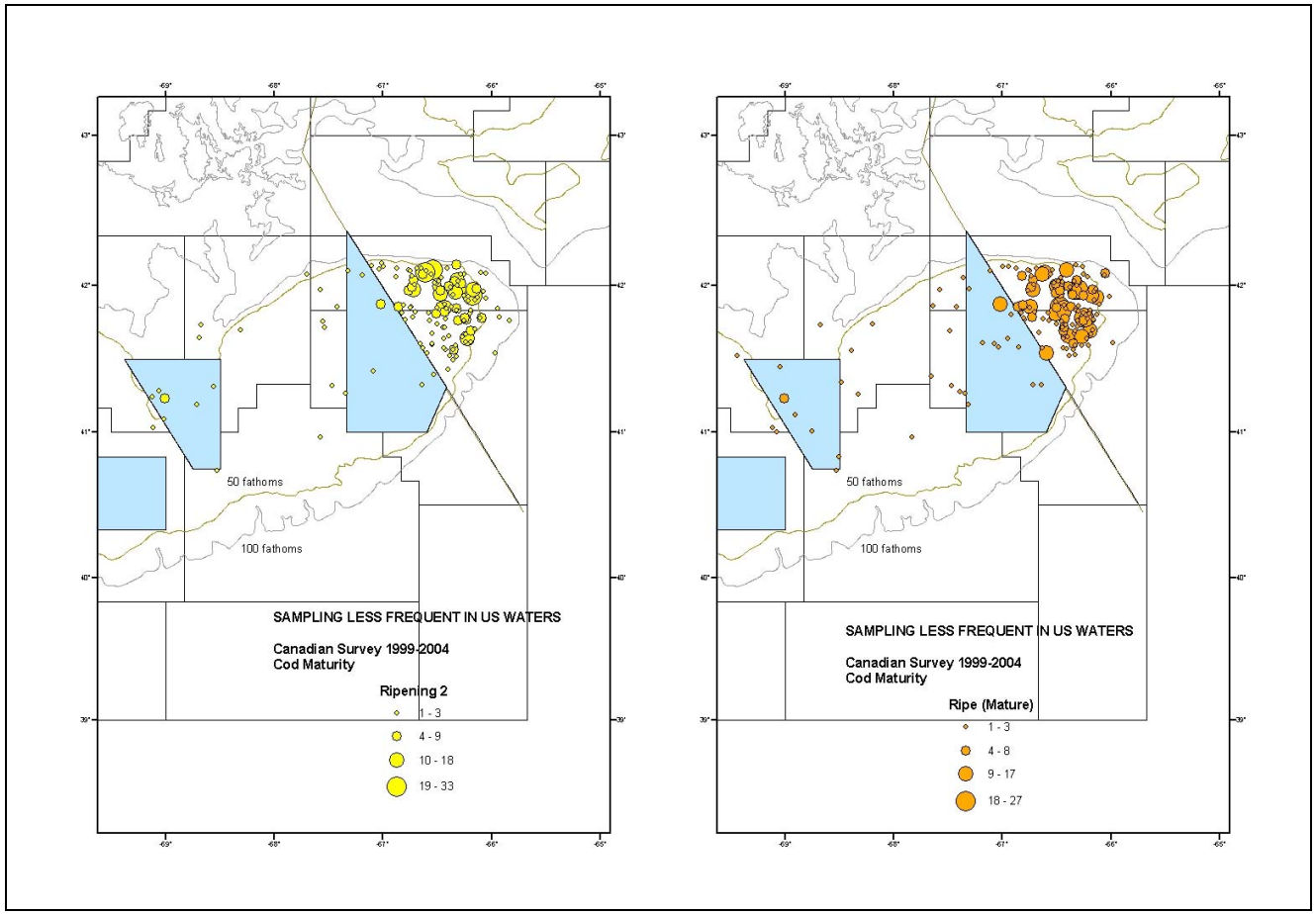


Figure 37 - Ripening and mature cod, Canadian spring trawl survey, 1999-2004

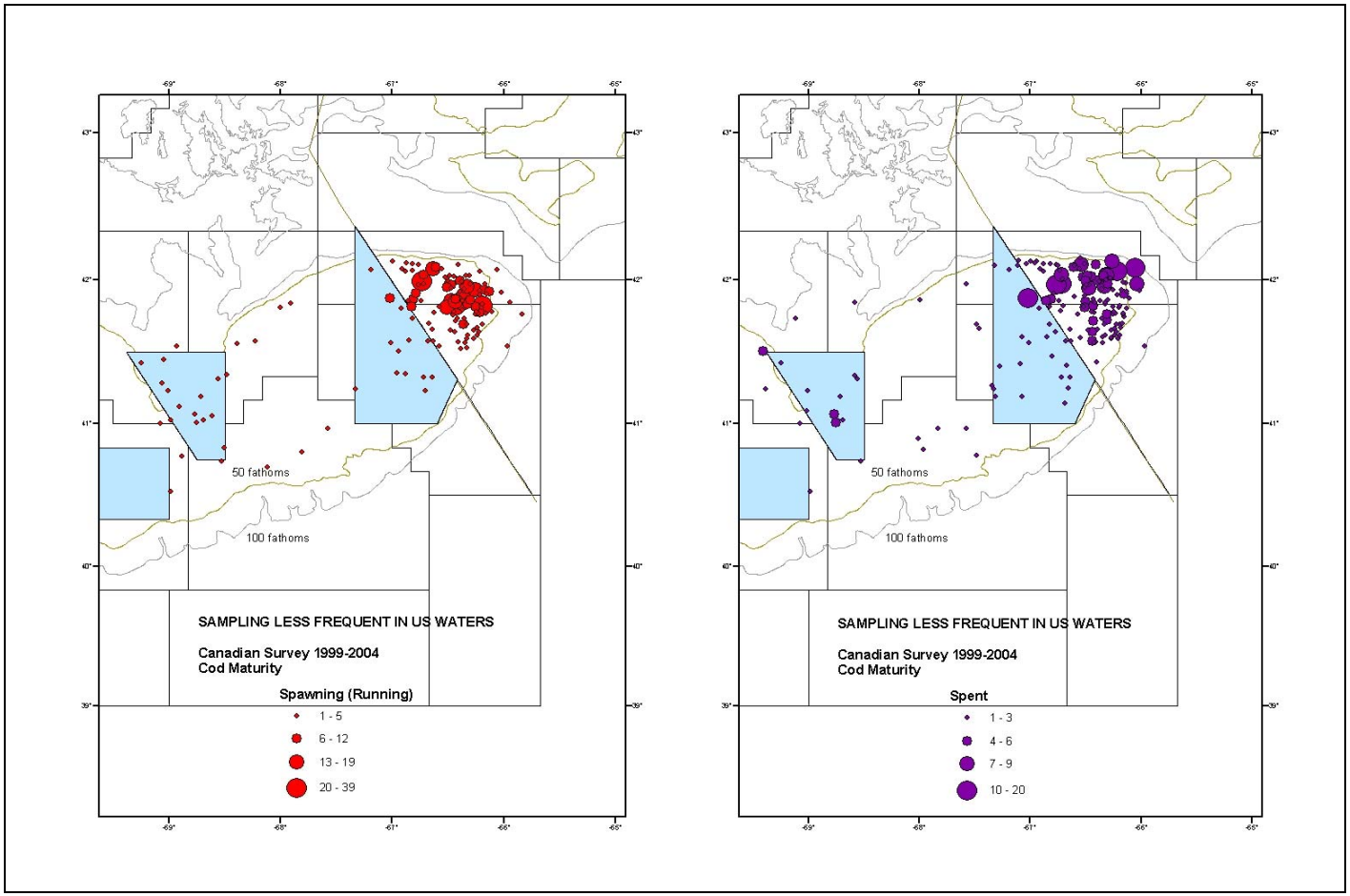


Figure 38 – Spawning and spent cod from the Canadian spring trawl survey, 1999-2004

Summary

The distribution of herring and regulated groundfish species overlap though there may be some seasonal separation due to the migratory patterns of herring and groundfish. There is evidence that regulated groundfish can be caught during herring fishing operations. The evidence is not sufficient to develop overall discard rates or to detect seasonal or spatial variation. From the data available, this is a more common occurrence in mid-water (including paired mid-water) trawls as opposed to purse seines.

If the No Action alternative is selected, there will not be any changes to the management measures that apply to herring fishing vessels. Fishing will continue to be allowed in the groundfish closed areas subject to current prohibitions on landing, possessing, or fishing for regulated groundfish, and there will not be any additional requirements adopted to monitor the bycatch of groundfish in the herring fishery. Available information indicates that herring vessels – particularly mid-water trawl (including paired mid-water trawl) vessels – would be expected to catch groundfish and may, on occasion, catch thousands of pounds of groundfish. While it is not possible to estimate an overall discard rate given the available data, the bycatch of groundfish appears to be minor and may not be substantial enough to hinder groundfish rebuilding programs.

Herring landings in the year round closed areas are a small percentage of total herring landings. If landings are accepted as a proxy for the distribution of herring effort, the small amount of herring effort in the year round closures would likely be redistributed to adjacent open areas. Impacts from this shift of effort on regulated groundfish are likely to be negligible to groundfish if bycatch rates are similar inside and outside the closed areas. It is not known if discard rates are similar inside and outside the closed areas, but shortly after establishment of CAI, CAII, and the NLCA as year round closures in 1994, Fogarty and Murawski (1998) noted that concentrations of groundfish were higher in these closed areas than outside the areas, particularly for cod and haddock. If this is still the case, the increased density of groundfish could lead to increased discard rates inside the closed areas, in which case shifting effort out of the closed areas would be expected to reduce groundfish bycatch at a given level of effort. Herring landings from CAI, CAII, and the NLCA are low, but effort could potentially increase in Herring Management Areas 2 and 3 as landings have not approached the area specific TAC.

CAI, CAII, and to a lesser extent the WGOM Closed Areas are important areas for groundfish spawning activity. The peak months for this activity are the period January through June, though the time of spawning varies for each species. There is direct evidence that bottom trawl fishing disrupts the behavior of spawning cod. This is a particular concern for GB cod, since spawning biomass in 2002 was only 12 percent of the rebuilding target. Prohibiting herring fishing in the closed areas would reduce the possibility of impacts on spawning fish in these areas. These impacts could include not only the catch and discard of spawning fish, but interference with spawning activity for those fish that are not caught by the gear.

With respect to specific options under consideration, the distribution of herring landings summarized in section 7.8.1.1.1.1 shows most herring fishing in the groundfish year round mortality closed areas is by mid-water (including paired mid-water) trawl vessels. Purse seine vessels fished a small amount in the WGOM and Cashes Ledge areas, but do not fish in CAI, CAII, or the NLCA. Purse seine vessels also have less reported incidences of groundfish bycatch. As a result, there would be little impact on groundfish mortality due to bycatch in the herring fishery by prohibiting purse seine fishing for herring as proposed by Options 2 and 3. Most of the (limited) benefits would result from prohibiting mid-water trawl fishing as in Option 1. All of these options would provide minor beneficial impacts compared to the No Action alternative.

Option 4 places requirements on the herring fishery in order to improve monitoring. If selected, this option will not have any different impacts on regulated groundfish than the No Action alternative impacts. If monitoring improves as a result of these measures the quality of information on groundfish bycatch may improve in the future.

7.8.1.2 Impacts on Other Species/Bycatch

The proposed measures are designed to reduce interactions between the herring fishery and regulated groundfish. The primary bycatch of concern is regulated groundfish. The impacts of the proposed measure on groundfish are described in the preceding section (see section 7.8.1.2). There are other species that are caught and discarded during herring fishing. The observed reports (section 7.8.1.2) identify several species that are discarded by herring vessels: herring and spiny dogfish tend to be the largest quantities (by weight). The proposed options that would restrict mid-water trawl or purse seine fishing in the groundfish mortality closed areas are unlikely to significantly affect discards of other species. While it is possible that the distribution of fish may be different inside and outside these areas, there is no data available to reliably determine whether discards would decline if herring fishing was not allowed in the closures.

7.8.1.3 Habitat Impacts

The proposed measures consider restrictions on the use of midwater trawls in groundfish mortality closed areas (and the portions of the habitat closed areas that they include) to avoid the catch of species of groundfish that are managed under the Multispecies FMP. The habitat impacts of midwater trawls in this fishery have been determined to be minimal and temporary in nature (See Section 9.3 of Amendment 13 and EFH DEIS for Herring FMP). Therefore, from a habitat perspective, the use of herring midwater trawls in the year-round groundfish mortality closed areas is not of concern.

7.8.1.4 Impacts on Endangered, Threatened, and Protected Species

Herring mid-water trawl and purse seine vessels do have records of interactions with protected species, particularly pinnipeds and small cetaceans. Removing them from areas with high concentrations of animals such as the WGOM Area may have positive benefits, assuming that interactions might occur when the species above are pursuing herring as prey items and the herring fishery is active. Observations aboard mid-water trawl vessels have documented harbor seals, white-sided dolphins and pilot whales. Interactions with purse seine vessels are more likely to occur inshore than in offshore areas. Any meaningful discussion relative to protected species interactions is hampered by lack of observer data, although it can definitively stated that the WGOM Area is a high use region for many species of marine mammals in the spring and summer seasons and removal of vessels that could be involved in interactions could provide positive benefits.

This measure considered four options. Option 1 would prohibit mid-water trawl vessels from all year round groundfish mortality closed areas, Option 2 would prohibit mid-water trawl and purse seine vessels from all year-round groundfish mortality closed areas, and Option 3 would prohibit purse seine vessels from the same areas. Option 2 would likely provide the most benefit to threatened species since it would prohibit more vessels from the areas. Options 1 and 3 would follow, in order. Option 4 – the proposed action – imposes additional reporting requirements that may improve observer coverage and eventually contribute to a better understanding of the interactions between herring vessels and endangered, threatened, or protected species.

7.8.1.5 Economic Impacts

This measure would change the conditions under which vessels that fish for herring in the year-round groundfish closures. The economic effects of this measure would accrue to any vessel fishing for herring using either purse seine or mid-water trawl (including pair trawl) in the closed areas regardless of whether or not the vessel holds a groundfish permit. As of November, 2004, there were a total of 2,209 vessels that held some type of groundfish (open access or limited access) and also held a herring permit (VMS or Non-VMS) for the 2004 permit year. The most common combination of herring and groundfish permit (1,776) was a non-vms herring/limited access groundfish permit (Table 145). Compared to all other home port states the majority of permitted vessels were from Massachusetts (868). Maine, New York and New Jersey all had between 250 and 300 permitted vessels while both Rhode Island and New Hampshire had at least 100 permitted vessels. The number of vessels permitted to land herring and groundfish was less than 100 in all remaining states.

The difference in fishing year between herring (calendar year) and groundfish (May 1 to April 30) complicates analysis of impacts changes in regulations may take effect on differing schedules. For purposes of analysis, VTR data were queried for calendar year 2003 to identify all trips that were taken inside any one of the year-round groundfish closure areas that use either purse seine or mid-water trawl gear. Calendar year 2003 was selected because all regulations for both groundfish and herring were constant throughout the year and because the majority of impacts were deemed to be likely to fall on vessels that may be predominantly engaged in the herring fishery.

Although there were more than 2,000 vessels permitted to land herring, only 138 reported having landed any herring on their VTR for all of CY2003. Of these vessels only 33 reported having used either purse seine or mid-water trawl gear to fish for herring. Further, only 14 of those vessels using either purse seine or mid-water trawl gear reported any landings in any of the groundfish year-round closure areas. Note that the VTR records are likely to underestimate the number of affected trips since only one position coordinate is recorded for each trip. For herring this may be less of an issue as compared to other fisheries since trip durations tends to be short and when herring are encountered they are highly aggregated. This means that the position location provided in the VTR may reasonably approximate the general location where fishing activity occurs. Since all but one of the affected vessels used mid-water trawl gear, impact estimates were computed only for option 2 (prohibition on both gears) since reporting is not possible for either Option 1 or Option 3 due to confidentiality concerns.

On average, the 14 affected vessels averaged $1.26 million in gross sales of which $0.96 million (76%) was herring. The average revenue derived from herring trips that would be affected by Option 2 was $52 thousand or about 4.1% of annual fishing revenue. Given the nature of the herring fishery, there may or may not be opportunities to overcome these losses as the distribution of herring varies substantially in time and space. For the same reason, realized losses could be larger than that reported here and could affect a larger number of vessels.

Option 4 would provide an opportunity to fish inside a groundfish year-round closure area. This option would mitigate the economic impacts of a prohibition on fishing but would impose some costs on trip flexibility due to the notification requirement. As noted above, herring fishing is subject to considerable variability and advance trip scheduling may be difficult. This measure would also impose administrative costs since NMFS would have to reply to each vessel request for an observer and would have to receive requests for observations of an offload. It is not clear that any benefits will accrue with the imposition of these costs. Absent additional funding for the observer program or an established desired observer coverage level, the notification process by itself will not increase observer coverage of the herring fishery. The extent to which this requirement would compromise economic efficiency is not known.

Home Port	VMS/ None	VMS/ Open	VMS/ Limited	Non-VMS/ None	Non-VMS/ Open	Non-VMS/ Limited	Row Total
ME	1	1	9	40	5	253	309
NH	0	0	4	3	5	102	114
MA	4	6	33	33	31	761	868
RI	1	0	3	6	3	120	133
CT	0	0	0	0	5	39	44
NY	0	0	3	16	14	229	262
NJ	1	2	26	28	35	154	246
DE	0	0	0	3	0	6	9
MD	0	0	0	4	0	14	18
VA	0	1	0	17	31	33	82
NC	0	1	0	19	20	39	79
Other	1	1	2	8	7	26	45
Column Total	8	12	80	177	156	1776	2209

Table 145 - Summary of Permit Year 2004 Herring/Groundfish Permit Combinations by Home Port State

7.8.1.6 Social Impacts

Herring Vessel Interactions with Regulated Groundfish (Measure J)

There are two groups of fishing communities that could be affected by the options that address herring vessel access: groundfish fishing communities and herring fishing communities. While there is some overlap between these communities, the primary herring fishing ports of Vinalhaven, MA, Lubec and Eastport ME, Prospect Harbor ME and Bath ME have not been identified as primary groundfish ports (though they re included in secondary port descriptions). The social impacts on herring communities are described in section 7.8.1.7.3.2.2. The following discussion described the likely social impacts on groundfish fishing communities.

Option 1

This option would restrict mid-water trawl vessels (both single and paired mid-water trawl vessels) from fishing for herring in these year round groundfish mortality closed areas: Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed area II. Vessels may transit these areas if gear is properly stowed. While this option may result in some lost revenue, the economic analysis identified a likely pool of affected vessels from CY 2003 data. Given gear and area closure restrictions, only 14 vessels that meet these criteria reported any landings.

Option 2

This option would prohibit the use of purse seines or mid-water trawl (both single and paired mid-water trawl vessels) from fishing for herring in these year round groundfish mortality closed areas: Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed area II. Vessels may transit these areas if gear is properly stowed.

Option 3

This option would restrict herring purse seine from fishing for herring in these year round groundfish mortality closed areas: Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed area II. Vessels may transit these areas if gear is properly stowed.

SAP Observer Requirement (Measure J)

This measure requires that vessels participating in an authorized SAP must carry an observer if requested to do so. Monitoring of the use of Category B DAS requires observer coverage. Any vessel, irrespective of size, that fishes beyond 12 miles and complies with federal regulations would qualify. The most likely to be affected by this measure are vessels less than 36' that always carry three or fewer people and stay within 12 miles from land. Such vessels are not required to carry a life raft. The SAP that fits this specification is the WGOM SAP which is less than 12 miles from land. However, these criteria fit only in limited areas e.g., Provincetown is less than 12 miles from the southern boundary and Kennebunkport is less than 12 miles in the northwestern corner. The social cost would be for vessels less than '36 that do not possess a life raft. This cost would be in addition to the potential requirement of an observer.

7.8.1.7 Impacts on Other Fisheries

For the purposes of this analysis, the Herring PDT considered the potential impacts of the following measures under consideration in Framework 40B on the herring resource and herring fishery:

Option 1 (Measure G.1): Midwater trawl vessels (including both single and paired midwater trawl vessels) are not allowed to fish for herring in the following year round groundfish mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

Option 2 (Measure G.2): Vessels are not allowed to fish for herring using purse seines or midwater trawl gear (including both single and paired midwater trawl vessels) in the following groundfish year round mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

Option 3 (Measure G.3): Herring purse seine vessels are not allowed to fish in the following groundfish year round mortality closed areas: the Western Gulf of Maine Closed Area, the Cashes Ledge Closed Area, the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. Vessels may transit these areas if all gear is properly stowed.

7.8.1.7.1 Fishing Patterns in the Atlantic Herring Fishery

7.8.1.7.1.1 Annual Fishing Patterns

The data provided in this section represent a summary of the current herring fishery and its interactions with five year-round groundfish closed areas. These data were generated from specific herring catch locations as reported on Vessel Trip Reports (VTRs). Herring are mostly caught and landed on a daily basis and the VTRs generally capture the location data for each trip accurately. While offshore trips are comprised of multiple days, fishing activity normally occurs over a concentrated time period and within the same statistical area (therefore no new VTR is required).

The tabulated data below summarize the amount of herring caught in each groundfish closed area between 2000-2003. The total catch amount is reported by gear type and month. Only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area(s) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also shown. This is clarified by using examples in the subsections below.

Cashes Ledge Closed Area (CLCA)

Table 146 summarizes herring catches that occurred in the Cashes Ledge Closed Area (CLCA) from 2000-2003, and Figure 39 illustrates herring fishing patterns in and around the CLCA, which is located within herring management Area 1B. In Table 146, the total catch amount is reported by gear type and month, and only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area (Area 1B in this case) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also provided. For example, in Table 146 below, 31% of the herring caught in Area 1B during the month of May in 2000 came from the CLCA. Similarly, 40% of all herring caught in Area 1B during the 2000 fishing year were taken in the CLCA.

Herring fishing activity in the CLCA is rather limited but represents a relatively large proportion of the Area 1B catch. Fishing activity in the CLCA occurs primarily in the summer months (May – July), although some limited activity in this area was documented during November 2000. Both purse seines and midwater trawls (single and paired) utilize the CLCA to fish for Atlantic herring, although the majority of the catch in this area comes from midwater trawls. From 2000-2003, herring landings from the CLCA averaged 15.25% of the total landings from Area 1B. However, the Area 1B catch represents a rather small percentage of the total herring catch in a given year (about 10% of total herring landings if the Area 1B TAC is fully utilized in a given fishing year). Therefore, relative to the herring fishery as a whole, the CLCA does not appear to be an important fishing area for herring, but this area makes a considerable contribution to the herring fishery occurring in Area 1B. Figure 39 confirms that, according to VTRs, there is little fishing activity for herring occurring in the CLCA.

2000					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
5			36	36	31
7	54			54	9
11	1903	710		2612	47
Grand Total	1956	710	36	2702	40
AREA 1B TOTAL					**6715**
2001					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
5		61		61	14
Grand Total	0	61	0	61	0
AREA 1B TOTAL					**16866**
2002					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
5	122	691	162	976	92
7	267	116	241	624	89
Grand Total	390	807	404	1600	21
AREA 1B TOTAL					**7614**
2003					
NOTHING REPORTED IN CLOSED AREA					
AREA 1B TOTAL					**5267**

Table 146 - Herring Catches (mt) from the Cashes Ledge Groundfish Closure by Year, Month and Gear

Note: OTM = midwater trawl; PTM = paired midwater trawl; PUR = purse seine

Western Gulf of Maine Closed Area (WGOM)

Table 147 summarizes herring catches that occurred in the Western Gulf of Maine Closed Area (WGOM) from 2000-2003, and Figure 39 illustrates herring fishing patterns in and around the WGOM, which is located primarily within herring management Area 1A. In Table 147, the total catch amount is reported by gear type and month, and only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area (Area 1A in this case) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also provided. For example, in Table 147 below, 34% of the herring caught in Area 1A during the month of May in 2000 came from the WGOM. Similarly, 10% of all herring caught in Area 1A during the 2000 fishing year were taken in the WGOM.

Because of the location of the area within Area 1A, fishing activity for Atlantic herring in the WGOM is more substantial than in any other year-round groundfish closed area. In addition, fishing activity in this area occurs throughout most of the year with the exception of the months of January and February. Midwater trawls (single and paired) have taken the majority of herring from the WGOM since 2000, and very little purse seine activity has been documented in this area. From 2000-2003, herring landings from the WGOM averaged 9.25% of the total landings from Area 1A. Historically, Area 1A has been viewed as the most significant fishing area for Atlantic herring, as the TAC in this area is fully utilized every year and represents about 50-65% of the total herring catch. Consequently, the WGOM is an important area for herring fishing since almost 10% of the Area 1A TAC is being taken, on average, from this area. The fishing patterns illustrated in Figure 39 indicate that the vast majority of herring fishing in the WGOM occurs in the northern half of the area around Jeffrey's Ledge.

2000					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
3	75			75	100
5	1551	962		2512	34
6	167			167	2
8	1307	363	326	1996	16
10	229	407		636	7
11		301		301	42
Grand Total	3329	2033	326	5687	10
AREA 1A TOTAL					**59412**

Table 147 - Herring Catches (mt) from the Western Gulf of Maine Groundfish Closure by Year, Month and Gear

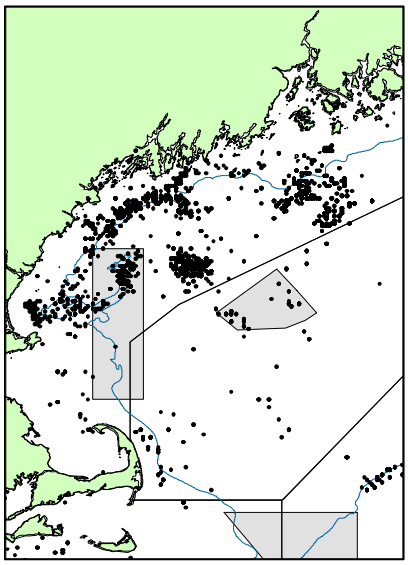
2001					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
3	13	17		30	2
4	420			420	15
5	1375	1682	113	3170	51
6	238			238	3
7	26	814		840	11
8		1747		1747	24
9		176		176	3
10			68	68	1
12	57			57	42
Grand Total	2130	4435	181	6747	13
AREA 1A TOTAL					**52660**
2002					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
4	64		183	247	8
6	2359	1468		3827	39
7		196		196	2
8		420		420	6
9	61			61	1
10	24			24	0
11		366		366	4
Grand Total	2508	2449	183	5140	9
AREA 1A TOTAL					**59723**
2003					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
5	721	1540		2261	54
6	147	77		225	2
10			82	82	1
11		256	151	406	6
Grand Total	869	1873	232	2974	5
AREA 1A TOTAL					**59401**

Table 147 continued (WGOM)

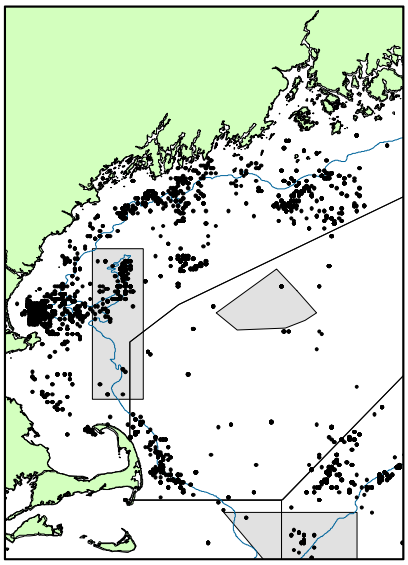
Note: OTM = midwater trawl; PTM = paired midwater trawl; PUR = purse seine

Figure 39 - Annual Herring Fishing Patterns Inside and Outside of the Western Gulf of Maine and Cashes Ledge Groundfish Closed Areas, 2000 - 2003

2000

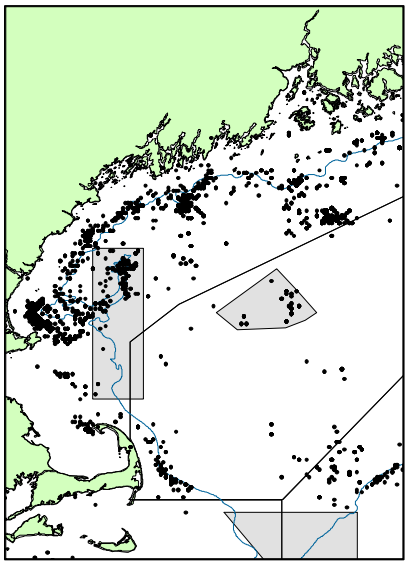


2001

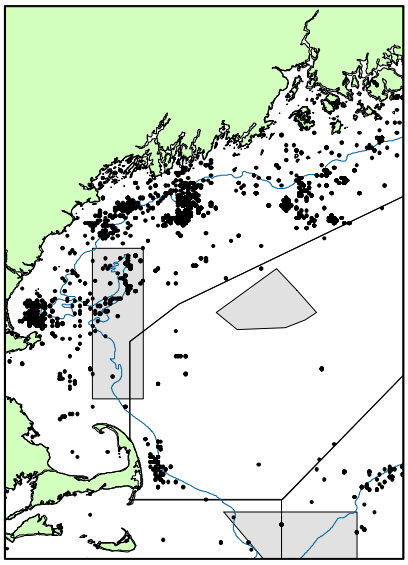


The dots represent where a herring catch was made for a given trip based on the VTR data.

2002



2003



Closed Area 1 (CAI)

Table 148 summarizes herring catches that occurred in Closed Area 1 (CAI) from 2000-2003, and Figure 40 – Figure 43 illustrate herring fishing patterns in and around CAI, which is located primarily within herring management Area 3 (as well as a small portion in Area 2). In Table 148, the total catch amount is reported by gear type and month, and only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area (Area 3 in this case) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also provided. For example, in Table 148 below, 7% of the herring caught in Area 3 during the month of September in 2000 came from CAI. Similarly, 4% of all herring caught in Area 3 during the 2000 fishing year were taken in CAI.

Fishing activity for Atlantic herring in CAI appears to be limited and occurs during the later months of the fishing year (September – December). While this closed area overlaps with herring management Areas 2 and 3, Figure 40 – Figure 43 show that there is almost no fishing activity for herring in the western portion of CAI, which overlaps with herring Area 2. Almost all fishing activity that has been documented in CAI occurs in the portion of the closed area that is located in herring Area 3. Paired midwater trawl vessels dominate the small amount of fishing activity for herring in CAI, and no purse seine activity has been documented in this area since 2000. From 2000-2003, herring landings from CAI averaged 1.25% of the total landings from Area 3.

