Framework Adjustment 41 to the Northeast Multispecies Fishery Management Plan

Including an
Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis

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

Initial framework meeting: February 3, 2005
Final framework meeting: March 31, 2005
Date submitted: April 15, 2005
Date resubmitted: May 9, 2005

Cover photograph: Captain Ken Eldredge longlines haddock during an experimental fishery. Photograph by Jesse Agee. Property of GB Hook Sector, Inc., used with permission.

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 (NMFS) 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. Framework Adjustment 40A was implemented by NMFS on November 19, 2004 and created opportunities to target healthy groundfish stocks. Framework Adjustment 40B is currently under review; it proposes several changes to improve the effectiveness of the effort control program.

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. Additional programs were adopted by Framework Adjustment 40A, including a program that allows longline vessels to fish in Closed Area I to target haddock. This program was only partially approved and does not allow participation by vessels that are not members of the GB Cod Hook Sector. The **purpose** of this action is to revise the Closed Area 1 Hook Gear Haddock SAP to allow participation by non-sector vessels. This program will help mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

Before describing the proposed measures, 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.

This action implements measures that govern the use of Category B DAS to target healthy stocks.

Proposed Action

The proposed action implements two specific management measures. A general description of each measure is provided below. The specific details for each measure are provided in the framework document, section 4.2.

Category B DAS Incidental Catch TACs: Amendment 13 adopted strict mortality targets for stocks of concern. One of the primary tools used to reduce fishing mortality for those stocks was a reduction in DAS – in particular, Category A DAS. Any increase in fishing effort that results from using Category B DAS could threaten the mortality objectives of Amendment 13 if the catch of stocks of concern is not controlled. The proposed action reduces the risk these objectives will be compromised by specifying the catch (landings and discards) of stocks of concern that can be caught on a Category B DAS. This measure specifies the total allowable catch (TAC, landings and discards) of the primary stocks of concern that can be caught while using Category B DAS, and allocates those TACs to specific Category B DAS programs. The proposed incidental catch TACs, and the proposed allocations to Category B DAS programs, are shown below. These TACs are based on an evaluation of the likely impacts of Amendment 13. They are set at very low levels (five percent or less) of the target TACs for each stock. The TACs will be recalculated every two years based on current stock status; changes to the percentage allocations can only be made in a future management action (framework adjustment or amendment).

In addition to the overall incidental catch TAC, this measure allocates that incidental catch TAC to the programs that will use Category B DAS. The percentage allocation to specific programs can be changed in a future management action, while the TACs will be recalculated during the periodic adjustment process. There is some uncertainty over the allocation of incidental TAC for GB cod that will be implemented by this framework since FW 40B has not yet been approved and the allocation depends on both FW 40B and the date of implementation of this framework.

		Incidental Catch TAC		
	Percentage of Total TAC	**2004**	**2005**	**2006**
GOM cod	Two	97	127	149
GB cod	Two	79	97	127
CC/GOM yellowtail	Two	18	25	21
Plaice	Five	185	181	151
White Hake	Two	77	76	76
SNE/MA Yellowtail	Five	35	99	166
SNE/MA Winter Flounder	Five	143	178	222
Witch Flounder	Five	259	350	383

Table 1 – 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**	**Eastern US/CA Haddock SAP**	**Research Set-Aside**
GOM cod	100%	NA	NA	NA
GB cod	45%	14.4%	30.6%	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

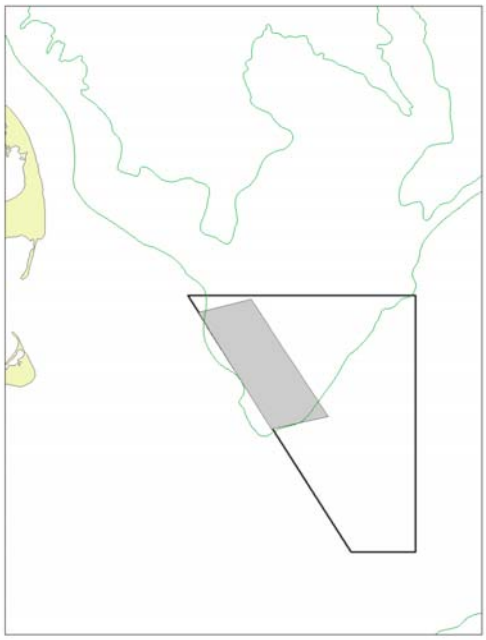
Table 2 - Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	FY 2004	**FY 2005**	**FY 2006**
Category B (regular) DAS Pilot Program	52.1	43.6	57.1
CAI Haddock SAP	0	14	18.3
Eastern US/CA Haddock SAP	27	29.7	38.9
GB Cod research set aside	0	9.7	12.7

Table 3 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

Changes to the Closed Area I (CAI) Hook Gear Haddock SAP: This SAP allows vessels using longline or tub trawl gear to harvest 1,000 metric tons of haddock while fishing in a small area located in the northwest corner of CAI. Fishing in the SAP is only allowed from October 1 through December 31. All vessels participating in the SAP must use a VMS and are subject to specific reporting requirements so that catches are monitored daily. The requirements for vessels in the GB Hook Sector differ from those for vessels that are not in the sector. Vessels in the hook sector cannot discard legal size cod and do not have a landing limit for cod, but all cod catches apply against the sector's GB cod allocation. Vessels that are not in the hook sector are limited to 1,000 lbs of cod per trip. Cod catches by non-sector vessels fishing are counted against the GB cod incidental catch TAC for this SAP. Vessels not in the hook sector can only use Category B (regular or reserve) DAS to fish in the SAP. They are not allowed to fish inside and outside the SAP area on the same trip. The program is ended for all vessels if the haddock TAC is caught, and non-sector vessels cannot participate in the program while using Category B DAS if the cod incidental catch TAC is caught.

In order to reduce the possibility that a derby fishery will develop between sector and non-sector vessels, in FY 2005 sector vessels will fish in the SAP from October 1 through November 15, and non-sector vessels will fish from November 16 through December 31. The catch of haddock in each period is limited to half the TAC – 500 mt in FY 2005. The group that fishes in each period will alternate each year. This approach does not have any influence on measures that may be adopted in the future to prevent a derby fishery. Catches in this SAP do not apply to a vessel's catch history.



CAI hook gear haddock SAP area (shaded)

Summary of Environmental Consequences

The environmental impacts of this action are discussed in detail in section 6.0. Biological impacts are described in section 6.3.1, impacts on essential fish habitat are described in section 6.3.2, impacts on endangered and other protected species are described in section 6.3.3, the economic impacts are described in section 6.3.4, and social impacts are described in section 6.3.5. Cumulative effects are described in section 6.5.

Biological Impacts

The action does not increase the haddock TAC for this SAP and as a result is not expected to increase haddock fishing mortality. Fishing mortality could increase on GB cod if it is caught by non-sector vessels fishing in the SAP. Since this catch of cod is limited by an incidental cod TAC designed to reduce the risk to the mortality target, this action is not expected to threaten the mortality targets for GB cod. This TAC is established at a level so that, based on the analyses in Amendment 13 and this document, the risk of exceeding rebuilding targets will be small. Catches of other species probably do not represent an increases compared to the No Action alternative, since the amount of effort in this SAP is bound by the haddock TAC, which is not changed by this action.

Essential Fish Habitat Impacts

Relative to other gears assessed, the Gear Effects Workshop report categorized longlines as having low impact to the benthic environment (NEEFHSC 2002). Based on the results of the experimental fishery for the hook gear access program, an increase in 440 DAS is expected as a result of this SAP to harvest haddock. As such, the impacts to habitat will be minimal and the effects temporary in nature and will not impact the baseline level of protection afforded to EFH by Amendment 13 (approximately 43,000 DAS were allocated under Amendment 13 as A DAS).

Impacts on Endangered and Other Protected Species

The measures described in this alternative 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. Additionally, longline vessels have accounted for few, if any, interactions with protected species in the northeast. The approval of this SAP is unlikely to change that scenario.

Economic Impacts

This SAP provides an opportunity for some vessels to mitigate the impacts of the effort reductions of Amendment 13 by targeting haddock in CAI. Economic analysis indicates the maximum potential revenue from fishing in the closed area was $2.5 million, and after subtracting variable costs and crew share the estimated vessel profit was $1.5 million. Since the season is divided into two periods, and non-sector vessels may be limited by their incidental catch of GB cod, the estimated revenue earned by sector participants is $1.26 million, while non-sector participants would earn $605 thousand for a total of $1.9 million. Crew wages for sector participants would be $486 thousand, while non-sector crew wages would be $234 thousand. Total vessel surplus (profit) for sector vessels would be $772 thousand, or $19,297 per vessel. For non-sector vessels, total surplus (profit) is $333 thousand, or $16,650 per vessel. If non-sector vessels are able to their cod catch rate to less than 0.13 mt (287 lbs.) per day, the total revenues from the SAP will increase.

Social Impacts

This action will most likely benefit vessels and ports that are in proximity to Georges Bank. Communities that are expected to benefit include Chatham, Gloucester, and other Cape Cod communities, New Hampshire ports, and some southern Maine ports. This action will also address the perception that FW 40A, as implemented, unfairly allocated this SAP to vessels in the GB cod hook sector.

Impacts on Other Fisheries

Since the proposed action provides opportunities for more groundfish vessels to use Category B DAS to target healthy groundfish stocks in the CAI Hook Gear Haddock SAP, in theory it could 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. These impacts are likely to be minor. Most MAFMC quota-managed fisheries are trawl fisheries, while most of the participants in the SAP are likely to be vessels that have a history of using hook gear. There is little apparent overlap between these two groups.

Cumulative Effects

The cumulative effects of this action are not likely to have a substantial impact on any of the VECs associated with the multispecies fishery. The overall reductions in fishing effort adopted by previous management actions will have a positive biological impact on groundfish and other stocks. While the proposed action may result in a small increase in effort, controls such as hard TACs, DAS and time restrictions are included to ensure that the mortality objectives of the management plan are not threatened. While there may be a small increase in mortality for some stocks (cod, skates and dogfish) as a result of increased access to the CAI Haddock SAP and the use of B DAS, this increase is not likely to have a significant impact. With respect to endangered and other protected species, the proposed measures would have negligible impacts. Impacts on habitat and EFH are also expected to be minimal. Finally, the proposed action would mitigate some of the negative economic and social impacts incurred as a result of Amendment 13. Therefore, the proposed action would not result in significant cumulative impacts to fisheries resources, habitat, protected species or communities.

2.0 CONTENTS

2.1 Table of Contents

APPENDICES

2.2 List of Tables

2.3 List of Figures

Intentionally Blank

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

Intentionally Blank

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, which in some cases are sub-divided into different stock areas. 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.

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.

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. 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 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 was calculated. These years were compared, and the largest number of DAS (limited by 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 are as follows. 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 are to be used only in specific programs that are designed to target healthy groundfish stocks. Category C DAS cannot be used at his 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 program includes specific gear requirements, seasons, and limits on the number of trips. FW 40A adopted two other SAPs designed to target GB Haddock: the Eastern U.S/Canada Haddock SAP and the CAI Hook Gear Haddock SAP.

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). Framework Adjustment 40A (FW 40A) adopted programs to target healthy stocks and adopted incidental catch TACs in order to limit the catches of these stocks by vessels using Category B DAS, including in SAPs. Framework Adjustment 40B – submitted but not yet approved – proposes modifications to the Amendment 13 effort control program to improve its effectiveness.

Subsequent to the approval of Amendment 13, four organizations filed suit, claiming that Amendment 13 did not comply with various statutes (M-A Act, NEPA, APA, etc.). These suits were combined into one case before the U.S. District Court, Washington, DC. The published its ruling on the Amendment 13 lawsuit on March 9, 2005. For the most part, the court rejected the claims of the plaintiffs that Amendment 13 did not comply with various statutes. The court did rule, however, that Amendment 13 does not meet SFA requirements because it fails to fully evaluate reporting methodologies to assess bycatch, it does not mandate a "standardized reporting methodology", and it fails to respond to potentially important scientific information. This aspect of Amendment 13 was remanded to the Secretary for further action. NMFS and the Council are in the process of reviewing this decision and developing a schedule to address the shortcomings of the Northeast Multispecies FMP. The plan will be brought into compliance with the bycatch reporting requirements of the M-S Act through a future action.

3.2 Purpose and Need for the 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 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. Additional programs were adopted by Framework Adjustment 40A, including a program that allows longline vessels to fish in Closed Area I to target haddock. This program, however, does not allow participation by vessels that are not members of the GB Cod Hook Sector. This action is needed to provide all vessels (i.e. non-sector vessels in addition to those vessels that are members of the GB Cod Hook Sector) using longline gear access to the CAI Hook Gear Haddock SAP. The purpose of this action is to implement the CAI Hook Gear Haddock SAP such that it addresses the concerns raised by NMFS in their disapproval of this SAP as it was originally proposed by the Council in FW 40A. The program proposed in this action creates an opportunity for vessels to use additional DAS to target healthy stocks (specifically, GB haddock). This action will provide an opportunity for vessels that are not in the GB Cod Hook Sector to participate in this program. This program will help mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

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 Amendment 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 the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, and FW 40B (not yet approved) improved the effectiveness of the effort control program.

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 7.2.1. The evaluation that this action will not have significant impacts is in section 7.2.2, and the required Finding of No Significant Impact (FONSI) statement is included at the end of that section.

4.0 ALTERNATIVES CONSIDERED INCLUDING THE PROPOSED ACTION

4.1 No Action

Under this alternative, the management measures adopted by Amendment 13 and Framework 40A, as implemented, would remain in effect. These two actions adopted a suite of measures to manage the multispecies fishery. They are described in section 3.1. The implementing regulations can be found at 50 CFR 648 Subpart F.

Of the Amendment 13 and FW 40A management measures that would not be changed if the No Action alternative were selected, the one that bears most directly on the proposed action are the Closed Area I Haddock SAP and the Incidental Catch TACs. In order that the No Action alternative can be clearly contrasted with the proposed action, these measures will be described in further detail. Other measures adopted by Amendment 13 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.

The CAI Hook Gear Haddock SAP was submitted in FW 40A and implemented November 19, 2004. This SAP allows vessels using longline gear to target haddock in a defined area inside CAI during the months of October through December. As implemented, this SAP can only be used by participants in the GB Cod Hook Sector. If the No Action alternative is selected, permit holders that have not joined the sector will not be allowed to fish in this SAP. The current provisions of this SAP include:

- Season: October 1 through December 31
- Area: As shown in Figure 1
- Gear: Longlines or tub trawls. No limit on amount of gear.
- Target Catch: GB haddock, limited to 1,000 mt TAC
- Incidental Catch: Prohibition on discarding cod, all cod catch applied against the sector's cod TAC. No cod possession limit since the cod catch counts against the sector's cod TAC and all fishing by the sector ends when the total cod TAC is caught.
- Other provisions: Participants are required to comply with reporting, notification, and observer requirements, including the use of a Vessel Monitoring System (VMS).