2000					
NOTHING REPORTED IN CLOSED AREA					
AREA 3 TOTAL					**12699**
2001					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
9		962		962	7
10		450		450	6
12	53			53	100
Grand Total	53	1413	0	1466	4
AREA 3 TOTAL					**38659**
2002					
NOTHING REPORTED IN CLOSED AREA					
AREA 3 TOTAL					**14088**

Table 148 - Herring Catches (mt) from Closed Area 1 by Year, Month and Gear

2003					
MONTH	OTM	PTM	PUR	Grand Total	PERCENT
9		252		252	15
Grand Total	0	252	0	252	1
AREA 3 TOTAL					21759

Table 148 continued (CAI)

Note: OTM = midwater trawl; PTM = paired midwater trawl; PUR = purse seine

Closed Area 2 (CAII)

Table 149 summarizes herring catches that occurred in Closed Area 2 (CAII) from 2000-2003, and Figure 40 – Figure 43 illustrate herring fishing patterns in and around CAII, which is located within herring management Area 3. In Table 149, the total catch amount is reported by gear type and month, and only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area (Area 3 in this case) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also provided. For example, in Table 149 below, 2% of the herring caught in Area 3 during the month of September in 2000 came from CAII. Similarly, 1% of all herring caught in Area 3 during the 2000 fishing year were taken in CAII.

Fishing for herring in CAII has been documented only from July – October in recent years and represents a small proportion of the total catch of Atlantic herring as well as the herring catch occurring in all of Area 3. From 2000-2003, herring landings from CAII averaged 5.75% of the total landings from Area 3. No purse seine activity was documented in CAII during this time period. Figure 40 – Figure 43 show that fishing activity for herring that occurs in CAII is concentrated in the northern half of the area, along the northern edge of Georges Bank. No fishing for herring has occurred in the southern half of CAII since 2000.

2000					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
9		119		119	2
Grand Total	0	119	0	119	1
AREA 3 TOTAL					**12699**
2001					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
7	678	393		1071	12
8	931	236		1167	15
9		500		500	4
10	369	401		770	10
Grand Total	1978	1531	0	3508	9
AREA 3 TOTAL					**38659**

2002					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
7	614			614	18
8		20		20	1
9		418		418	11
10		154		154	6
Grand Total	614	593	0	1207	9
AREA 3 TOTAL					**14088**
2003					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
7		455		455	4
8	265			265	8
10		139		139	4
Grand Total	265	594	0	859	4
AREA 3 TOTAL					**21759**

Table 149 - Herring Catches (mt) from Closed Area 2 by Year, Month and Gear

Note: OTM = midwater trawl; PTM = paired midwater trawl; PUR = purse seine

Nantucket Lightship Closed Area (NLSCA)

Table 150 summarizes herring catches that occurred in the Nantucket Lightship Closed Area (NLSCA) from 2000-2003, and Figure 40 – Figure 43 illustrate herring fishing patterns in and around the NLSCA, which is located within herring management Area 2. In Table 150, the total catch amount is reported by gear type and month, and only months with positive catch reports of herring are represented. The "PERCENT" column indicates, on a monthly basis, how much of the total catch within the related herring management area (Area 2 in this case) came from the groundfish closed area. The annual percentage of landings from the groundfish closed area within the related herring management area is also provided. For example, in Table 150 below, 3% of the herring caught in Area 2 during the month of January in 2001 came from the NLSCA. Similarly, 2% of all herring caught in Area 2 during the 2001 fishing year were taken in the NLSCA.

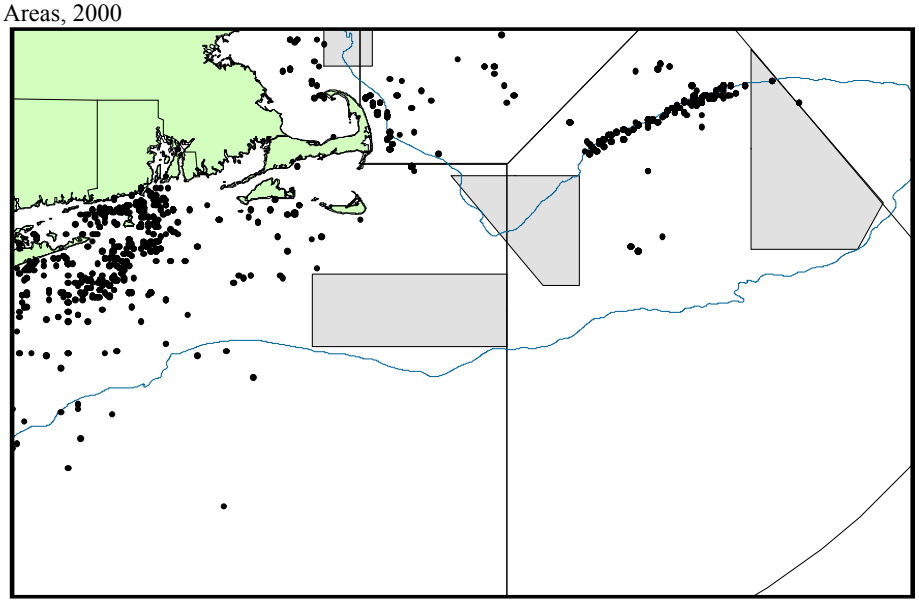
Fishing activity for Atlantic herring in the NLSCA occurs during the winter months (November–January), consistent with the Area 2 winter fishery. Overall, there has been very little fishing activity for herring occurring in this area since 2000, and no purse seine activity has been documented in the area during this time period. From 2000-2003, herring landings from the NLSCA averaged 1.25% of the total landings from Area 2. Figure 40 – Figure 43 show that the vast majority of the Area 2 fishery for herring occurs west of the NLSCA, around Long Island and Block Island.

2000					
NOTHING REPORTED IN CLOSED AREA					
AREA 2 TOTAL					**26683**
2001					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
1	263			263	3
11		63		63	8
Grand Total	263	63	0	327	2
AREA 2 TOTAL					**15793**
2002					
NOTHING REPORTED IN CLOSED AREA					
AREA 2 TOTAL					**11266**
2003					
MONTH	**OTM**	**PTM**	**PUR**	**Grand Total**	**PERCENT**
12		494		494	10
Grand Total	0	494	0	494	3
AREA 2 TOTAL					**16465**

Table 150 - Herring Catches (mt) from the Nantucket Lightship Closed Area by Year, Month and Gear

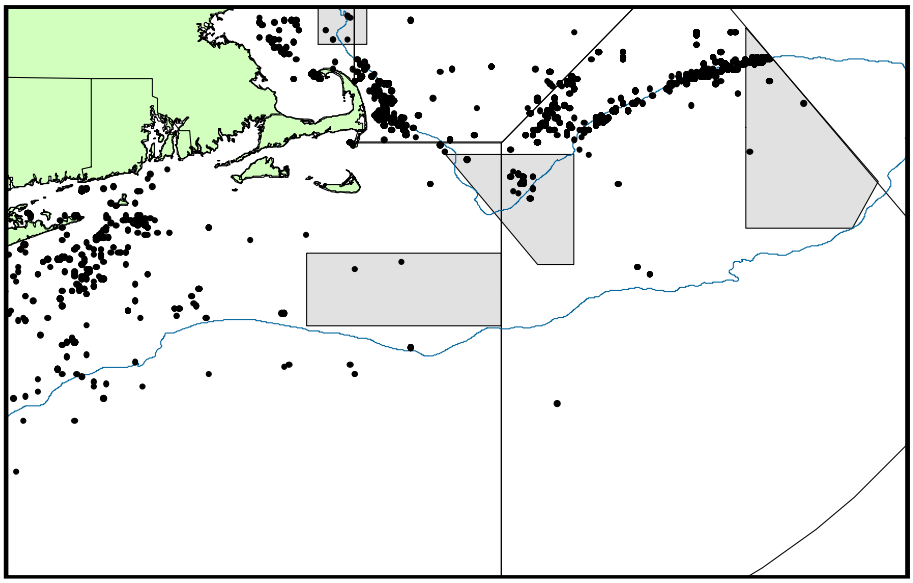
Note: OTM = midwater trawl; PTM = paired midwater trawl; PUR = purse seine

Figure 40 - Annual Herring Fishing Patterns Inside and Outside of the Georges Bank Groundfish Closed Areas, 2000



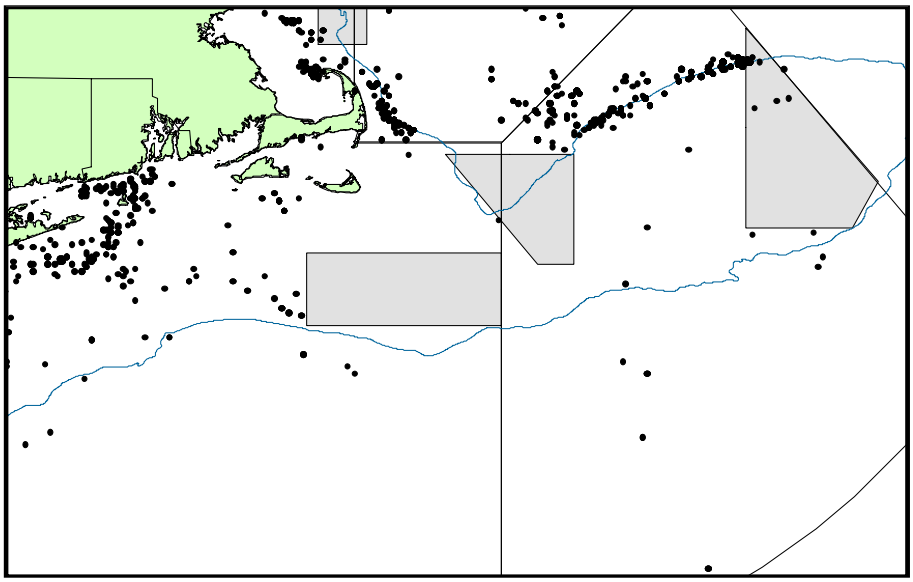
The dots represent where a herring catch was made for a given trip based on the VTR data.

Figure 41 - Annual Herring Fishing Patterns Inside and Outside of the Georges Bank Groundfish Closed Areas, 2001



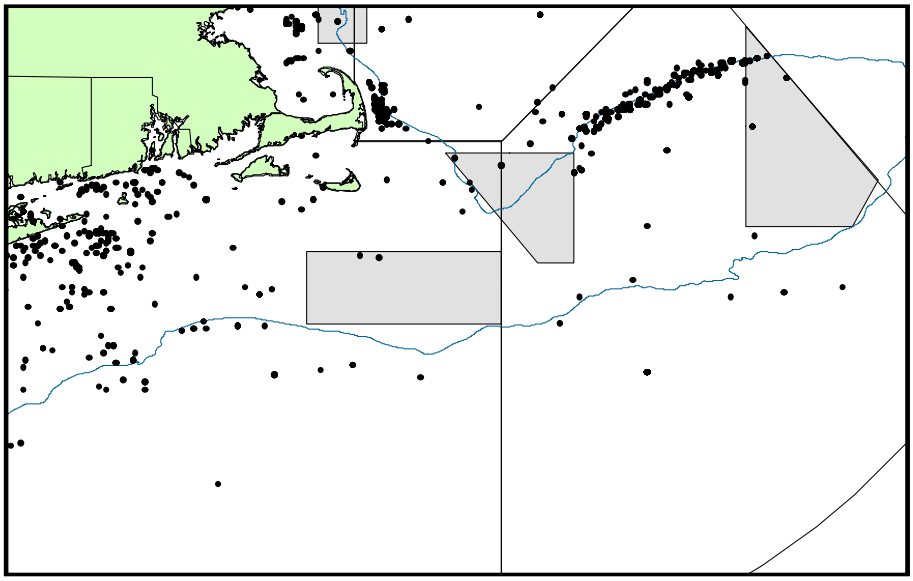
The dots represent where a herring catch was made for a given trip based on the VTR data.

Figure 42 - Annual Herring Fishing Patterns Inside and Outside of the Georges Bank Groundfish Closed Areas, 2002



The dots represent where a herring catch was made for a given trip based on the VTR data.

Figure 43 - Annual Herring Fishing Patterns Inside and Outside of the Georges Bank Groundfish Closed Areas, 2003



The dots represent where a herring catch was made for a given trip based on the VTR data.

7.8.1.7.1.1.1 Seasonal Fishing Patterns

Figure 44 – Figure 47 illustrate herring fishing patterns in and around the year-round groundfish closed areas by season for the 2000 – 2003 fishing years. Seasonal fishing patterns are important to consider in the herring fishery, as herring is a migratory species and is not distributed widely in all management areas during all times of the year. When evaluating the impacts of a prohibition on fishing for herring in the year-round groundfish closed areas, it is important to consider where fish may occur and where vessels may fish for herring if they cannot access the groundfish closed areas. This varies seasonally with the distribution of the fish; for example, the herring fishery in Area 2 is predominantly a winter fishery (December – April), and while fishing for herring in Area 1A generally occurs throughout the year, the peak season in Area 1A is during the summer and fall. For the purposes of illustration, fishing patterns are shown in Figure 44 – Figure 47 for the following "seasons:"

- January – April
- May – August
- September – December.

Figure 44 – Figure 47 indicate that most fishing for herring during the early part of the fishing year (January – April) occurs in Area 2 west of the NLSCA, primarily around Block Island and Long Island. Some limited fishing occurs in the inshore Gulf of Maine, primarily west (inshore) of the WGOM closed area. During the middle of the fishing year (May – August), the fishery moves northwards, consistent with migration patterns for the herring resource. The summer fishery is active throughout Area 1A and along the northern flank of Georges Bank. The Area 1A fishery is concentrated inshore; if vessels are not fishing for herring in the WGOM closure during this time of year in Area 1A, then they are fishing primarily along the Maine coast (outside of ME State waters but west of the WGOM closure). There is very little fishing for herring occurring in Area 2 during the middle part of the fishing year. During the later part of the fishing year (September – December), fishing activity for herring occurs throughout the region in all management areas. The Area 2 winter fishery begins during the later months, and fishing effort appears to be relatively dispersed throughout Area 1A.

Figure 44 - Atlantic Herring Catches by Season, 2000

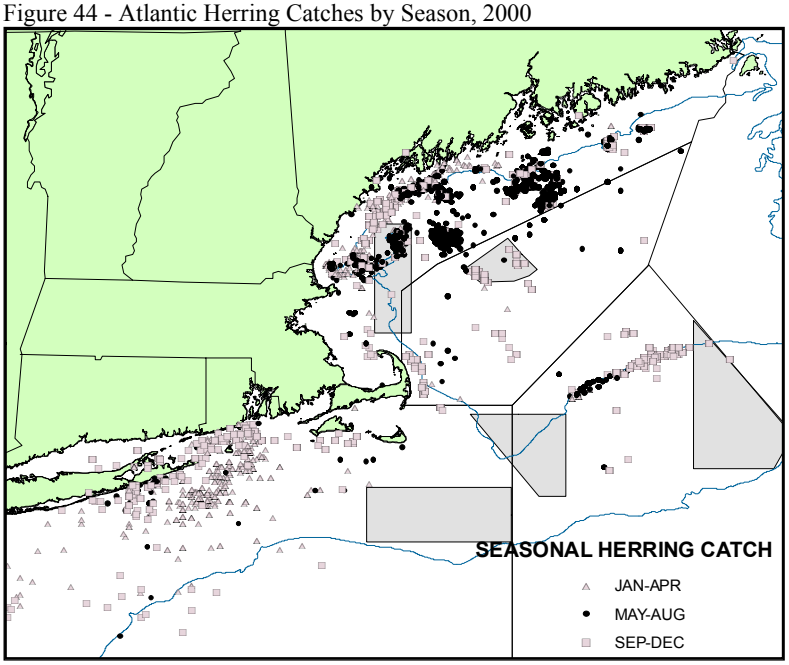


Figure 45 Atlantic Herring Catches by Season, 2001

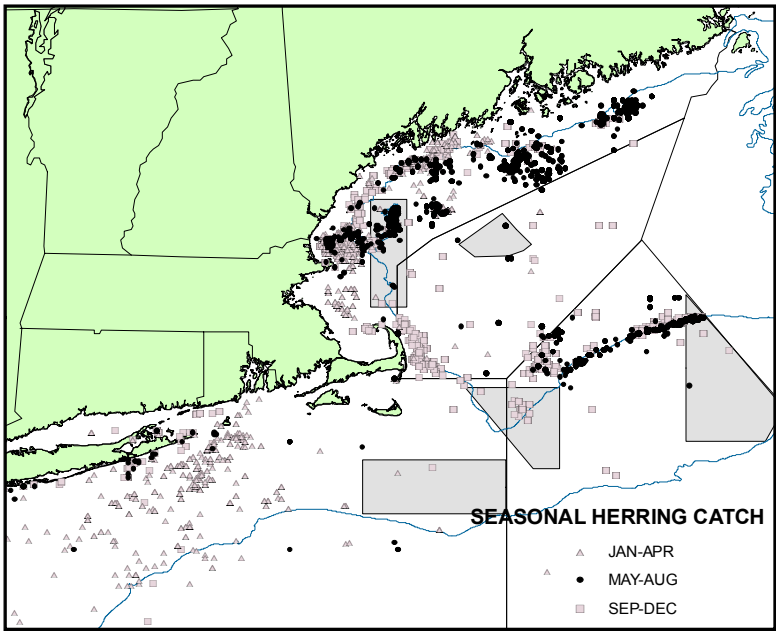


Figure 46 Atlantic Herring Catches by Season, 2002

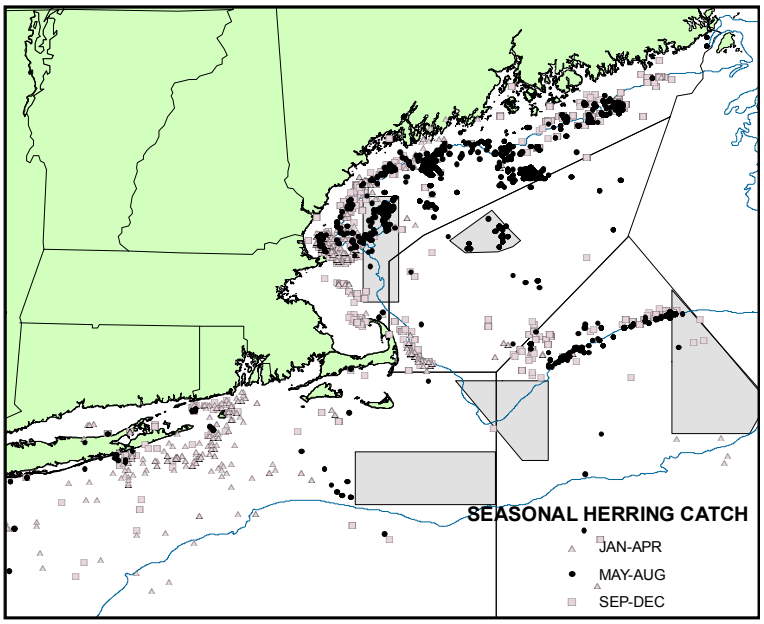
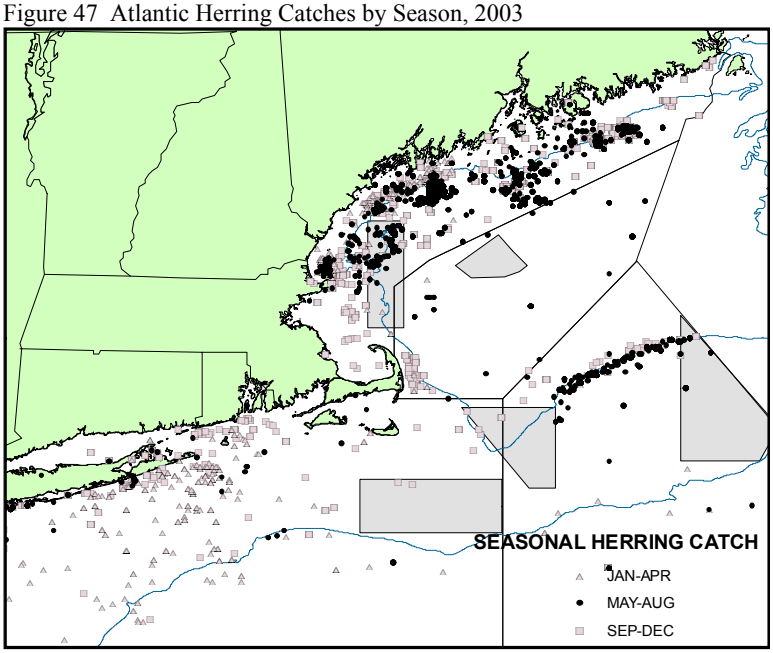


Figure 47 Atlantic Herring Catches by Season, 2003



7.8.1.7.2 Summary of Available Enforcement-Related information

Table 151 summarizes information obtained from enforcement personnel (State and Federal) relative to dockside monitoring of herring landings during July – November 2004. A total of twenty landing events were observed and documented by enforcement agents during this time period. Two

bycatch events involving haddock on herring midwater trawl vessels were documented on August 10, 2004 (Rows 2 and 3 in Table 151), which led the Council to consider the action proposed in Framework 40B. The entire offload from these two trips was not monitored, however, and bycatch percentages were estimated from sampling the offload; as a result, absolute amounts of groundfish bycatch cannot be provided for these two trips.

With the exception of the two bycatch events documented on August 10, 2004, herring offloads that were monitored in their entirety by enforcement personnel displayed very low levels of regulated multispecies (large-mesh groundfish) bycatch. The 18 herring offloads (not including the two bycatch events on 8/10/04) produced a total of 8,036,000 pounds of herring (3,646 mt, or about 3.5% of total annual herring landings) and 22,000 pounds of various species referred to in the table as "groundfish" bycatch. It is important to note that dogfish and whiting represented a substantial proportion of the documented "groundfish" bycatch (for example, the comments in Table 151 indicate that dogfish comprised all of the bycatch on three offloads that documented 16,473 pounds of bycatch). For these 18 offloads, total bycatch amounted to an average of 0.27% of the total catch of herring that was landed. It appears that regulated multispecies (large-mesh groundfish) bycatch averaged about 0.05% of the total catch from the trips documented in Table 151.

Date	Location	Herring (lbs)	Groundfish (lbs)	Groundfish (%)	Comments
7/16/04	Gloucester, MA	600,000	2,422	0.40	NOAA/MEP/USCG monitor of offload; haddock (2,422 lbs) abandoned and disposed of.
8/10/04	Rockland, ME	290,000	***	4.5***	*** MMP officers conducted a random sampling of the catch using a methodology of sampling 10 fish totes (approx 1200 lbs); sample indicated 4.5% haddock within the sampled portion of the herring delivery.
8/10/04	Portland, ME	900,000	***	2.0***	*** NOAA and MMP officers conducted a random sampling of the catch using a methodology of sampling 10 fish totes (approx 1200 lbs); sample indicated 2.0% haddock within the sampled portion of the herring delivery. Haddock from sample abandoned and disposed of.
8/11/04	Newington, NH	600,000	133	0.02	NHF&G/NOAA monitor of entire offload; total of 153 haddock found (133 lbs); haddock abandoned and disposed of.
8/12/04	Gloucester, MA	600,000	744	0.12	NOAA/MEP monitor of entire offload; haddock (744 lbs) abandoned and disposed of.
8/16/04	Gloucester, MA	205,000	1,343	0.655	NOAA and USCG monitored offload; bycatch was mostly dogfish with assorted groundfish, which was abandoned.

Table 151 - Summary of Herring Landings Monitored by Enforcement Personnel, July – November 2004

Date	Location	Herring (lbs)	Groundfish (lbs)	Groundfish (%)	Comments
8/18/04	Newington, NH	300,000	203	.068	NOAA monitored / inspected / investigated a complaint of illegal codfish being offloaded by this fishing vessel. The offload consisted of 300,000 lbs of herring. The following is a count of fish other than herring: dogfish - 45, redfish - 15, flats - 8, haddock - 2, greysole- 3, whiting - 6, hake -2. A total of 203 lbs of other species prohibited to possess or land.
8/25/04	Gloucester, MA	1,100,000 (combined)	6 haddock	0.00	MEP monitored the offloads of both vessels; combined landing was 1.1 million lbs of herring with 6 individual haddock mixed in the load
8/30/04	Portland, ME	448,000	0	0.00	MMP detected no groundfish bycatch in this delivery.
8/30/04	Portland, ME	380,000	0	0.00	MMP detected no groundfish bycatch in this delivery.
8/31/04	Gloucester, MA	80,000	0	0.00	MEP monitored offload and no groundfish were found mixed in with the catch.
8/31/04	Newington, NH	600,000	866.5	0.14	NHF&G conducted a complete monitor of this landing and hand culled all groundfish observed from the delivery.
9/13/04	Newington, NH	45,000	6 dogfish	0.00	NHF&G conducted a monitor of this landing and found 6 individual dogfish in the delivery.
9/27/04	Newington, NH	200,000	10 haddock	0.00	NHF&G conducted a monitor of this landing and found 10 individual haddock in the delivery.

Table 151 continued

Date	Location	Herring (lbs)	Groundfish (lbs)	Groundfish (%)	Comments
11/3/04	Newington, NH	40,000	20	0.05	NHF&G conducted a monitor of this landing and found 20 lbs. of haddock in the delivery.
11/13/04	Gloucester, MA	882,000	3675	.42%	Discovered in cooler by NOAA SA during inspection of facility on 11/16/04. All bycatch was dogfish.
11/15/04	Gloucester, MA	580,000	5714	.99%	Discovered in cooler by NOAA SA during inspection of facility on 11/16/04. All bycatch was dogfish.
11/16/04	Gloucester, MA	396,000	7084	1.79%	NOAA SA and MEP monitored offload; all bycatch was dogfish.
11/17/04	Gloucester, MA	380,000	0	0.0%	NOAA SA, MEP, and USCG monitored offload. Captain stated he culled 4,000 individual dogfish at sea. FV had observers onboard to witness.
11/18/04	Gloucester, MA	600,000 (combined)	4 dogfish, 1 hake	0.0	NOAA SA, MEP, and USCG monitored offload. 20 tote samples were taken from offload. ***160 individual dogfish were observed being pumped into trucks, but were not in the 20 tote samples. Also both captains stated they culled 2,000 pounds each of dogfish at sea.

Table 151 continued

7.8.1.7.3 Discussion of Impacts

In general, while there are likely to be impacts on the herring fishery from the proposed action (see Section 7.8.1.7.3.2), it is unlikely that a prohibition on fishing for herring in the year-round groundfish closed areas will preclude the utilization of the herring TACs and/or prevent the Area 1A TAC from being fully utilized. A prohibition on fishing in the WGOM Closed Area is likely to produce the most substantial impacts on the fishery; however, an average of 9.25% of the Area 1A catch has come from the WGOM Closed Area from 2000-2003, and market demands (particularly for lobster bait) will likely continue to result in a fully-utilized TAC in Area 1A. The potential impacts on the herring resource and fishery are discussed in more detail in the following subsections.

7.8.1.7.3.1 Biological Impacts – Herring Resource

Relative to fishing for Atlantic herring, the year-round groundfish closed areas can be categorized into three groups: (1) areas with relatively low herring catches; (2) areas with relatively high herring catches; and (3) areas with herring catches that have been variable by year and season. Examination of catch distribution within the groundfish closed areas suggests that Closed Area 1 & the Nantucket Lightship Closed Area have little directed herring fishing effort within them. The Cashes Ledge Closed Area and Closed Area 2 have experienced periods of high fishing effort within them during some recent years.

Overall, the most important, highest, and most consistent catches within the proposed closed areas can be found in the Western Gulf of Maine Closed Area (WGOM), primarily in the vicinity of Jeffrey's Ledge (Figure 44 – Figure 47). Herring catches in Closed Area 1, Closed Area 2, and the Nantucket Lightship Closed Area are predominantly from paired and single midwater trawl vessels, while the WGOM and Cashes Ledge Closed Area document catches by all major herring gear types including purse seines in recent years (Table 146, Table 147).

7.8.1.7.3.1.1 Impacts on Spawning

Figure 49 provides a generalized view of the current major spawning areas for Atlantic herring, as reported in the most recent stock assessment for herring (TRAC 2003). In addition, offshore hydroacoustic surveys of Atlantic herring have been conducted by the National Marine Fisheries Service (NMFS) since 1999 during times when the offshore component of the resource is thought to congregate for spawning. As shown in Figure 49 and measured by the NMFS Hydroacoustic Survey of the offshore component of the herring resource (Figure 50), Closed Area 1, the Nantucket Lightship Closed Area, and the Cashes Ledge Closed Area do not contain significant portions of herring spawning relative to total spawning activity. Both Closed Area 2 and the WGOM Closed Area are associated with traditional spawning activity; however, Closed Area 2 includes only small amounts of spawning when compared to the entire aerial extent of the offshore spawning component. The WGOM Closed Area has traditionally been an area associated with a high amount of spawning activity for the inshore component of the resource. Potential impacts of the proposed action on both of these areas are discussed generally below.

Given the relatively low level of spawning activity in three out of the five areas proposed for closure, impacts of the proposed action (positive and/or negative) on Atlantic herring spawning activity are likely to be minimal in these areas. In addition, the WGOM Closed Area is currently protected by ASMFC spawning restrictions. The spawning area restrictions in ASMFC's Amendment 1 to the Interstate FMP for Atlantic Herring balances the need to protect Atlantic herring during spawning events

with providing a controlled opportunity to harvest herring at their most valuable stage (higher fat content during spawning).

ASMFC Amendment 1 delineates the areas with spawning restrictions and describes criteria for determining the start and duration of the closure period (Figure 48). The restrictions allow vessels to fish, take, land, or possess spawn herring from a restricted spawning area as long as the spawn herring comprise less than 20% by number of the amount of herring on board. The ASMFC amendment defines spawn herring as mature sea herring in ICNAF gonadal stages V and VI. In addition to the 20% spawning tolerance, non-directed fisheries may land 2,000 pounds of spawn herring as bycatch and will not be accountable for the 20% tolerance provision. The spawning restrictions limit the removal and targeting of spawning fish from the MA/NH spawning area, which also encompasses the WGOM Closed Area (Figure 48). The regular spawning closure period extends for four weeks (Table 152). If catch sampling after the end of the initial restricted period determines that 25% or more mature herring, by number, have yet to spawn, then the spawning restrictions would resume for an additional two weeks.

As part of the Atlantic Coastal Cooperative Statistics Program (ACCSP), ME DMR staff samples commercial catches of Atlantic herring on a regular basis. Table 153 provides a summary of how many commercial samples have been collected by ME DMR since 2000. All samples are taken from fish caught in Area 1A during August – October of each year, which overlaps with the various spawning closures in Area 1A (Table 152). Of the more than 250 commercial samples that have been collected since 2000, only 12 have contained more than 20% spawning females. Information is not available at this time to determine whether or not those 12 samples were taken from fish caught within a spawning closure time/area. Overall, though, the percentage of catches that have exceeded the spawning tolerances since 2000 appears to be low.

YEAR	SPAWNING AREA					
	Eastern ME		Western ME		MA/NH	
	Start	End	Start	End	Start	End
2000	15-Aug	11-Sept	1-Sept	21-Sept	21-Sept	18-Oct
2001	26-Aug	23-Sept	2-Sept	30-Sept	21-Sept	18-Oct
2002	15-Aug	12-Sept	13-Sept	11-Oct	4-Oct	1-Nov
2003	1-Sept	29-Sept	1-Sept	29-Sept	21-Sept	19-Oct
Default Date	**15-Aug**	**13-Sept**	**1-Sept**	**30-Sept**	**21-Sept**	**19-Oct**

Table 152 - Historical and Default Dates for ASMFC Spawning Area Closures (see Figure 48 for spawning areas)

Year	# Samples > 20%	Total samples
2000	3	76
2001	0	49
2002	8	70
2003	1	62

Table 153 - Number of Samples Containing > 20% Spawning Females (ICNAF stages 5&6)

Note total samples are the numbers of samples taken from Area 1A August - October of each year.

In addition to commercial catch sampling for ACCSP, landings of herring are inspected by Maine Marine Patrol to better ensure compliance with the ASMFC spawning provisions. Thirty-six inspections of Atlantic herring vessels were made in Maine ports between May and November of 2003. The inspections were conducted both at-sea and in port while vessels were offloading. Maine Marine Patrol officers noted the date and location of the catch along with the total amount caught, bycatch observed, and spawning condition of the herring. Seven of the inspections were conducted on vessels that were fishing in spawning closed areas under the tolerance provision. None of the inspected vessels exceeded the tolerance provision of >20% stage 5 and 6 herring.

According to Table 152, the spawning closure areas located throughout the inshore Gulf of Maine are effective at various times from August – October. In recent years, fishing activity in the WGOM Closed Area during the months of spawning closures has decreased to low levels, suggesting that the impacts on spawning from removing this activity may be comparably small. From 2000-2003, fishing activity in the WGOM Closed Area from August – October averaged 22.1% of total herring fishing activity in the WGOM Closed Area, which averaged 9.25% of the total landings from Area 1A during this time period. In 2003, only 2.8% of the herring fishing activity in the WGOM Closed Area occurred from August – October. Overall, current herring effort in this area is relatively low during the time when spawning closures are effective. Note that any fishing activity in the WGOM Closed Area during this time period is subject to the ASMFC spawning restrictions.

Regardless of whether or not vessels are fishing for herring in the WGOM Closed Area, they are subject to restrictions to protect spawning herring in the MA/NH Closure Area and other spawning areas in the inshore Gulf of Maine when effective. If vessels shift effort out of the WGOM Closed Area and move inshore, they would still be subject to spawning restrictions. If vessels shift effort out of the WGOM Closed Area and move offshore, there may be positive impacts on spawning herring in the inshore Gulf of Maine, but these impacts are difficult to predict and would likely be minimal based on available information.

Figure 50 suggests that the northern portion of Closed Area 2 includes spawning grounds for the offshore component of the herring resource. However, a greater proportion of spawning appears to occur outside of Closed Area 2, along the northern flank of Georges Bank and into the Great South Channel. Information from the most recent stock assessment for Atlantic herring (TRAC 2003) indicates that herring spawning locations on Georges Bank (including Nantucket Shoals) have been variable over time, contracting and protracting around Nantucket Shoals. Major grounds include the Northeast Peak of GB, Cultivator Shoals, and the Nantucket Shoals (Melvin et al. 1997, Reid et al. 1999). Currently, spawning

appears to be continuous from Massachusetts Bay into Great South Channel and along the northern fringe of Georges Bank to the Northeast Peak.

Given the recent low levels of fishing effort for herring in Closed Area 2, the impacts of a prohibition on fishing for herring in Closed Area 2 is likely to have negligible impacts on spawning herring from the offshore component of the resource. Recently (2000-2003), fishing for herring in Closed Area 2 has been documented only from July – October and represents a small proportion of the total catch of herring as well as the catch occurring in all of Area 3 (Georges Bank). From 2000-2003, herring landings from Closed Area 2 averaged 5.75% of the total landings from Area 3. Moreover, all of the documented fishing activity in Closed Area 2 from 2000-2003 occurred during the months of July, August, September, and October. Herring spawning activity is known to occur in the summer and fall, starting earlier along the eastern Maine coast and southwest Nova Scotia (August – September) than in the southwestern Gulf of Maine (early to mid-October in the Jeffreys Ledge area) and as late as November – December on Georges Bank (Reid et al. 1999). It is therefore possible that fishing activity in Closed Area 2 does not overlap with peak times of offshore spawning activity.

Additionally, fishing with midwater trawls, the gear predominantly used in the herring fishery, does not impact essential fish habitat (EFH) in a manner that is more than minimal and less than temporary in nature. For more information, Section 5.0 of the Draft EIS for Minimizing Impacts of the Atlantic Herring Fishery on EFH, which includes the most recent gear effects evaluation and adverse impacts determination, can be referenced.

Overall, removing herring fishing effort from the year-round groundfish closed areas is expected to result in minimal impacts with respect to herring spawning. The nature of these impacts cannot be predicted with any accuracy because it depends on the location and availability of herring outside of the closed areas, which will influence when and where vessels may shift fishing effort. It is assumed that the current spawning restrictions implemented through the ASMFC FMP for Atlantic Herring will continue to provide adequate protection to spawning herring.

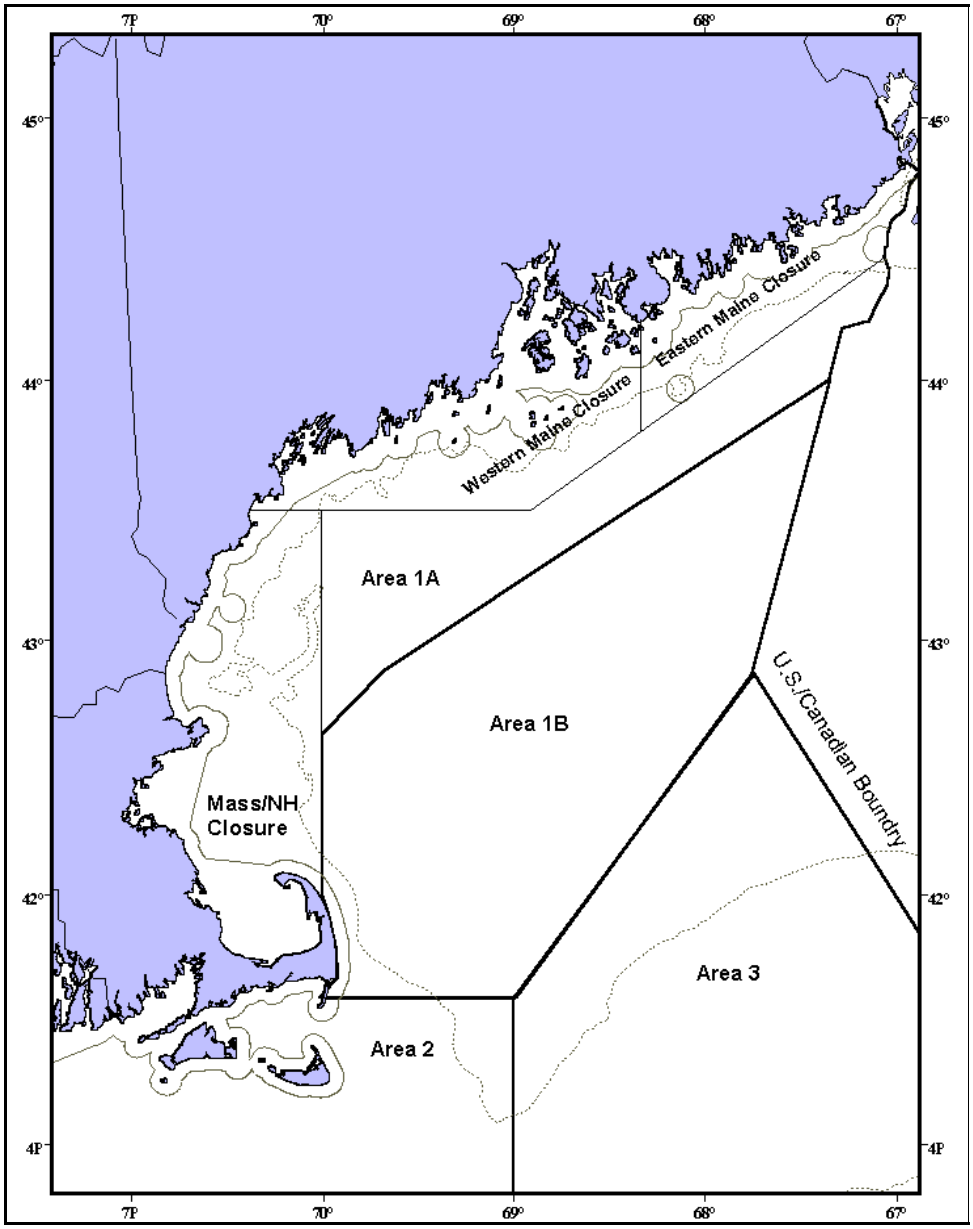


Figure 48 - ASMFC Inshore Spawning Restriction Areas

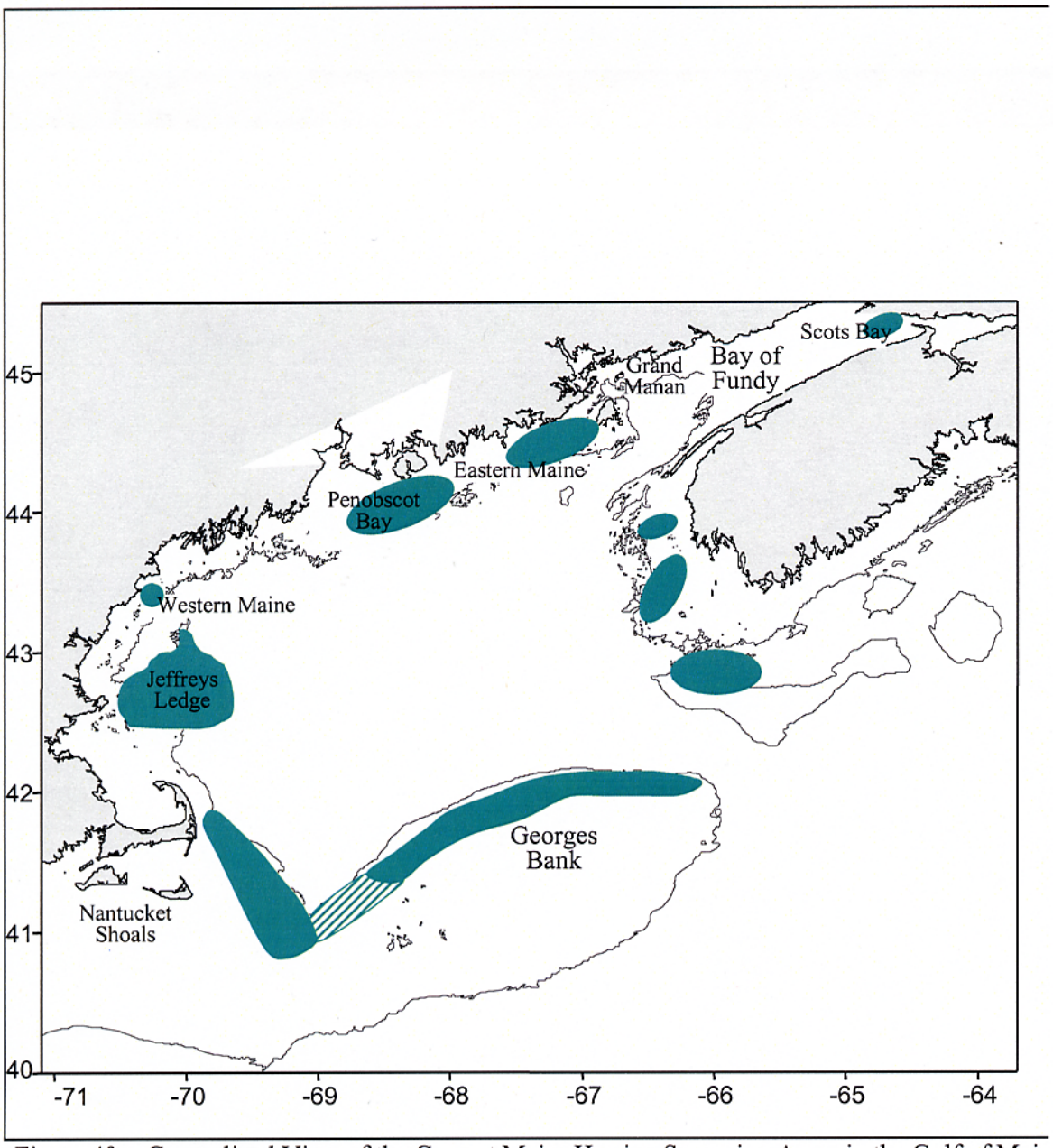


Figure 49 - Generalized View of the Current Major Herring Spawning Areas in the Gulf of Maine and on George Bank

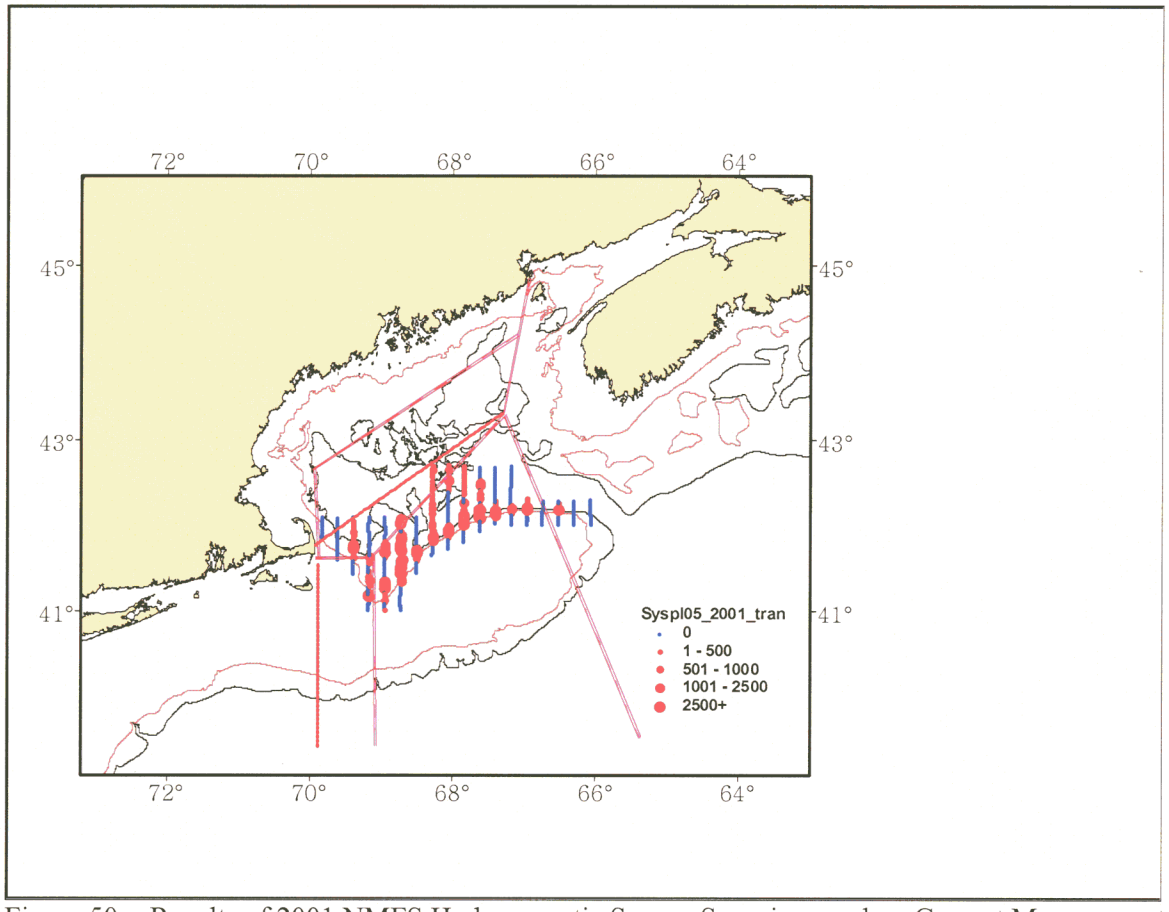


Figure 50 - Results of 2001 NMFS Hydroacoustic Survey Superimposed on Current Management Area Boundaries and Proposed Revisions to Area 3 Under Consideration in Amendment 1 to the Herring FMP

7.8.1.7.3.1.2 Impacts on Inshore (Gulf of Maine) and Offshore (Georges Bank) Herring Stock Components

Preliminary examination of the Nantucket Lightship Closed Area as well as Closed Areas 1 and 2 suggest that the bulk of removals from the offshore component of the herring resource does not occur in these areas (Figure 44 – Figure 47). According to VTRs, the bulk of removals from the offshore component occurs in areas adjacent to but outside of the areas proposed for closure. Based on recent trends in herring fishing patterns (2000-2003), minimal impacts on the herring resource can be expected if the Georges Bank year-round groundfish closed areas are closed to the directed herring fishery.

Relative to the inshore component of the herring resource, the WGOM Closed Area and Cashes Ledge Closed Area are somewhat similar to the offshore (Georges Bank) areas proposed for closure. Data from VTRs (Figure 44 – Figure 47) indicate that herring are normally available either in adjacent areas or other inshore areas outside of those proposed for closure. As a result, no significant positive or negative impacts on the inshore component of the herring resource can be specifically identified from the proposed action.

However, the above conclusions should be interpreted with some caution. As indicated in Table 147, herring catch within the WGOM Closed Area represents a very high percentage of the monthly landings from Area 1A during some years since 2000. This is particularly true during the late spring and early summer directed herring fishery in Area 1A. Should herring not be available in other areas within Area 1A, a reduction in herring catch rates may result from the closure of the WGOM Area to the herring fishery.

Herring located in the inshore Gulf of Maine are assumed to consist of a mix of the inshore and offshore stock components during the summer and exclusively the inshore component from fall onward (see discussion of relative risk assessment approach and stock mixing scenarios, described in many documents related to the development of Amendment 1 to the Herring FMP and the 2005 herring fishery specifications). Consequently, one possible result of a prohibition on herring fishing in the Gulf of Maine groundfish closed areas could be an extension of the Area 1A herring fishery through the later part of the fishing year (or a shift in fishing effort for herring to the later part of the year).

Based on available information about the mixing of inshore and offshore herring in Area 1A, a prohibition on herring fishing in the WGOM Closed Area could result in a greater proportion of herring removed from the inshore component when compared to recent removals, depending on the degree to which the 1A fishery shifts to later in the season. The Council's Scientific and Statistical Committee (SSC) recommended against increasing removals from the inshore component of the resource above recent levels (see June 19, 2003 Final SSC Recommendations). How significant this effect will be, should this measure be implemented, cannot be predicted or analyzed at this time, as it is unclear how the herring fishery may adapt to the closure of the WGOM area. The degree of the impact and the ability of the fishery to adapt also will depend on the availability of fish outside the WGOM area and still within Area 1A.

7.8.1.7.3.2 Herring Fishery Impacts – Economic and Social

7.8.1.7.3.2.1 Economic Impacts

There are sixteen (16) vessels which used midwater pair trawls as their primary gear in 2003 and averaged more than 2,000 pounds of herring per trip. Using the same criteria, seven (7) vessels used

single midwater trawls, and five (5) vessels used purse seines (Table 154).

Table 154 - Number of Vessels, Herring Trips and Days, and Herring Sold (mt) by Management Area and Principal Herring Gear for Vessels Averaging more than 2,000 pounds of Herring per Trip in All Areas During 2003

		1A	1B	2	3	Total
Midwater Pair Trawl 16 vessels	**Number of trips**	396	37	105	131	669
	Days at Sea	907	98	343	561	1909
	Landings (mt)	32,804	3,784	11,286	17,576	65,450
Midwater Trawl 7 vessels	**Number of trips**	156	11	55	10	232
	Days at Sea	290	25	152	49	516
	Landings (mt)	7,337	980	3,001	2,565	13,883
Purse Seine 5 vessels	**Number of trips**	323	5	12	0	340
	Days at Sea	623	10	14	0	647
	Landings (mt)	19,193	153	810	0	20,156
Bottom Trawl 10 vessels	**Number of trips**	17	0	43	36	96
	Days at Sea	17	0	147	215	379
	Landings (mt)	66	0	958	85	1109
Total 38 vessels	**Number of trips**	892	53	215	177	1337
	Days at Sea	1837	133	656	825	3451
	Landings (mt)	59,400	4,917	16,055	20,226	100,598

There are two primary ways in which a measure to prohibit fishing for herring in the year-round groundfish closed areas may economically impact herring vessels. The first is by increasing vessel operating costs (primarily fuel costs), which is related to longer steam times if a vessel's optimal fishing location is in a groundfish closed area and the vessel must choose a second-best location that is farther away from port than the closed area. The second is the cost of decreased net revenues (revenues less the cost of items that vary directly with the quantity of fish caught such as pumping, refrigeration, and packaging costs) from choosing a second-best fishing location. These two impacts are related in that the choice of fishing location depends on the cost of reaching the location and the expected abundance and quality of fish at that location. These choice factors, and others including business relationships with buyers (choice of market), the vessel's homeport, and the status of the TAC in a management area, contribute to the selection of fishing locations.

If the proposed closures are implemented for the herring fishery and the best fishing location happens to be in one of the closed areas, then the captain is faced with balancing the additional costs of choosing a more distant location with the expected catch from the alternative area. It may be that due to the seasonal migration of herring, the only choice is to transit a closed area in order to find fish during a particular time of the year. Given that the second-best choice involves increased operating costs, the total impact would include the increased vessel operating costs and the decreased net revenue.

Circumstances may dictate that the second-best fishing location may be a location which is closer to port and results in a cost savings for the vessel(s). In this situation, the net impact would be the loss of net revenue as offset by the decreased steaming costs. Presumably, the loss of net revenue is greater than the cost savings in this case, or the fishing captain would have chosen the alternative location in the first place.

The above discussion assumes that a single fishing location is selected for a particular trip. In many cases, a fishing trip may include several different fishing locations. Each location choice then depends on the success of the previous choice, and the interplay of the decision points described for the single location would occur as the trip unfolds.

With a provision that gear must be stowed while transiting a closed area, additional vessel operating costs may be incurred if a vessel captain decides to steam around a closed area rather than stow the gear.

In addition, the above discussion assumes that closed areas of the size, number, and location proposed in this framework adjustment will not reduce the amount of herring that are available to be caught. This assumption is based on the fact that herring seasonally migrate through these areas unlike a highly localized resource where a closed area essentially fences off a portion of the resource (scallops, for example).

There would likely be increased enforcement costs associated with the proposed action. Enforcement of the management area TACs is currently accomplished through VMS monitoring (NMFS) and Coast Guard observations. Applying closed areas to the herring fishery would increase the number of vessels the Coast Guard would have to monitor, which may increase associated enforcement costs.

Western Gulf of Maine Closed Area

The proposed closure of the WGOM Closed Area to herring fishing, while not the largest of the five closed areas, contains the highest historical levels of catch and effort (relative to the other closed areas). When considering the WGOM Closed Area's size, shape, and location, it is clear that this closure is the one most likely to result in economic impacts on the herring fleet. The WGOM Closed Area is located in the middle of management Area 1A, which is the one area where the herring TAC is fully utilized and, in some years, is taken before the end of the fishing year (the season is split into two periods). If the Area 1A TAC is near full utilization and herring are concentrated in the WGOM Closed Area (as can happen on Jeffrey's Ledge late in the season), herring vessels could be precluded from obtaining adequate supplies. The degree to which this may occur is difficult to predict, as the distribution of fish can be quite variable both spatially and temporally.

Gear Conversions

For Options 1 and 3, where only one type of herring gear is restricted from the groundfish closed areas, a possible strategy vessel owners may consider is changing gear type. Based on the number of trips and the catch historically observed in these closed areas, this strategy does not seem likely except perhaps

for vessels dependent on the Western Gulf of Maine Closed Area (particularly purse seine vessels that may not be able to fish offshore). This strategy would involve incurring significant costs.

The cost associated with gear conversion will depend on the size and characteristics of the individual vessel. At a minimum, a new purse seine net for a 150 to 200 metric ton capacity vessel costs on the order of $200,000. Nets for smaller inshore vessels cost about $50,000 to $100,000. Cost information for midwater trawl nets is not available at the time of this writing. Moreover, in order to use a different gear type, other equipment changes are required, depending on the current configuration of the vessel. These may include changes to/additions of: hydraulic rollers, power blocks, and the mast. Also, certain vessels may have to add/remove a gallows frame. For a conversion to purse seining, a vessel may need to purchase a 20 to 25 ft aluminum "bug boat" or add thrusters.

7.8.1.7.3.2.2 Social Impacts

In addition to the economic impacts described above, excluding the herring fleet as a whole or in part from the year-round groundfish closed areas may have social and cultural impacts on the herring fishery. It is difficult to understand what these impacts might be because it is not clear how fishing behavior will change as a result of the proposed action. Therefore, the following paragraphs describe *potential* impacts to fishery participants and communities and other fisheries (namely the lobster fishery) associated with the herring fishery.

As stated in the section above, the herring fishery is composed of a relatively small number of vessels that account for the vast majority of the total catch. Approximately 40% of the total herring catch is processed (frozen or canned), and the remaining 60% is sold (usually after being salted) as bait for the lobster fishery. The American lobster fishery ranges from 'Downeast' Maine to Rhode Island, with northern locations having a greater dependence on this particular type of bait than their southern counterparts who utilize multiple sources of bait.

Potential impacts of the Framework 40B measures are disaggregated below by primary and secondary impacts. Primary impacts are those associated with the herring fishery itself, and secondary impacts are those related to fisheries and processing activities.

7.8.1.7.3.2.2.1 Impacts on Herring Fleet (Crew, Communities, Families)

As stated above, analysis of 2000 – 2003 VTR data suggests that the greatest impacts of restricting herring fleet access to the year-round groundfish closed areas would be associated with the WGOM Closed Area, which is located within Area IA. This becomes particularly apparent when examining data from May-August. The following paragraphs suggest some of the potential primary impacts that closing the WGOM and other groundfish areas to the herring fleet may produce.

It is unclear how herring fleet behavior might change if any of the options under consideration (apart from no action) are implemented. One possibility is that steaming time is increased as captains go farther from port to catch herring. Increased steaming time may mean longer fishing trips and therefore longer work hours, more time away from home for crew, and the associated impacts. Longer trips may also increase safety risks. As fishing is one of the most dangerous occupations, any increase in time spent at sea increases safety risks. In addition, because vessels may be farther from port, they may be more vulnerable to changing weather patterns that could also have implications for vessel and crew safety.

The economic analysis presented above suggests that restricted access to the groundfish closed areas could financially impact herring businesses. It is therefore likely that these impacts translate into economic losses for crew as well, particularly when they are paid in shares. In addition, impacts may affect fishery participants differently. For example, different gear types such as purse seiners and smaller trawlers may be more vulnerable to the proposed prohibitions, as these vessels may not be properly 'tanked' for longer trips and may not have the same fishing options that are available to larger vessels. There also may be certain fishery participants who depend more on Area 1A than others. Participants that do not engage in the southern winter fishery may be harder hit by changes to Area 1A that others that may be more diversified.

7.8.1.7.3.2.2.2 Impacts on the Lobster Fishery

The Atlantic herring fishery is largely dependent on fish extracted from Area 1A, located in the inshore Gulf of Maine. This area is particularly important for the summer herring fishery (May – September), which coincides with the peak months of the American lobster fishery. Not only is the lobster fishery the most valuable fishery in terms of dollar amount, it is also a very place-based fishery where whole communities are significantly dependant on fishing as a source of income as well a basis for local tradition and culture (for example, Vinalhaven and Monhegan ME). This issue will be explored in more detail in Amendment 1 to the Herring FMP. In addition, lobstering communities are often located in physically remote areas where transport is limited and where there are few alternative sources of employment. These factors make these communities more vulnerable to changes in their fishery or, in this case, changes in access to the bait on which their primary fishery depends.

In many cases, access to lobster bait during peak months for the fishery is already managed at the margins, where bait dealers only have a few days supply of bait available to cushion lobster fishermen between herring deliveries. Therefore, any changes to the supply of herring bait or timing of deliveries to these sectors could result in economic losses (particularly during key months) for these individuals and fishing communities. This may also mean that during peak lobster fishing times, fishermen may have to take longer trips and work longer hours to compensate for periods of decreased bait supply.

Shifts in the location where herring are taken also may result in shifts in where the fish are landed from one port to another. This may have implications for trucking companies, bait and lobster dealers, and ultimately, lobster fishermen and their families.

7.8.1.7.3.2.2.3 Impacts on Processing Plants

Although overall herring catch is not likely to be reduced from the proposed action, shifting fishing locations has the potential to negatively affect supplies of herring to processing plants (see related discussion in economic impacts section above). These impacts also may translate to reduced opportunities for plant employees and/or fewer work hours. For example, some plant employees only work (and therefore are only paid) when product is available. This issue will be explored in more detail in the DSEIS for Amendment 1 to the Herring FMP.

7.8.2 Category B DAS Observer Requirement (Measure L)

7.8.2.1 Biological Impacts

This measure will prevent a vessel from using a Category B DAS if it is not capable of carrying an observer. It will not have any direct impacts on regulated groundfish or other species. It may, however, improve monitoring of the programs that facilitate the use of Category B DAS and thus may have indirect impacts on groundfish. These impacts are likely to be positive, but cannot be quantified.

This measure will not have any direct impacts on other species. It may have some small indirect impacts in that all vessels using Category B DAS will be eligible to accept observers. This may improve the understanding of the incidental catches of other species while fishing for groundfish. This measure will not have any direct impacts on bycatch, but may improve the information collected through the observer program and thus facilitate more accurate estimates of bycatch in the future.

7.8.2.2 Habitat Impacts

This measure limits the participants in the SAPs to those that can carry an observer. This measure will have no habitat impacts.

7.8.2.3 Impacts on Endangered, Threatened, and Protected Species

Although the SAPs approved to date and proposed in this action appear to operate in locations in which encounters with protected species are infrequent events, any increase in observer coverage should facilitate a better evaluation of the impacts of management measures and the fishery. It will be important, however, that observer protocols include a component that requires monitoring of protected species interactions.