The Council submitted FW 40B to NMFS in January, 2005. While this action has not yet been reviewed and implemented by NMFS, it is possible that this will occur before FW 41 is adopted. The measures of FW 40B would thus apply to the No Action alternative. The measure that bears most directly on this action is the allocation of incidental catch TACs. FW 40B proposes that ten percent of the GB cod incidental catch TAC be set aside for research purposes. If approved, this reduces the amount of GB cod available to Category B DAS programs, including the CAI Hook Gear Haddock SAP. The proposed action assumes that this set-aside will be approved, but also provides the percentage allocations to each Category B DAS program should the research set aside not be approved. The incidental catch TACs that will be in place if FW 40B is approved as submitted are shown in Table 2 through Table 7.

		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 4 – Incidental catch TACs for major stocks of concern (mt) (assuming approval of FW 40B). 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 5 – Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC) (assuming approval of FW 40B).

	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 6 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006 (assuming approval of FW 40B).

	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 7 – Current estimates of the GOM cod incidental catch TACs for FY 2005 and FY 2006 (assuming approval of FW 40B).

4.2 Alternative 1 – Proposed Action

This alternative modifies the CAI Hook Gear Haddock SAP so that non-sector vessels are allowed to participate in the SAP. In order to make this change, the allocation of Incidental Catch TACs must be revised (as compared to the No Action alternative) and the requirements for participation must be defined.

4.2.1 Measure A.1: Incidental Catch Total Allowable Catch

In order to ensure that any catch 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 will be constrained by a "hard" incidental catch TAC. 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 2004, 2005 and 2006, are shown in Table 8. The percentages can be changed by a future management action, and the actual incidental catch TACs will be re-calculated during the periodic adjustment process. The first re-calculation will occur in 2005 and could affect the FY 2006 TACs. The percentages in Table 9 assume that the research set-aside for GB cod proposed in FW 40B is approved and implemented. If this set-aside is not approved, the distribution of incidental catch TACs would be 50 percent to the Category B (regular) DAS Pilot Program, 16 percent to the CAI Hook Gear SAP, and 34 percent to the Eastern US/CA Haddock SAP.

The GB cod incidental catch TAC for the Category B (regular) DAS Pilot Project is divided into two time periods, May through July and August through October, 2005. There is uncertainty over the exact TACs that will result since final action has not been taken on FW 40B and the approval date of FW 41 is uncertain. It is possible that if the GB cod research set-aside is approved in FW 40B, and FW 41 is approved after May 1, 2005, the GB cod TAC for the Category B (regular) DAS Pilot Project in August through October, 2005 will be reduced to account for the CAI Hook Gear Haddock SAP. For this reason, in FY 2005 NMFS will estimate any uncaught GB cod incidental catch TAC from the first quarter of the Category B (regular) DAS Pilot Project and will add that amount to the second quarter GB cod incidental catch TAC for the Category B(regular) DAS Pilot Project. This will only be done for GB cod.

		Incidental Catch TAC		
	Percentage of Total TAC	**2004**	**2005**	**2006**
GOM cod	Two	97	127	149
GB cod	Two	79	97	127
CC/GOM yellowtail	Two	18	25	21
Plaice	Five	185	181	151
White Hake	Two	77	76	76
SNE/MA Yellowtail	Five	35	99	166
SNE/MA Winter Flounder	Five	143	178	222
Witch Flounder	Five	259	350	383

Table 8 – 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	Eastern US/CA Haddock SAP	Research Set-Aside
GOM cod	100%	NA	NA	NA
GB cod	45%	14.4%	30.6%	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 9 - 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	43.6	57.1
CAI Haddock SAP	0	14	18.3
Eastern US/CA Haddock SAP	27	29.7	38.9
GB Cod research set aside	0	9.7	12.7

Table 10 – Current estimates of the GB cod incidental catch TACs for FY 2005 and 2006

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 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.

A two-tier approach is proposed for establishing the appropriate TACs. 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 incidental catch limit for these stocks is two percent of the overall TAC. This approach is explained in detail in section 6.0.

Incidental catch TACs were first allocated by FW 40A. When non-sector vessel access to the CAI Hook Gear Haddock SAP was disapproved, the incidental catch TAC for GB cod that was allocated to this program was shifted to the Category B (regular) DAS Pilot Program. The fishing year incidental catch TACs for the Category B (regular) DAS Pilot Program are allocated to three-month periods (May through July and August through October, 2005). The TAC for GB cod that was allocated to this program by the implementation of FW 40A will be changed when the GB cod research set-aside submitted in FW 40B is approved. When this framework is approved, the TAC of the Category B (regular) DAS Pilot Project will be reduced to provide the TAC for the CAI Hook Gear Haddock SAP. Since this framework will not be implemented by May 1, the entire reduction will be taken from the August through October

period for the Category B (regular) DAS Pilot Project. In order to help reduce the impacts of this adjustment, any remaining TAC from the May through July period will be carried over into the subsequent period.

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

4.2.2 Measure A.2: Closed Area I Hook Gear Haddock SAP

This SAP allows vessels using hook gear to target haddock in a small area of Closed Area I (CAI). There are two groups of possible participants: vessels that fish with hooks and are members of the Hook Sector, and vessels that fish with hooks that are not members of the hook sector. The current SAP only allows participation by vessels that are members of the GB Cod Hook Sector. This alternative modifies the CAI Hook Gear Haddock SAP to allow participation by vessels that are not in the GB Cod Hook Sector. The specifics of the program for non-sector vessels are described below. There are also some changes to the General Provisions that will affect sector vessels. While the broad provisions of the SAP apply to both groups, there are some differences because the mortality controls for each sector differ. The Hook Sector is controlled through a hard TAC on GB cod for all fishing, while for vessels not in the sector catch is controlled through the use of effort controls.

Under this SAP, vessels not in the hook sector are allowed to use Category B DAS to target haddock in CAI. This increases the amount of fishing effort available to those vessels, since DAS are used to control the fishing effort of non-sector vessels. The primary control on fishing effort of the hook sector vessels is a hard TAC on the GB cod those vessels are allowed to harvest. Sector vessels get more fishing effort under the SAP if they are able to successfully target haddock without catching cod.

4.2.2.1 General Provisions

These provisions apply to both vessels in the GB Cod Hook Sector and to non-sector vessels.

Participants: Vessels possessing a limited access days-at-sea commercial multispecies permit. On implementation of FW 41, vessels that are not members of the GB Cod Hook Sector will be allowed to participate in this SAP. GB Cod Hook Sector members will continue to be allowed to participate in the SAP.

Location: The SAP area is that part of CAI bounded by the following coordinates (see Figure 1):

41º 26’ 58’ N 69º 20’17” W (13700/43820)
41º 29’ 22” N 69º 08’ 06” W (12625/43820)
41º 08’ 52” N 68º 50’18” W (13625/43680)
41º 06’ 44” N 69º 03’ 25” W (13700/43680)

Any changes to this area will be adopted through a future management action (framework adjustment or amendment).

Rationale: This area matches the boundaries of an experimental fishery that demonstrated hook gear can catch haddock without catching large amounts of cod. The area can be changed in the future, but a change will require a management action so that impacts on groundfish and other species can be evaluated.

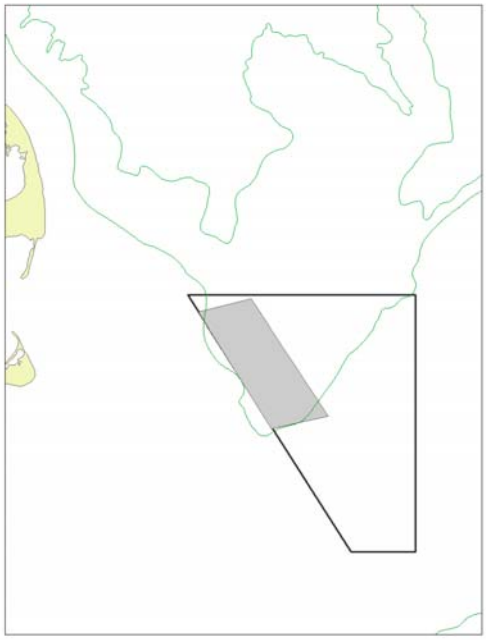


Figure 1 – Initial CAI hook gear haddock SAP area (shaded)

Season: October 1 through December 31. Any changes to the season will be adopted through a future management action.

Rationale: The SAP is limited to the months that are consistent with the experimental fishery because catch rates (in particular, the catch of cod) could be different outside this period. Changes may be made through future management actions after considering impacts on groundfish and other species.

Haddock catch limitation: 1,000 mt (landings and discards). If 1,000 mt of haddock will be caught before the season ends, participation in this SAP will be terminated until the following fishing year. This overall catch limitation applies to all haddock caught in the SAP, whether by non-sector or GB Cod Hook Sector vessels.

Rationale: Amendment 13 management measures were designed to meet mortality objectives for groundfish stocks, with the major control being limitations on the use of Category A DAS. Because this SAP provides an opportunity to fish outside of the Category A DAS program, the catch of haddock must be controlled so that it does not result on overfishing of GB haddock. As discussed in section 6.3.1.1, this allocation provides an opportunity for hook fishermen to catch haddock while preventing the catch from causing overfishing. It is possible that if the catch of haddock during the first period (see below) exceeds half the haddock TAC, vessels fishing in the second period will only be allowed to harvest less than half the haddock TAC.

Gear: All vessels must use longline gear (defined as longlines or tub trawls).

Rationale: The experiment used to justify this SAP did not have a sufficient number of trips using rod/reel to evaluate whether this gear can successfully avoid cod.

Declarations:

(1) All vessels participating in this SAP must use an approved Vessel Monitoring System (VMS).
(2) Vessels must declare their intent to fish in the SAP at the beginning of the trip through the use of an approved VMS prior to leaving the dock. Vessels must identify the type of DAS (Category B (regular) or Category B (reserve)) being using for that trip.
(3) A vessel participating in the SAP is not allowed to fish outside the area of the SAP on the same trip and no gear may be set outside the SAP area while fishing in the SAP.
(4) All vessels (both hook sector and other vessels) must declare their intent to participate in the SAP by September 1 (this provision maybe adjusted by the RA for fishing year 2005 if the final regulations are not published by September 1, 2005). The vessel does not need to specify when trips will be taken in the SAP area with this declaration. This declaration will facilitate planning for the observer program by identifying the pool of vessels that may be SAP participants. If a vessel does not make this declaration, it cannot participate in the SAP during that fishing year.
(5) Vessels must notify the observer program three days in advance (72 hours before departure) of a trip in this SAP.

Rationale**:** These requirements facilitate monitoring of the SAP to ensure that the TACs are not exceeded. The VMS requirement makes it easier to verify that vessels are fishing in the SAP area, and it provides the vessels an easier way to provide catch reports and notify NMFS of their participation in the SAP. Preventing vessels from fishing outside the SAP while on a Category B (Regular) DAS makes it easier to attribute catches to the SAP. The requirement to notify intent to participate in the SAP by September 1 facilitates planning for the observer program, while the requirement to notify the observer program three days in advance provides time for an observer to reach the departure port.

Observer Coverage: The targeted level of observer coverage will be sufficient to ensure the program is working as designed.

Rationale: Observer coverage is necessary to provide estimates of catch (both kept and discarded). The level of coverage necessary depends on that necessary to reduce sampling error to an acceptable level, and sufficient to prevent changes in behavior when observers are present. As information is collected through the program, the level of coverage may be adjusted (increased or decreased) as necessary.

Other provisions:

(1) A vessel cannot fish in this SAP while making a trip under the Category B (regular) DAS Pilot Program.
(2) Individual catch history developed due to access to the SAP will not be considered as a part of any future allocation of the overall haddock TAC

Rationale: Vessels are not allowed to participate in both the Category B (regular) DAS Pilot Program and this SAP on the same trip because to do so would complicate enforcement and administration since the programs have different requirements. Since the measures for controlling derby effects restrict the access of sector and non-sector vessels to only part of the TAC, the Council does not want catches in this SAP to apply to catch history in future allocation decisions.

Measure for Controlling Possible Derby Effects: The SAP season will be divided into a period for sector vessels and a period for non-sector vessels. In FY 2005, the sector will fish during the first half of

the SAP season (October 1 through November 15). The haddock catch during this period will be capped at 500 mt (1.1 million pounds) in FY 2005 (half the TAC). Non –sector vessels will fish during the second half of the SAP season (November 16 through December 31), or if the haddock cap for the first period is reached before November 15, non-sector vessels can begin fishing when notified by NMFS through procedures consistent with the APA. The catch during the non-sector period will be capped at 500 mt (1.1 million pounds, half the TAC) in FY 2005. The seasons will alternate each year between sector and non-sector vessels (i.e. non-sector vessels fish October 1 – November 15 in FY 2006 unless changed by a future action). If the catch of haddock in the first period does not equal half the TAC, the remainder will be applied to the second period.

Rationale: The purpose of this alternative is to revise the CAI Hook Gear Haddock SAP to allow participation by non-sector vessels. This program will help mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13. In order to mitigate derby effects this option separates fishing in the SAP by sector and non-sector vessels. Working together, sector and non-sector vessel owners who plan to participate in the program have crafted an industry-based solution to avoid a derby fishery in the SAP. The solution does not constitute an allocation to any user group but solves the immediate problems of a derby. Further discussions of the CAI Hook Gear Haddock SAP should not be based on this current solution nor should the solution constitute a precedent for the development of SAPS, Category B (regular) DAS programs, or other allocations in the future. It is the intent of the Council that none of the catch in this SAP will be considered part of a vessel's catch history with respect to any future allocation of the overall haddock TAC.

Sector and non-sector vessels alternate halves of the SAP season on an annual basis so that each group has similar access to haddock. Non-sector vessels fish in the second half in FY 2005 so that there is less likelihood they will lose part of the period if implementation is delayed. The overall haddock TAC is divided equally between the seasons since, as discussed in sections 6.3.1.1.1 and 6.3.4.2, the catch rates of haddock were similar over the course of an experimental fishery. By dividing the TAC in half, each group (sector and non-sector vessels) has an equal opportunity to catch haddock. In the absence of any historic basis to assign an allocation, this division was viewed as the most equitable. Because the SAP is a new program, and non-sector vessels have not had the opportunity to fish in the SAP, the alternative of basing the split on recent historic catches could not be used.

Two additional options for controlling a derby fishery were considered but rejected. They included:

Option 1: No limits on the number of trips per week that a vessel can take in this SAP. This option would implement the SAP as submitted in FW 40A. This option does not adopt any measures designed to slow catch rates or mitigate possible derby effects in the SAP. It avoids a perceived allocation of the SAP catch to different user groups and allows vessels to compete for the resource on an equal basis. This option was rejected because it would not prevent a derby fishery from developing.

Option 2: Vessels may only start two trips into the SAP in each calendar week (Sunday through Saturday). This option attempted to slow catch rates in the fishery and mitigate possible derby effects through the use of a control on the number of trips. This measure introduces some control on catch rates without a perceived allocation of the SAP to any user groups. This option was rejected because it would only partially address derby effects and may cause increased safety problems in the fishery.

4.2.2.2 Requirements for Vessels not in the Hook Sector

Incidental Catch Restrictions: The catch (landings and discards) of GB cod will be limited to a "hard" incidental catch TAC of 14.4 percent of the total GB cod incidental catch TAC. Current estimates of this limit are shown in Table 11 for FY 2005 and 2006. When this TAC is caught, vessels that are not in the hook sector cannot participate in the SAP. TACs will be recalculated every two years during the periodic adjustment process. The first re-calculation will occur in 2005 and could change the FY 2006 TAC.

Fishing Year	TAC
2005	14
2006	18.3

Table 11 – Proposed GB cod incidental catch
TACs for the CAI hook gear haddock SAP (mt)

Rational: This incidental catch TAC prevents cod catch while fishing in this sector from threatening rebuilding objectives. The allocation of 14.4 percent of the GB cod incidental catch TAC is similar to the percentage of GB cod landed by hook gear in recent years.

Possession limits:

(1) The cod catch is limited to 1,000 lbs./trip for non-sector vessels. This limit applies for the entire trip of any vessel participating in the SAP.
(2) Vessels are not allowed to discard legal sized cod prior to reaching the catch limit. A trip must end if a vessel exceeds the cod catch limit.
(3) Possession/landing limits for haddock and other species will be the same as required under Amendment 13 regulations.

Rationale: Analysis in section 6.3.1.1 shows that during the experimental fishery, cod catch rarely exceeded 500 lbs./DAS. The cod limit applies to all cod caught, whether retained or not. This serves as an incentive for vessels fishing in the SAP to avoid cod so that the maximum amount of haddock will be caught in the SAP.

Gear:

(1) There are no limits on the number of hooks that can be set while fishing in the SAP.
(2) Vessels participating in this SAP are not allowed to use squid or mackerel for bait, and cannot possess squid or mackerel on board the vessel during a SAP trip.
(3) Non-sector vessels cannot possess gear on board that is not allowed to be used during a SAP trip.

Rationale: Since the catch of cod and haddock is limited by TACs, gear restrictions would merely impose unnecessary inefficiencies for fishermen. An experimental fishery demonstrated that using squid as bait increased catch rates of cod. By prohibiting the use or possession of this bait, the catch of cod will be further controlled. The experiment also suggested that mackerel would lead to higher catches of cod, though the results were inconclusive. Non-sector vessels cannot have gear on board that is prohibited in the SAP (for example, trawl or gillnet gear) to reduce the possibility vessels may fish outside of the SAP area during a SAP trip.

Other provisions:

(1) Non-sector vessels may not use Category A DAS to fish in this SAP. They can only use groundfish Category B (regular or reserve) DAS in this SAP.

(2) Vessels that participate in this SAP may not fish outside the SAP area on the same trip. They may not have any gear set outside the SAP area while participating in the SAP.
(3) Vessels must report their catch (kept and discarded) of haddock and cod daily through VMS when fishing on a Category B DAS. Catches of haddock and stocks of concern will be reported as kept or discarded (estimated).

Rationale: Vessels are not allowed to use Category A DAS in this SAP, and are not allowed to fish outside the SAP area while participating in the SAP in order to facilitate accurate monitoring of SAP catches. Daily reporting via VMS will facilitate monitoring of the TAC.

5.0 AFFECTED ENVIRONMENT

5.1 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 2) 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.

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 fishing activity under the Category B (regular) DAS program could occur through the geographic range of the fishery, the CAI Hook Gear Haddock SAP is limited to a well-defined area. The CAI Hook Gear Haddock SAP will take place in the northwestern corner of CAI. Depths in this area generally range from fifty to eighty fathoms, though there are some shallower depths along the southern and southeastern boundaries. As shown in Figure 14, the sediment in most of this area is gravelly sand, with some small patches that are primarily sand in the northwest and southeast corners. While there are some gravel areas in CAI, they are outside of the SAP area. The total area for the proposed SAP is 221 sq. nm., while the area for CAI is 1,148 sq. nm.

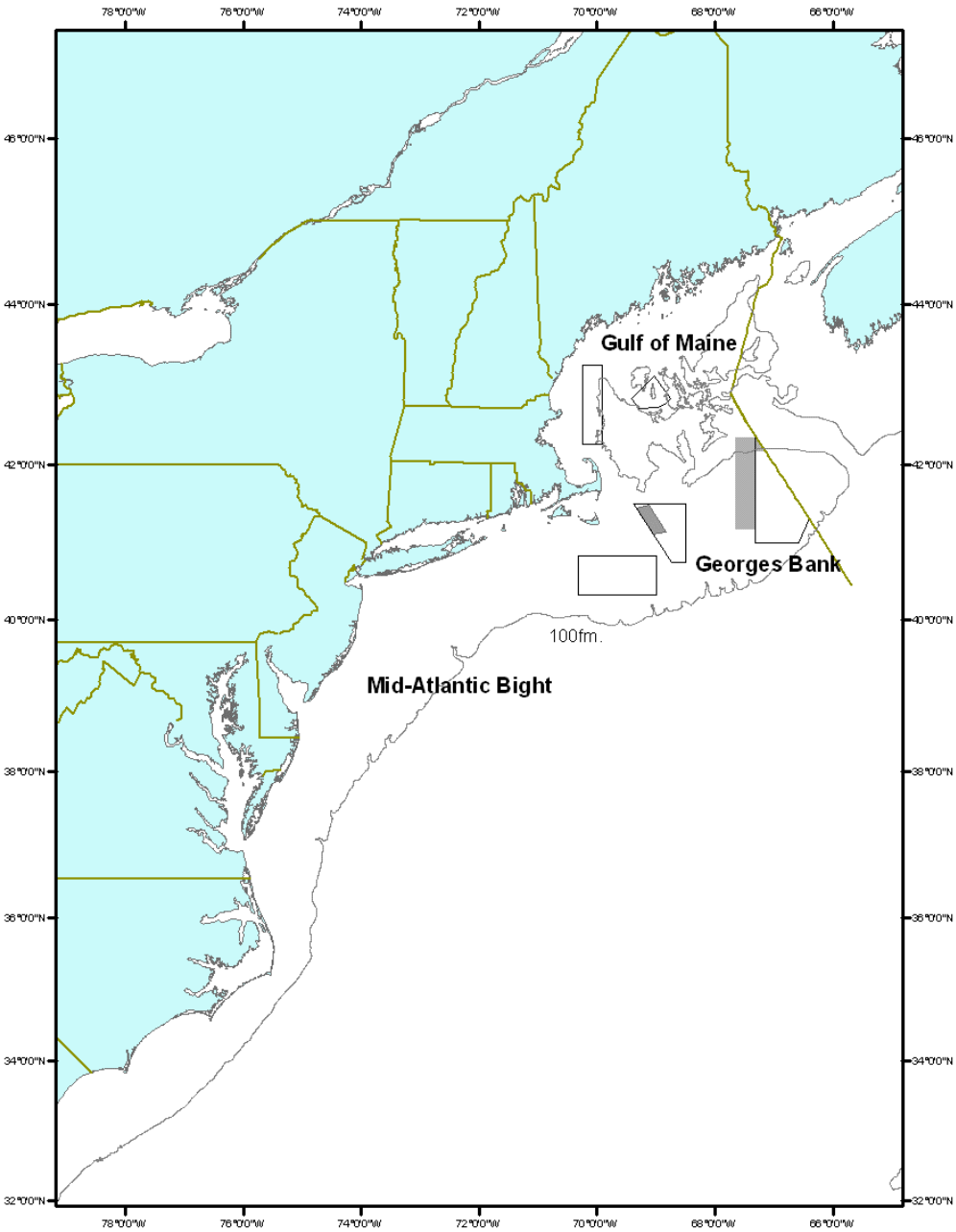


Figure 2 – U.S. Northeast Shelf Ecosystem, showing multispecies year round mortality closed areas and CA I Hook Gear Haddock SAP and Eastern US/CA Area Haddock SAP areas (shaded)

5.2 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.

5.2.1 Regulated 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 12 and Figure 3. 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 August 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. The stocks in the area affected by this action include Georges Bank haddock, American plaice, witch flounder, pollock, Cape Cod/ Gulf of Maine yellowtail, and white hake,. 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 included (% reduction in F needed to achieve F_{MSY} threshold): Georges Bank cod (58%), American plaice (30%), witch flounder (44%), and white hake (40%). 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. The stocks in this situation that may be affected by this action were (% increase in stock biomass needed to achieve B_{MSY} target): Georges Bank cod (716%), Georges Bank haddock (151%), white hake (128%), ocean pout (115%), 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. Similar estimates cannot yet be made for FY 2004.

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 13 and charted for relevant stocks in Figure 4.

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 13). 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 12 – 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.

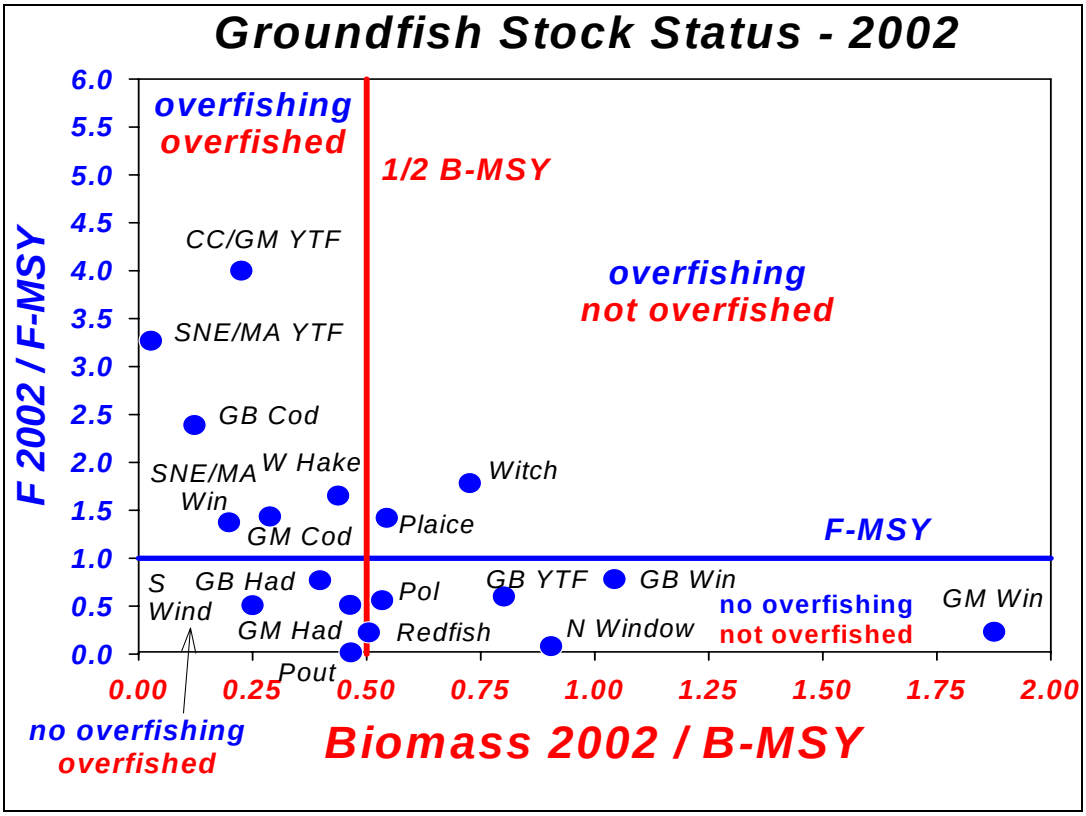


Figure 3 - Groundfish stock status, 2002 (NEFSC, see Table 12 for sources)

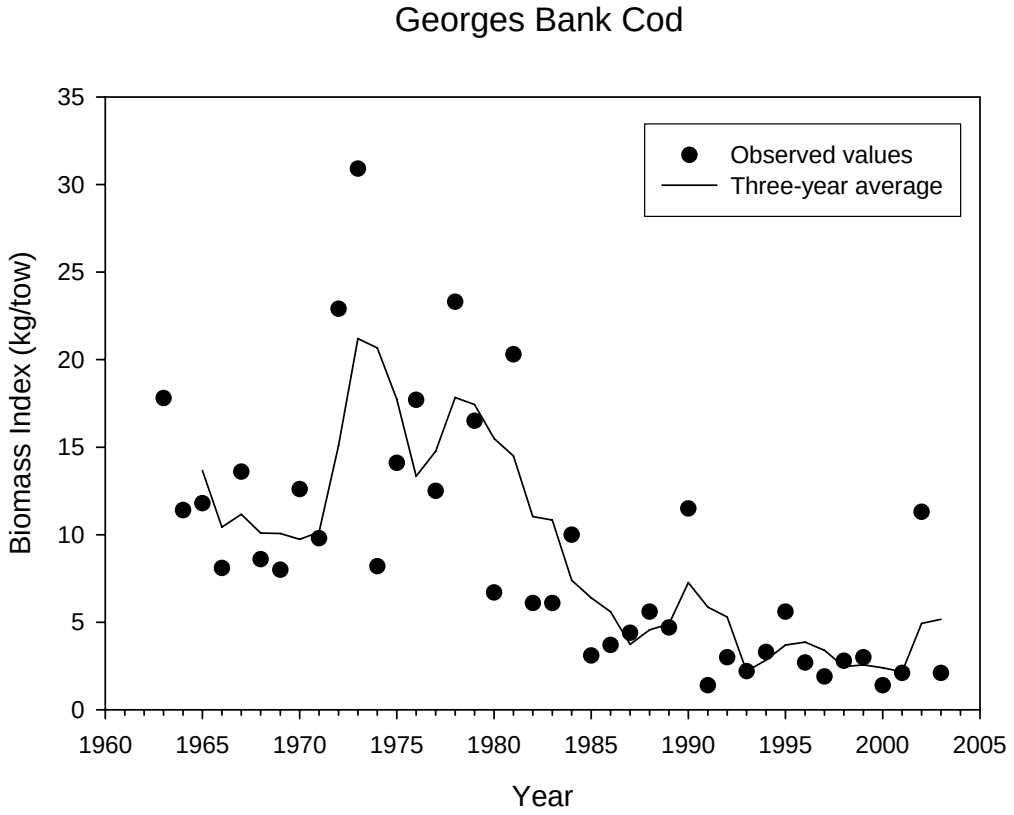
Year	GB Cod	3-yr Average GB Cod	GB Haddock	3-yr Average GB Haddock	GB Yellowtail	3-yr Average GB Yellowtail	SNEMA Yellowtail	3-yr Average SNEMA Yellowtail	CCGM Yellowtail	3-yr Average CCGM Yellowtail	GM Cod	3-yr Average GM Cod	Witch	3-yr Average Witch	American plaice	3-yr Average American plaice	GB Winter 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%**	