7.8.2.4 Economic Impacts

Monitoring of incidental TACs for stocks of concern or targeted stocks requires that an appropriate level of observer coverage be obtained. For this reason, any vessels that may participate in an SAP must be capable of taking an observer if requested to do so. This measure would prohibit anyone that may not meet this standard from participating in any given SAP. In general, any vessel regardless of size that fishes beyond 12 miles and complies with the Federal Requirements for commercial fishing vessels would meet the minimum requirements to carry an observer provided the necessary equipment is in good working order. Specifically, the observer program safety checklist includes the following:

- Current USCG vessel safety examination decal
- EPIRB

- Life Raft
- Immersion suits and flotation devices
- Radio
- Fire Extinguisher
- Emergency signaling flares
- First aid supplies
- Life rings

Of these items Federal regulations already require an EPIRB for any vessel operating beyond three miles and with the exception of a life raft each of the remaining items would be standard safety equipment for all boats or would be relatively inexpensive to obtain. Any vessels that is less than 36' and carries three or fewer people, and is within 12 miles of the coast is not required to carry a life raft. If any one of these criteria is not met i.e. 4 people are on board or fishing takes place beyond 12 miles or the vessel is more than 36' then a vessel must have a life raft. This means that the only vessels that may be affected by the SAP observer requirement would be vessels less than 36', always carry three or fewer people, and never fish beyond 12 miles. The only SAP that would be less than 12 miles from the coast for any vessel would be the proposed WGOM rod and reel SAP. However, this SAP is less than 12 miles from any coastline in only limited areas, for example, the southern boundary is less than 12 miles from Provincetown and the Northwestern corner is less than 12 miles from Kennebunkport. This means that for all practical purposes, participation in the SAP would require the purchase of a life raft independent of the proposed observer requirement and regardless of vessel size.

7.8.2.5 Social Impacts

This measure requires that vessels participating in an authorized SAP must carry an observer if requested to do so. Monitoring of the use of Category B DAS requires observer coverage. Any vessel, irrespective of size, that fishes beyond 12 miles and complies with federal regulations would qualify. The most likely to be affected by this measure are vessels less than 36' that always carry three or fewer people and stay within 12 miles from land. Such vessels are not required to carry a life raft. The SAP that fits this specification is the WGOM SAP which is less than 12 miles from land. However, these criteria fit only in limited areas e.g., Provincetown is less than 12 miles from the southern boundary and Kennebunkport is less than 12 miles in the northwestern corner. The social cost would be for vessels less than '36 that do not possess a life raft. This cost would be in addition to the potential requirement of an observer.

7.8.2.6 Impacts on Other Fisheries

This measure is not expected to negligible impacts on other fisheries. Based on recent experience, that few vessels will be unable to carry an observer and will thus not be able to use Category B DAS. It is not likely that vessels will choose to participate in other fisheries solely due to their inability to carry and observer and thus use Category B DAS.

7.9 Comparison of Alternatives

In order to facilitate decision making, this section provides a short summary of the direct and indirect impacts of the alternatives. It is based on the analyses presented in sections 7.2 through 7.7. In order to make a valid comparison among alternatives, this analysis only compares the independent measures adopted by the proposed action to the No Action alternative. The alternatives are compared with respect to their impacts on biology (for both groundfish and other species), essential fish habitat,

endangered and other protected species, and the human environment (economic and social impacts). Most of the comparisons between alternatives are described in general relative terms. Comparisons are made not only between the alternatives but to the expected impacts of Amendment 13 and FW 40A (the No Action alternative). While it is possible that the actual impacts of Amendment 13 and FW 40A may prove different than those predicted, the regulations have not been in place long enough to reliably assess these differences. For more specific information, refer to the detailed analyses above. The comparison of impacts is summarized in Table 155.

7.9.1 Biological Impacts

All of the alternatives will have impacts on groundfish and other species. Groundfish impacts for the SAPs created or modified in this action can be described in relation to species or stocks targeted for harvest and those caught incidental to the targeted stocks. Compared to the expected impacts of Amendment 13 and FW 40A, the No Action alternative would be least likely to increase fishing mortality on any regulated groundfish stock. This is because this alternative does not change any of the existing management provisions. While the analyses concluded that none of the alternatives would risk Amendment 13 mortality objectives, there are differences between them. Alternative 1 adopts all of the measures under consideration and is the most likely alternative to result in changes in fishing mortality. Two SAPs would be adopted that would increase fishing on GB and GOM haddock. In addition, changes to the DAS leasing and transfer programs could result in more exchanges of DAS, though the impacts on mortality depend on what conservation tax, if any, is adopted for these programs. This alternative could also change the DAS baseline allocation method, which could affect mortality as well. Alternative 2 would have similar impacts, except that GB haddock mortality would not increase since the alternative does not include Measure C.1, the SAP designed to target haddock north of CAI. The biological impacts of Alternatives 3 and 4 would be similar to each other. The difference between these two alternatives is that Alternative 3 does not include Measure C.2 (WGOM Closed Area Rod/Reel SAP) which would have minor impacts on GOM cod and haddock mortality, and does not modify the conservation tax for the leasing and transfer programs. The biological impacts of the differences between these two alternatives are minor. The impacts of the proposed action (less the adopted independent measures) would be similar to the impacts of Alternative 2. There may be slight increases in GOM cod and haddock mortality as a result of the WGOM Rod/Reel Haddock SAP, but potential increases are constrained by the small TACs that apply. The changes to the DAS transfer program may increase effort (and mortality) in the short-term, but will decrease latent effort available in the future.

With respect to the independent measures adopted by the Proposed Action, the one most likely to increase mortality compared to the No Action alternative is the removal of the net limit for trip gillnet vessels. This measure may increase mortality on GOM cod, pollock, GB cod, monkfish, dogfish, and skates. It is not possible to state whether these increases will threaten mortality objectives for any stock. The other independent measures are likely to have only minor impacts on the biology of any stock.

7.9.2 Habitat Impacts

None of the measures that are being proposed or were considered in any of the alternative packages are expected to have more than minimal impacts on essential fish habitat. As a result, with respect to impacts on essential fish habitat there is little difference between the No Action alternative and any of the alternatives. Any differences between the alternatives are slight.

7.9.3 Impacts on Endangered, Threatened, and Protected Species

None of the alternatives, including the Proposed Action, are expected to have impacts on protected species beyond those described and analyzed in Amendment 13 and FW 40A (the No Action impacts).

7.9.4 Economic Impacts

The proposed action implements a number of separate measures that are likely to have only modest economic effects when compared to No Action. The largest impacts may result from changes to the CAII Yellowtail Flounder SAP, making a more direct link between this SAP and the available TAC and thus provides a higher level of assurance that economic benefits of Category A DAS are realized. At the same time, the reduced possession limit for this SAP may discourage participation. Removing the net limit for trip gillnet vessels will increase the flexibility of these vessels and will probably have only small effects on revenues. The WGOM rod/reel SAP will provide some benefits to small hook fishermen in the GOM, but the revenues increases may be partially offset by the cost of a VMS that is required.

Of the four identified alternatives, the Alternative 1 would have the most economic impacts. It includes an additional SAP to target haddock north of CAI. The most important difference between Alternative 1 and the Proposed Action is that this alternative includes options to change the DAS baseline. Depending which option were selected, DAS allocation could be reduced for up to 80 percent of groundfish vessels, increasing the importance of Category B DAS, DAS transfers, and DAS leasing. At the same time, however, other vessels would gain DAS and overall groundfish revenues would likely increase by $6.5-$6.7 million. The impacts of Alternative 2 would be similar to the Proposed Action unless a different DAS baseline were selected. Alternatives 3 would differ from Alternative 1 in that the minimum effective effort allocation would be not granted, there would be no changes to the GB cod hook sector, the WGOM Rod/Reel Haddock SAP would not be adopted, and the DAS transfer program conservation tax would not change. As a result, the economic impacts of Alternative 3 would differ slightly from Alternative 1 in that smaller vessels and the hook sector would not receive as many economic benefits. Alternative 4 is similar to Alternative 3, but would include the WGOM Rod/Reel SAP.

7.9.5 Social Impacts

The proposed action is expected to have minor beneficial impacts on fishing communities when compared to No Action because it modifies provisions for the DAS transfer program, creates an additional SAP, improves the administration of the CAII Yellowtail Flounder SAP, and modifies net limits for trip gillnet vessels. The other alternatives are also expected to have minor beneficial impacts that differ slightly from the proposed action because different measures are included.

7.9.6 Impacts on Other Fisheries

The measures in the proposed action are only expected to have minor impacts on other fisheries as compared to No Action. The proposed action does remove the limit on the number of nets that can be fished by trip gillnet vessels. If this increases fishing effort on monkfish in the GOM it could lead to impacts on that fishery in the future. Overall, there is likely only minor differences between No Action and any of the other alternatives. Alternatives 1, 3, and 4 include the Haddock Fishery SAP North of CAI, which may draw effort away from other fisheries. All of the alternatives could have changed the DAS

baseline calculation, which could encourage some vessels to fish more heavily in other fisheries while reducing the amount of time spent in other fisheries by a smaller number of vessels. Alternatives 1 and 3 may have slightly more impacts as the changes to the DAS transfer program could increase effort in other fisheries as compared to Alternatives 2 and 4.

Type of Impacts	Alternative					
	Proposed Action	**No Action**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Biological						
Groundfish	Possible short-term increase in effort Increased mortality (minor) for GOM haddock; not expected to threaten A13 mortality objectives.	No difference from A13/FW 40A expected	Possible short-term increase in effort Additional uncertainty over biological impacts of management program Increased mortality for GB and GOM (minor) haddock; not expected to threaten A13 mortality objectives	Possible short-term increase in effort Increased mortality (minor) for GOM haddock; not expected to threaten A13 mortality objectives.	Additional uncertainty over biological impacts of management program Increased mortality for GB haddock; not expected to threaten A13 mortality objectives	Possible short-term increase in effort Increased mortality for GB haddock; not expected to threaten A13 mortality objectives
Other species	Negligible difference from A13/FW 40A	No difference from A13/FW 40A expected	Negligible difference from A13/FW 40A	Negligible difference from A13/FW 40A	Negligible difference from A13/FW 40A	Negligible difference from A13/FW 40A
Bycatch	Negligible difference from A13/FW 40A	No difference from A13/FW 40A expected	Minor increases in effort may lead to slight bycatch increase	Negligible difference from A13/FW 40A	Minor increases in effort may lead to slight bycatch increase	Minor increases in effort may lead to slight bycatch increase
Habitat	Negligible differences from A13 expected	No difference from A13/FW 40A expected	Negligible differences from A13 expected	Negligible differences from A13 expected	Negligible differences from A13 expected	Negligible differences from A13 expected
Endangered/ Protected Species	Few if any impacts different from No Action	No difference from A13/FW 40A expected	Few if any impacts different from No Action	Few if any impacts different from No Action	Few if any impacts different from No Action	Few if any impacts different from No Action
Human Environment						
Economic	Modest benefits compared to No Action	No difference from A13/FW 40A expected – will not achieve OY on healthy stocks	Modest benefits compared to No Action – larger than other alternatives	Modest benefits compared to No Action	Modest benefits compared to No Action	Modest benefits compared to No Action
Social	Minor benefits compared to No Action	No difference from A13/FW 40A expected – negative impacts on communities	Minor benefits, but hinges on DAS baseline option selected	Minor benefits, but hinges on DAS baseline option selected	Minor benefits, but hinges on DAS baseline option selected	Minor benefits, but hinges on DAS baseline option selected
Other Fisheries	Little Difference from No Action expected	No difference from A13/FW 40A expected	Minor increase in effort in other fisheries	Little Difference from No Action expected	Minor increase in effort in other fisheries	Little Difference from No Action expected

Table 155 – Comparison of the impacts of the alternatives (not including independent measures adopted by the Proposed Action)

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8.0 APPLICABLE LAW

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 Consistency with National Standards

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

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

The proposed action will facilitate catching optimum yield from the Northeast Multispecies fishery by creating additional opportunities to target healthy groundfish stocks. Amendment 13 to the Northeast Multispecies FMP adopted formal rebuilding plans and measures to end overfishing on this complex. Because of the multispecies nature of this fishery, the measures necessary to rebuild overfished stocks also reduce fishing mortality on healthy stocks. The primary tool used to reduce fishing mortality was a reduction in fishing effort through controls on the number of DAS that can be fished by limited access vessels. These effort reductions were designed to end overfishing and to rebuild overfished stocks consistent with legal requirements. Because DAS controls are not a selective management tool, fishing mortality is also expected to be reduced on stocks where it is not necessary. This could prevent harvesting the optimum yield from those stocks while rebuilding programs are being followed for the overfished stocks.

The proposed action includes measures that are designed to facilitate harvests of healthy stocks. These measures include a special access program to target GOM haddock using rod and reel. In addition, the action modifies the CAII Yellowtail Flounder SAP so that the number of the trips in the SAP will more closely match that available harvest. These programs are designed to increase the harvest of healthy stocks so that optimum yield can be harvested. At the same time, the proposed action includes measures that will prevent these programs from causing overfishing or threatening the rebuilding programs adopted by Amendment 13. The primary tool is a hard TAC on the incidental catches of stocks of concern – regulated groundfish stocks that require a reduction in fishing mortality. Other elements of this action that address other management concerns are designed so that they will prevent overfishing. For example, the DAS transfer program is being modified to make it more attractive to permit holders, but it wil continue to have a conservation tax that is estimated to reduce the likelihood that fishing effort will increase substantially.

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

The proposed action is based on the most recent estimates of stock status available. These estimates are in the form of unpublished information provided by the Northeast Fisheries Science Center. Stock size and fishing mortality in calendar year 2002 was estimated based on landings information for that period. In addition, the amendment used information from the most recent stock assessments: either the updated assessments in November 2002 for the groundfish complex as a whole, or assessments published during 2003 for five stocks (witch flounder, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, SNE/MA winter flounder, and GOM winter flounder). Estimates of fishing mortality and stock

biomass are not yet available for calendar year 2003. Preliminary commercial landings statistics for calendar year 2003 were used to characterize likely stock status in the absence of new projections or assessments. These were supplemented with updated trawl survey indices for groundfish stocks. While subject to year-to-year variability, these survey indices provide evidence of trends in stock size over time. With respect to bycatch information, the action uses bycatch information from observer reports. These data have been analyzed by the Groundfish Plan Development Team, a multi-disciplinary body charged with analyzing the proposed measures.

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

The proposed action manages each individual groundfish stock as a unit throughout its range. In general, management measures specifically designed for one stock are applied to the entire range of the stock.

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

The proposed management measures do not discriminate between residents of different states. They are applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. For example, the SAP designed to target GOM haddock may not be available to fishermen who do not use a specific gear or do not fish in the GOM. Some of these impacts may be localized, as often communities may have developed small boat fisheries to target nearshore stocks. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.

The proposed action does include some measures designed to mitigate these distributive impacts. The special access programs are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts.

The proposed action does not include measures that allow a particular individual, corporation, or other entity to acquire an excessive share of fishing privileges.

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

The Amendment 13 management program relies primarily on restrictions in time fishing – days-at-ea (DAS) – to control fishing mortality. The proposed action creates an opportunity to use additional DAS (Category B DAS), and improves the management of the CAII Yellowtail Flounder SAP. While measures are included that tend to reduce economic efficiency of vessels (gear requirements, limits on the number of trips, etc.), they are generally required for sound management reasons. For example, the WGOM Closed Area Rod/Reel Haddock SAP does not allow the use of other gear in order to reduce bycatch of non-targeted species and to provide protection to the habitat closed area. The proposed action also includes measures that are designed to improve economic efficiency. This action makes several

modifications to elements of the DAS leasing and DAS transfer programs in order to facilitate their use. These two programs provide opportunities for vessels to obtain additional DAS so that they can be operated more efficiently and provide greater returns to their owners. In addition, the DAS transfer program is designed to gradually reduce excess capacity in the fishery by imposing a conservation tax on DAS that are transferred and eliminating one vessel from all fisheries for every transfer.

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

The measures allow for the use of different gear, vessel size, and fishing practices. While the SAP that is proposed includes restrictions on the type of gear, area fished, seasons fished, and landing limits for some species, there are no restrictions preventing the use of a specific gear in an open area, and few restrictions on the deployment of that gear.

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

The proposed management measures do not duplicate other fishery regulations. They provide opportunities to target healthy regulated groundfish stocks that were conceived, but not explicitly developed by, Amendment 13. While the proposed measures do duplicate reporting requirements for vessels that choose to participate in the SAP, this duplication is necessary to monitor catches in a timely manner so that TACs are not exceeded.

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

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." Current guidance on National Standard 8 specifies that communities are place-based: geographic units such as towns and cities that might fit the Census Bureau's definition of a "place." But actual methodological guidelines are still in the process of refinement and resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. For example, the weigh-out data and the permit files document landing and home ports, but these are not necessarily the same places where people live, where specific styles of and knowledge about fishing are practiced, or where the impacts of management are most strongly felt. It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other communities in the region.

Nevertheless, effort has been made in recent years to better identify the nature of fishing dependency on communities where people fish. Hall-Arbor et al., (2001) developed a series of regional dependency indices and port profiles for New England. Profiles for the Mid-Atlantic (McCay and Cieri 2000) are in the process of being updated. The Hall-Arbor et al, (2001) report evaluated regional dependence in New England using several measurement metrics including: the percentage of related occupations within a region; the percentage of fishing to total employed, and an index of alternative

occupations. While the indices represent sub-regions within New England[2], rather than communities, they do provide a context within which port level dependence on fishing can be understood. Table 1 shows the potential level of involvement in the WGOM Closed Area sorted by the alternative occupation ratio summary and accompanied by other related employment indices. Use of this measure is an example of the potential relationship between one measure and another. The indices themselves, though using different measurement metrics, show remarkable symmetry. This table shows that the regions most highly dependent on fishing, Downeast and Upper Midcoast, Maine, and Cape and Islands/Chatham, would be affected neither positively nor negatively by this particular measure. For some areas such as Gloucester/North Shore the positive benefits of this measure may be offset by the negative benefits of another measure.

Although the overall impacts of the proposed measure are considered to have only modest social impacts, it is possible that some individual and combined measures may have a differential effect on some regions and/or communities. The modest gains of the proposed measure may be the result of the overall interplay between the benefits of some measures and/or the lack of benefits in other measures.

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

The proposed management measures include provisions that will minimize bycatch. The proposed action adopts limits on the incidental catch (landings and discards) of regulated groundfish stocks of concern (section 4.3). These limits promote the use of selective fishing practices, since vessels can only fish for target stocks as long as the incidental catch TACs have not been met. In order to monitor fishing practices and make sure that unreported discards do not result in the TACs being exceeded, all of the Category B DAS programs proposed will have sufficient observer coverage to accurately monitor catches. The proposed WGOM Closed Area Rod/Reel Haddock SAP includes strict limits on the catch of cod in order to discourage targeting of that species. The use of rod and reel gear will also minimize the mortality of cod that is caught, since each fish will be individually released and a high percentage are expected to survive. The notification requirements for Category 1 herring vessels may lead to an improved understanding of the interactions between the herring fishery and regulated groundfish.

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

The proposed action continues to rely on DAS as a primary management tool, and provides an opportunity for vessels to use additional DAS. DAS provide flexibility to fishing vessel operators to fish when they deem it safe to do so.

Fishing in the WGOM Rod/Reel Haddock SAP is limited to March and April. As discussed in section 7.2.6, these two months have the third and fifth highest average winds. Since the vessels in this SAP are likely to be smaller groundfish dayboats, the SAP does cause concerns over vessel safety. Mitigating this to some extent is the fact these vessel typically fish shorter trips and are more able to choose a period of good weather in which to fish.

[2]Similar indices for the Mid-Atlantic have not yet been developed

				Impact of Involvement
SUB-REGIONS	**% Related Occupations**	**% of Total Employed**	**Alternative Occupation Ratio Summary**	**WGOM Rod/and Reel SAP**
Downeast Maine	45	3.6	255.54	
Upper Midcoast Maine	36	2	171.05	
Cape and Islands/ Chatham	27	0.79	104.43	
Lower Midcoast Maine /Portland	23	0.46	51.32	
New Bedford/South Shore	27	0.4	38.95	Low
Southern Maine	23	0.39	36.94	Low
Rhode Island	24	0.31	30.86	
Gloucester/North Shore	20	0.21	24.91	High
New Hampshire Coast	8	0.09	9.46	Low
Boston Area	7	0.05	6.39	Medium

Table 156 - Impact of Involvement in WGOM Closed Area and Changes to DAS Option 1, Comparative Fishing Dependence Indices for the Eleven Sub-regions of New England (adapted from Hall-Arbor et. Al., 2001)

8.1.2 Other M-SFCMA requirements

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

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

Optimum yield from this fishery is harvested entirely by U.S. vessels. There is no opportunity and there are no provisions for foreign fishing in this management plan.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

A detailed description of the fishery is included in the Affected Human Environment section of Amendment 13. A brief update of the fishery is included in the Affected Human Environment section of this document, section 6.0.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

Maximum sustainable yield is described in Amendment 13, section 3.1.5 with a short explanation of the source of this estimate. Optimum yield continues to be defined as in Amendment 9. The condition of the fishery is included in section 6.0, while information on landings and revenues from the fishery is in section 9.4 of Amendment 13 and is updated in section 6.4.2. Probable future stock conditions are estimated in section 5.2.1.1 of Amendment 13. The future economic condition of the fishery is described in section 5.4 of Amendment 13 and updated to reflect the impacts of the proposed action in section 7.2.4.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3), (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

Fishing vessels of the U.S. will harvest the optimum yield from the fishery and none will be available to foreign fishing. All catch will be sold in the U.S.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

Reporting requirements for the multispecies fishery are defined in section 3.4.14 of Amendment 13. They are supplemented by requirements for the specific measures adopted by this proposed action. These requirements are included in sections 4.4, 4.10, and 4.11.

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

The proposed action does not alter a provision of the multispecies FMP that allows the carry-over of a small number of DAS from one fishing year to the next. If a fisherman is unable to fish because of weather or other ocean conditions, this measure allows his available fishing time to be used in the next fishing year. This practice does not require a consultation with the Coast Guard.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Essential fish habitat was defined in an earlier action (Amendment 11). This action does not change those definitions. These designations are being reviewd in an omnibus amendment.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

Additional research needs are specified in sections 6.0 and 9.3.4 of Amendment 13.

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

Section 7.2 described the impacts of the proposed action on the multispecies fishery. Impacts of the alternatives on other fisheries are described in sections 7.2.7, 7.3.6, 7.4.6, 7.6.6, and 7.7.6.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished,

contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

These criteria are defined in section 3.1 of Amendment 13 and are not changed by the proposed action.

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority--

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided;

Standardized reporting methodologies have been defined in previous actions for this management plan. They include the Vessel Trip Report system and the dealer reporting system. The VTR regulations require vessel operators to report discards of fish. In addition to these reporting systems, Amendment 13 adopted an observer program that provides additional information on bycatch. The proposed action establishes a requirement that observer coverage be sufficient to characterize discards in the WGOM Rod/Reel Haddock SAP. It also adopts additional daily electronic reporting requirements of catch (kept and discarded) for this program.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

This management plan does not include any catch and release recreational management measures, and this proposed action does not address recreational fishing regulations.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors; and

Descriptions of the commercial, recreational, and charter fishing sectors which participate in the fishery, including trends in landings by these sectors, are in section 9.4 of Amendment 13. A brief update for the commercial sector is included in section 6.4.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

Amendment 13 to the FMP established rebuilding plans and conservation measures for groundfish stocks. These programs, and measures adopted to achieve the rebuilding programs, are likely to reduce overall harvest. Proposed management measures restrict harvest levels for all sectors of the fishery. Recovery benefits have been allocated equitably, most notably with respect to haddock: commercial trip limits have been relaxed, and the proposed action removes the haddock bag limit for recreational vessels. The proposed action creates an additional opportunity to target healthy groundfish stocks through the WGOM Closed Area Rod/Reel Haddock SAP. While this SAP provides an

opportunity for hook fishermen to benefit from the ongoing recovery of GOM haddock, any vessel with a limited access permit can choose to participate in this SAP.

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

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

(A) Identify and description of EFH

EFH for the management unit of the Northeast Multispecies FMP has been identified and described in Amendment 10. The Council plans to update these EFH designations through an omnibus amendment that will be initiated in early 2004 and will become Amendment 14 to the Northeast Multispecies FMP.

(B) Fishing activities that adversely affect EFH

(i) Evaluation of potential adverse effects

The EFH Final Rule (50 CFR Part 600) provides guidance to the Regional Fishery Management Councils for identifying fishing activities that adversely impact essential fish habitat (EFH). In addition to the EFH Final Rule, guidance provided by the Habitat Conservation Division (HCD) headquarters office in the form of a memo dated October 2002. This evaluation should primarily include the impacts of activities associated with the fishery that is the subject of the management action, as well as other federally-managed and state-managed fishing activities. Based on the guidance provided by the EFH Final Rule and the HCD office, this determination focuses on the effects of fishing activities in the New England multi-species fishery on groundfish EFH. It also includes information on the effects of other federally-managed fishing activities on groundfish EFH, and identifies gears used in state-managed fisheries that could affect groundfish EFH. Most of the information needed to complete this determination is provided in more detail in previous sub-sections of section 9.3.1 of Amendment 13.

Section 9.3.1.2 of Amendment 13 describes commercial fishing gears used in the Northeast region of the U.S. and the geographic distribution and use of the principal bottom-tending gears in three broadly-defined habitat types. It also evaluates the effects of bottom trawls and dredges on benthic marine habitats in the region. The information in this section serves as the basis for evaluating which gear types, if any, are most likely to have an adverse impact on essential fish habitat for federally-managed species in the NE region.

Section 9.3.1.3 of Amendment 13 evaluates the vulnerability of all 37 federally-managed species to gear types found to have potential adverse impacts on EFH. Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. Results are summarized by species and life stage.

Section 9.3.1.8 of Amendment 13 summarizes the results and findings of this section, identifying the potential adverse impacts of the three principal mobile, bottom-tending gears on three principal bottom types in the region. These results serve as the basis for analyzing proposed alternatives to minimize the adverse impacts of these gears on EFH.

(ii) Minimizing adverse effects

The EFH Final Rule stipulates "each FMP must minimize to the extent practicable the adverse effects of fishing on EFH that is designated under other federal FMPs". Federally-managed species that could be affected by the New England groundfish fishery are listed in section 9.3.1.7 of Amendment 13.

In order to minimize and mitigate the adverse effects of the fishery on EFH the Council implemented effort reductions, gear restrictions and habitat closed areas for bottom tending mobile gear. The Council has determined that the combination of these measures minimizes, to the extent practicable, the adverse effects of fishing on EFH. This includes the adverse effects of the groundfish fishery on all federally-designated EFH as well as the adverse effects of other federally-managed fisheries on groundfish EFH.

(C) Identification of non-Magnuson-Stevens Act fishing activities that may adversely affect EFH
Section 9.3.1.9 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(D) Identification of non-fishing related activities that may adversely effect EFH.
Section 9.3.1.10 of Amendment 13 addresses the requirements of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(E) Cumulative impacts analysis
Section 7.9.2 of this document addresses the requirement of this component.

(F) Identification of conservation and enhancement actions.
Section 9.3.2 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(G) List the major prey species and discussion the location of the prey species' habitat
Section 9.3.3 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(H) Identification of habitat areas of particular concern
Section 9.3.5 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(I) Recommendations for research and information needs

Section 9.3.4 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(J) Review and revision of EFH components of FMPs.

Section 9.3.6 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

8.1.3 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

8.1.3.1 Description of Action

The proposed action is described in section 4.0. In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. The primary purpose of this action is to improve the effectiveness of the Amendment 13 effort control program, including the opportunities developed to use effort to target healthy stocks and other measures that were adopted to facilitate adaptation to the amendment's effort reductions. The Council is considering measures to clarify the DAS allocations and provide a small allocation to all permit holders, modify the DAS leasing and transfer programs, improve opportunities to target healthy stocks, and adjust the GB cod hook sector provisions in order to meet this purpose. The secondary purpose of this action is to consider measures developed to address interactions between the herring fishery and regulated groundfish. This fishery is not allowed to fish for, possess, or land groundfish. Catches of groundfish that occur are wasted and do not contribute to optimum yield in the groundfish fishery.

The proposed action is a suite of management measures that will:

- Reduce the conservation tax for the DAS transfer program to make the Days-At-Sea Leasing and Transfer program more attractive;
- Adjust the incidental TACs due to the increase in Special Access Programs (SAP) programs proposed by this framework action;
- Implement a SAP that would allow hand-tended rod/reel commercial fishing to target haddock inside the WGOM closed area
- Revise the season for the CAII Yellowtail Flounder SAP to July 1 through December 31 to account for the conflicts with peak spawning months for yellowtail flounder on Georges Bank and subsequent reduced demand;
- Allocate a minimum of ten Category B (reserve) DAS to vessels that did not qualify under Amendment 13 to provide for a limited opportunity to participate in some existing SAPs for and have more hope of future participation as stocks rebuild.
- Allow any vessel, regardless of historical gear usage, to join the George's Bank Cod Hook Sector. Future targeting of cod by these vessels will be done using hook gear.
- Removes the requirement that vessels wishing to participate in the DAS Transfer program fall within the tonnage permit upgrade restrictions. This makes the requirements

of the DAS transfer program more similar to the requirements for the DAS leasing program.

- Allow, for the purposes of the DAS leasing program only, permit holders to make a one-time downgrade of the baseline characteristic of their permit (length, horsepower, gross and net registered tonnage).
- Provide DAS credit for limited access groundfish vessels for standing by an entangled whale.
- Require herring fishing vessels, with Category 1 herring permits that catch or intend to catch herring in the Georges Bank or Gulf of Maine Regulated Mesh areas, to contact NMFS and request an observer at least 72 hours in advance of any herring fishing trip in these areas.
- Remove the restriction on the number of nets that can be carried by trip gillnet vessels fishing in any regulated mesh area.

In general, the activity described by this proposed action, fishing for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout) occurs off the New England and Mid-Atlantic coasts within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

8.1.3.2 Assessing the Potential Adverse Impacts

Changes to the DAS leasing and transfer conservation tax (Measure A.1)

This measure reduces the conservation tax scheme for both the DAS leasing and the DAS transfer programs. Creating incentives for permit holders to participate in these programs will increase the rate at which latent DAS and permits will be removed from the fishery. While this may increase active fishing effort over the short-term, it will potentially reduce the amount of latent effort that could be re-applied to the fishery in the long-term as stocks rebuild. Effort reduction was an important tool employed by the Council under Amendment 13 to minimize the adverse effects of bottom-tending gear on EFH. Significant effort reductions and DAS categorizations assisted in, not only rebuilding stocks, but also in reducing the number of DAS that a vessel can use. However, the main mitigation tool employed by the Council to minimize the effects of bottom-tending mobile gear on EFH was the creation of the Habitat Closed Areas. Under this measure, these areas will remain closed and any additional short-term effort resulting from this alternative will be applied outside the Habitat Closed Areas, in areas that are currently being fished. Therefore, the essential fish habitat impacts of this measure will be minimal.

Incidental Catch TACs (Measure B)

This measure increased the incidental TACs for stocks of concern to accommodate the two new proposed SAPs in this framework action. This measure will not increase habitat impacts as it is largely administrative.

Approval of WGOM Closed Area Rod/Reel Special Access Program (Measure C.1

The proposed SAP area is located entirely within the WGOM Habitat Closed Area. However, because rod and reel gear was determined not to impact EFH in a manner that is more than minimal and

less than temporary in nature in Amendment 13 (see section 9.3 of the Amendment 13 FSEIS), there are no habitat impacts of this measure.

Modification to the CA II Yellowtail Flounder SAP (Measure C.2)
The proposed changes to this SAP are not expected to have any habitat impacts.

Minimum effective effort allocation of B (reserve) DAS (Measure D
The proposed measure will re-allocate a minimum of 10 category C DAS as category B (reserve) DAS for those vessels not receiving a minimum effective effort allocation above 0 under Amendment 13. Because these DAS will only be allowed on hook vessels fishing in the Closed Area I Hook Gear Haddock SAP or Western Gulf of Maine Closed Area Rod/Reel SAP, this measure will not produce any discernible habitat impacts.

Changes to George's Bank Cod Hook Sector Vessel Eligibility Criteria (Measure E)
The proposed measure will enable the hook gear sector to use member's GB cod landings, regardless of gear used, to qualify for their TAC share. The method of qualification, as it relates to habitat impacts, is moot because the TAC will be fished using hook gear which has been shown not to impact habitat in a manner that is more than minimal and less than temporary in nature. The proposal to take a larger portion of the TAC with a gear that has no adverse habitat is an approach that is supported by current Council EFH policy to "Modify fishing methods and create incentives to reduce the impacts on habitat associated with fishing". Therefore, the measure will not produce any discernible habitat impacts.

Change to DAS Baseline Calculation (Measure F)
No change proposed.

Removal of tonnage from DAS transfer program restrictions (Measure G)
This measure proposes to only base the assessment for transfer on the length and horsepower characteristics of the vessel and remove the tonnage variable. This measure will not have any discernible habitat impacts as it will not increase effort or infringe on Habitat Closed Areas.

One-time Permit Baseline Characteristics Downgrade (Measure H)
This measure proposes to allow a one-time downgrade of the baseline characteristics for a permit to encourage the use of the DAS transfer and leasing programs. This measure will reduce the amount of latent fishing capacity inherent in small permits but may increase the amount of short-term active fishing effort. While this may increase active fishing effort over the short-term, it will potentially reduce the amount of latent effort that could be re-applied to the fishery in the long-term as stocks rebuild. Effort reduction was an important tool employed by the Council under Amendment 13 to minimize the adverse effects of bottom-tending gear on EFH. Significant effort reductions and DAS categorizations assisted in, not only rebuilding stocks, but also in reducing the number of DAS that a vessel can use. However, the main mitigation tool employed by the Council to minimize for the effects of bottom-tending mobile gear on EFH was the creation of the Habitat Closed Areas. Under this alternative, these areas will remain closed and any additional short-term effort resulting from this alternative will be applied outside the Habitat Closed Areas, in areas that are currently being fished. Therefore, the essential fish habitat impacts of this measure will be minimal.

DAS Credit for Standing by Entangled Whales (Measure I)
This measure proposes to provide DAS credit for a vessel to stand by an entangled whale while the appropriate authorities locate the reported entanglement and arrive on the scene.

Herring Vessel Interactions With Regulated Groundfish (Measure J)

The proposed measures consider restrictions on the use of midwater trawls in groundfish mortality closed areas (and the portions of the habitat closed areas that they include) to avoid the catch of species of groundfish that are managed under the Multispecies FMP. The habitat impacts of midwater trawls in this fishery have been determined to be minimal and temporary in nature (See Section 9.3 of Amendment 13 and EFH DEIS for Herring FMP). Therefore, this measure will not have any discernible habitat impacts.

Trip Gillnet Net Limitations (Measure K)

This measure proposes to remove the restriction for nets and net tags on trip gillnet vessels. Gillnets have been determined not to cause habitat impacts that are more than minimal (See Section 9.3 of Amendment 13) and, as such, the EFH impacts of this measure will be minimal.

Section 7.2.1.3 provides a complete assessment of the potential habitat impacts of the proposed measures. The actions proposed by this framework will not compromise the established strategy by the Council under Amendment 13 to the Northeast Multispecies to minimize adverse impacts. The primary tool used in this strategy was to establish a network of habitat closed areas where the use of bottom-tending mobile gear is prohibited. While this framework may allow for slight increases in the use of bottom-tending gears in the region, none of these gears are proposed to operate in either the Habitat Closed Areas or the designated Habitat Areas of Particular Concern. Additionally, gear that is allowed to operate in SAPs within the Habitat Closed Areas are not bottom-tending gears (hook gear) and, thus, will not compromise the performance of the Habitat Closed Areas. Over time and space that is addressed by this actions, the adverse effects on the EFH of any managed species by this action will not be more than minimal and temporary in nature relative to the baseline conditions established under Amendment 13.

8.1.3.3 Minimizing or Mitigating Adverse Impacts

Section 7.2.1.3 demonstrates that the overall habitat impacts of all the measures combined in this action have minimal negative impacts relative to the baseline habitat protections established under Amendment 13. In addition, the fishery must respect the 2811 square nautical miles of habitat closed areas established by the Amendment 13. Therefore, any additional effort will occur in areas that are already open to bottom tending mobile gears or by gears that have been determined to not adversely impact EFH in a manner that is more than minimal and less than temporary in nature. Therefore, measures to mitigate or minimize adverse effects on EFH are not necessary.

8.1.3.4 Conclusions

The action proposed under this framework adjustment should have no more than a minimal adverse effect on EFH of federally managed species. A brief summary of the expected habitat impacts is described here. See section 7.2.1.3 for a complete description of the habitat impacts.

- Changes to the DAS Leasing and Conservation Tax (Measure A.1): Impacts on essential fish habitat are minimal.
- Incidental Catch TACs (Measure B): Will not increase habitat impacts.
- WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2): This measure will not have any habitat impacts.
- Closed Area II Yellowtail Flounder SAP Changes (Measure C.3): This measure will not compromise the baseline level of protection for essential fish habitat.
- Minimum Effective Effort Allocation (Measure D): This measure will not produce any discernible habitat impacts.

- GB Cod Hook Sector Revisions (Measure E): This measure will not produce any discernible habitat impacts.
- Changes to DAS Effective Effort Calculation (Measure F): As long as additional Category B DAS are used in currently defined SAPs and not by bottom-tending gear in Habitat Closed Areas, the habitat impacts will be negligible.
- Removal of the Tonnage Criterion for the DAS Transfer Program (Measure G): This measure will not have any discernible habitat impacts as it will not increase effort or infringe on Habitat Closed Areas.
- Permit Baseline Characteristics Downgrade (Measure H): This measure will have minimal habitat impacts as it will not increase effort or infringe on Habitat Closed Areas.
- DAS Credit for Standing by Entangled Whales (Measure I): There will be no habitat impacts of this measure.
- Herring Vessel Interactions with Regulated Groundfish (Measure J): This alternative will cause minimal impacts on habitat as the use of herring midwater trawls does not result in impacts to EFH that are more than minimal and less than temporary.
- Removal of Net Limit for Trip Gillnet Vessels (Measure K): Gillnets have been determined not to cause habitat impacts that are more than minimal and, as such, the EFH impacts of this measure will be minimal.
- Category B DAS Observer Requirement (Measure L): This measure will have no habitat impacts.

Because there are no substantial adverse impacts associated with this action, an abbreviated consultation may be the only required action.

8.1.4 Skate Baseline Review

8.1.4.1 Introduction

The Skate FMP identified and characterized a baseline of management measures in other fisheries that provide additional conservation benefits to skate species. The FMP requires that if the Council initiates an action in another FMP that changes one or more of the baseline measures such that the change is likely to have an effect on the overall mortality for a species of skate in a formal rebuilding program, then a baseline review is required. In general, this section will evaluate whether the measures proposed and under consideration in this framework will have a greater impact on overall skate mortality as compared to the additional benefits of other measures implemented in this action as well as recent actions such as significant reductions in allocated DAS in Amendment 13.

A baseline review must be initiated if one of seven categories of management measures are changed which have been identified as beneficial for skates. The seven categories of management measures identified in the Skate FMP are: (i) NE Multispecies year-round closed areas; (ii) NE Multispecies DAS restrictions; (iii) Gillnet gear restrictions; (iv) Lobster restricted gear areas; (v) Gear restrictions for small mesh fisheries; (vi) Monkfish DAS restrictions for monkfish only permit holders; and (vii) Scallop DAS restrictions (see Section 4.1.6 of the Skate FMP for more details). Framework 40B triggered a skate baseline review because it considered changing several measures which have been identified as beneficial for skates: 1) NE Multispecies year-round closed areas; 2) gillnet gear restrictions; and 3) NE Multispecies DAS restrictions.

First, Framework 40B considered two new special access programs to allow multispecies vessels to use Category B DAS to target rebuilding stocks: the GB Haddock Fishery North of Closed Area I (Measure C.1) (which is not within one of the year-round closed areas), and Measure C.2 – the WGOM Closed Area Rod/Reel Haddock SAP. Measure C1 is not part of the proposed action. This framework action is also proposing several modifications to the existing SAP in Closed Area II for Yellowtail flounder (Measure C.3). Framework 40B is also proposing a measure that would remove the restriction on the number of nets permitted onboard trip gillnet vessels (Measure K). Under this measure, trip gillnet vessels would still be required to remove all gillnets from the water and carry them on board when returning to port. As a result of the Framework 33 lawsuit, the number of allowable gillnets was restricted to 150 for Gulf of Maine trip gillnet vessels, 50 nets for Georges Bank trip gillnet vessels, and 160 nets for Mid-Atlantic trip gillnet vessels. Measure K in Framework 40B is proposing the allowance of trip gillnet vessels to use an unlimited number of nets.

Lastly, there are several measures considered in this action that could change the NE Multispecies DAS restrictions. One measure being proposed could actually decrease the amount of DAS allocated based on a conservation tax on DAS leasing and DAS transfers (Measure A.1). On the other hand, one measure being proposed in this action could increase the number of allocated Category B DAS (Measure D-Minimum Effective Effort Allocation). Measure F- Change to DAS Effective Effort Calculation (option 2 and option 3) could also increase the number of Category B DAS, however neither of these options (Option 2 or 3) were selected as part of the proposed action. Measure F, Option 4 keeps the DAS allocations as implemented for FY 2004 under Amendment 13.

It is important to point out that the skate baseline review is only required for skate species that are currently in a formal rebuilding program. Of the seven skate species managed under the Northeast Skate Complex FMP, only two species are in a formal rebuilding program: thorny and barndoor. Therefore, this

baseline review will only evaluate the impacts of the measures considered in this framework action on the mortality rates of these two species. Furthermore, the Skate FMP identifies only seven categories of management measures that would trigger a baseline review. Therefore, while there may be other measures considered in this framework action that could indirectly increase or decrease overall skate mortality, the baseline review is only required to evaluate the seven identified categories of measures. Therefore, this baseline review will assess only three of the seven categories of management measures: 1) NE Multispecies year-round closed areas; 2) gillnet gear restrictions; and 3) NE Multispecies DAS restrictions. Before the measures are assed, the following section will summarizes updated information on the stock status for skate species under a formal rebuilding program.

8.1.4.2 Updated Stock Status for Thorny and Barndoor Skates

The overfishing definitions in the Skate FMP are based on a three-year moving average survey index. Since the FMP was submitted there have been additional biomass surveys that may show new trends in skate population rebuilding. Table 157 shows the Autumn survey indices for the two species of skate that are in a formal rebuilding program. Updated values for 2002 and 2003 have been added to the bottom of the table, as well as a new three-year average (2001-2003) for each species. According to the respective three-year average updated through 2003,barndoor biomass has increased, while thorny biomass has declined slightly. Figure 51 show the spatial distributions of barndoor and thorny skates based on NMFS Autumn trawl survey data (1963 – 2003). In general, barndoor skate is distributed on Georges Bank and southern New England, while thorny skate is found primarily in deeper waters throughout the Gulf of Maine, and secondarily, along the southern edge of Georges Bank.

This baseline assessment focuses on the Autumn survey for several reasons. First, the Autumn survey was determined to be the most appropriate survey to use for overall biomass estimates for these two species. Second, the spatial distributions of the two surveys are relatively consistent for barndoor and thorny skates, thus analyzing both is redundant.

Table 158 represents the total number of skates caught for the entire 41-year time series (1963-2003). The survey area includes Federal waters from Maine to North Carolina, as well as some inshore locations and stations in Canadian waters. For the entire time series, about 19.8% of the survey tows caught one or more thorny skates, but the majority of stations in the Gulf of Maine had positive tows for thorny skate. It is important to point out that since neither barndoor nor thorny skates live in the Mid-Atlantic region, including those stations in the total Autumn survey database reduces the overall percent of tows that caught those species of skates.

Table 159 depicts the number of skates caught on the Autumn survey within the groundfish mortality closed areas. This table documents the “baseline” skate mortality protection afforded by the groundfish mortality closed areas, as described in the Skate FMP. It is important to note that these values are only an estimate of abundance inside versus outside of the groundfish mortality closed areas because station density inside and outside the closed areas is not consistent from year to year. Therefore, it is difficult to compare the number of skates caught inside versus outside the groundfish mortality closed areas. The NMFS survey is stratified based on predefined strata, not a specific number of stations inside and outside the closed areas. With that in mind, 123 individual barndoors of the 727 barndoor skates recorded in the full time series were from within the boundaries of the groundfish closed areas (17%). In terms of thorny skates, thirteen percent of all the thorny skates recorded from the NMFS Autumn survey from 1963-2003 were found within the boundaries of the groundfish mortality closed areas as compared to the entire area (1,391 / 10,586).

	BARNDOOR	THORNY
YEAR	**AUTUMN SURVEY (kg/tow)**	**AUTUMN SURVEY (kg/tow)**
1992	0.002	0.96
1993	0.14	1.66
1994	0.04	1.51
1995	0.11	0.78
1996	0.04	0.81
1997	0.11	0.85
1998	0.09	0.65
1999	0.30	0.48
2000	0.29	0.83
2001	0.54	0.33
1999-2001 Three-year average	**0.38**	**0.55**
Values above this line are from the Skate FMP. Values below are new updates.		
2002	.78	.44
2003	.55	.74
2001-2003 Three-year average	**0.62** *(+ 0.24 since FMP)* *(0.19 below threshold)*	**0.50** *(- 0.05 since FMP)* *(1.7 below threshold)*
SAW 30 Biomass Threshold	0.81	2.20
CURRENT STATUS	**OVERFISHED**	**OVERFISHED**

Table 157 – NEFSC Autumn survey indices and updated status of Barndoor and Thorny skates

Number of skates in the entire survey area

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	727
	Total weight of barndoor caught (kg)	2,147
	Number of tows in the entire survey area that caught barndoor	371 (2.6%)
	Average number of barndoor skates caught per year	17.7
THORNY	Number of thorny skates	10,586
	Total weight of thorny caught	22,758
	Number of tows in the entire survey area that caught thorny	2,816 (19.8%)
	Average number of thorny skates caught per year	258.2

Table 158 – Number of barndoor and thorny skates from the NMFS Autumn trawl survey (1963 through 2003).

Number of skates found within the groundfish mortality closed areas

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	123
	Total weight of barndoor caught	327
	Number of tows in the GF mortality closed areas that caught barndoor	60
	Average number of barndoor skates caught per year	3.0
THORNY	Number of thorny skates	1,391
	Total weight of thorny caught	2,720
	Number of tows in the GF mortality closed areas that caught thorny	266
	Average number of thorny skates caught per year	33.9

Table 159 – Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the Groundfish closed areas (1963 through 2003).

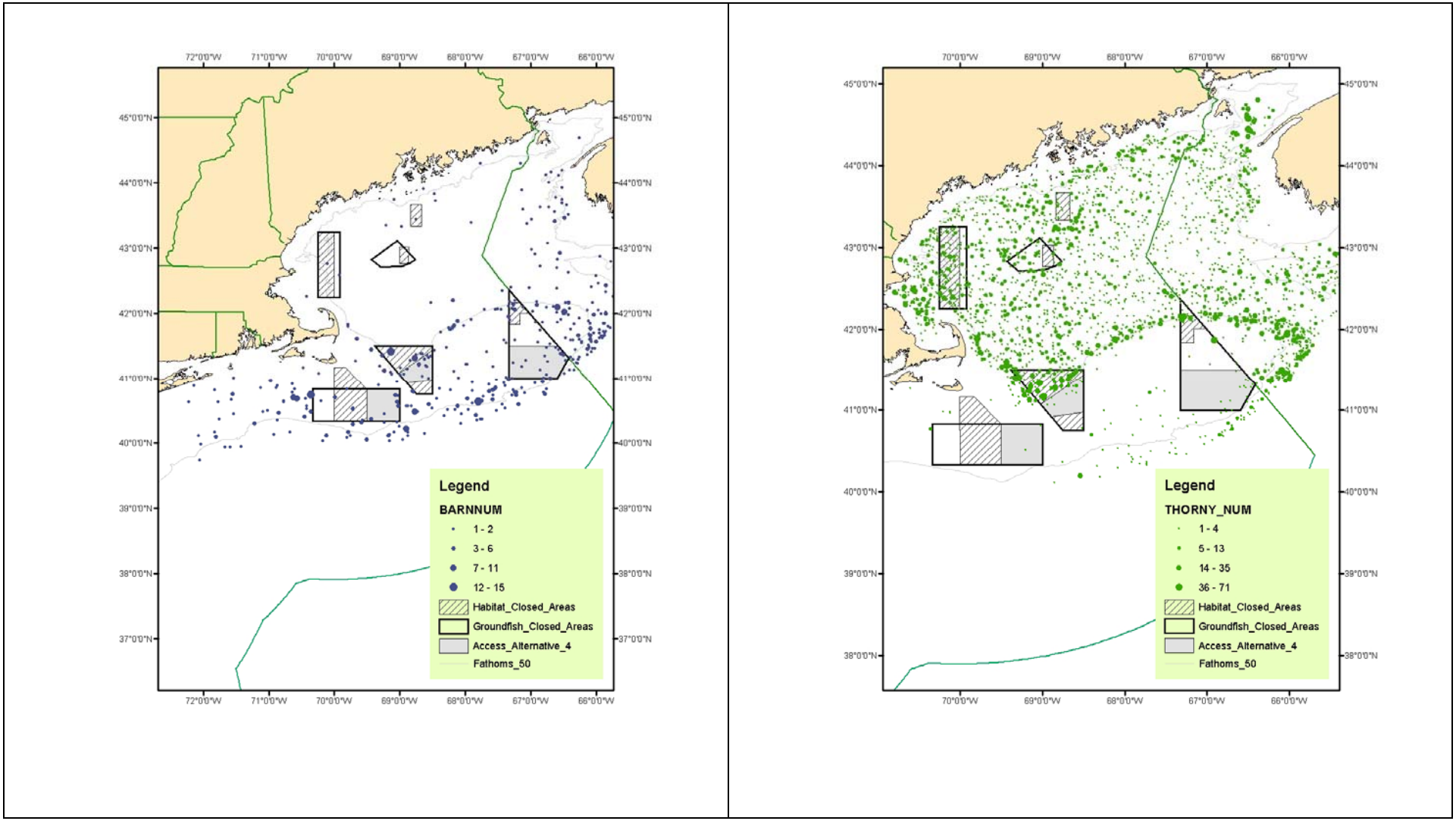

Figure 51 - Distribution of Barndoor skate (left) and Thorny skate (right) from NMFS Autumn trawl survey data (1963 – 2003)

8.1.4.3 Measures that consider changes to the NE Multispecies year-round closed areas

Framework 40B considered two new SAPs and changes to an existing SAP. The GB Haddock Fishery North of Closed Area I (Measure C.1) is not within one of the year-round closed areas, thus does not formally trigger a skate baseline review. Note, Measure C.1 is not part of the proposed action. Furthermore, the Closed Area II Yellowtail Flounder SAP (Measure C.3) does not formally trigger a baseline review because this SAP has been approved already under Amendment 13. This Framework is proposing to make the existing yellowtail SAP more restrictive than the one adopted in Amendment13 by shortening the season and limiting the number of trips that can be taken by a vessel per month. The potential impacts of this SAP on skate mortality will be discussed briefly, but since this program has been approved already, it does not formally trigger a baseline review. Measure C.2, the WGOM Closed Area Rod/Reel Haddock SAP is the third SAP being considered in this framework. Figure 51 displays an overlap of the three SAPs considered and distribution of barndoor and thorny skates based on the Autumn Trawl Survey.

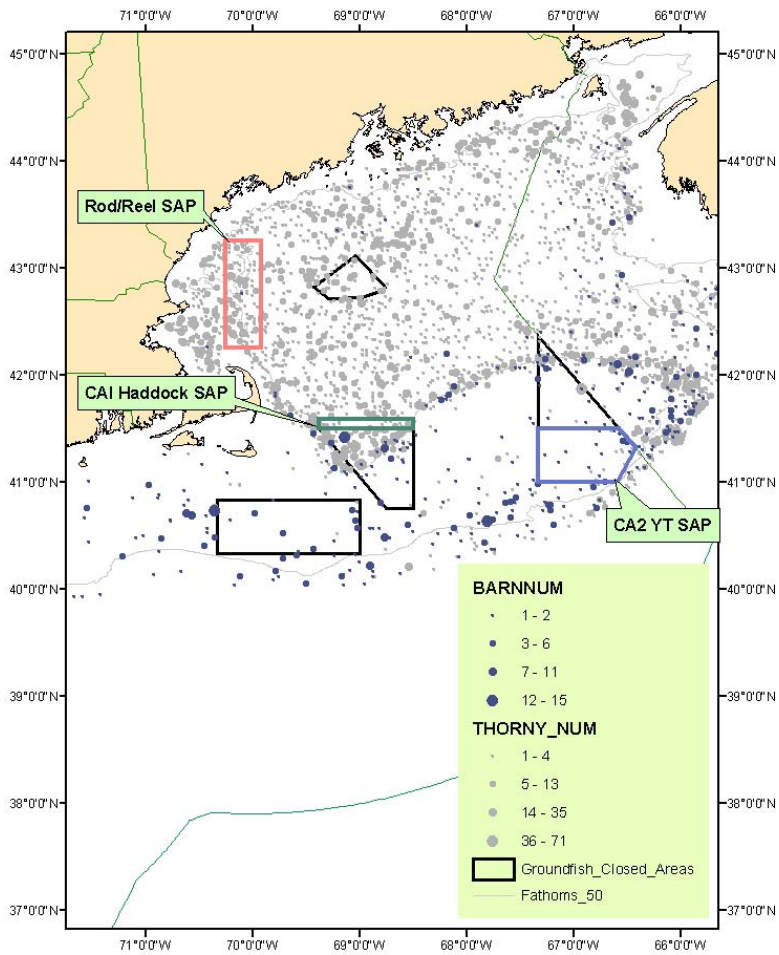

Figure 52 – Overlap of three SAPs considered and distribution of Barndoor (dark gray) and Thorny skate (light gray) from NMFS Autumn trawl survey data (1963 – 2003).

** Note: CA1 Haddock SAP is not proposed.*

8.1.4.3.1 GB Haddock Fishery North of Closed Area I SAP (Measure C. 1)

The GB Haddock Fishery North of Closed Area I SAP (Measure C.1) is not within one of the year-round closed areas, thus does not formally trigger a skate baseline review. Furthermore, this measure is not part of the proposed action. However, the potential impacts of this SAP on overall skate mortality will be discussed briefly. An experiment has not been conducted that estimates the incidental catch rates of non-target species in this area north of Closed Area I. However, the Groundfish PDT has used recent observer reports and several gear experiments to evaluate the impacts of the proposed SAP on non-target species. The details and constraints of the data used are explained in section 7.3.1.1. Table 90 summarizes the species caught on observed tows from 2000 to 2003 where haddock was listed as the target species. Several different skate species were caught on these tows, and accounted for roughly 8.5% of the total catch observed in this area. However, a haddock separator trawl will be required for this SAP, and there is evidence that most of the skate bycatch would be eliminated using the separator trawl.

A survey by DFO (1992) reported an almost complete absence of skate species in the top cod end during an experiment conducted in 1992, which used similar haddock separator trawl. More recently, Raymond and Manomet (2004) tested a haddock separator trawl on Georges Bank (some tows north of Closed Area I). Overall, about 94% of the total skate catch was within the bottom cod end, while only 6% was in the top cod end. Therefore, the vast majority of skates are expected to be avoided from this SAP due to the requirement of the proposed haddock separator trawl gear. Overall, it is not likely that effort in this SAP will have a negative impact on overall skate mortality, since this SAP proposes to allow a relatively small amount of fishing effort (about 178-358 Category B DAS), this area is fished already by other gears and fisheries, and most of the skates encountered with the haddock separator trawl are not expected to be caught.

8.1.4.3.2 WGOM Closed Area Rod/Reel Haddock SAP (Measure C.2) *(Proposed)*

Similar to the Haddock SAP north of Closed Area I, an experiment has not been conducted within the WGOM closed area that estimates the incidental catch rates of non-target species in this area. In the absence of those estimates, the Groundfish PDT has used the party/charter VTR logbook data to determine the likely catches of non-target species from rod and reel gear within this SAP. The details and constraints of the data used are explained in section 7.4.1. About 5,420 party/charter trips reported to the VTR database in calendar year 2003, which used handgear within the Gulf of Maine. These reports have been summarized to determine if there was a significant level of skate bycatch. Of the 5,420 trips reported in 2003, only 53 unclassified skates were reported as discards, out of about 208,000 fish that were reported as discards on the same trips. None of the 53 skates reported as discards were during the months of March and April, the time period this SAP is being proposed. While these data are not specific to the proposed area, or commercial fishery that will participate in this SAP, they do indicate that the level of skate bycatch from rod and reel gear is expected to be low, thus the impact of this SAP on overall skate mortality is not expected to be significant. As for the observer database, there were fewer than ten observed trips for vessels using handline gear in 2002 and 2003, and no skate records were reported on those trips. In addition, there is no directed skate fishery using rod and reel gear, therefore the effectiveness of this gear to target skates is expected to be low. According to the Skate FMP, otter trawl gear is the primary gear type used to catch skates, and gillnets are secondary. Hook gear averaged 0% of total skate bait landings and about 1% of the total skate wing landings from 1995-1999 (NMFS weighout database). Therefore, according to the data available, the level of skate discards from this SAP are not expected to be substantial enough to impact the overall mortality of skates.

In addition, the level of effort that will be available under this SAP is most likely small, because this SAP is limited to a hard TAC of 50 mt of haddock. The number of DAS needed to harvest this TAC is unknown, because there are no estimates of catch rates for this handline fishery. The total TAC for haddock is 4,000 mt, and the entire groundfish fishery currently lands about 1,000 mt; thus an additional 50 mt is not expected to amount to a great deal of additional mortality. In addition, this SAP will expire two years after implementation; therefore, if high skate discards become an issue, the Regional Administrator has the authority to end the program after two years.

Based on Figure 51, there are essentially no records of barndoor catch from within in the WGOM closed area. On the other hand, thorny skates are distributed throughout the WGOM closed area, as well as most of the Gulf of Maine. Table 160 depicts the number of skates caught on the Autumn survey within the WGOM closed area. Over the entire 41-year time series (1963-2003), only two barndoor skates have been recorded within the boundaries of the WGOM closed area. Therefore, this SAP is expected to have no impacts on the overall mortality of barndoor skates. About 390 thorny skates were recorded within the WGOM closed area during the same time period. While this seems like a significant amount, it is important to recognize that a substantial portion of thorny skate distribution is still within the other groundfish year-round mortality closed areas, especially Closed Area I. According to this data set, about 12% of the total thorny skate distribution by weight in the entire survey area is contained within the boundaries of the five year-round groundfish mortality closed areas (2,720 mt / 22,758 mt). About 4% of the total thorny skate distribution by weight is contained within the WGOM closure (911 mt / 22,758 mt). Therefore, there is still a significant portion of the thorny skate population protected by the year-round groundfish mortality closed areas. While the specific level of skate bycatch from this gear type is uncertain for this area, existing VTR and observer data do suggest that the level of skate discards from rod and reel gear is small. The Skate PDT does not expect the overall impact from the SAP to be significant since it is proposing a level of effort that will harvest only 50mt of haddock, and the program is proposed for a very limited window of time (March-April).

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	2
	Total weight of barndoor caught	5
	Number of tows in the WGOM closed area that caught barndoor	2
	Average number of barndoor skates caught per year	0.05
THORNY	Number of thorny skates	390
	Total weight of thorny caught	911
	Number of tows in the WGOM closed area that caught thorny	125
	Average number of thorny skates caught per year	9.5

Table 160 - Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the WGOM closed area (1963 through 2003).

8.1.4.3.3 Closed Area II Yellowtail Flounder SAP (Measure C.3) *(Proposed)*

Since this SAP was already adopted under Amendment 13, this framework action does not propose changing existing regulations to make access less restrictive. Therefore this measure does not formally trigger a skate baseline review; however the potential impacts on skates will briefly be discussed. This measure could actually make the existing SAP more restrictive by shortening the access period by one month, limiting participating vessels to one trip per month, and limiting the total number of trips each vessel can take. The start date of the existing SAP is June 1; this Framework proposes to change the start date to July 1. All other provisions under this SAP would remain the same.

According to Figure 51, the SAP area under consideration is located on the periphery of the range of thorny skate distribution. Fishing on Georges Bank would be unlikely to have a significant impact on thorny skate mortality. In fact, if groundfish fishing effort from parts of the Gulf of Maine and the Great South Channel shifts into this SAP, then fishing-related thorny skate mortality would be expected to decrease as a result of this action as fishing effort would decrease in areas where thorny skates are more abundant. Table 161 depicts the number of skates caught on the Autumn survey within the Yellowtail Flounder SAP under consideration. Over the entire 41-year time series (1963-2003), only 18 thorny skates have been recorded within the boundaries of this SAP. Furthermore, about 20 barndoor skates were recorded in this area.

Amendment 13 already assessed the likely impacts of this SAP on skate bycatch, therefore it is not necessary to re-examine that assessment here, since the only change proposed in this Framework is the start date of the program, and the number of trips. The Skate PDT does not expect the change of the start date to have any impact on overall skate mortality. For background purposes, a summary of the experiment conducted before the original SAP was implemented is described below.

An experimental fishery was conducted in the southern portion of Closed Area II prior to implementing the original SAP. According to that experiment, three of the seven managed skate species were caught. Based on total weight of catch, winter skate was second overall after yellowtail flounder,

little skate was fourth, and barndoor skate was eighth. Thorny skates were not caught at all. Therefore, the only skate species of concern in terms of the skate baseline review is barndoor skates. While barndoor skates were caught in this experiment, it is important to point out that the bycatch rate of barndoor skates was significantly lower in areas within the access program with high concentrations of yellowtail flounder, versus the entire access area. The locations of fishing effort from the original SAP in FY2004 are not available yet, but it can be assumed that the majority of effort was in areas with higher concentrations of yellowtail flounder. Table 111 in Amendment 13 summarizes that the bycatch rate of barndoor skate from the experiment in the SAP area with high concentrations of yellowtail was about 19% lower than the barndoor skate bycatch rate for the entire access area. There is no data available on the survivability of skates released as discards; however, the Skate PDT has discussed that skate survivability may be higher than most species because skates seem to be more robust when they are returned to the water. However, more research is needed to assess the actual mortality rates of skate bycatch after release.