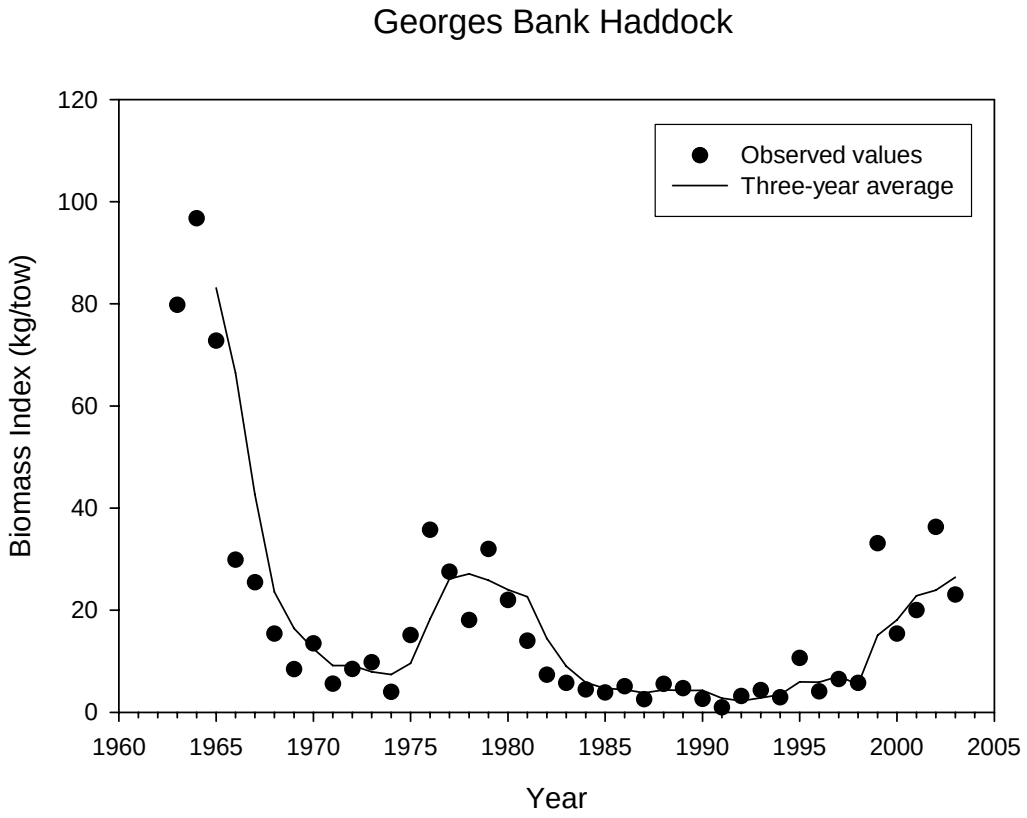
Table 13 - NEFSC survey biomass indices (kg/tow), 1963-2003

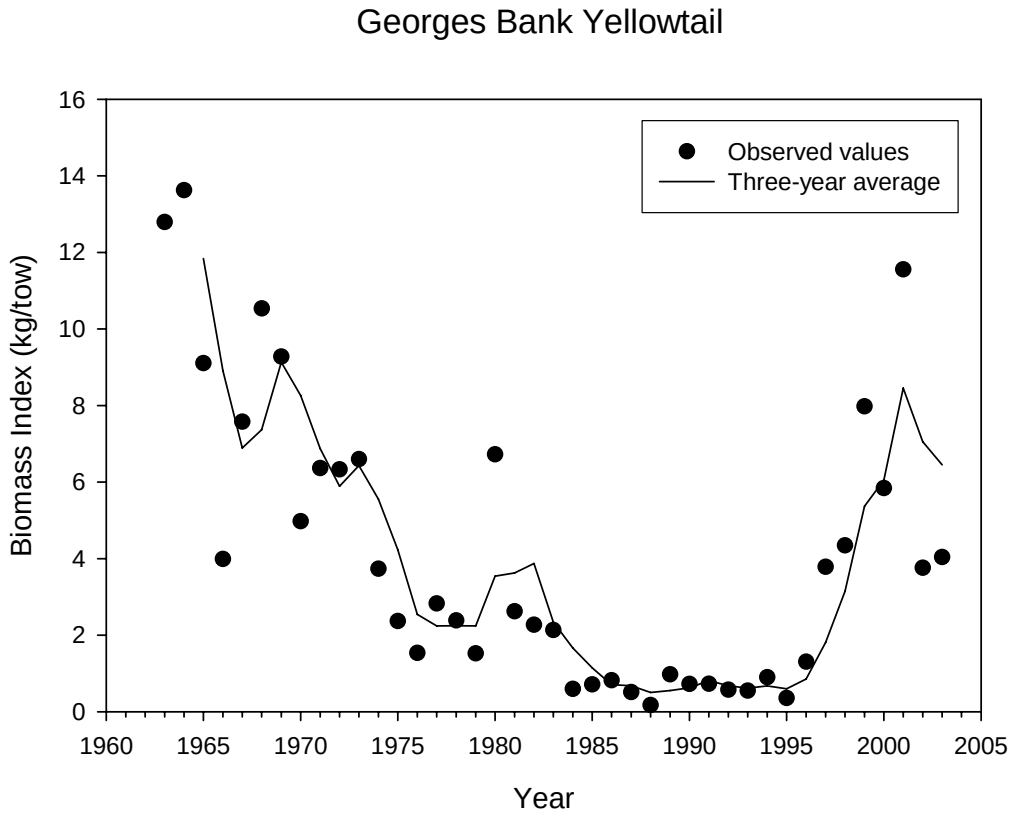
Year	White Hake (>60 cm)	3-yr Average White Hake (>60 cm)	Pollock	3-yr Average Pollock	Redfish	3-yr Average Redfish	Ocean pout	3-yr Average Ocean pout	N Windowpane	3-yr Average N Window-pane	S Windowpane	3-yr Average S Window-pane	GM Haddock	3-yr Average GM Haddock	Halibut	3-yr Average Halibut	GM Winter 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%**	

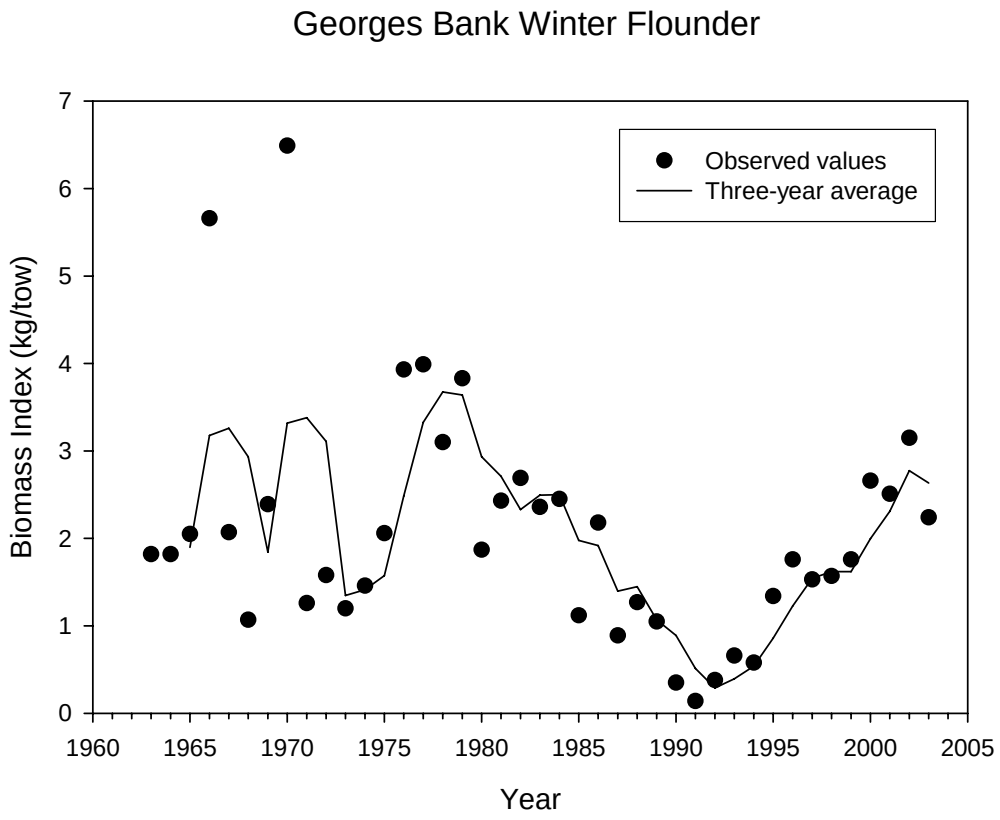
Table 13 - NEFSC survey biomass indices (kg/tow), 1963-2003 (cont.)

Figure 4 – Autumn trawl survey indices for regulated groundfish found on Georges Bank

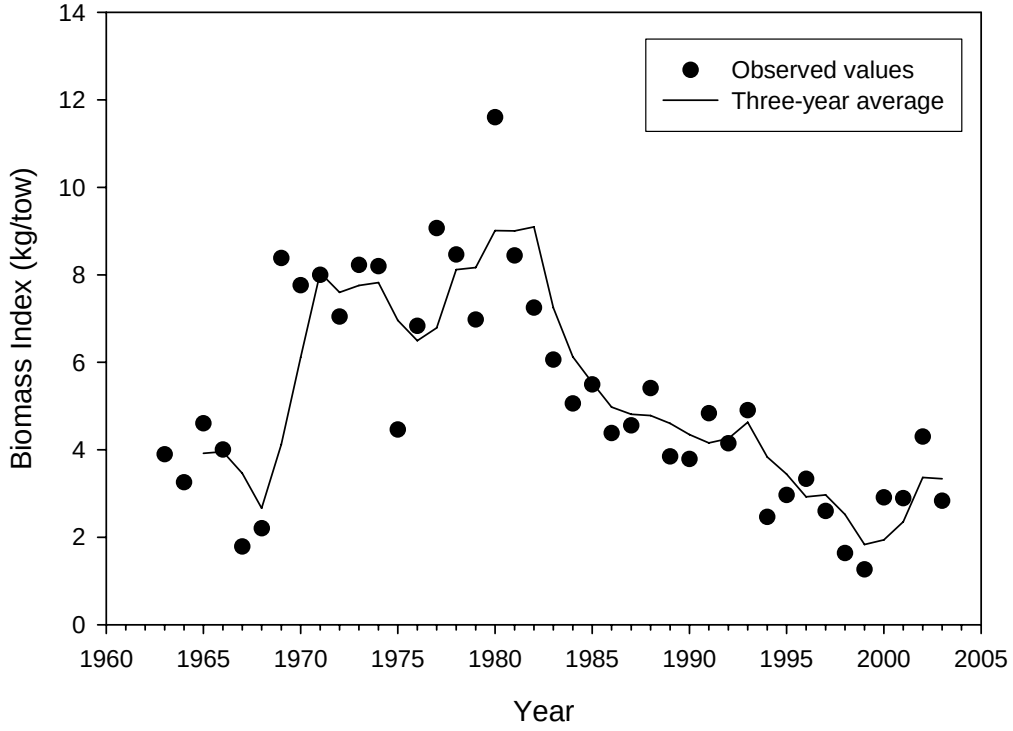




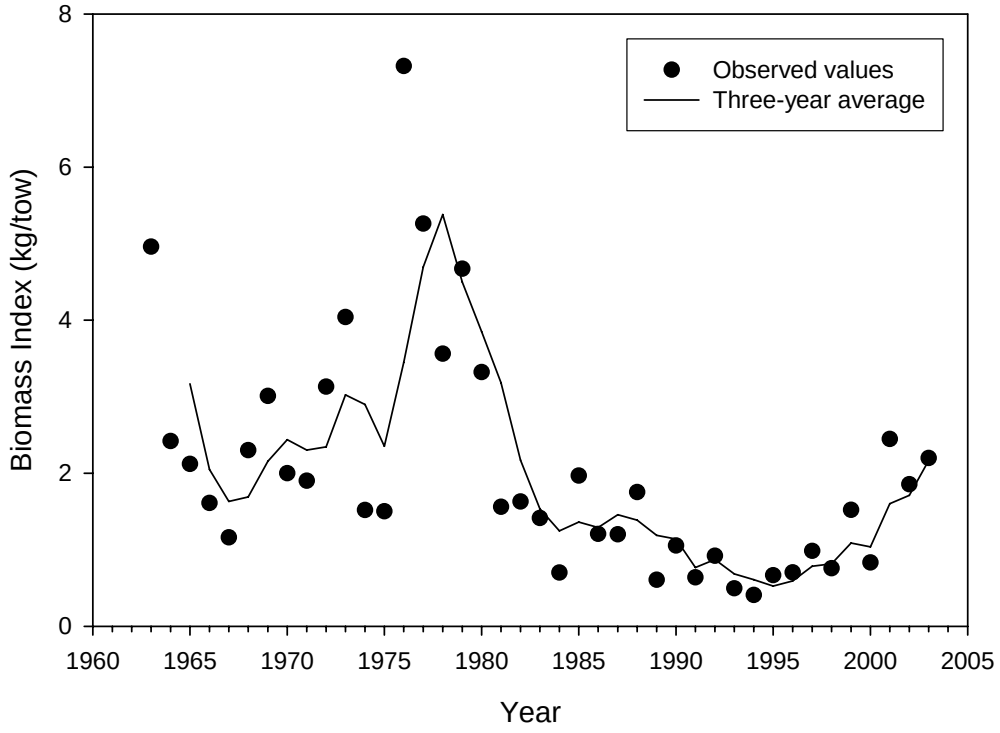

Georges Bank Yellowtail
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
2
4
6
8
10
12
14
16
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