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	20
	Total weight of barndoor caught	39
	Number of tows in the CAII YT SAP that caught barndoor	14
	Average number of barndoor skates caught per year	0.49
THORNY	Number of thorny skates	18
	Total weight of thorny caught	2.9
	Number of tows in the CAII YT SAP that caught thorny	12
	Average number of thorny skates caught per year	0.44

Table 161 - Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the Closed Area II Yellowtail Flounder SAP (1963 through 2003).

8.1.4.4 Measure that considers changing the gillnet gear restrictions *(Proposed)*

Measure K (Removal of net limit for trip gillnet vessels) is the only measure under consideration that would trigger the skate baseline review in terms of gillnet gear restrictions. Currently there are specific gillnet limits for trip gillnet vessels depending on what area they are fishing in. Limits on the number of gillnets were recently implemented as part of the settlement for the Framework 33 lawsuit. The Skate FMP states that gillnet vessels land mostly skate wings (winter, barndoor and thorny) and this vessel type represented an average of 8.5% of total skate landings between 1994-2000. It is uncertain whether the restriction on the number of allowable gillnets has impacted the percentage of skate landings from gillnet vessels.

Section 7.2.1.1 describes the biological impacts on removing the net limit for trip gillnet vessels on groundfish species and other species. The number of trip gillnet vessels peaked to 127 in FY2001, but declined to 68 by FY2003. The number of DAS allocated to trip gillnet vessels (excluding carry-over, sanctions, etc.) peaked at 12,413 DAS in FY2001 but declined to 4,126 in FY2003. The number of DAS used by vessels that declared as trip gillnet vessels was 4,092 in FY2001 but declined to 2,754 in FY2003.

VTR records were summarized for vessels declared in the trip gillnet vessel category for FY2001 – FY2003 to give an indication of the stocks most likely to be affected by the removal of the gillnet cap. Overall, skates were not a major component of the total catch in any of the areas assessed (GB, GOM, SNE/MA). Reported discards were also summarized (Table 67). On GB, the vast majority of reported discards were dogfish (92-98%), and the remainder was cod, pollock or skates. Skates were not a major component of reported discards from trips in the GOM. Various skate discards were reported in the SNE/MA area, significantly more in 2001, than 2002 or 2003. The observer database was also queried to determine if there were other stocks discarded that were not reported to the VTR. Overall, the information from the observer database is similar to the VTR reports. Skates (primarily little and winter) accounted for about 4% of the total observed discards from trips in the GB area from 2001-2003. Thorny skates accounted for about one percent of the observed total discards in the GOM. There was a significant amount of skate discards reported in the SNE/MA area, primarily little skates in 2003.

Section 7.2.4.12 summarizes the economic impacts of this measure. Removal of the net limit for trip gillnet vessels would provide operators greater flexibility to change targeting decisions as fishing conditions warrant. Section 7.2.4.3 assesses the number of gillnets used by vessels prior to the net limit implemented in 2002. VTR data from 2001 was evaluated and these data indicate that the number of nets used on groundfish trips was less than 150 nets for 90% of all trips taken in either the GOM , GB, or SNE/MA stock areas (Table 74). The maximum number of nets used in the GB stock area was 160 while the maximum number of nets used in the GOM was 300. If past experience is a reliable predictor of future use, removing the net limit on Georges Bank may not result in any appreciable change in biological impact, i.e. increased interaction with skates. However, the maximum number of nets used in the GOM during FY2001 was twice that of what is currently allowed. Therefore, if removing the limit on gillnets used by trip gillnet vessels in the GOM leads to an increase in the number of gillnets used in the GOM, like some trips in the past, more nets may be fished in the GOM.

Overall, the biological and economic assessment of this measure conclude that removing the limit on the number of nets fished by trip gillnet vessels will likely increase the number of nets fished, particularly in the GOM; however, skates are not a significant portion of the reported landed or discarded species in the GOM. Furthermore, the only species of concern for the skate baseline review are thorny and barndoor, and these species were not reported as landed or discarded in significant numbers according to this analysis. Therefore, this measure is not expected to have negative impacts on the overall mortality of skates in terms of the skate baseline review.

8.1.4.5 Measures that consider changes to the NE Multispecies DAS restrictions

The Skate FMP's baseline of management measures with respect to groundfish DAS was established according to the effort level prescribed in the interim action (about 62,000 DAS available to the entire fleet). Amendment 13 to the Multispecies FMP categorized DAS into A, B (regular and reserve), and C DAS. This change in designating DAS into several different categories is an important shift in management, especially when you consider the restrictions on their use. For example, Amendment 13 allocated about 43,000 Category A DAS, which are DAS that can be fished anywhere in open areas. Amendment 13 also allocated a specific number of Category B DAS that can only be used to target healthy stocks through programs like special access programs (SAPs). Amendment 13 allocated about 14,500 Category B regular and about 14,500 Category B reserve DAS. Amendment 13 also allocated Category C DAS, which do not represent actual effort because these DAS were established according to the level of latent effort that existed during the qualifying time frame; therefore, they are unavailable for use at this time.

Therefore, since the baseline assessed under the FMP, there are significantly less Multispecies DAS that can be fished in open areas (Category A DAS). The special access programs under consideration in this action will make some Category B DAS available for fishing that were already allocated under Amendment 13. Category B DAS have strict limitations that are expected to have minimal impacts on overall skate mortality, because they are designed to target healthy stocks with low bycatch levels. There are two measures being considered in this action that may change the DAS restrictions as compared to the baseline assessed in the Skate FMP. One measure is considering allowing some vessels to re-categorize ten Category C DAS to Category B reserve DAS (Measure D). And Measure F.2 is considering changing the DAS effective effort calculation used in Amendment 13.

8.1.4.6 Minimum Effective Effort Allocation (Measure D) *(Proposed)*

This measure proposes allowing any permit that was not allocated any Category A or B DAS, to re-categorize ten of the permit's Category C DAS to ten Category B (reserve) DAS. These DAS would only be allowed to be used in the CAI Hook Gear Haddock SAP or the WGOM Closed Area Rod/Reel Haddock SAP. Overall, this measure is expected to allocate about 4,000 Category B (reserve) DAS; Category A DAS will remain the same. At present, these DAS can only be used in the two SAPs previously mentioned, which are both handline gear only. Based on available data, the level of skate bycatch from handline gear does not seem to be substantial. This effort will be limited to the CAI Hook Gear SAP or the WGOM Rod/Reel SAP, neither of which have been determined to have overall negative impacts on skate mortality. It is important to keep in mind that SAPs are limited by hard TACs, trip limits, and other measures that limit effort.

8.1.4.7 Change to DAS Effective Effort Calculation (Measure F, Option 2 and Option 3)

These options considered changing the calculation used to determine DAS allocations implemented by Amendment 13. Neither of these options are part of the proposed action. Under Option 2, a permit's effective effort would be based on the maximum number of DAS used in any fishing year between 1996 and 2001, *not* limited by the permit's allocation in FY2001. It has been projected that this change would not impact the number of Category A DAS allocated, but the number of Category B DAS could increase by about 7 - 8,000 DAS. Under Option 3, the use of carry-over DAS would not be allowed to influence a vessel's allocation, and the number of Category B DAS allocated under this option would not be as high as under Option 2. It is important to keep in mind that Category B DAS are not DAS immediately available for use, they are DAS for use in specific, limited access programs that are controlled by hard TACs, trip limits, etc. Therefore, while this measure may increase the number of Category B DAS, that does not translate into more effort, those DAS are for specific access programs only. Thus, as a stand-alone measure, this measure does not increase actual fishing effort, thus there are no impacts on skate mortality.

Option 1 is the proposed action. This option defines a permit's effective effort (baseline allocation) as the maximum number of DAS used in any fishing year between 1996 and 2001, limited by the permit's allocation in FY 2001. Only fishing years where the permit landed 5,000 pounds or more of regulated groundfish are considered in the calculation. This measure keeps the DAS allocations as implemented for FY 2004 under Amendment 13.

8.1.4.8 Conclusions

Overall, none of the measures that triggered this skate baseline review are expected to have negative impacts on the overall mortality of skates. One of the access programs under consideration, but not proposed, is actually outside of the year-round closed areas, thus is not considered to have direct

impacts on the skates that are "protected" within the mortality closures. The CAII Yellowtail flounder SAP has been approved already under Amendment 13, this action only proposes to change the start date, total number of trips, and number of trips per month, and those adjustments are not expected to impact overall skate mortality. Therefore, the only access program under consideration that triggers a skate baseline review is the WGOM rod/reel Haddock SAP. The impacts on overall skate mortality from this proposed SAP are expected to be minimal.

In addition, the measure that is proposing the removal of the restriction on the number of nets a trip gillnet vessel may carry is not expected to have negative impacts on skate mortality; however, it is unknown whether removing this restriction will actually translate into more nets in the water. If past behavior can be used to assume future use, it is possible that more nets could be used in the GOM, according to VTR reports from trip gillnet vessels in FY2001. However, according to the species reported as discards to the VTR database from 2001-2003, skates were not a major component of reported discards from trips in the GOM. Lastly, the two measures that considered changing the NE Multispecies DAS allocations are not expected to have negative impacts on overall skate mortality because these measures do not allocate more DAS immediately available for use, they propose to allocate additional B DAS, which have many restrictions that will limit effort including hard TACs and trip limits. Therefore, no measures proposed in this action would require additional measures to reduce the impacts of this action on skate mortality, since no significant impacts have been identified.

Furthermore, as DAS are reduced, fishermen may adjust fishing practices and behavior to adapt to the reduced number of allocated groundfish DAS. Significant reductions in Multispecies DAS could result in even more reductions in skate fishing effort than expected because fishermen will be less likely to direct their effort on skates. If fishermen are allocated less DAS, they want to make as much money as possible from each day, and skates are not as lucrative as other species.

Recommendations

The Skate PDT does not expect overall negative impacts on skate mortality as a result of the measures under consideration in this action. Even though Category B effort may increase, portions of the mortality closed areas could be opened to limited fishing effort, and net restrictions may be lifted for trip gillnet vessels, the overall open area DAS allocated to the fleet is still significantly lower than allocated DAS evaluated in the skate baseline review. Overall, the impacts of this action on skate mortality are expected to be minimal.

The Skate PDT does recommend additional data collection and research that would improve the assessment of skate mortality from bycatch and the impacts of fishing.

- The Skate PDT recommends that a discard mortality study (for example, a skate tagging program) should be initiated as soon as possible to determine the actual discard mortality rates of barndoor and other skate species released as bycatch. Until this information becomes available, it will remain very difficult to predict skate mortality rates from bycatch and the actual impacts this type of access program is likely to have on skate rebuilding.
- Recognizing that the design, development, and implementation of a discard mortality study is a long-term project, the Skate PDT also recommends that observers collect additional information regarding skate bycatch in both proposed access programs. The Skate PDT requests that NMFS provide special instructions to the observers on these access programs. Specifically, the Skate PDT is requesting that observers be trained to identify all skate species accurately, and, in addition to the number of skates caught, the number and viability (or condition) of skates released as bycatch should be documented.

The Skate PDT also recommends that because groundfish management has changed substantially under Amendment 13, it may be necessary to re-assess the skate baseline for Multispecies DAS restrictions. Amendment 13 implements several DAS categories, and the baseline assessment may need to be adjusted to account for this change.

8.2 National Environmental Policy Act (NEPA)

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

8.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

- The need for this action is described in section 3.2;
- The alternatives that were considered are described in sections 4.0 (proposed action) and 5.0 (alternatives to the proposed action);
- The environmental impacts of the proposed action are described in section 7.0;
- The agencies and persons consulted on this action are listed in section 8.2.4

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

- An Executive Summary can be found in section 1.0.
- A table of contents can be found in section 2.0.
- Background and purpose are described in section 3.0.
- A summary of the document can be found in section 1.0.
- A brief description of the affected environment is in section 6.0.
- Cumulative impacts of the proposed action are described in section 7.2.8.
- A determination of significance is in section 8.2.2.
- A list of preparers is in section 8.2.3.
- The index is in section 9.3.

8.2.2 Finding of No Significant Impacts

National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides nine criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below.

1. Can the final action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action?

No, the proposed action is not reasonably expected to jeopardize the sustainability of any target species that may be affected by the action. This action modifies several existing management measures (DAS transfer and leasing programs, CAII Yellowtail Flounder SAP, GB cod Hook Sector, net limits for trip gillnet vessels, notification requirements for herring vessels), allocated a minimum amount of effective effort, proposes the WGOM Rod/Reel Haddock SAP, and modifies the Incidental Catch TACs. None of these measures are expected to cause large increases in fishing mortality that may jeopardize the sustainability of any regulated groundfish stock. The action is designed to be consistent with the mortality targets adopted in Amendment 13 to rebuild groundfish.

2. Can the final action be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in FMPs?

No, the proposed action cannot be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in FMPs. The conclusion of the EFH assessment (section 8.1.3.4) is that this action will have minimal impact on EFH.

3. Can the final action be reasonably expected to have a substantial adverse impact on public health or safety?

No, the action is not expected to have a substantial impact on public health or safety. The modifications to the DAS transfer and leasing programs are designed to facilitate increased use of those programs. These changes may help fishermen increase fishing revenues, either by obtaining additional DAS or by leasing DAS to other vessel operators. Increases in revenue may provide additional funds to maintain fishing vessels, increasing safe operations. The WGOM Rod/Reel Haddock SAP is limited to March and April, two months that experience high winds in the GOM. Since many of the participants in this SAP are expected to be smaller vessels, this could cause safety concerns. Mitigating these concerns to some extent are the fact that most small vessels fish on single-day trips and the WGOM Closed Area is relatively close to shore. Vessels participating in this SAP will have the ability to plan fishing trips around windows of good weather and are not likely to be caught on multi-day trips by an unexpected storm.

4. Can the final action be reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species?

No, the action cannot be reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species. A number of endangered or threatened species and marine mammals are found within the geographic range of the multispecies fishery (see section 6.3 for a listing). The impacts of the action on these species are described in section 7.2.3. Overall effort reductions are occurring as the result of reduced effort and other fishing restrictions on groundfish stocks, possibly reducing risks to protected species on the positive end of the spectrum. Most likely, the proposed measures will have a negligible impact because they do not appreciably affect effort beyond Amendment 13 levels in times and places where protected species occur. An enhanced monitoring program should facilitate a better evaluation of the impacts of this measure in the future.

5. Can the final action be reasonably expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

No, the proposed action cannot be reasonably expected to result in cumulative adverse effects that could have a substantial effect on the target or non-target species. Cumulative effects are summarized in section 7.2.8.5. While this action may result in small increases in mortality for GOM haddock, these increases are not expected to threaten the mortality targets adopted by Amendment 13. Removing the net limits on trip gillnet vessels may also result in small increases in mortality for several regulated groundfish stocks, but these small increases are also not expected to threaten Amendment 13 mortality targets. This action is not expected to have substantial effects on any other non-target species.

6. Can the final action be reasonably expected to jeopardize the sustainability of any non-target species?

No, the proposed action is not likely to jeopardize the sustainability of any non-target species. Most the measures adopted by the proposed action modify administrative measures in the Multispecies FMP (DAS leasing and transfer requirements, membership in the GB Cod Hook Sector, etc.) and are not expected to have substantial impacts on on-target species. Removing the net limit for trip gillnet vessels may increase fishing mortality on skates, dogfish, and monkfish compared to the No Action alternative, but not to such an extent that the sustainability of these species is threatened.

7. Can the final action be expected to have a substantial impact on biodiversity and ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

The final action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. Catches of target and incidental regulated groundfish stocks will be tightly controlled through the use of hard TACs and limits on the use of DAS. These catches will be consistent with the mortality targets of Amendment 13, and thus will not have a substantial impact on predator-prey relationships or biodiversity. While the proposed action will result in a very small increase in fishing effort as a result of the proposed WGOM Closed Area Rod/Reel Haddock SAP the removal of the net limit for trip gillnet vessels, this increase is not expected to have substantial impacts on habitat and thus will not affect benthic productivity.

8. Are significant social or economic impacts interrelated with significant natural or physical environmental effects?

There are no significant social or economic impacts, so interrelations with significant natural or physical environmental effects are moot.

9. To what degree are the effects on the quality of the human environment expected to be highly controversial?

The effects on the quality of the human environment are not expected to be controversial. The primary impact on the human environment of this action is that it will increase fishing opportunities to target healthy groundfish stocks and improve the flexibility of fishermen to conduct business in the Northeast Multispecies fishery. This should provide increased revenues to the fishing industry, which will benefit fishing communities that were adversely affected by the fishing effort reductions adopted by Amendment 13. At the same time, these opportunities are tightly controlled and will not impact rebuilding of groundfish, so these short-term benefits do not reduce the long-term benefits that will be

realized from Amendment 13. This action will partly mitigate the impacts of Amendment 13 and will help some current fishery participants remain economically viable until stocks rebuild and landings return to levels seen in the past. This action thus helps to educe the controversy over the implementation of Amendment 13.

FONSI STATEMENT: In view of the analyses presented in this proposed framework adjustment document, the SEIS for Amendment 13 to the Northeast Multispecies Fishery Management Plan, and the Environmental Assessment for Framework Adjustment 40A to the Northeast Multispecies Plan, the proposed action will not significantly affect the quality of the human environment with specific reference to the criteria contained in NOAA Administrative Order 216-6 implementing the National Environmental Policy Act. Accordingly, the preparation of a Supplemental Environmental Impact Statement for this proposed action is not necessary.

_____ _____

Assistant Administrator for Fisheries, NOAA Date

8.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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8.2.4 Agencies Consulted

The following agencies were consulted in the preparation of this document:

Mid-Atlantic Fishery Management Council
New England Fishery Management Council, which includes representatives from the following additional organizations:

- Connecticut Department of Environmental Protection
- Rhode Island Department of Environmental Management
- Massachusetts Division of Marine Fisheries
- New Hampshire Fish and Game
- Maine Department of Marine Resources

National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

8.2.5 Opportunity for Public Comment

The proposed action was developed during the period January 2004 through November 2004 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Groundfish Oversight	Holiday Inn, Mansfield, MA	1/14/2004
Council Meeting	Hotel Viking, Newport, RI	1/27 & 1/28/04
Groundfish Advisory Panel	Holiday Inn, Portsmouth, NH	2/25/2004
Groundfish Oversight	Holiday Inn by the Bay, Portland, ME	3/2/2004
Council Meeting	Tavern on the Harbor, Gloucester, MA	3/24/04
Groundfish PDT	Holiday Inn, Mansfield, MA	4/7/2004
Groundfish Advisory Panel	Holiday Inn, Peabody, MA	4/14/2004
Groundfish Oversight	Holiday Inn, Peabody, MA	4/22/2004
Council Meeting	Providence Biltmore, Providence, RI	5/12/04
Council Meeting	Holiday Inn, Portland, ME	7/14/2004
Groundfish Oversight	Holiday Inn, Mansfield, MA	8/9/2004
Groundfish PDT	Holiday Inn, Mansfield, MA	9/23/2004
Groundfish Advisory Panel	Holiday Inn, Peabody, MA	10/21/2004
Groundfish Oversight	Holiday Inn, Peabody, MA	10/22/2004
Council Meeting	Marriott, Portsmouth NH	11/15-11/17, 2004

8.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 13 Final Supplemental Environmental Impact Statement. NMFS has already concurred on that action.

The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 13. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 40B.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see sections 6.0 and 7.0 of this document.

8.4 Marine Mammal Protection Act

The NEFMC has reviewed the impacts of the proposed action on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the multispecies management unit, the measures will

not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see section 7.2.3 of this document.

8.5 Coastal Zone Management Act

The Council has determined that the final proposed alternatives comply with the rules and regulations of the Coastal Zone Management Act. This document has been sent to coastal states from Maine to North Carolina for review of compliance with individual state's CZMA management regulations.

8.6 Administrative Procedure Act

This action was developed in compliance with the requirements of the Administrative Procedures Act, and these requirements will continue to be followed when the proposed regulation is published.

8.7 Data Quality Act

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to complete these actions.

8.7.1.1 Utility of Information Product

Explain how the information product meets the standards for ***utility****:*

Is the information helpful, beneficial or serviceable to the intended user?

The proposed action and the proposed rule implementing that action include a description of Framework Adjustment 40B, including the purpose and need, measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included. This action implements the Northeast Multispecies FMP conservation and management goals consistent with the M-S Act and other applicable laws.

Is the data or information product an improvement over previously available information? Is it more current or detailed? Is it more useful or accessible to the public? Has it been improved based on comments from or interactions with customers?

This proposed action was developed as a result of a multi-stage process that involved review of the source document (Framework 40B to the FMP) by affected members of the public (through the Regional Fishery Management Council (Council) public review process). The latest information available from the Fisheries Statistics Office was used to update landings and quota figures from the proposed rule to the final rule.

What media are used in the dissemination of the information? Printed publications? CD-ROM? Internet? Is the product made available in a standard data format? Does it use consistent attribute naming and unit conventions to ensure that the information is accessible to a broad range of users with a variety of operating systems and data needs?

The Federal Register notice that announces the final rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements. The Framework 40BA document is also available on the Council's web site in standard PDF format. Copies are available on CD-ROM from the Council office.

8.7.1.2 Integrity of Information Product

Explain how the information product meets the standards for ***integrity:***

All electronic information disseminated by NOAA adheres to the standards set out in Appendix III, "Security of Automated Information Resources," OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

If information is confidential, it is safeguarded pursuant to the Privacy Act and Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business and financial information).

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

8.7.1.3 Objectivity of Information Product

Indicate which of the following categories of information products apply for this product:

Original Data
Synthesized Products
Interpreted Products
Hydrometeorological, Hazardous Chemical Spill, and Space Weather Warnings, Forecasts, and Advisories
Experimental Products
Natural Resource Plans

Corporate and General Information

This information product is a Natural Resource Plan.

Describe how this information product meets the applicable objectivity standards. (See the DQA Documentation and Pre-Dissemination Review Guidelines for assistance and attach the appropriate completed documentation to this form.)

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer reporting system operated by the Northeast Regional Office of the NMFS. Information on catch composition, by tow, is based on reports collected by the NMFS observer program and incorporated into the sea sampling and/or observer database systems. These databases are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team (PDT). A leasing simulation model used by the PDT is described in Appendix I.

What published standard(s) governs the creation of the Natural Resource Plan? Does the Plan adhere to the published standards? (See the NOAA Sec. 515 Information Quality Guidelines, Section II(F) for links to the published standards for the Plans disseminated by NOAA.)

In preparing framework document and environmental assessment document, the Council(s) must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 12612 (Federalism), 12630 (Property Rights), 12866 (Regulatory Planning), and 13158 (Marine Protected Areas). NOAA Fisheries has determined that the final rule to implement Amendment 13 to the FMP was consistent with the National Standards of the Magnuson-Stevens Act and all other applicable laws and will make a similar determination for FW 40B before publication of the final rule.

Was the Plan developed using the best information available? Please explain.

This proposed action and its implementing regulations have been found to be in compliance with all the applicable National Standards of the M-S Act, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures implemented under this rule were selected based upon the best scientific information available.

This information includes NOAA Fisheries dealer weighout (weight of fish landings) data from 1996 to 2002, which was used to characterize the economic impacts of the management proposals. These data, as well as the NOAA Fisheries Observer program database (1994 – 2003) and the Vessel Effort Monitoring System (VMS) program database (1998 – 2000), were used to characterize historic landings and effort.

Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the scallop fishery.

Have clear distinctions been drawn between policy choices and the supporting science upon which they are based? Have all supporting materials, information, data and analyses used within the Plan been properly referenced to ensure transparency?

The policy choices (i.e., management measures) implemented by this rule are supported by the available scientific information. The management measures contained in the rule and developed in Framework 40B to the FMP are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing, while maintaining sustainable levels of fishing effort for to ensure a minimal impact on fishing communities and the environment.

The supporting materials and analyses used to develop the measures in the final rule are contained the framework document and the accompanying environmental assessment.

Describe the review process of the Plan by technically qualified individuals to ensure that the Plan is valid, complete, unbiased, objective and relevant. For example, internal review by staff who were not involved in the development of the Plan to formal, independent, external peer review. The level of review should be commensurate with the importance of the Plan and the constraints imposed by legally enforceable deadlines.

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

8.8 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA.

The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

8.9 Executive Order 13132 (Federalism)

The E.O. on federalism establishes nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O also lists a series of policy making criteria to which agencies must adhere when forming and implementing policies that have federalism implications. No federalism issues or implications have been identified relative to the actions proposed in this framework and the associated regulations.

This framework adjustment does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 12612. The affected stats have been closely involved in the development of the proposed management measures through their involvement in the Regional Fishery Management Council process. This framework was developed with the full participation and cooperation of the state representatives of the New England Council and a representative of the Mid-Atlantic Council. No comments were received from any state officials relative to any federalism implications of FW 40B.

8.10 Executive Order 12898 – Environmental Justice

Executive Order (E.O.) 12898 requires that, "to the greatest extent practicable and permitted by law… each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions…" The outcomes that have been predicted in this framework adjustment may differentially affect some populations. Nonetheless, many of the participants in the groundfish industry may come from lower income and or ethnic minority populations. These populations may be more vulnerable to more restrictive management measures. For example, in many ports crew may be comprised of ethnic minorities, and many regions in which fishing is an important livelihood can also be economically impoverished.

8.11 Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995 requires that agencies obtain OMB approval before requesting most types of information from the public. "Information collections" include forms, interviews, record-keeping requirements, and a wide variety of other things. Framework 40B imposes additional information collection requirements on the public that include:

- Advance notice of participation in programs to facilitate observer coverage.
- Additional reporting of catches on a daily basis through electronic means.
- Notice of participation in specific fishing programs at the start of a trip.

Estimates of the burden (time and cost) of preparing, submitting, and administration of new data collection requirements for the proposed action as described in section 4.0 can be found in Appendix III. These estimates may be revised based on changes to the proposed action that may result during its review and approval by NMFS. A formal burden-hour analysis of these new reporting requirements in Framework 40B will be available with the proposed rule.

8.12 Regulatory Impact Review

8.12.1 Executive Order 12866

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

- Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, of the principles set forth in the Executive Order.

Of these four criteria, the discussion to follow focuses only on the expected magnitude of the economic impacts of the Proposed Action.

The proposed action would implement a number of regulatory actions that would increase economic opportunities under Amendment 13 to the Northeast Multispecies Fishery Management Plan by facilitating opportunities for DAS trading, the development of new Special Access Programs, and regulatory relief. A total of twelve different measures are proposed all of which would provide some level of increased flexibility or regulatory relief, but with few exceptions no quantitative estimate of the monetary benefit was possible. In general, the anticipated monetary impact of the proposed action is likely to be low and would not rise to the $100 million threshold and would not have an adverse affect on the economy, productivity, jobs, the environment, public health or safety, or State, local or tribal governments or communities. Therefore, for purposes of this E.O. the proposed action is not a significant regulatory action based on economic criteria. The discussion below provides a synopsis of the anticipated effects of each of the proposed regulatory measures (see section 7.2.4 for a more detailed treatment of each measure).

Change to DAS Transfer Conservation Tax

This measure is intended to facilitate consolidation of the groundfish fleet through market-based incentives. Under existing regulations a trading market in DAS has failed to develop, because sellers are unable to receive full compensation for effectively surrendering the right to fish. A reduction in the conservation tax from 40% to 20% would increase the value of the transaction to the buyer and would increase the likelihood that matches between sellers' reservation price and buyers' willingness to pay will be found.

Incidental Catch TACs

Incidental catch TACs ensure that catches from any SAP or other use of Category B DAS do not compromise the biological objectives and the economic opportunities for available Category A DAS. The latter is of particular importance since current opportunities to use B DAS are not equal across the groundfish fleet. The proposed action would not change the method for creating a total set-aside for incidental catch TACs but would change the allocation of the share of incidental TACs to accommodate anticipated demand for fishery experiments that would take Georges Bank cod and one new SAP (the WGOM Closed Area Rod/Reel Haddock SAP). In order to accommodate these new programs some portion of available incidental catch TACs will be reallocated. However, since the target TACs for FY2005 will be higher than they were in FY2004, the nominal incidental catch TACs allocated to any given SAP or experiment will actually increase. This means that economic opportunities will actually increase in existing Category B DAS programs even while economic opportunities will be expanded to the proposed additional programs.

WGOM Closed Area Rod/Reel Haddock SAP

This SAP would permit use of hand-tended rod and reel commercial fishing gear inside the WGOM closed area during March and April. SAP participants would not be able to retain any cod, although any cod catch would be counted against an incidental catch TAC of 6.3 MT for FY2005. Given a haddock TAC of 50 mt the economic benefits of the SAP would be limited to about $140 thousand valued at $1.27 per pound, the average price for FY2003. Given that hook gear primarily takes cod or haddock there is unlikely to be sufficient component catch that would contribute appreciably to potential trip income. Available data make it very difficult to ascertain the likelihood that the potential benefit from the SAP will be realized. That is, known fisheries using rod and reel gear target cod and provide insufficient information on whether fishermen will be able to selectively catch haddock while avoiding cod. Assuming a successful program participation in the SAP is expected to be limited to small vessels that have traditionally used hand gear in the Gulf of Maine.

Closed Area II Yellowtail Flounder SAP

The Closed Area II Yellowtail SAP was implemented with Amendment 13. At implementation there was no clear provision to change the number of allowable trips in response to changing stock conditions. The proposed change in the SAP would change the season, adjust the trip limit, limit the number of trips that could be taken, and would more clearly link the SAP with management objectives outside the SAP.

In general, most of the proposed changes to the SAP would mitigate the derby effects that resulted in depressed prices received by fishermen as large quantities of yellowtail flounder landed at one time could not be absorbed in the market. Adjusting the SAP season to begin in July instead of June would better align fishing opportunities with biological concerns as June is both an important month for Georges Bank yellowtail flounder spawning. June also happens to be a month where yellowtail flounder prices have been lowest in the past (June prices in New Bedford for yellowtail flounder averaged $0.67 per pound as compared to between $0.90 and $1.46 from July to December, 2003). Limiting vessels to one trip a month to the SAP would also spread out landings. The 10,000-pound trip limit would reduce the size of spikes of yellowtail flounder brought to market. All of these changes would likely result in improved average prices received for yellowtail flounder for all vessels whether they participate in the SAP or not. However, these changes come at some cost. The change in trip limit effectively increases the overall cost of catching the available TAC by increasing the number of trips needed to take the quota assuming that the SAP can be profitably prosecuted (see below) at all. Imposing a limit on number of trips per month interferes with trip planning and may prevent vessels from optimizing business plans to take into account either unexpected market or weather conditions.