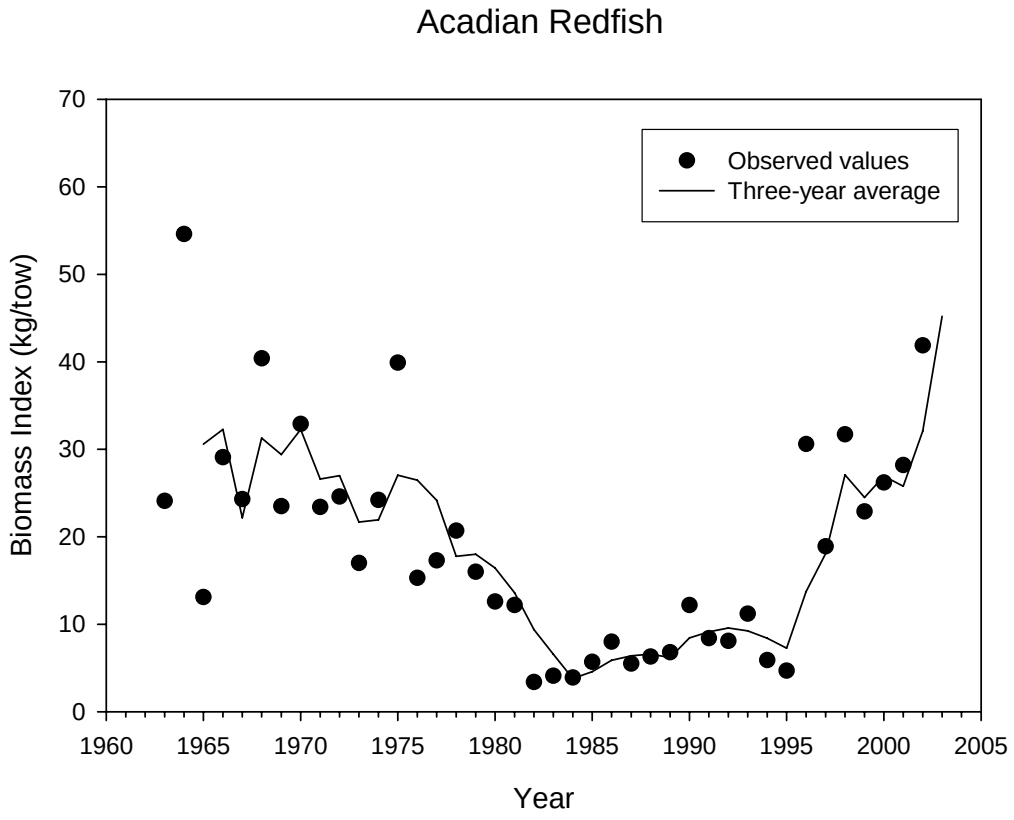

Georges Bank Winter Flounder
Observed values
Three-year average
Biomass Index (kg/tow)
Year
0
1
2
3
4
5
6
7
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005

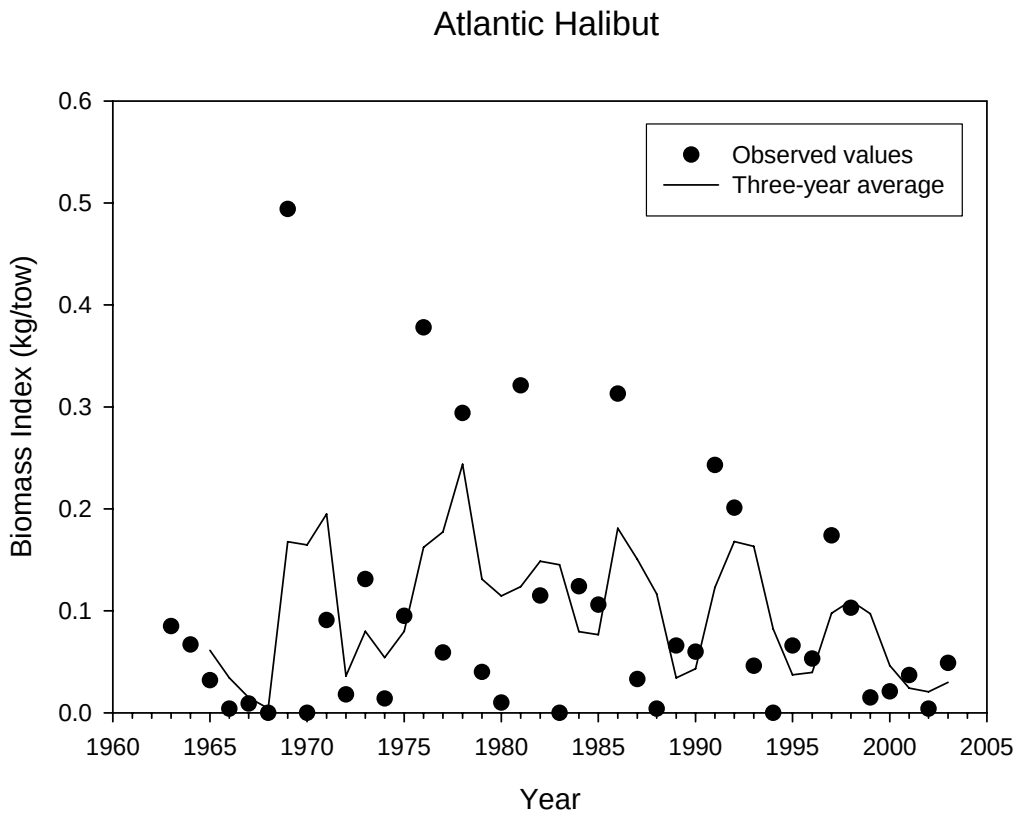
White Hake over 60 cm



Pollock




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


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

5.3 Habitat

5.3.1 Habitat Associations and Functions

Amendment 13 provided a detailed description of the habitat associations and functions for the multispecies fishery, throughout its range. Since the CAI Hook Gear Haddock SAP is limited to a specific area of GB, only that area is described below.

5.3.1.1 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 14. The sedimentary provinces (Valentine et al, 1993) do not cover all portions of Georges Bank, and do not describe the sediments found with the proposed SAP. To supplement these data, Figure 5 depicts the substrate type in all areas in and around Closed Area I based on Poppe et al (1986, 1989). These data are the only substrate data available for the entire Northeast region.

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 14.

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).

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. 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. 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.

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 14 - 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).

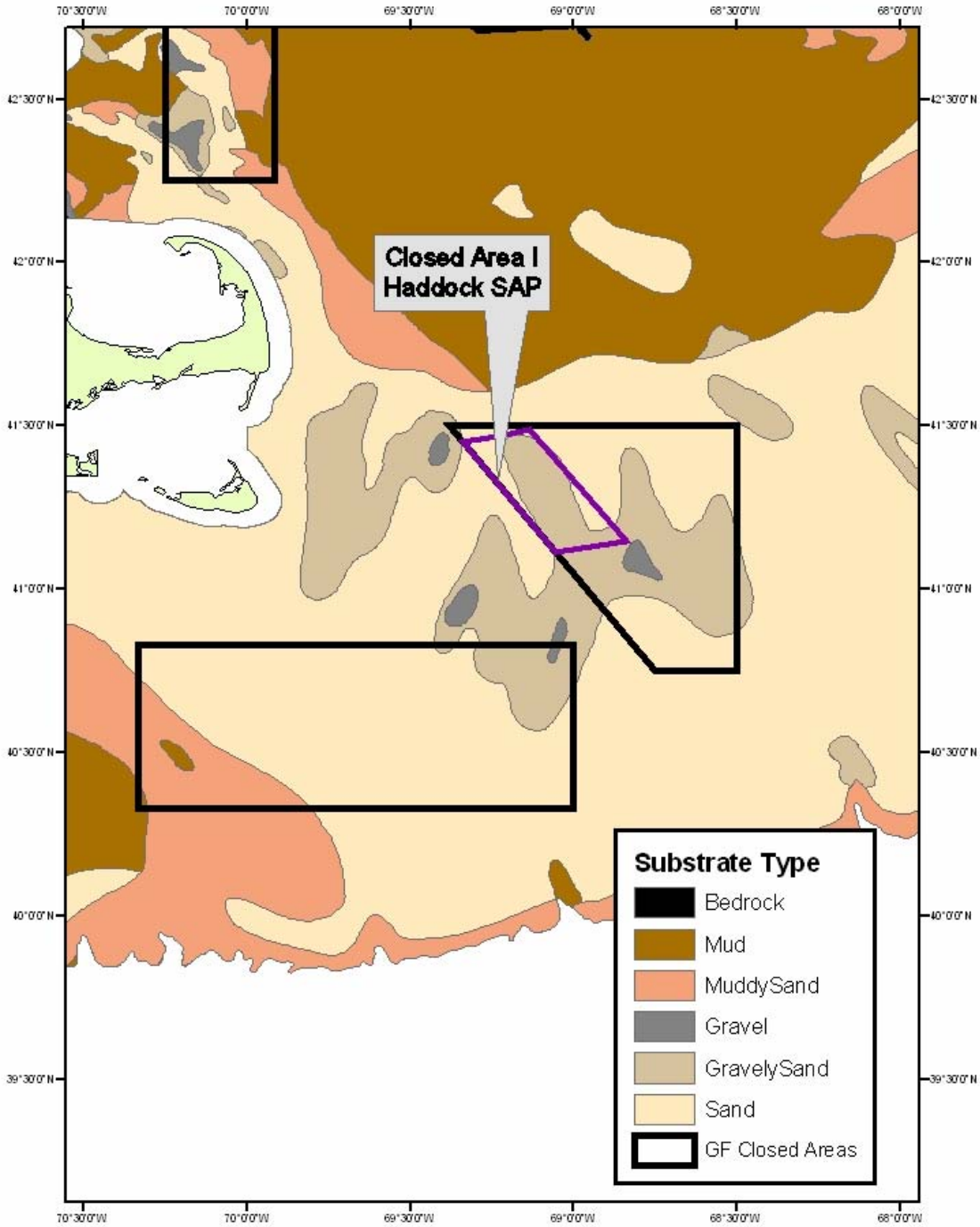


Figure 5 – Sediment of Georges Bank near CAI (Source: Poppe et al. 1989)

.

5.3.2 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). Most of the discussion in the references relates to mobile gear since that gear is believed to have more impacts on habitat than fixed gear. The following summary of the conclusions reached by these authors is extracted from a recent NOAA report (Johnson 2002). This discussion summarizes the impacts of all gears, but highlights the longline gear used in the CAI Hook Gear Haddock SAP.

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. This information is of limited use for this action, however, since only longline gear can be used in the CAI Hook Gear Haddock SAP.

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 (NEEFHSC 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 15 below. The results of the workshop have been considered in the next section, which includes a review of the relevant fishing gear effects literature.

TYPE OF IMPACT	DEGREE OF IMPACT	DURATION	TYPE OF EVIDENCE	COMMENTS
MUD				
Removal of Major Physical Features	N/A			
Impacts to Biological Structure	X	Months - Years	PJ	
Impacts to Physical Structure	X	Permanent[1] Days - Months[2]	PJ	[1] Refers to clays [2] Soft bottom muds
Changes in Benthic Prey	N/A			
SAND				
Removal of Major Physical Features	N/A			
Impacts to Biological Structure	X	Days - Months	PJ	
Impacts to Physical Structure	N/A			
Changes in Benthic Prey	N/A			
GRAVEL				
Removal of Major Physical Features	N/A			
Impacts to Biological Structure	X	Months - Permanent[1]	PR, GL, PJ	[1] corals
Impacts to Physical Structure	N/A			
Changes in Benthic Prey	N/A			

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 judgement. For definitions of Sediment Type and Type of Impact see Appendix D.

Table 15 - **Impacts of Sink Gillnets and Bottom Longlines on Benthic Habitat**

Longlining for bottom species on continental shelf areas and offshore banks is undertaken for a wide range of species including cod, haddock, dogfish, skates, and various flatfishes (Sainsbury 1996). A 9.5 m (31 ft) vessel can fish up to 2500 hooks a day with a crew of one and twice that number with 2 crew members. Mechanized longlining systems fishing off larger vessels up to 60 m (195 ft) can fish up to 40,000 hooks per day (Sainsbury 1996).

In the Northeast up to six individual longlines are strung together, for a total length of about 460 m (1500 ft), and are deployed with 20-24 lb (9 - 11 kg) anchors. The mainline is parachute cord or sometimes stainless steel wire. Gangions (lines from mainline to hooks) are 38 cm (15 inches) long and 1-2 m (3-6 ft) apart. The mainline, hooks, and gangions all come in contact with the bottom. Circle hooks are potentially less damaging to habitat features than other hook shapes. These longlines are usually set for only a few hours at a time (NREFHSC 2002). Longlines used for tilefish are deployed in deep water, may be up to 40 km (25 miles) long, are stainless steel or galvanized wire, and are set in a zig-zag fashion (NREFHSC 2002). These activities are managed under federal fishery management plans.

Bottom longlining during 1995-2001 was conducted primarily in coastal waters of the southwestern GOM and extended southeast of Cape Cod along the western edge of the Great South Channel. A few trips were also reported on the northern edge of GB, in the outer portion of the GOM, in SNE coastal waters, and at scattered locations along the outer continental shelf. Almost all longline trips were reported in the GOM and GB sub-regions, with approximately twice as many in GB. The proportion of each sub-region where 90% of the longline trips were reported diminished from north to south. Of the three fixed gear types, longlines accounted for fewer trips during 1995-2001 than pots or bottom gill nets. Longline trips were also reported from TMS that occupied a smaller percentage of the Northeast shelf area than pot or gill net trips.

Like the other two fixed gear types, bottom longline trips were most commonly reported from TMS in sandy bottom areas, but in relation to the areal extent of each sediment type present in the NE region, longlining was more closely associated with gravelly sand and gravel. Longlining was reported from a very low proportion of mud in the GOM and GB sub-regions, and from a high proportion of sand in the GOM and gravelly sand and gravel areas in the GB sub-region. The low number of trips in SNE were more strongly associated with gravelly sand than with any other sediment type.

Of the five gear types that are either used to harvest the 15 species of groundfish that are managed under the NEFMC Multi-Species FMP, or which are capable of catching groundfish (i.e., as by-catch), or which are used in other federally-managed fisheries, there are three that could adversely affect benthic EFH for the groundfish species. These are bottom otter trawls, scallop dredges, and hydraulic clam dredges. This conclusion is based on two recent reports. The first of these (NREFHSC 2002) is the report of a workshop held in October 2001 that examined the habitat effects of gears used in the Northeast region on three substrate types (gravel, sand, and mud). A panel of experts concluded that otter trawls and scallop dredges were the two highest priority gears in terms of impacts, with minimal impacts for clam dredges, nets and lines, and pots and traps. Clam dredges were ranked lower than otter trawls and scallop dredges because they are used primarily in sandy, high-energy environments that are exposed to extreme natural disturbances and because the fishery operates in a much smaller area than the scallop and groundfish fisheries. This action does not affect the use of these three gears.