Perhaps the most beneficial impact of the proposed change to this SAP is the potential to avoid a premature closure of the Eastern GB portion of the resource sharing area similar to what occurred in FY2004. In effect, the change makes the SAP the residual claimant to the yellowtail TAC after expected catches of yellowtail flounder that take place outside the SAP have been deducted. This ensures that the full economic benefit from the use of Category A DAS (the primary source of economic benefit derived from Amendment 13) will be realized.

Minimum Effective Effort Allocation

This measure would provide an opportunity for vessels that received a zero DAS baseline under the criteria implemented for Amendment 13 to qualify for a minimum allocation of 10 reserve B DAS. This allocation would only enable these vessels to participate in established SAPs and would not be eligible to participate in any regular B DAS fisheries. The economic impact of this measure is expected to be positive for vessels that would receive a minimum allocation but could adversely affect other vessels did receive a non-zero DAS baseline. That is, since the economic benefit of any given SAP is effectively limited by TACs for both target species and incidental TACs for stocks of concern, any increase in the potential number of participants will spread the potential benefits across more vessels. In essence, granting increased access to SAPs represents an implicit tradeoff between vessels that have only been peripherally involved in the groundfish fishery since 1996 and vessels that have been comparatively more active.

GB Cod Hook Sector Revisions

Initial history for purposes of establishing a quota share for the GB Cod Hook Sector was limited to cod landings using hook gear even though sector participants may have had documented landings of GB cod using any number of different gears. This alternative would revise the sector share by recalculating landings history including all Georges Bank cod landings regardless of gear type. Presumably, any additional cod that may be attributable to sector participants will increase the overall cod TAC that will be available to the membership.

The economic impact of this measure would be two-fold. Most obviously, the hook sector will be able to increase overall fishing revenues (although how these benefits may be distributed among the membership is not known) as its allocation of GB cod may increase. The second impact is less obvious. Specifically, an increase in GB cod TAC may be more valuable as a bycatch in other directed fisheries; either as regular B DAS or in SAPs. For example, a higher GB cod TAC would provide greater assurance that the economic benefits of the Closed Area I haddock hook SAP would be fully realized since sector participants would be less likely to have to stop fishing because a cod TAC may be reached. The relative importance of higher TAC levels to enhance directed cod or cod bycatch fisheries is not known at this time.

While changing the qualification criteria for the GB Cod Hook Sector would undoubtedly benefit the sector and its membership, the resulting increase in TAC share would be accompanied by a corresponding decrease in TAC share to everyone else. Even though the TAC to non-sector participants is a target which would not result in an in-season closure it does increases the probability (by some unknown small amount) that the target TAC would be exceeded unless some type of compensatory action is taken to account for the lowered target TAC. In essence, this is a zero-sum game and any change in TAC allocation means that enhanced income opportunities to one group will have to be offset by a reduction in income opportunities to others.

Change to Effective Effort Calculation

The proposed action would make no change to the DAS allocations as they were implemented for FY2004 and would have no economic effect relative to taking no action. This action was selected to avoid the potential uncertainties and economic effects that would have resulted with a change in criteria to

establish each vessel's effective effort baseline. That is, changes to these criteria were considered that would have resulted in an increase in baseline DAS for between 195 and 390 vessels depending on the selected option. However, due to the need to achieve specified conservation objectives the split between Category A and B DAS would have had to be modified such that at least 80% of limited access vessels with a non-zero baseline allocation would have seen the number of Category A DAS reduced in FY2005 compared to the number of allocated A days in FY2004. The proposed changes were also determined to result in a possible net increase in effort as Category A DAS tended to be transferred from smaller to larger vessels. If realized, this change could have required further adjustments to the Category A and B DAS split.

Removal of the Tonnage Criterion for the DAS Transfer Program

Removal of tonnage from the DAS transfer program restrictions would make the DAS transfer program subject to the same baseline conditions as that of the leasing program. Removing tonnage would also make it more likely that vessels would be able to find other compatible vessels with whom a DAS transfer could be executed. The extent to which such a change would facilitate trades is not known but is likely to positive and would have positive economic impacts.

Permit Baseline Characteristics Downgrade

Both DAS transfer and DAS leasing limit trades based on groundfish permit baselines. However, this limitation applies to trades that would move DAS from vessels with smaller baselines to vessels with larger vessels but trades from large to small would be allowed. In this respect, it is advantageous to have a smaller baseline since large vessels may only trade with other large vessels but smaller vessels have a larger pool of potential trading partners since they may acquire DAS from other small vessels as well as any vessel with a larger baseline. Through a recent or past ownership transfer or vessel replacement, some vessels may actually have smaller physical dimensions than when the permit was originally obtained. This measure would enable given vessel owners the option for a one-time downgrade in baseline to reflect the characteristics of their current vessel. Vessel owners that avail themselves of this opportunity would be able to better take advantage of available DAS transfer or DAS leasing programs. The economic impact of this option is likely to be positive although neither the number of vessels that might downgrade their vessel nor the economic value of the downgrade is quantifiable.

DAS Credit for Standing by Entangled Whales

This measure would provide both an economic benefit to vessels and to large whales. The DAS credit would provide vessels with an incentive to stand by an entangled whale since recovery of the time spent in that activity would be recoverable. The extent to which this measure would result in an improvement in successful disentanglement efforts is not known, but even small improvements for species such as the Northern right whale would be beneficial. The economic value of this improvement cannot be quantified but studies of endangered species protection programs do indicate positive both existence and non-consumptive use values (whale watches, for example).

Herring Vessel Interactions with Regulated Groundfish

The proposed action would require all Category A herring vessels to notify the observer program prior to taking a trip. Since the herring fishery is already receiving 15% to 20% coverage, this action would not change current practice from what is already being done. However, the notification requirement would impose some costs on trip flexibility. As noted above, herring fishing is subject to considerable variability and advance trip scheduling may be difficult. The extent to which this requirement would compromise economic efficiency is not known. Even when a waiver is granted, vessels would still be required to notify NMFS enforcement prior to entering port to allow for inspection of the catch.

Removal of Net Limit for Trip Gillnet Vessels

This measure would remove the limit on the number of groundfish nets that may be used by trip gillnet vessels. Amendment 13 limits trip gillnet vessels to no more than 150 nets in the water (more may be on-board) and requires that each net be tagged. Some trip gillnet vessels carry nets of multiple mesh sizes including nets used to target regulated groundfish and larger mesh that may be used for species like monkfish. Operationally, if a vessel operator wants to switch over to different size nets he/she must remove net tags from one set of gear and put them on another which is cumbersome and time consuming while at-sea. Removing the net limit would obviate the need for net tags for groundfish and would allow vessel operators to keep tags only on their monkfish gear, which would still be required. This change would provide operators greater flexibility to change targeting decisions as fishing conditions warrant. The economic impact of affording trip gillnet operators with greater flexibility in addition to the cost savings associated with having to switch net tags is not known but would certainly be positive. Assuming, vessels do not change the number of nets that are fished vessels would not receive any additional revenue. The veracity of this assumption has implications for potential revenue gains that trip gillnet vessels may be able to obtain as well as any biological impacts that an increase in net use would entail.

8.12.2 Regulatory Flexibility Act

The proposed action would provide regulatory relief to small fishing vessels that participate in the Northeast Multispecies fishery that would not otherwise be available. Under the SBA size standards for small fishing entities ($3.5 million) all permitted and participating vessels in the groundfish fishery are considered to be small as gross sales by any one entity does not exceed this threshold. The proposed action would implement twelve separate measures each of which would apply to any vessel that holds a limited access groundfish permit (a total of 1,409).

As a practical matter, each of the measures would probably affect a limited number of current and potential participating vessels. For this reason, the discussion below (see section 7.2.4 for more detailed analysis of impacts) identifies the conditions under which vessels may participate, the potential number of affected entities, and an assessment of the possible economic impacts. Note that the number of affected entities is difficult to assess since participation in any one of the proposed action measures would be voluntary. This means that no small entity would be made to bear any added regulatory or economic burden unless it was convinced that it would be financially beneficial to do so.

Considered as a package, the proposed action includes a total of twelve different management measures. In addition to the proposed action four other similarly "packaged" alternatives were considered. In each case the non-selected packaged alternatives contained some measures that were equivalent to that of the proposed action while other measures were either rejected outright or represented a different formulation of a measure as compared to the proposed action. To clearly distinguish between proposed action measures and rejected options for the proposed action the following discusses the proposed and rejected versions on a measure-by-measure basis.

DAS Leasing and Transfer Program Conservation Tax

This measure would reduce the conservation tax on the DAS transfer program to 20% while leaving DAS leasing program unchanged. Every vessel holding a limited access DAS permit would be eligible to participate in the DAS transfer program including any of the 448 vessels that received a zero effective effort baseline allocation. Given the fact that, to date, no vessels have participated in the DAS transfer program it is difficult to assess how many vessels would be likely to participate in the revised program. Further, the extent to which the level of the conservation tax was prohibiting market

development is not known since selling vessels would be required to discontinue fishing altogether. For vessels with multiple limited access permits to other fisheries the full value of the business could not be recouped by the sale of groundfish DAS alone whether the conservation tax is reduced or not.

In general the reduction in the conservation tax would increase the potential return to both buyers and sellers and would offer small entities an opportunity to improve business profits. Therefore, the regulatory action would be expected to have a beneficial impact on small entities although the magnitude of the impact is uncertain.

Two different options for the leasing and DAS transfer program conservation tax were considered but rejected. Option 2 (see section 5.2.1.1.2) would have implemented a 20% conservation tax on both DAS leasing and DAS transfer. Like the Proposed Action participation in either program would be voluntary. However, Option 2 would affect a larger number of vessels compared to the Proposed Action since it would apply to both the leasing and DAS transfer programs. The 20% conservation tax would create a beneficial economic effect equivalent to that of the proposed action while the conservation tax on leased DAS would have an adverse economic effect on vessels that may choose to participate in the leasing program. That is, the market value of a lease would be reduced since all exchanges would be discounted by the conservation tax. This would reduce the return to sellers as well as reducing the potential earnings to buyers from the use of leased DAS.

Option 3 (see section 5.2.1.1.3) would have implemented a 10% conservation tax on DAS transfer and a 10% tax on leased DAS. Compared to the Proposed Action this option would have implemented a lower conservation tax on DAS transfer but would levy a 10% tax on DAS leasing. The former would likely have a relatively greater beneficial effect as the potential value of a DAS trade would increase while the latter would have an adverse affect on DAS leasing. Thus, a tradeoff is implied between the potential gains from providing improved incentives to engage in consolidation of the groundfish fishery through the DAS transfer program as compared to reducing the incentive to engage in temporary transfers through leasing. As noted above, a change in the conservation tax alone may not be sufficient inducement to use the DAS transfer program as vessel owners would still be unable to receive full remuneration for the opportunity cost of ceasing fishing altogether. Thus, on balance, the conservation tax on leased DAS would likely result in greater adverse economic effect on small entities as compared to any economic gains that may be garnered through greater incentives to participate in DAS transfer.

DAS Transfer Program Modifications

Transfer of DAS was intended to permit consolidation of groundfish vessels through market incentives. Unfortunately, existing requirements impose a conservation tax on transferred DAS and requires that the selling vessel surrender all other fishing permits. The combination of these two conditions has effectively prevented a transfer market from developing. In effect, the current transfer program limits the value (or willingness to pay) to a buyer to only the groundfish DAS less the conservation tax when the value to the seller includes the value of the groundfish DAS plus all other limited access permits. In this context, the total value of the vessel and all associated permits will exceed the value of the groundfish permit and associated DAS alone so the seller's asking price will exceed the buyer's willingness to pay. The proposed options for changing the transfer program would increase the potential value of the transfer to the buyer using several different possible modifications.

While these options may have benefited fishermen by increasing the potential value of the transfer to buyers, a number of problems were identified that coult not be resolved in time for this management action. For example, the measures did not detail how the landings nad DAS use history of the permits will be treated, nor how the transfer affects the permit baseline characteristics of length,

horsepower, and tonnage. Because of the administrative complexity in administering these modifications, they were not adopted in this action but the Council may condsider similar changes in a future action.

Accepting Non-Groundfish Permits

Under present conditions the only thing that could be transferred is groundfish DAS. Allowing selling vessels to transfer any non-groundfish limited access permits along with the groundfish DAS would increase the potential value of the transferable asset to the buyer. This option would have no effect on potential trades among vessels with identical suites of limited access permits or if the seller only holds a groundfish permit. Conversely, the ability to accept non-groundfish permits would be much greater to vessels that only have a groundfish permit or to a vessel where there were fewer duplicate permits. While this option would undoubtedly increase the potential value of the trade to both buyer and seller, the realized economic benefit of such a change is not known. However, this option would also introduce the possibility that in addition to effort a probable increase in groundfish effort, effort directed on other fisheries could increase as well.

Refusing Non-Groundfish Permits

As noted above the ability to waive the conservation tax on transferred groundfish DAS would increase the value of the potential trade to the buyer. If the seller has multiple non-groundfish limited access permits then the value of the groundfish DAS without a transfer tax may still be insufficient compensation to the seller to make a trade worthwhile. This option would have no impact on vessels with identical suites of limited access permits since the buyer would have no limited access permit that could be "refused." The condition that would make a trade favorable to both buyer and seller would require that the value of the DAS without the transfer tax would have to exceed the combined value to both buyer and seller of the limited access permits held by the seller that are not held by the buyer. The realized effect of this option is not known but would likely be positive compared to current limitations on DAS transfer.

Removal of Proxy Vessel

The economic effect of this option is uncertain but would likely to be positive. Evaluation of the effect of the option is complicated by the fact that it is unclear as to whether the transfer tax would still apply. The option also only indicates that a vessel with a comparable permit baseline could be removed but does not indicate whether the proxy vessel would even have to have a limited access groundfish permit or whether the proxy vessel would have to have a comparable suite of limited access permits. The option also does not indicate whether the proxy vessel has to exist (i.e. in the CPH program) or has to be in a fishable condition.

Incidental Catch TACs

Incidental catch TACs ensure that catches from any SAP or other use of Category B DAS do not compromise the biological objectives and the economic opportunities for available Category A DAS. The latter is of particular importance since current opportunities to use B DAS are not equal across the groundfish fleet. The proposed action would not change the method for creating a total set-aside for incidental catch TACs but would change the allocation of the share of incidental TACs to accommodate anticipated demand for fishery experiments that would take Georges Bank cod and one new SAP (the WGOM Closed Area Rod/Reel Haddock SAP). The setting of incidental catch TACs affects small entities in that these TACs limit the potential benefit that may be derived from any given SAP. The proposed action would change the share of TAC allocated to existing programs to offset the need to accommodate new programs. However, because of increasing total TACs the nominal amount of quota assigned to each existing program will actually increase. This means that economic opportunities to small entities that may be participating in existing programs will not be diminished even as new programs are being developed.

WGOM Closed Area Rod/Reel Haddock SAP

This SAP would permit use of hand-tended rod and reel commercial fishing gear inside the WGOM closed area during March and April. SAP participants would not be able to retain any cod, although any cod catch would be counted against an incidental catch TAC of 6.3 MT for FY2005. Given a haddock TAC of 50 mt the economic benefits of the SAP would be limited to about $140 thousand valued at $1.27 per pound, the average price for FY2003. Given that hook gear primarily takes cod or haddock there is unlikely to be sufficient component catch that would contribute appreciably to potential trip income.

Although any vessel with a limited access permit would be eligible to participate in this SAP, given the limited season and gear requirement the number likely participants in the SAP may be limited to vessels that have a history of using hang gear in the GOM to target groundfish. Based on FY2004 permit categories there were a total of 91 vessels that fished with hand gear on at least one occasion in the Gulf of Maine during FY2003. Average trip income for these vessels when haddock was landed was less than $300. This estimate is likely to be low since hand gear vessels were subject to restrictive trip limits on combined cod, haddock and yellowtail flounder during FY2003.

The rejected option for the proposed WGOM Rod and Reel SAP would have excluded vessels with Handgear A permits from participating in the SAP. Based on FY2004 permit application data, this would have eliminated 42 vessels from being eligible to participate in the SAP. The realized impact that this might have on these small entities is not known since the permit category did not exist prior to May 1, 2004.

GB Haddock Fishery North of Closed Area I SAP

A proposed Georges Bank haddock SAP was rejected. The rejected SAP would have provided vessels with the opportunity to fish for haddock in a designated area north of Closed Area II on a Category B DAS. Participation in the SAP would have been limited to vessels using approved gear with a demonstrated low bycatch of cod which at present is limited to trawl gear using a haddock separator trawl. Vessels would also have been required to use a VMS and report when they have entered the SAP, the category DAS they will be using, and must provide daily catch reports for selected species. Note that vessels may also choose to fish inside the SAP area on a Category A DAS without being subject to the gear requirement.

A more detailed evaluation of economic impact for this rejected SAP is provided in section 7.4.4.4. A summary of that discussion follows. Any vessel with a limited access groundfish permit and a DAS allocation would have been eligible to participate in the SAP. However, the number of participants would probably have been limited to vessels with a history of having actually fished in the area. Data from FY2002 VTR records were queried to identify how many vessels reported using trawl gear inside the proposed SAP or in close proximity to it. Based on these data there were a total of 48 vessels that took at least one trip using trawl gear inside the proposed SAP and an additional 195 vessels that took at least one trip using trawl gear inside areas 521 or 522 but did not report any trip location within the proposed SAP boundary. Thus, a total of 243 vessels have reported otter trawl activity either inside of the proposed SAP or at least within an area in close proximity to the proposed SAP.

Since the proposed SAP would have required use of a haddock separator trawl the realized economic benefits to participating vessels cannot be estimated with precision, because available performance data using this gear is not yet available. Nevertheless, past performance by vessels fishing inside the proposed SAP area provides some indication of the economic potential that may have been derived from the SAP. This estimate of potential economic benefit from the proposed SAP was obtained by applying average annual revenue by species from dealer data to the reported retained catch in the

VTRs. The average revenue per day was calculated by dividing total trip revenues by days absent (elapsed time between the date sailed and landed date in the VTR).

Across all trawl trips taken inside the rejected SAP revenue per day averaged $5,700 inside the proposed SAP and $4,600 within statistical areas 521 and 522 but outside the proposed SAP. Thus, on average, the rejected SAP was more productive in terms of revenue than areas outside the SAP. For a TAC of 1,000 MT the estimated number of regular B DAS that could be fished in the proposed SAP would be 238 and an additional 120 category B DAS for each additional 500 MT of haddock quota. Therefore, using the estimated average revenue per day ($5,700) from inside the proposed SAP, the potential revenue from a 1,000 MT TAC could have been $1.4 million. Each 500 MT increment in haddock TAC would have been worth an additional $0.7 million such that a 2,000 MT TAC would generate potential revenues of $2.8 million. Note that this estimate is relatively crude and realized impacts could have been higher or lower depending on prices, catch rates, and biological conditions.

While this SAP may hae provided some economic benefits to fishermen, it was rejected because the administrative complexity did not appear to warrant the benefits that may be realized from this SAP. The small area, limited season, and prohibition on fishing outside of the SAP area while on a trip made it likely that fishermen would not choose to participate in the SAP. Catches of haddock in this area can be highly variable and fishermen said that committing to the SAP area would be too much of an economic risk – especially since other opportunities exist to fish in the area on either a Category A or Category B (regular) DAS.

Closed Area II Yellowtail Flounder SAP

The Closed Area II Yellowtail SAP was implemented with Amendment 13. At implementation there was no clear provision to change the number of allowable trips in response to changing stock conditions. The proposed change in the SAP would change the season, adjust the trip limit, limit the number of trips that could be taken, and would more clearly link the SAP with management objectives outside the SAP.

In general, most of the proposed changes to the SAP would mitigate the derby effects that resulted in depressed prices received by fishermen as large quantities of yellowtail flounder landed at one time could not be absorbed in the market. Adjusting the SAP season to begin in July instead of June would better align fishing opportunities with biological concerns as June is both an important month for Georges Bank yellowtail flounder spawning. June also happens to be a month where yellowtail flounder prices have been lowest in the past (June prices in New Bedford for yellowtail flounder averaged $0.67 per pound as compared to between $0.90 and $1.46 from July to December, 2003). Limiting vessels to one trip a month to the SAP would also spread out landings. The 10,000-pound trip limit would reduce the size of spikes of yellowtail flounder brought to market. All of these changes would likely result in improved average prices received for yellowtail flounder for all vessels whether they participate in the SAP or not. However, these changes come at some cost. The change in trip limit effectively increases the overall cost of catching the available TAC by increasing the number of trips needed to take the quota assuming that the SAP can be profitably prosecuted (see below) at all. Imposing a limit on number of trips per month interferes with trip planning and may prevent vessels from optimizing business plans to take into account either unexpected market or weather conditions.

Minimum Effective Effort Allocation

This measure would provide an opportunity for vessels that received a zero DAS baseline under the criteria implemented for Amendment 13 to qualify for a minimum allocation of 10 reserve B DAS. This allocation would only enable these vessels to participate in established SAPs and would not be eligible to participate in any regular B DAS fisheries. The economic impact of this measure is expected to be positive for vessels that would receive a minimum allocation but could adversely affect other vessels

did receive a non-zero DAS baseline. That is, since the economic benefit of any given SAP is effectively limited by TACs for both target species and incidental TACs for stocks of concern, any increase in the potential number of participants will spread the potential benefits across more vessels. In essence, granting increased access to SAPs represents an implicit tradeoff between vessels that have only been peripherally involved in the groundfish fishery since 1996 and vessels that have been comparatively more active.

For FY2004 there were a total of 448 vessels that received a zero DAS baseline, of which, 44 were enrolled in the CPH program as of September, 2004. The majority of vessels that were not in CPH were from Massachusetts home ports (173) with no other state having more then 50. Based on vessel size more than 75% of vessels that received a zero baseline for FY2004 were less than 50 feet LOA.

GB Cod Hook Sector Revisions

Initial history for purposes of establishing a quota share for the GB Cod Hook Sector was limited to cod landings using hook gear even though sector participants may have had documented landings of GB cod using any number of different gears. This alternative would revise the sector share by recalculating landings history including all Georges Bank cod landings regardless of gear type. Presumably, any additional cod that may be attributable to sector participants will increase the overall cod TAC that will be available to the membership (52 vessels).

The economic impact of this measure would be two-fold. Most obviously, the hook sector will be able to increase overall fishing revenues (although how these benefits may be distributed among the membership is not known) as its allocation of GB cod may increase. The second impact is less obvious. Specifically, an increase in GB cod TAC may be more valuable as a bycatch in other directed fisheries; either as regular B DAS or in SAPs. For example, a higher GB cod TAC would provide greater assurance that the economic benefits of the Closed Area I haddock hook SAP would be fully realized since sector participants would be less likely to have to stop fishing because a cod TAC may be reached. The relative importance of higher TAC levels to enhance directed cod or cod bycatch fisheries is not known at this time.

While changing the qualification criteria for the GB Cod Hook Sector would undoubtedly benefit the sector and its membership, the resulting increase in TAC share would be accompanied by a corresponding decrease in TAC share to everyone else. Even though the TAC to non-sector participants is a target which would not result in an in-season closure it does increases the probability (by some unknown small amount) that the target TAC would be exceeded unless some type of compensatory action is taken to account for the lowered target TAC. In essence, this is a zero-sum game and any change in TAC allocation means that enhanced income opportunities to one group will have to be offset by a reduction in income opportunities to others.

Change to Effective Effort Calculation

The proposed action would make no change to the DAS allocations as they were implemented for FY2004 and would have no economic effect relative to taking no action. This action was selected to avoid the potential uncertainties and economic effects that would have resulted with a change in criteria to establish each vessel's effective effort baseline. That is, changes to these criteria were considered that would have resulted in an increase in baseline DAS for between 195 and 390 vessels depending on the selected option. However, due to the need to achieve specified conservation objectives the split between Category A and B DAS would have had to be modified such that at least 80% of limited access vessels with a non-zero baseline allocation would have seen the number of Category A DAS reduced in FY2005 compared to the number of allocated A days in FY2004. The proposed changes were also determined to result in a possible net increase in effort as Category A DAS tended to be transferred from smaller to

larger vessels. If realized, this change could have required further adjustments to the Category A and B DAS split.

The proposed action would leave the criteria for establishing effective effort baselines unchanged. Two other options were considered for changing DAS baselines were considered. Option 2 would have changed allocations such that the effective effort baseline would be the maximum number of DAS called-in without regard to annual allocation or carryover not limited by the FY2001 allocation. Option 3 would have changed DAS allocations in a manner similar to that of Option 2 with the exception that carry-over DAS would not be counted. The economic impacts of these two options are discussed in detail in section 7.4.4.7.

Since no vessel would receive a reduction in its effective effort baseline either Option 2 or 3 would result in an increase in total baseline allocations. Given the requirement to meet specified conservation objectives that were calibrated to be achieved an expected DAS use of 35 to 36 thousand Category A days, any increase in baseline DAS would have to be offset by a greater reduction in Category A DAS. Under this circumstance, vessel owners whose effective effort baseline would increase proportionally more than the needed adjustment to the Category A and B DAS split would actually end up with a net increase in Category A DAS. Conversely, any vessel whose effective effort allocation would either not change or would be proportionally less than the adjusted A/B split would see a reduction in available Category A DAS for FY2005 than they held in FY2004. This means that rejected Options 2 and 3 would result in gains to some small entities and losses to others. Based on the analysis of impacts for these options at least 80% of all permitted vessels with a non-zero effective effort baseline would lose Category A DAS. The average loss for these vessels was estimated to be at least 3 days valued at approximately $5,200. The 20% of vessels that would receive an increase in Category DAS would gain an estimated 12 Category A DAS valued at $35 thousand. That is, had either Option 2 or 3 been selected, even though the number small entities was comparatively small, their average gain was nearly seven times greater than the average loss for the majority of small entities. Note also that the average economic gain was proportionally greater than the average gain in DAS because gaining vessels tended to be larger, higher revenue earning vessels than vessels that would have lost Category A fishing opportunities. In fact, the aggregate net gain in economic benefits exceeded accumulated losses to small entities by $2.8 million for Option 2 and $2.2 million for Option 3. Within the existing management plan there is no mechanism for small entities that would gain from the proposed change to compensate the adversely affected small entities. Given the fact that either of the rejected options would have had an adverse economic impact on the overwhelming majority of small entities they were both rejected.

Removal of the Tonnage Criterion for the DAS Transfer Program

Removal of tonnage from the DAS transfer program restrictions would make the DAS transfer program subject to the same baseline conditions as that of the leasing program. Removing tonnage would also make it more likely that vessels would be able to find other compatible vessels with which a DAS transfer could be executed. The extent to which such a change would facilitate trades is not known but is likely to positive and would have positive economic impacts. This change would remove the tonnage requirement for all limited access permit holders. However, the realized impact would be limited to an unknown number of vessels that actually participate in the DAS transfer program.

Permit Baseline Characteristics Downgrade

Both DAS transfer and DAS leasing limit trades based on groundfish permit baselines. However, this limitation applies to trades that would move DAS from vessels with smaller baselines to vessels with larger vessels but trades from large to small would be allowed. In this respect, it is advantageous to have a smaller baseline since large vessels may only trade with other large vessels but smaller vessels have a larger pool of potential trading partners since they may acquire DAS from other small vessels as well as any vessel with a larger baseline. Through a recent or past ownership transfer or vessel replacement,

some vessels may actually have smaller physical dimensions than when the permit was originally obtained. This measure would enable given vessel owners the option for a one-time downgrade in baseline to reflect the characteristics of their current vessel. Vessel owners that avail themselves of this opportunity would be able to better take advantage of available DAS transfer or DAS leasing programs. The economic impact of this option is likely to be positive although neither the number of vessels that might downgrade their vessel nor the economic value of the downgrade is quantifiable.

DAS Credit for Standing by Entangled Whales

This measure would provide both an economic benefit to vessels (the 1409 vessels DAS vessels) and to large whales. The DAS credit would provide vessels with an incentive to stand by an entangled whale since recovery of the time spent in that activity would be recoverable. The extent to which this measure would result in an improvement in successful disentanglement efforts is not known, but even small improvements for species such as the Northern right whale would be beneficial. The economic value of this improvement cannot be quantified but studies of endangered species protection programs do indicate positive both existence and non-consumptive use values (whale watches, for example).

Herring Vessel Interactions with Regulated Groundfish

The proposed action would require all Category A herring vessels to notify the observer program prior to taking a trip. Since the herring fishery is already receiving 15% to 20% coverage, this action would not change current practice from what is already being done. However, the notification requirement would impose some costs on trip flexibility. As noted above, herring fishing is subject to considerable variability and advance trip scheduling may be difficult. The extent to which this requirement would compromise economic efficiency is not known. Even when a waiver is granted, vessels would still be required to notify NMFS enforcement prior to entering port to allow for inspection of the catch. This option would affect any vessel that held a Category A herring permit (107 vessels in CY2003) every time a trip was taken (1221 purse seine or mid-water trawl trips taken by 28 vessels during CY2003).

Rejected Option 1 for herring vessel interactions with regulated groundfish would have prohibited the use of mid-water trawl gear in any of the year-round groundfish closure areas. Option 2 would have prohibited the use of both, purse seine or mid-water trawl gear in any year-round groundfish closed area while Option 3 would have banned just purse seine gear. Compared to the proposed action, any one of these options would have had a larger adverse impact on small entities that fish for herring inside any one of the prescribed closure areas.

The economic effects of these rejected options measure would accrue to any vessel fishing for herring using either purse seine or mid-water trawl (including pair trawl) in the closed areas regardless of whether or not the vessel holds a groundfish permit. As of November, 2004, there were a total of 2,209 vessels that held some type of groundfish (open access or limited access) and also held a herring permit (VMS or Non-VMS) for the 2004 permit year.

The difference in fishing year between herring (calendar year) and groundfish (May 1 to April 30) complicates analysis of impacts changes in regulations may take effect on differing schedules. For purposes of analysis, VTR data were queried for calendar year 2003 to identify all trips that were taken inside any one of the year-round groundfish closure areas that use either purse seine or mid-water trawl gear. Calendar year 2003 was selected because all regulations for both groundfish and herring were constant throughout the year and because the majority of impacts were deemed to be likely to fall on vessels that may be predominantly engaged in the herring fishery.

Although there were more than 2,000 vessels permitted to land herring, only 138 reported having landed any herring on their VTR for all of CY2003. Of these vessels only 33 reported having used either

purse seine or mid-water trawl gear to fish for herring. Further, only 14 of those vessels using either purse seine or mid-water trawl gear reported any landings in any of the groundfish year-round closure areas. Note that the VTR records are likely to underestimate the number of affected trips since only one position coordinate is recorded for each trip. For herring this may be less of an issue as compared to other fisheries since trip durations tends to be short and when herring are encountered they are highly aggregated. This means that the position location provided in the VTR may reasonably approximate the general location where fishing activity occurs. Since all but one of the affected vessels used mid-water trawl gear, impact estimates were computed only for Option 2 (prohibition on both gears) since reporting is not possible for either Option 1 or Option 3 due to confidentiality concerns.