The second report (Morgan and Chuenpagdee 2003) evaluated the effects of ten different commercial fishing gears on marine ecosystems in U.S. waters. It differentiated between habitat impacts and by-catch issues and listed the effects of each gear type in more detail than the first report. (It also relied on input from a larger group of experts and used more scientifically-based methods for collecting

and analyzing the information). The report concluded that bottom trawls and dredges have very high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. Individual types of trawls and dredges were not evaluated. The impacts of bottom gill nets, traps, and longlines were limited to warm or shallow-water environments with rooted aquatic vegetation or “live bottom” environments (e.g., coral reefs). Based on these analyses, bottom longlines in the GB area are not expected to have substantial nor significant effects on bottom habitat.

5.4 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.

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.

5.4.1 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 41 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.

5.4.2 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.

5.4.3 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.

5.4.3.1 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.

5.4.3.2 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.

5.4.3.3 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.

Intentionally Blank

5.5 Human Environment

5.5.1 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 2003. 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, and FW 40B added data for FY 2003.

Because the proposed action is being submitted less than twelve 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, FW 40A, and FW 40B. 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 a measure that applies only 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. Most of this information applies to the fishery as a whole, and is not specific to longline fishing.

5.5.2 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.

5.5.2.1 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 16). 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 17). 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 18. 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 16 – 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 17 – 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 18 – 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.

5.5.2.2 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 19 through Table 35 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 19 – 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 20 – 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 21 – 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 22 – 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 23 – Groundfish revenues (1,000's of 1999 dollars) by multispecies permit holders

5.5.2.3 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 24 – 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 25 – 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 26 – 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 27 – Regulated groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by length

5.5.2.4 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).

Regulated groundfish landings by bottom longline vessels in FY 2003 were only 27 percent of the landings from this gear in FY 1994. Revenues, in constant dollars, were only 21 percent of the revenues in FY 1994. Clearly, the SAP proposed in this action will help mitigate the impacts of the management program on this sector.

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 28 – 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	2003
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 29 – 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 30 – 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 31 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by gear

5.5.2.5 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 32 – 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 33 – 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 34 – 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 35 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by homeport state

5.5.2.6 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 36. 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 37 shows the number of DAS leased 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 38 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 or may not represent a partial increase in revenues over 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 36 – 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 37 – 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 38 – Dollar transfers between states from DAS leasing activity (NMFS unpublished data through January 12, 2005)

5.5.2.7 Expected Impacts of Framework Adjustment 40A

The Council submitted FW 40A in July, 2004 and it was implemented November 19, 2004. 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 1,038,776 pounds of haddock on 217 trips (an average of 4,786 lbs./trip landed). An additional 2,351 pounds of haddock were discarded. Only 20,265 pounds of cod were caught 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.

5.5.2.8 Expected Impacts of Framework 40B

FW 40B was submitted to NMFS on January 28, 2005 and is currently under review. Since the measures proposed in this action have not yet been implemented, there is no information available to determine the actual impacts of this action. The submitted measures most likely to affect the commercial fishing industry included changes to the CAII Yellowtail Flounder SAP and the removal of the limit on the number of nets that can be fished by trip gillnet vessels. These changes, however, were expected to have minor beneficial impacts on the fishery. Other measures – such as modifications to provisions of the DAS transfer and leasing programs – were expected to improve the usefulness of those programs but were not expected to result in major changes to the fishery. Some benefits were also expected to accrue to commercial rod-reel fishermen as a result of the WGOM Closed Area Haddock SAP.

5.5.2.9 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 19 and Table 22). 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.

The CAI Hook Gear Haddock SAP provided benefits to vessels in the GB Cod Hook Sector in 2004. Even though the SAP was only open for about forty-one days, over a million pounds of haddock were landed by twenty-five sector vessels.

5.5.3 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.).

5.5.4 Communities

5.5.4.1 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

5.5.4.2 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 6 through Figure 8. 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 which alternative is ultimately selected to address rebuilding requirements and 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.

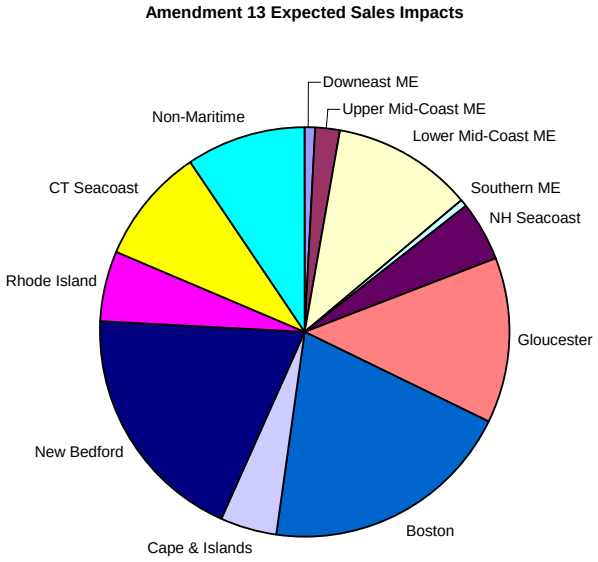


Figure 6 – Amendment 13 expected sales impacts, by port group

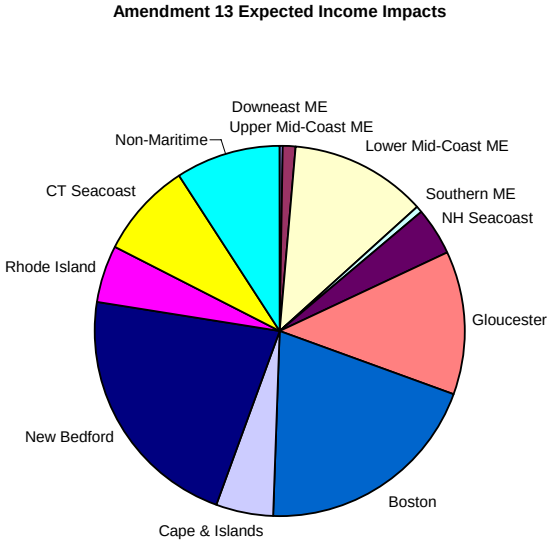


Figure 7 – Amendment 13 expected income impacts, by port group

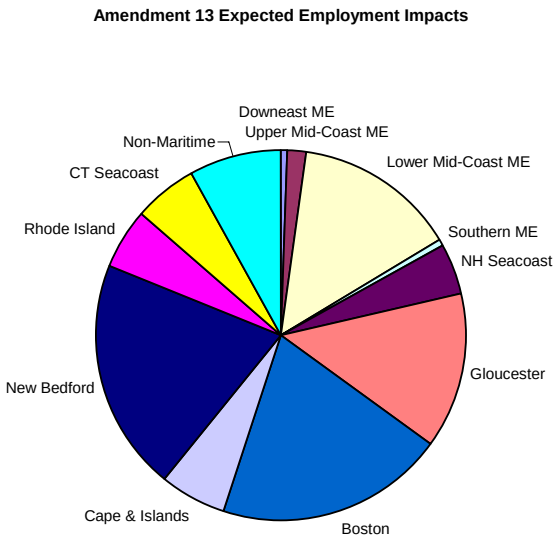


Figure 8 – Amendment 13 expected employment impacts, by port group

6.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF IMPACTS

6.1 Introduction

FW 41 proposes to modify the CAI Hook Gear Haddock SAP. The impacts of the proposed action are compared to No Action alternative in the following sections. They are described with respect to biological (including bycatch and endangered and threatened species), habitat, economic, and social impacts. The two alternatives are compared and cumulative effects of this an other actions are summarized.

6.2 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. In addition, the impacts of No Action may include the impacts of measures included in FW 40B. While FW 40B has been submitted to NMFS, it has not yet been approved. The following discussion briefly summarizes the impacts of the measures that were proposed in FW 40B.

6.2.1 Biological Impacts

6.2.1.1 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), FW 40A (NEFMC 2004), and FW 40B (NEFMC 2005) (if this last framework is implemented by NMFS). 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, is 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. This Category B (regular) DAS Pilot Program will only be in effect through October, 2005 and so any increased in mortality that result are temporary. 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.

FW 40B was submitted in January, 2005. If the entire suite of measures in that action are implemented, there may be additional biological impacts on groundfish. 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.

6.2.1.2 Impacts on Other Species/Bycatch

The multispecies fishery results in bycatch of both regulated groundfish and other species. 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. 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.

If adopted, the measures submitted in FW 40B may result in a small increase in fishing effort compared to Amendment 13 and FW 40A. 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.

6.2.2 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. The measures submitted in FW 40B are expected to have either no or minimal impacts on EFH.

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 39 – 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

6.2.3 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 the most recent frameworks 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.

An analysis of FW 41 measures does not change the conclusion that there should be 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.

6.2.4 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.

The measures proposed (but not yet approved) in FW 40B 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. Changes 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, FW 40B 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, FW 40B would affect NMFS costs for the observer program. The WGOM Closed Area Rod/Reel Haddock SAP would impose additional costs on the observer program. 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.

6.2.5 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.

The proposed FW 40B 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.

6.2.6 Impacts on Other Fisheries

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. Proposed FW 40B measures 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.

6.3 Alternative 1

The details of this alternative are described in section 4.2. To summarize, this alternative specifies the requirements for non-sector vessels to fish in the CAI Hook Gear Haddock SAP.

6.3.1 Biological Impacts

This section examines the direct and indirect biological impacts of this alternative. The impacts are analyzed with respect to:

- Impacts on groundfish (both targeted and incidental catch species)
- Impacts on other species
- Impacts on the bycatch of both groundfish and other species. To some extent, this discussion duplicates parts of the first two analyses. Because of the M-S Act requirement to minimize bycatch, to the extent practicable, these impacts are highlighted.
- Skate baseline review. The Skate FMP requires a review of the impacts of a proposed action on the skate fishery under certain conditions, described in more detail in a later section.

While arguably impacts on habitat and protected species are another type of biological impacts, these impacts are discussed in separate sections.

6.3.1.1 Impacts on Groundfish

Impacts on groundfish are discussed in relation to the target stock (GB haddock) and other stocks.

6.3.1.1.1 Target Stocks

This alternative modifies one SAP that is designed to target GB haddock. The primary control on haddock catch is a "hard" TAC. When the catch – landings and discards – of haddock is projected to reach the TAC, fishing under the SAP will cease.

Category B DAS Incidental Catch TACs

This measure limits the catch of stocks of concern taken by non-sector vessels while using Category B DAS. The proposed GB cod TAC for the CAI Hook Gear Haddock SAP is set at very low levels (124 mt in FY 2005, increasing to 18.3 mt in FY 2006) to reduce the risk to Amendment 13 mortality objectives. This TAC may be caught and the program may be ended early, limiting the catch of the target stock. Based on an experiment conducted in the area, the average catch of cod for each day fished (trips in the experiment were one day) was 0.13 mt, while the catch of haddock was 2.27 mt. At these catch rates, 220 days fished are needed to catch 500 mt of haddock. The catch of cod in 220 days would be expected to be 28.6 mt. Any incidental catch TAC of less than this amount means that the incidental catch TAC may be taken before the entire haddock TAC.

CAI Hook Gear Haddock SAP

The CAI hook gear haddock SAP implements a program that allows longline fishing in a small part of CAI to target haddock. The specific details of the program are described in section 4.2.2. As noted in that section, there are two groups of possible participants: those vessels that participate in a hook sector established by Amendment 13, and those vessels that do not participate in this sector. An overall "hard" TAC of 1,000 mt limits the haddock catch of both groups. The Amendment 13 target TAC for GB haddock was calculated at F_{MSY} for FY 2004 through 2006, and is shown in Table 41. Some GB haddock is harvested by Canadian vessels, however, as allocated under the U.S./Canada Resource Sharing Understanding. FW 40A analyses showed that the target TAC would not threaten haddock mortality targets in FY 2004. Allocations under this understanding are determined annually and have been established for FY 2005. Under the approved Amendment 13 management measures, fishing mortality for GB haddock is expected to decline from that in FY 2001 (see Table 40) to less than F_{MSY} (0.26). The Amendment 13 target TAC for 2005, reduced by the Canadian share of GB haddock, was compared to recent catches of GB haddock. This comparison is only used to illustrate the difference between available catch and actual catch in recent years. There is over a 6,500 mt difference between the 2005 target TAC (12,282 mt) and the highest recent catches of haddock (6,325 mt in 2001). The conclusion from these comparisons is that absent additional opportunities to target GB haddock, landings of GB haddock under the Amendment 13 management measures are likely to be far less than the FY 2005 TAC. Based on these comparisons, it is not likely that the TAC for the CAI Hook Gear haddock SAP will threaten mortality objectives of Amendment 13.

An important question is whether the catches in the SAP can be monitored accurately enough to predict with a reasonable degree of certainty if/when the haddock TAC will be caught. The proposed measures include daily reporting requirements for vessels participating in the SAP and sufficient observer coverage to ensure the objectives of the program are met. The sampling precision that may be achieved by different levels of observer coverage can be estimated by examining the results of an experimental fishery that was conducted October through December, 2003. The experiment demonstrated that longline vessels in CAI could effectively target haddock. The average catch of haddock for all trips was about 5,000 lbs./trip (Table 42) (each trip took place during one DAS). Based on the proposed TAC of 1,000 mt (2.2 million pounds), the expected number of trips that will result from this SAP is 440 trips (DAS). The

results of the experimental fishery can be used to estimate the level of precision that will result from different levels of observer coverage.