On average, the 14 affected vessels averaged $1.26 million in gross sales of which $0.96 million (76%) was herring. The average revenue derived from herring trips that would be affected by Option 3 was $52 thousand or about 4.1% of annual fishing revenue. Given the nature of the herring fishery, there may or may not be opportunities to overcome these losses as the distribution of herring varies substantially in time and space. For the same reason, realized losses could be larger than that reported here and could affect a larger number of vessels.

These options were rejected in part because it is not clear that the protection provided to groundfish resources by eliminating herring fishing in year–round closed areas justified the possible economic losses. The Council instead chose an option that may lead to an improved understanding of interactions between these two fisheries without imposing additional costs on the herring fishery,

Removal of Net Limit for Trip Gillnet Vessels

This measure would remove the limit on the number of groundfish nets that may be used by trip gillnet vessels. Amendment 13 limits trip gillnet vessels to no more than 150 nets in the water (more may be on-board) and requires that each net be tagged. Some trip gillnet vessels carry nets of multiple mesh sizes including nets used to target regulated groundfish and larger mesh that may be used for species like monkfish. Operationally, if a vessel operator wants to switch over to different size nets he/she must remove net tags from one set of gear and put them on another which is cumbersome and time consuming while at-sea. Removing the net limit would obviate the need for net tags for groundfish and would allow vessel operators to keep tags only on their monkfish gear, which would still be required. This change would provide operators greater flexibility to change targeting decisions as fishing conditions warrant. The economic impact of affording trip gillnet operators with greater flexibility in addition to the cost savings associated with having to switch net tags is not known but would certainly be positive. Assuming, vessels do not change the number of nets that are fished vessels would not receive any additional revenue. The veracity of this assumption has implications for potential revenue gains that trip gillnet vessels may be able to obtain as well as any biological impacts that an increase in net use would entail.

9.0 REFERENCES

9.1 Glossary

Adult stage: One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect: Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation: A group of animals or plants occurring together in a particular location or region.

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship S=1-A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define B_{MSY} and F_{MSY} reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1^+, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, $B_{threshold}$ is often defined as either $1/2B_{MSY}$ or $1/4\ B_{MSY}$. $B_{threshold}$ is also known as $B_{minimum}$.

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (B_{MSY} or proxy) as a management objective. The biomass threshold ($B_{threshold}$ or B_{min}) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

Discards: animals returned to sea after being caught; see Bycatch (n.)

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterised by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exempt fisheries: Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no

other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses F_{MSY} or F_{MSY} proxy for $F_{threshold.}$ 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Lethrinids: Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A_{50} is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^+ mean biomass; mean biomass summed across ages 3 and over is 3^+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L_{25} is the length where 25% of the fish encountered are retained by the mesh. L_{50} is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Minimum spawning stock threshold: the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks.

The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Special Access Program (SAP): A modification to the groundfish regulations that facilitates targeting of healthy groundfish or other stocks (e.g. fishing in a closed area to target scallops or yellowtail flounder).

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

Surplus production: Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Surplus production models: A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass

history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Two-bin (displacement) model: a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria

were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

9.2 Literature Cited

Alverson, Dayton L. 1998. Discarding practices and unobserved fishing mortality in marine fisheries: an update. Sea Grant, Washington, DC.

Atlantic States Marine Fisheries Commission (ASMFC). 1999. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Sea Herring. Fishery Management Report No. 33.

Auster, P.J. and R.W. Langton. 1999. The effects of fishing on fish habitat. In L.R. Benaka, editor. Fish Habitat: Essential fish habitat and rehabilitation. American Fisheries Society, Symposium 22, Bethesda, Maryland.

Auster, P.J., R.J. Malatesta, R.W. Langton, L. Watling, P.C. Valentine, C.L.S. Donaldson, E.W. Langton, A.N. Shepard, and I.G. Babb. 1996. The impacts of mobile fishing gear on seafloor habitats in the Gulf of Maine (northwest Atlantic): implications for conservation of fish populations. Reviews in Fisheries Science 4(2):185-202.

Barlow, J., and P. J. Clapham. 1997. A new birth-interval approach to estimating demographic parameters of humpback whales. Ecology, 78: 535-546. Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mamm. Sci. 9: 309-315.

Barnette, M.C. 2001. A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat. NOAA Technical Memorandum (NMFS-SEFSC-449).

Berube, M. and A.Aguilar. 1998. A new hybrid between a blue whale, *Balaenoptera musculus*, and a fin whale, *B. physalus*: frequency and implications of hybridization. Mar. Mamm. Sci. 14:82-98.

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. Pp. 199-233 In: Lutz, P.L. and J.A. Muscik, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Blaylock, R.A., J.W. Hain, L.J. Hansen, D.L. Palka, and G.T. Waring. 1995. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments. NOAA Tech. Memo. NMFS-SEFSC-363. U.S. Department of Commerce, Washington, D.C. 211 pp.

Cappo, M., D.M. Alongi, D. Williams, and N. Duke. 1998. A review and synthesis of Australian fisheries habitat research. Volume 2: Scoping Review, Issue 4: Effects of Harvesting on Biodiversity and Ecosystems. FRDC 95/055.

Cargnelli, Luca M. Griesbach, Berrien, Peter L. Sara J., B., Johnson, Johnson, Donna L. , Wallace W., . 1999. Haddock, *Melanagrammus aeglefinus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-128.

Caswell, H., M. Fujiwara, and S. Brault. 1999. Declining survival probability threatens the North Atlantic right whale. Proc. Nat. Acad. Sci. 96: 3308-3313

Cetacean and Turtle Assessment Program (CeTAP). 1982. Final report or the cetacean and turtle assessment program, University of Rhode Island, to Bureau of Land Management, U.S. Department of the Interior. Ref. No. AA551-CT8-48. 568 pp.

Colette and Klein-MacPhee. Eds. 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. Smithsonian Institution Press.

Collie, J.S. 1998. Studies in New England of fishing gear impacts on the sea floor. Pp. 53-62 In: E.M. Dorsey and J. Pederson, editors. Effect of Fishing Gear on the Sea Floor of New England. Conservation Law Foundation. Boston, Massachusetts. 160 p.

Collie, J.S., S.J. Hall, M.J. Kaiser, and I.R. Poiner. 2000. A quantitative analysis of fishing impacts on shelf-sea benthos. Journal of Animal Ecology 69:785-798.

Colvocoresses, J.A. and J.A. Musik. 1983. Species associations and community composition of middle Atlantic bight continental shelf demersal fishes. U.S. Fisheries Bulletin 82(2):295-313.

D'Entremont, Jean Guy. 2002. Personal communication.

Department of Fisheries and Oceans, Canada. 1992. Cod and Haddock Separator Trawl. Industry Services and Native Fisheries Report No. 38, November 1992. Scotia-Fundy Region, Fisheries and Oceans, Canada.

Eckert, S.A., D.W. Nellis, K.L. Eckert, and G.L. Kooyman. 1996. Diving Patterns of Two Leatherback Sea Turtles, (Demochelys coriacea) During Interesting Intervals at Sandy Point, St. Croix, U.S. Virgin Islands. Herpetologica. Sep. 42(3):381-388.

Engås, A., Jørgensen, T. and West, C. W. 1998. A species-selective trawl for demersal gadoid fisheries. ICES Journal of Marine Science, 55: 835-845.

Epperly, S.P., J. Braun, A.J. Chester, F.A. Cross, J. Merriner, and P.A. Teater. 1995. Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. Bull. Mar. Sci. 56(2):519-540.

Fogarty, Michael J., and Murawski, Steven A. 1998. Large-scale disturbance and the structure of marine systems: fishery impacts on Georges Bank. Ecological Applications, 8(1) Supplement.

Frid, C.L.J., R.A. Clark and J.A. Hall. 1999. Long-term changes in the benthos on a heavily fished ground of the NE coast of England. Marine Ecology Progress Series 188:13-29.

Gabriel, W. 1992. Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, northwest Atlantic. Journal of Northwest Atlantic Fisheries Science 14:29-46.

Garrison, Lance P. 2000. Spatial and dietary overlap in the Georges Bank groundfish community. Can. J. Fish. Aquat. Sci. 57:1679-1691.

Garrison, Lance P. and Link, J.S. 2000. Dietary guild structure of the fish community in the Northeast United States continental shelf ecosystem. Marine Ecology Press Series 202:231-240.

Gilbert, J.R. and N. Guldager. 1998. Status of harbor and gray seal populations in northern New England. Final Report to NMFS, NEFSC, Woods Hole, MA. Coop. Agree. 14-16-009-1557. 13pp.

Giroux, Brian. May 4, 2004. Personal communication.

Goff, G.P. and J.Lien. 1988. Atlantic leatherback turtle, *Dermochelys coriacea*, in cold water off Newfoundland and Labrador. Can. Field Nat.102(1):1-5.

Hall, S.J. 1999. The Effects of Fishing on Marine Ecosystems and Communities. Blackwell Science. Oxford, United Kingdom. 274 p.

Hall-Arber, Madeleine, Christopher Dyer, John Poggie, James McNally and Renee Gagne. 2001. Fishing Communities and Fishing Dependency in the Northeast Region of the United States. MARFIN Project Final Report to National Marine Fisheries Service.

Hamilton, P.K., and C.A. Mayo. 1990. Population characteristics of right whales (Eubalaena glacialis) observed in Cape Cod and Massachusetts Bays, 1978-1986. Rep. Int. Whal. Comm., Special Issue 12: 203-208.

Hansson, M., M. Lindegarth, D. Valentinsson and M. Ulmestrand. 2000. Effects of shrimp-trawling on abundance of benthic macrofauna in Gullmarsfjorden, Sweden. Marine Ecology Progress Series 198:191-201.

Hartley, Marcus. 2004. A review of the economic analyses contained in the DSEIS for Amendment 13. http://www.nefsc.noaa.gov/groundfish/Hartley_review_DSEIS.pdf.

Hayes, M.L. 1983. Active fish capture methods, in *Fisheries Techniques.* Nielson, L.A. and D.L. Johnson, eds. American Fisheries Society, Bethesda, Maryland.

Hermsen, Jay. 2004. Northeast Regional Office, National Marine Fisheries Service.

Hutchings, J.A., T. D. Bishop, and C. R. McGregor-Shaw. 1999. Spawning behaviour of Atlantic cod, *Gadus morhua*: evidence of mate competition and mate choice in a broadcast spawner. Canadian Journal of Fisheries and Aquatic Sciences 56: 97-104.

Hutchings, J.A., T. D. Bishop, and C. R. McGregor-Shaw. 1999. Spawning behavior of Atlantic cod, *Gadus morhua*: evidence of mate competition and mate choice in a broadcast spawner. Canadian Journal of Fisheries and Aquatic Science, 56:97-104.

ICES 2001. Effects of Different Types of Fisheries on North Sea and Irish Sea Benthic Ecosystems. Report of the ICES Advisory Committee on the MarineEnvironment 2000. ICES Coop. Res. Rep. No. 241, 27 pp.

ICES. 1973. Effects of trawls and dredges on the seabed. International Council for the Exploration of the Sea, Gear and Behavior Committee. ICES CM 1973 /B:2.

IWC. 1992. Report of the comprehensive assessment special meeting on North Atlantic fin whales. Rep. Int. Whal. Commn 42:595-644.

Jennings, S. and M.J. Kaiser. 1998. The effects of fishing on marine ecosystems. Advances in Marine Biology 34:201-352.

Jennings, S., J.K. Pinnegar, N.V.C. Polunin, K.J. Warr. 2001. Impacts of trawling disturbance on the trophic structure of benthic invertebrate communities. Marine Ecology Progress Series 213: 127-142.

Johnson, K.A. 2002. A review of national and international literature on the effects of fishing on benthic habitats. NOAA Technical Memorandum NMFS-F/SPO-57. 72 p.

Kaiser, M.J., A.S. Hill, K. Ramsay, B.E. Spencer, A.R. Brand, L.O. Veale, K. Prudden, E.I.S. Rees, B.W. Munday, B. Ball, and S.J. Hawkins. 1996a. Benthic disturbance by fishing gear in the Irish Sea: a comparison of beam trawling and scallop dredging. Aquatic Conservation: Marine and Freshwater Ecosystems 6:269-285.

Kaiser, M.J., B.E. Spencer, and P.J. Hart. 2000. Fishing-gear restrictions and conservation of benthic habitat complexity. Conservation Biology 14(5):1512-1525.

Kaiser, M.J., D.B. Edwards and B.E. Spencer. 1996b. Infaunal community changes as a result of commercial clam cultivation and harvesting. Aquatic Living Resources 9:57-63.

Katona, S.K., and J.A. Beard. 1990. Population size, migrations, and feeding aggregations of the humpback whale (Megaptera novaeangliae) in the Western North Atlantic Ocean. Rep. Int. Whal. Comm., Special Issue 12: 295-306.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginia's sea turtles: 1979-1986. Virginia J. Sci. 38(4):329-336.

Kenchington, E.L.R., J. Prena, K.D. Gilkinson, D.C. Gordon Jr., K. MacIssace, C. Bourbonnais, P.J. Schwinghamer, T.W. Rowell, D.L. McKeown, and W.P. Vass. 2001. Effects of experimental otter trawling on the macrofauna of a sandy bottom ecosystem on the Grand Banks of Newfoundland. Canadian Journal of Fisheries and Aquatic Science 58:1043-1057

Jennings, S., J.K. Pinnegar, N.V.C. Polunin, K.J. Warr. 2001. Impacts of trawling disturbance on the trophic structure of benthic invertebrate communities. Marine Ecology Progress Series 213: 127-142.

Kenney, R.D., M.A.M. Hyman, R.E. Owen, G.P. Scott, and H.E. Winn. 1986. Estimation of prey densities required by Western North Atlantic right whales. Mar. Mamm. Sci. 2(1): 1-13.

Kenney, R.D., H.E. Winn, and M.C. Macauley. 1995. Cetaceans in the Great South Channel, 1979-1989: right whale (Eubalaena glacialis). Cont. Shelf Res. 15:385-414.

Langton, R.W. and Bowman, R.E. 1980. Food of fifteen northwest Atlantic gadiform fishes. NOAA Tech. Rep. NMFS-SSRF-740.

Langton, R.W. and Bowman, R.E. 1981. Food of eight Northwest Atlantic pleuronectiform fishes. NOAA Tech. Rep. NMFS-SSRF-749.

Leatherwood, S., and R.R. Reeves. 1983. The Sierra Club handbook of whales and dolphins. Sierra Club Books, San Francisco, California. 302 pp.

Lindeboom, H.J., and S.J. de Groot, 1998. Impact II. The effects of different types of fisheries on the North Sea and Irish Sea benthic ecosystems. NIOZ Rapport 1998-1. 404 p.

Link, J.S. and Garrison, Lance P. 2002. Trophic ecology of Atlantic cod on the northeast US continental shelf. Mar. Ecol. Prog. Set. 227: 109-123).

Mahon, R., S.K. Brown, K.C.T. Zwanenburg, D.B. Atkinson, K.R. Buja, L. Claflin, G.D. Howell, M.E. Monaco, R.N. O'Boyle, and M. Sinclair. 1998. Assemblages and biogeography of demersal fishes of the East Coast of North America. *Can. J. Fish. Aquat. Sci*. **55**: 1704-1738

Mayo, C. A. and M. K. Marx. 1990. Surface foraging behavior of the North Atlantic Right Whale, *Eubaleana glacialis*, and associated zooplankton characteristics. Canadian Journal of Zoology, 68:2214-2220.

McCay, Bonnie and Marie Cieri. 2000. Fishing Ports of the Mid-Atlantic. Report to the Mid-Atlantic Fishery Management Council. Dover, Delaware.

Melvin, G. D., R. l. Stephenson, M. J. Power, F. J. Fife, S. Paul. 1997. Evaluation of the stock status of 4WX herring. Canadian Stock Assessment Secretariat Research Document 97/61.

Mitchell, E. and D.G. Chapman. 1977. Preliminary assessment of stocks of northwest Atlantic sei whales (Balaenoptera borealis). Rep. Int. Whal. Comm. Special Edition 1:117-120.

Mizroch, S.A. and A.E. York. 1984. Have pregnancy rates of Southern Hemisphere fin whales, *Balaenoptera physalus*, increased? Rep. Int. Whal. Commn (Spec. Iss. 6):401-410.

Moran, M.J. and P.C. Stephenson. 2000. Effects of otter trawling on macrobenthos and management of demersal scalefish fisheries on the continental shelf of north-western Australia. ICES Journal of Marine Science 57:510-516.

Morgan, L.E. and R. Chuenpagdee. 2003. Shifting Gears: Addressing the collateral impacts of fishing methods in U.S. waters, Pew Science Series on Conservation and the Environment, Washington D.C., Island Press, 41 p.

Morgan, M. J., Deblois, E. M. & Rose, G. A. (1997). An observation on the reaction of Atlantic cod (*Gadus morhua*) in a spawning shoal to bottom trawling. *Canadian Journal of Fisheries and Aquatic Sciences* **54**(Suppl. 1), 217–223.

Morgan, M.J., and E.A. Trippel. 1996. Skewed sex ratios in spawning shoals of Atlantic cod (*Gadus morhua*). J. Cons. int. Explor. Mer. 53: 820-826.

Morreale, S.J. and E.A. Standora. 1998. Early life stage ecology of sea turtles in northeastern U.S. waters. U.S. Dep. Commer. NOAA Tech. Mem. NOAA Fisheries-SEFSC-413, 49 pp.

Murison, L.D., and D.E. Gaskin. 1989. The distribution of right whales and zooplankton in the Bay of Fundy, Canada. Can. J. Zool. 67:1411-1420.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pp 137-164 In: Lutz, P.L. and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

National Marine Fisheries Service (NMFS, NOAA Fisheries). 2004. Draft EIS for Minimizing Impacts of the Atlantic Herring Fishery on Essential Fish Habitat (EFH). Draft EIS prepared July 1, 2004 and currently under review.

National Research Council. 2002. Effects of Trawling and Dredging on Seafloor Habitat. National Academy Press. 126 p.

New England Fishery Management Council (NEFMC). 1994. Amendment 5 to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council (NEFMC). 1996. Amendment 7 to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council (NEFMC). 1997. Amendment 11 to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council (NEFMC). 1999. Final Atlantic herring fishery management plan. Incorporating the environmental impact statement and regulatory impact review. Volume I. NEFMC in consultation with the ASMFC, MAFMC, and NMFS. Final document submitted March 8, 1999.

New England Fishery Management Council (NEFMC). 2003. Amendment 13 to the Northeast Multispecies Fishery Management Plan.

New England Fishery Management Council (NEFMC). 2004. Framework Adjustment 40A to the Northeast Multispecies Fishery Management Plan.

NMFS and USFWS. 1991. Recovery plan for the U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, D.C. 64 p.

NMFS and USFWS. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

NMFS and USFWS. 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, Maryland. 139 pp.

NMFS Southeast Fisheries Science Center. 2001. Stock assessments of loggerheads and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S. Department of Commerce, National Marine Fisheries Service, Miami, FL, SEFSC Contribution PRD-00/01-08; Parts I-III and Appendices I-IV. NOAA Tech. Memo NMFS-SEFSC-455, 343 pp.

NMFS. 1991. Final recovery plan for the North Atlantic right whale (Eubalaena glacialis). Prepared by the Right Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 86 pp.

NMFS. 1998a. Draft recovery plans for the fin whale (Balaenoptera physalus) and sei whale (Balaenoptera borealis). Prepared by R.R. Reeves, G.K. Silber, and P.M. Payne for the National Marine Fisheries Service, Silver Spring, Maryland. July 1998.

NMFS. 1998b. Recovery plan for the blue whale (Balaenoptera musculus). Prepared by Reeves, R.R., P.J. Clapham, and R.L. Brownell, Jr. for the National Marine Fisheries Service, Silver Spring, Maryland. Mitchell, E. 1974. Present status of the northwest Atlantic fin and other whale stocks. Pages 108-169 in W. E. Schevill (ed) The Whale Problem: A status report. Harvard University Press. Cambridge, Massachusetts, 419pp.

Northeast Fisheries Science Center (NEFSC). 2002a. Assessment of 20 Northeast Groundfish Stocks through 2001: a report of the Groundfish Assessment Review Meeting (GARM), Northeast fisheries Science Center, Woods Hole, MA, October 8-11, 2001.

Northeast Fisheries Science Center (NEFSC). 2002b. Report of the 35th Northeast Regional Stock Assessment Workshop (35th SAW): Consensus Summary of Assessments. NEFSC Reference Document 02-014).

Northeast Fisheries Science Center (NEFSC). 2003. Report of the 37th Northeast Regional Stock Assessment Workshop (35th SAW): Consensus Summary of Assessments. NEFSC Reference Document 03-016).

Northeast Region Essential Fish Habitat Steering Committee (NREFHSC). 2002. Workshop on the Effects of Fishing Gear on Marine Habitats Off the Northeastern United States, October 23-25, 2001, Boston, Massachusetts. Northeast Fish Sci Cent Ref Doc 02-01; 86 p.

Norton, John. September 25, 2003. President, Cozy Harbor Seafood, Maine. Personal communication.

Overholtz, W.J. and A.V. Tyler. 1985. Long-term responses of the demersal fish assemblages of Georges Bank. U.S. Fisheries Bulletin 83(4):507-520.

Overholtz, W.J., L.D. Jacobson, G.D. Melvin, M. Cieri, M. Power, D. Libby, and K. Clark. 2004. Stock assessment of the Gulf of Maine – Georges Bank Atlantic herring complex, 2003. Northeast Fisheries Science Center Reference Document 04-06.

Payne, P.M., D.N. Wiley, S.B. Young, S. Pittman, P.J. Clapham, and J.W.Jossi. 1990. Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine in relation to changes in selected prey. Fish. Bull. 88 (4): 687-696

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The Sperm Whale In: The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.

Poppe, L.J., Schlee, J.S., Butman, B., and Lane, C.M., 1989, Map showing the distribution of surficial sediment, Gulf of Maine and Georges Bank: U.S. Geological Survey Miscellaneous Investigations Series Map I-1986-A, 1 sheet, scale 1:1,000,000.

Pratt, S. 1973. Benthic fauna. Pp. 5-1 to 5-70 in: Coastal and offshore environmental inventory, Cape Hatteras to Nantucket Shoals. University of Rhode Island, Marine Publication Series No. 2. Kingston, RI.

Prescott, R.L. 1988. Leatherbacks in Cape Cod Bay, Massachusetts, 1977-1987, p 83-84 In: B.A. Schroeder (comp.), Proceedings of the Eighth Annual Workshop on Sea Turtle Conservation and Biology. NOAA Technical Memorandum NMFS-SEFC-214.

Raymond, John D. and Manomet Center for Conservation Sciences. 2004. A Collaborative Program to Test the Use of a Cod/haddock Separator Panel in Trawl Nets. Report to the NOAA/NMFS CRPI.

Rebel, T. P. 1974. Sea turtles and the turtle industry of the West Indies, Florida and the Gulf of Mexico. Univ. Miami Press, Coral Gables, Florida.

Reid, R.N., L. M. Cargnelli, S. J. Griesbach, D. B. Packer, D.L. Johnson, C.A. Zetlin, W.W. Morse, and P.L. Berrien. 1999. Essential Fish Habitat Source Document: Atlantic Herring, *Clupea harengus* L., Life History and Habitat Characteristics. NMFS, Highlands, NJ.

Reid, R.N., L.M. Cargnelli, S.J. Griesbach, D.B. Packer, D.L. Johnson, C.A. Zetline, W.W. Morse and P.L. Berrien. 1999. Essential fish habitat source document: *(series*) [Species] life history and habitat characteristics. NOAA Tech. Mem. NMFS-NE-124 through 152. National Marine Fisheries Service Northeast Fisheries Science Center, Woods Hole, MA.

Reid, Robert N. Cargnelli, Luca M. Griesbach, Sara J., Packer, David B., Johnson, Donna L., Zetlin, Christine A. Morse, Wallace W., and Berrien, Peter L. 1999. Atlantic herring, *Clupea Harengus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-126.

Robbins, J., and D. Mattila. 1999. Monitoring entanglement scars on the caudal peduncle of Gulf of Maine humpback whales. Report to the National Marine Fisheries Service. Order No. 40EANF800288. 15 pp.

Rogers, S.I., M.J. Kaiser, and S. Jennings. 1998. Ecosystem effects of demersal fishing: A European perspective. Pp. 68-78 In: E.M. Dorsey and J. Pederson, editors. Effect of Fishing Gear on the Sea Floor of New England. Conservation Law Foundation. Boston, Massachusetts. 160 p.

Ross, J.P. 1979. Green turtle, *Chelonia mydas*, Background paper, summary of the status of sea turtles. Report to WWF/IUCN. 4pp.

Sainsbury, J.C. 1996. *Commercial Fishing methods: An introduction to vessels and gears,* 3rd Ed. Fishing News Books, Oxford, England.

Sainsbury, K.J., R.A. Campbell, R. Lindholm, and A.W. Whitelaw. 1997. Experimental management of an Australian multispecies fishery: examining the possibility of trawl-induced habitat modification. Pp. 107-112 in E.K. Pikitch, D.D. Huppert, and M.P. Sissenwine, editors. Global trends: fisheries management. American Fisheries Society, Symposium 20, Bethesda, Maryland.

Schevill, W.E., W.A. Watkins, and K.E. Moore. 1986. Status of Eubalaena glacialis off Cape Cod. Rep. Int. Whal. Comm., Special Issue 10: 79-82.

Schwinghamer, P., D.C. Gordon, Jr., T.W. Rowell, J. Prena, D.L. McKeown, G. Sonnichsen, and J.Y. Guigne. 1998. Effects of experimental otter trawling on surficial sediment properties of a sandy-bottom ecosystem of the Grand Banks of Newfoundland. Conservation Biology 12(6):1215-1222.

Seipt, I., P.J. Clapham, C.A. Mayo, and M.P. Hawvermale. 1990. Population characteristics of individually identified fin whales, *Balaenoptera physalus*, in Massachusetts Bay. Fish. Bull. 88:271-278.

Shoop, C.R. and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6: 43-67. Rebel, T.P. 1974. Sea turtles and the turtle industry of the West Indies, Florida and the Gulf of Mexico. Univ. Miami Press, Coral Gables, Florida.

Spotila, J.R., A.E. Dunham, A.J. Leslie, A.C. Steyermark, P.T. Plotkin, and F.V. Paladino. 1996. Worldwide Population Decline of Demochelys coriacea: Are Leatherback Turtles Going Extinct? Chelonian Conservation and Biology 2(2): 209-222.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mammal Sci. 9:309-315.

Theroux, R.B. and M.D. Grosslein. 1987. Benthic fauna. Pp. 283-195 in: R.H. Backus (ed.), Georges Bank. MIT Press, Cambridge, MA.

Theroux, R.B. and R.L. Wigley. 1998. Quantitative composition and distribution of the macrobenthic invertebrate fauna of the continental shelf ecosystems of the northeastern United States. NOAA Technical Report NMFS 140. U.S. Dept. of Commerce, Seattle, WA.

Thrush, S.F., J.E. Hewitt, V.J. Cummings, P.K. Dayton, M. Cryer, S.J. Turner, G.A. Funnell, R.G. Budd, C.J. Milcurn, and M.R. Wilkinson. 1998. Disturbance of the marine benthic habitat by commercial fishing: impacts at the scale of the fishery. Ecological Applications 8(3):866-879.

Trans-Boundary Resource Assessment Committee (TRAC). 2004. Eastern Georges Bank Haddock Stock Status Report. TRAC Status Report 2004/02, available at http://www.mar.dfo-mpo.gc.ca/science/TRAC/TSRs/TSR_2004_02_E.pdf.

Trans-Boundary Resource Assessment Committee (TRAC). 2004. Eastern Georges Bank Cod Stock Status Report. TRAC Status Report 2004/01, available at http://www.mar.dfo-mpo.gc.ca/science/TRAC/TSRs/TSR_2004_01_E.pdf.

Tsou, Tien-shui and Collie, Jeremy S. 2001. Estimating predation mortality in the Georges Bank fish community. Can. J. Fish. Aquat. Sci 58: 908-922.

Tuck, I.D., S.J. Hall, M.R. Robertson, E. Armstrong, and D.J. Basford. 1998. Effects of physical trawling disturbance in a previously unfished sheltered Scottish sea loch. Marine Ecology Progress Series 162:227-242.

Tupper, Mark H., Anthony, Vaughn C., Chenoweth, Stanley B., MacCluen, Holly A. 1998. Biology and Assessment of Gulf of Maine Herring Stocks. Commissioned by the Gulf of Maine Aquarium, Portland, Me.

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp=s ridley (Lepicochelys kempii) and loggerhead (Caretta caretta) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

Turtle Expert Working Group (TEWG). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-444, 115 pp.

Valentine, P. 1998. Brief notes on habitat geology and clay pipe habitat on Stellwagen Bank. In Dorsey, E.M. and J. Pederson, eds. Effects of Fishing Gear on the Sea Floor of New England. Boston, MA: Conservation Law Foundation. 119-120.

Valentine, P.C. and R.G. Lough. 1991. The sea floor environment and the fishery of eastern Georges bank. Dept. of Interior, U.S. Geological Survey, Open File Report 91-439.

Valentine, P.C., E.W. Strom, R.G. Lough, and C.L. Brown. 1993. Maps showing the sedimentary environment of eastern Georges bank. U.S. Geological Survey, Miscellaneous Investigations Series, Map I-2279-B, scale 1:250,000.

Waring, G.T., C.P. Fairfield, C.M. Ruhsam, and M. Sano. 1993. Sperm whales associated with Gulf Stream features off the northeastern USA shelf. Fish. Oceano. 2(2):101-105.

Waring, G.T., J.M. Quintal, C. P. Fairfield (eds). 2002. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2001. NOAA Technical Memorandum NMFS-NE-168.

Waring, G.T., R.M. Pace, J.M. Quintal, C. P. Fairfield, K. Maze-Foley (eds). 2003. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2001. NOAA Technical Memorandum NMFS-NE-182. 287 p.

Watkins, W.A., and W.E. Schevill. 1982. Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. Fish. Bull. 80(4): 875-880.

Watkins, W.A., K.E. Moore, J. Sigurjonsson, D. Wartzok, and G. Notarbartolo di Sciara. 1984. Fin whale (Balaenoptera physalus) tracked by radio in the Irminger Sea. Rit Fiskideildar 8(1): 1-14.

Watling, L. 1998. Benthic fauna of soft substrates in the Gulf of Maine. Pp. 20-29 in: Effects of fishing gear on the sea floor of New England, E.M. Dorsey and J. Pederson (eds.). MIT Sea Grant Pub. 98-4.

Wynne, K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant, Narragansett. 115pp.

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