Stock	2001 Fishing Mortality	Expected Reduction in Mortality Assuming a Reduction in DAS Used Of			Needed Reduction (includes expected mesh effects)
		50%	**45%**	**39%**	
GB Cod	0.38	49%	45%	42%	39%
GOM Cod	0.47	47%	44%	38%	46%
GB Haddock	0.22	41%	35%	30%	NA
GOM Haddock(1)	0.12	43%	38%	33%	NA
GB Yellowtail Flounder	0.13	36%	33%	28%	NA
Cape Cod/GOM Yellowtail Flounder	0.75	69%	65%	63%	65%
SNE/MA yellowtail flounder	0.91	65%	59%	56%	59%
American Plaice	0.43	51%	49%	42%	41%
Witch Flounder	0.76	53%	49%	42%	67%
GOM Winter Flounder	0.14	50%	43%	34%	NA
GB Winter Flounder	0.25	38%	32%	28%	NA
SNE/MA Winter Flounder	0.51	49%	43%	37%	31%
Acadian Redfish(3)	0.01	--	--	--	--
White Hake(1)	1.36	42%	37%	32%	17%
Pollock(1)	3.55	40%	36%	31%	NA
Windowpane Flounder (North)(1)	0.1	30%	27%	23%	NA
Windowpane Flounder (South)(1)(4)	0.69	NA	NA	NA	NA
Ocean Pout(4)	0.008	NA	NA	NA	NA
Atlantic Halibut(4)	NA	NA	NA	NA	NA

Table 40 - Estimated mortality reductions expected under Amendment 13, assuming different levels of a reduction in DAS used

(1) Index based stock assessments
(2) Reduction needed to end overfishing
(3) Changes lost in rounding errors
(4) Closed area model results not reported due to low levels of input data

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	12,282
2006	31,866	Unk.	Unk.

Table 41 – Target TACs (mt) for 2004 through 2005 and recent U.S. haddock catches

	Number of trips	Grand Total	mean per trip	variance	Standard deviation	Standard Error	% of total catch	Cumulative %
Haddock	49	240964	4918	6714988.49	2591.33	370.19	0.79	0.79
Cod, Atlantic	49	14251	291	94168.13	306.87	43.84	0.05	0.83
Dogfish	49	13649	279	593187.05	770.19	110.03	0.04	0.88
Skate, Thorny	49	8222	168	47150.57	217.14	31.02	0.03	0.91
Cusk	49	7084	145	20972.51	144.82	20.69	0.02	0.93
Skate, Unidentified	49	6884	140	74460.00	272.87	38.98	0.02	0.95
Hake, White	49	5498	112	18990.13	137.80	19.69	0.02	0.97
Skate, Barndoor	49	2273	46	7100.58	84.26	12.04	0.01	0.98
Hake, Red	49	1833	37	1964.28	44.32	6.33	0.01	0.98
Hake, Silver	49	960	20	12150.99	110.23	15.75	0.00	0.99
Skate, Smooth	49	954	19	2408.38	49.08	7.01	0.00	0.99
Skate, Clearnose	49	881	18	8733.73	93.45	13.35	0.00	0.99
Redfish	49	704	14	295.22	17.18	2.45	0.00	0.99
Monkfish	49	480	10	220.85	14.86	2.12	0.00	1.00
Shark, Unidentified	49	200	4	816.33	28.57	4.08	0.00	1.00
Scallop	49	170	3	121.96	11.04	1.58	0.00	1.00
Halibut	49	158	3	258.76	16.09	2.30	0.00	1.00
Shark, Mako	49	150	3	459.18	21.43	3.06	0.00	1.00
Shark, Blue	49	100	2	204.08	14.29	2.04	0.00	1.00
Anemone	49	41	1	3.06	1.75	0.25	0.00	1.00
Sculpin	49	37	1	3.72	1.93	0.28	0.00	1.00
Shell, Unidentified	49	31	1	4.28	2.07	0.30	0.00	1.00
Debris, Rock	49	28	1	3.54	1.88	0.27	0.00	1.00
Wrymouth	49	26	1	7.13	2.67	0.38	0.00	1.00
Unknown Living Matter	49	24	0	11.76	3.43	0.49	0.00	1.00
Sponge, Unidentified	49	23	0	2.38	1.54	0.22	0.00	1.00
Debris, Fishing Gear	49	22	0	3.00	1.73	0.25	0.00	1.00
Wolffish	49	16	0	1.46	1.21	0.17	0.00	1.00
Hake, Red/White	49	15	0	3.72	1.93	0.28	0.00	1.00
Hagfish	49	14	0	1.75	1.32	0.19	0.00	1.00
Pollock	49	14	0	0.82	0.90	0.13	0.00	1.00
Debris, nk	49	14	0	0.59	0.77	0.11	0.00	1.00
Flounder, Winter	49	10	0	2.04	1.43	0.20	0.00	1.00
Snail, Unidentified	49	6	0	0.19	0.44	0.06	0.00	1.00
Starfish, Sea/Unidentified	49	6	0	0.36	0.60	0.09	0.00	1.00
Invertebrate, Unidentified	49	3	0	0.18	0.43	0.06	0.00	1.00
Grey Sole	49	2	0	0.08	0.29	0.04	0.00	1.00
Hake, Unidentified	49	2	0	0.08	0.29	0.04	0.00	1.00
Clam, Unidentified	49	1	0	0.02	0.14	0.02	0.00	1.00
Eggs, Unidentified	49	1	0	0.02	0.14	0.02	0.00	1.00
Flounder, Yellowtail	49	1	0	0.02	0.14	0.02	0.00	1.00
Sea Squirt, Unidentified	49	1	0	0.02	0.14	0.02	0.00	1.00
Hake, Offshore (Whiting)	49	1	0	0.01	0.07	0.01	0.00	1.00
Grand Total		305751.69						

Table 42 - Total catch per trip (round weight, pounds), mean catch per trip, variance per trip, standard deviation, standard error and coefficient of variation for all species in experimental hook fishery. All bait types combined.

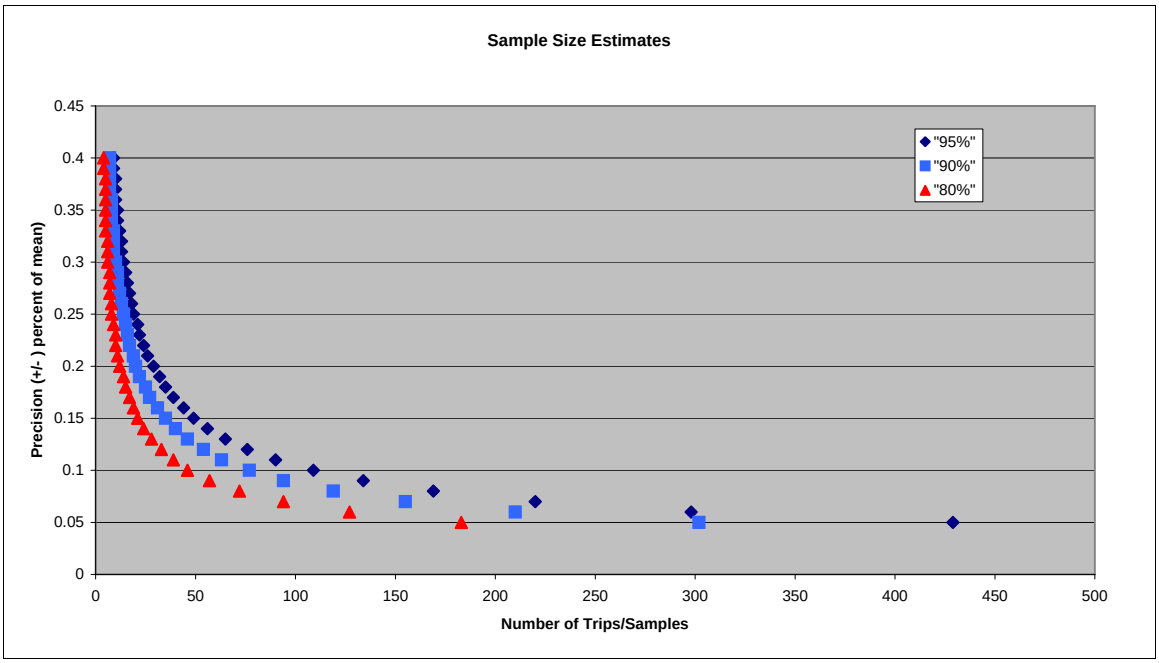


Figure 9 – Estimates of sample size necessary to estimate haddock catch at a given level of precision for the CAI hook gear haddock SAP. Three confidence levels shown.

6.3.1.1.2 Incidental Catch Stocks

Category B DAS Incidental Catch TACs

While the main purpose of this action is to create an opportunity for non-sector hook vessels to target haddock in the CAI Hook Gear Haddock SAP, there may be some catch of groundfish stocks of concern. FW 40A established hard TACs for the incidental catches (landings and discards) of groundfish stocks of concern that may be caught while using Category B DAS, including in this SAP. Incidental catch TACs are not specified for ocean pout, Atlantic halibut, or windowpane flounder (south) because overall catches of these species are so low that a TAC would be not provide any additional protection. While programs are not yet created that may result in taking of all of these stocks, setting these limits is the first step in determining what opportunities may exist in the future for the use of Category B (regular or reserve) DAS use. Using these incidental catch TACs requires that:

- The TACs are set at a level so that there is little risk of exceeding Amendment 13 mortality objectives.
- The specific measures adopted by this alternative will not result in high catch rates of incidental catch stocks, compromising the ability to monitor and enforce the TACs.
- Monitoring and administration of the program is sufficient to accurately estimate catches so that the incidental catch TACs are not exceeded.
- Any indirect impacts on the incidental catch stocks will not threaten mortality objectives.

Developing limits on the catch of stocks of concern was complicated by the uncertainty over the exact impact of Amendment 13 management measures. This uncertainty argues for a cautious approach to setting these limits until the Council has experience with the actual performance of the proposed measures. This uncertainty also means that in some cases the Council recommends conservative limits on

catch until more information can be collected. While the only way to be certain that any incidental catch of stocks of concern on a Category B DAS does not increase mortality is to prevent the use of any Category B DAS, setting incidental catch TACs at low levels does not create much risk for these stocks. The incidental catch TACs were analyzed in FW 40A. This action does not change the total incidental catch TACs and thus the expected biological impacts on stocks of concern is no different than if the entire incidental catch TAC were caught under the No Action alternative. The allocation of GB cod to various Category B DAS programs is changed in order to allow for non-sector vessel participation in this SAP. It is possible that by distributing the GB cod incidental catch TAC in a different manner than under the No Action alternative the catch of GB cod while using Category B DAS may be different (even though it cannot exceed the incidental catch TAC). Such changes cannot be estimated until the various Category B DAS programs are evaluated.

CAI Hook Gear Haddock SAP

The CAI hook gear haddock SAP implements a program that allows longline fishing in a small part of CAI to target haddock. The specific details of the program are described in section 4.2.2. As noted in that section, there are two groups of possible participants: those vessels that participate in a hook sector established by Amendment 13, and those vessels that do not participate in this sector. The incidental catches of groundfish are treated differently for these two sectors. For the hook sector vessels, incidental catches of cod are counted against the cod allocation granted to the sector. Since this cod catch is based on the target TAC for the entire stock, as long as it is monitored and enforced the catch of cod by sector vessels will not threaten mortality objectives for the amendment. Other vessels are limited to an incidental catch TAC of GB cod, with two options considered for this TAC. Since this TAC (at either level) is a subset of the overall incidental catch TAC for GB cod, as long as this catch is adequately monitored and enforced it should not threaten mortality objectives for GB cod.

This SAP proposes to implement fishing activity that was examined by an experimental fishery conducted during September through December, 2003. The experiment demonstrated that haddock can be effectively targeted by longline vessels in CAI with acceptable levels of cod incidental catches. For the overall experiment, cod catch totaled five percent, by weight, of the overall catch. Catches of cod averaged 291 lbs./trip for the entire experiment. The only other groundfish stock caught in any quantity was white hake, with an average catch of 112 lbs./trip for the entire experiment. The catch resulting from the experiment is shown in Table 42. The distribution of cod to haddock caught is shown in Figure 10. This figure shows that cod catch exceeded 600 lbs. on only seven of the experiment's 49 trips. Because the regression of cod on haddock is significant, the catch of haddock is a good predictor of the catch of cod.

The experiment tested different types of bait, and the results did not demonstrate a statistically significant difference in haddock catches as a result of bait type. For cod, however, the experiment demonstrated that the use of herring bait (bait type 2) resulted in statistically significant lower cod catches than squid bait (bait type 3). A third bait – mackerel - was tested, but while cod catch appeared higher than while using herring, the number of trips was not sufficient to draw statistically valid conclusions. Table 43 and Table 44 show the difference in cod catch that resulted from the change in bait. Herring bait resulted in a lower average cod catch and only two trips where cod catch exceeded 600 lbs./trip. This suggests that the choice of bait can further reduce the catch of cod. Based on these results, the proposed action does not allow the use of squid as bait. In addition, while the data are inconclusive, the use of mackerel is also prohibited as a precautionary measure.

To summarize, the experimental fishery demonstrated that a longline fishery could be conducted in CAI from October through December that can target haddock without catching large amounts of cod. The choice of bait can further reduce cod catches. The catch of haddock can be used to reliably estimate the catch of cod. For vessels not in the hook sector, the proposed SAP establishes a trip/possession limit

of 1,000 lbs./trip. The experimental results show that this daily limit is not likely to result in excessive cod discards, since most trips did not catch this amount of cod.

As a result of this experiment, FW 40A proposed a CAI Hook Gear Haddock SAP using longline (including tub trawl) gear. The area and season were the same as proposed in this alternative. As approved, only members of the GB Cod Hook Sector were allowed to fish in this SAP in FY 2004. The season was shortened because of a delayed implementation. Catches in this SAP, however, were similar to the results of the earlier experiment. According to preliminary information received from sector managers, 25 vessels took 217 trips in this SAP. They caught 1,041,127 pounds (472 mt) of haddock, including 2,351 pounds of discards. Total cod catch was 20,265 pounds, including 218 pounds of discards. The haddock/cod ratio for the reported catch was 51.3:1. All of the vessels that participated in the SAP were observed at least once, with a total of 104 observed trips for a coverage of about 46 percent. On observed trips, kept haddock totaled 471,956 lbs. and discarded haddock was 7,096 lbs. Kept cod amounted to 8,482 pounds and discarded cod was 197 pounds. The ratio of haddock to cod on observed trips was 55:1. The reason for the difference between reported and observed discards of haddock has not been determined.

Given recent poor recruitment of cod on GB, this proposed SAP was examined to determine if it would result in an unusual catch of small cod. In the experimental fishery, which measured the length of all cod caught, most of the cod caught exceeded the minimum size limit for cod (see Figure 11). Based on these results, it is not likely the SAP will result in an excessive catch of juvenile cod.

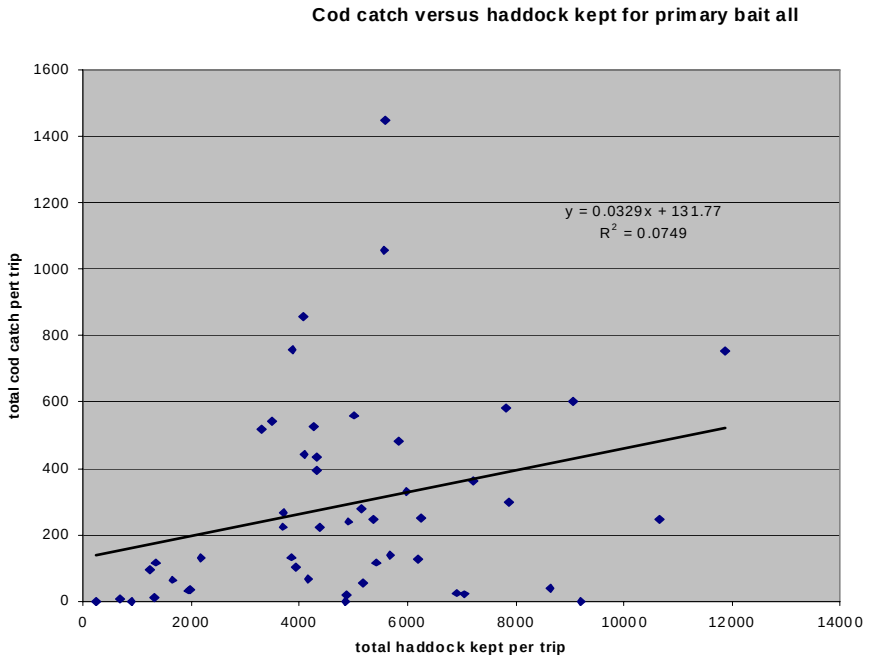


Figure 10 – Cod vs. haddock caught, all trips.

	Number of trips	Grand Total	mean catch per trip (pounds)	variance	standard deviation	standard error
total Cod catch	40	5598	139.9	36948.4	192.2	13.9
total haddock catch	40	126631	3165.8	4288487.6	2070.9	45.5
total Cod kept	40	5555	138.9	36915.1	192.1	13.9
total haddock kept	40	124932	3123.3	4248568.1	2061.2	45.4
total cod discarded	40	42	1.1	14.4	3.8	1.9
total haddock discarded	40	1700	42.5	1375.0	37.1	6.1
Ratio cod: haddock kept			0.045			

Table 43 – Summary statistics for cod and haddock, bait type = herring

	Number of trips	Grand Total	mean catch per trip (pounds)	variance	standard deviation	standard error
total Cod catch	31	8563	276.2	111050	333.2	18.3
total haddock catch	31	112306	3622.8	8567907	2927.1	54.1
total Cod kept	31	8523	274.9	110613	332.6	18.2
total haddock kept	31	110311	3558.4	8271510	2876.0	53.6
total cod discarded	31	40	1.3	14	3.7	1.9
total haddock discarded	31	1995	64.3	4660	68.3	8.3
Ratio total cod: kept haddock			0.08			

Table 44 – Summary statistics for cod and haddock, bait type = squid

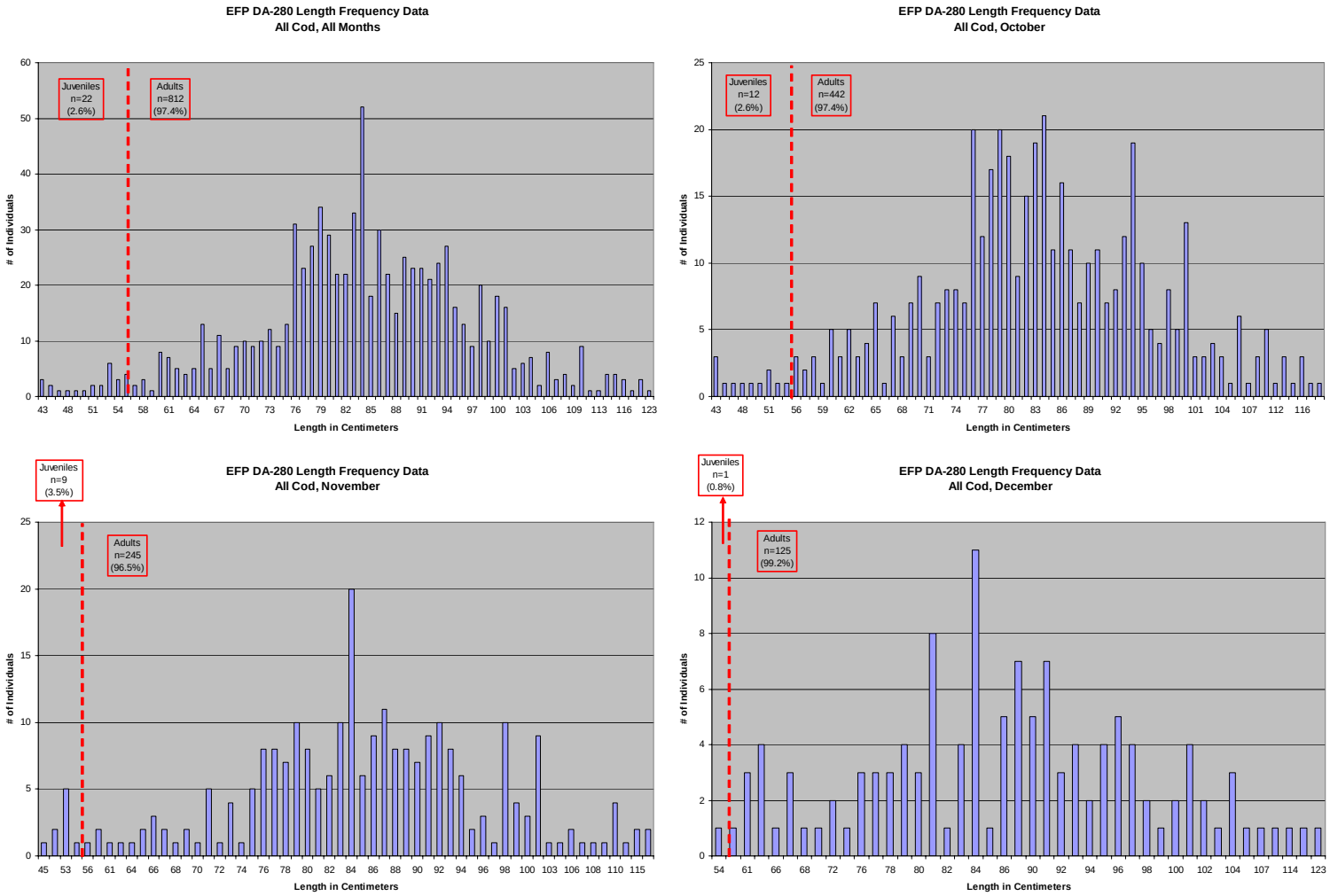


Figure 11 – Length/frequency distribution of cod caught in the CAI hook gear haddock experimental fishery

The third issue to be addressed is whether the enforcement and monitoring provisions of the proposed SAP are sufficient to reliably estimate the incidental catch of cod. A primary tool used to monitor the SAP is the daily reporting of catches by vessels in the hook sector by the sector operator, and by vessels not in the hook sector through an approved VMS. Timely reporting will enable NMFS to monitor the reported catches on a daily basis, enabling them to predict when the incidental catch TAC will be reached. In addition, the SAP targets sufficient observer coverage of the DAS fished so the objectives of the program can be met. Based on the experimental results and the TAC set for haddock (see the preceding discussion), the number of trips expected to be necessary to harvest the haddock is 440 trips (each trip is assumed to be one DAS). Using the information from the experimental fishery (mean and variance of cod catches), and assuming that the SAP results are similar, the level of precision that will result from the observer coverage can be estimated. As shown in Figure 12, if 85 trips are sampled, the mean cod catch for all trips is likely to be within 20 percent of the mean for the sampled trips at the 90 percent confidence interval.

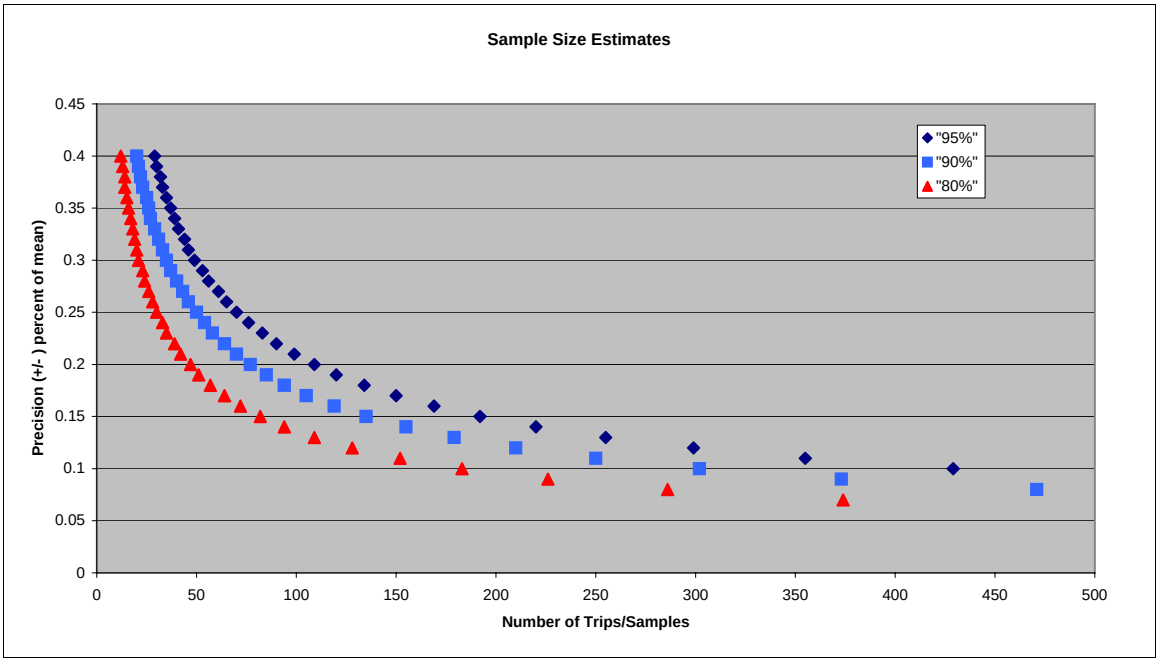


Figure 12 – Estimates of sample size necessary to estimate cod catch at a given level of precision for the CAI hook gear haddock SAP. Three confidence levels shown.

Any changes to the season or area for this SAP will require a future management action (plan amendment or framework adjustment). Additional experiments are being conducted to determine if the boundaries can be changed without increasing cod catch. Changing the season proposed for the SAP could extend the SAP into groundfish spawning seasons. There is no evidence that longline fishing activity interferes with cod spawning other than through the removal of spawning fish. Given the poor recruitment of GB cod in recent years, before this SAP is extended into other months the Council will carefully consider whether future experiments show that the cod caught during these months are in spawning condition.

6.3.1.1.3 Summary of Impacts on Groundfish Species

This section summarizes the biological impacts of the proposed action on groundfish stocks, both those that are targeted and those that are caught incidentally. Overall, this action is not expected to have significant impacts on any regulated groundfish stock.

The proposed action will create opportunities for more fishermen to target GB haddock in the CAI Hook Gear Haddock SAP. The action does not increase the haddock TAC for this SAP and as a result is not expected to increase haddock fishing mortality. Fishing mortality could increase on GB cod if it is caught by non-sector vessels fishing in the SAP. Since this catch of cod is limited by an incidental cod TAC designed to reduce the risk to the mortality target, this action is not expected to threaten the mortality targets for GB cod. This TAC is established at a level so that, based on the analyses in Amendment 13 and this document, the risk of exceeding rebuilding targets will be small.

6.3.1.2 Impacts on Other Species

This alternative may have impacts on other species as a result of the catch of other species on groundfish trips. The following sections discuss the catch of non-groundfish species that may result from each proposed measure. Part of this catch may be discarded, defined as bycatch by the M-S Act. For groundfish species, bycatch is discussed in the previous section.

Category B DAS Incidental Catch TACs

Establishing incidental catch TACs for groundfish stocks of concern will not have any direct impacts on other species. This measure may restrict the fishing activity under any Category B DAS program, since the TAC will bind these programs. This will limit any increase in bycatch that results from the increase in effort that results from Category B DAS programs. The TACs may also encourage the development of more selective fishing methods as fishermen learn to target healthy stocks while avoiding groundfish stocks of concern. To the extent that stocks of concern mix with other bycatch species, the TACs may indirectly reduce bycatch.

CAI Hook Gear Haddock SAP

The CAI hook gear haddock SAP allows longline vessels to target haddock in a defined area in CAI. An experimental fishery was conducted in this area in October through December 2003. Results of that experiment can be used to estimate the bycatch that may result. Table 42 summarizes the catch in this experimental fishery. Those species that accounted for one percent or more of the total catch are shown in Table 45, with all other species caught represent less than one percent of the total catch. Based on an estimate that 440 trips will take place in this fishery before the haddock TAC is caught, the expanded catch of these species is also shown. Based on the experimental results, about eight percent of the total catch in the SAP will probably be discarded. Of the seven species shown, current regulations prevent retention of two (thorny and barndoor skates) and trip limits restrict retention of a third (dogfish). The two skate species must be discarded, and much of the dogfish catch is likely to be discarded as well due to regulatory restrictions. The impacts of the skate discards will be discussed in the skate baseline review (section 7.1.3).

Catches of other species probably do not represent an increases compared to the No Action alternative. For vessels in the hook sector, the hook gear SAP may represent shifts in effort from other areas into the SAP area. Without knowing the catch of other species in those areas, it cannot be determined if this catch represents an increase or decrease. Some trips in this SAP may be taken by vessels that are not in the hook sector. To the extent those vessels use Category B DAS, this represents an increase in effort and probably represents an increase in catch of these species. To put the catch of dogfish

in perspective, the expected catch of 56 mt is less than one percent of the 2002 commercial catch (7,200 mt, landings and discards).

Species	Total Catch (lbs)	Average	Variance	Standard Deviation	Standard Error	CV (SE/Mean)	Percent of Total	Expected Catch
Dogfish	13649	279	593187.05	770.19	110.03	39.50	0.04	122,760
Skate, Thorny	8222	168	47150.57	217.14	31.02	18.49	0.03	73,920
Cusk	7084	145	20972.51	144.82	20.69	14.31	0.02	63,800
Skate, Unidentified	6884	140	74460.00	272.87	38.98	27.75	0.02	61,600
Hake, White	5498	112	18990.13	137.80	19.69	17.54	0.02	49,280
Skate, Barndoor	2273	46	7100.58	84.26	12.04	25.95	0.01	20,240
Hake, Red	1833	37	1964.28	44.32	6.33	16.92	0.01	16,280

Table 45 – Species that accounted for one percent or more, by weight, of the total catch in the CAI hook gear haddock experiment.

Summary of impacts on other species

The proposed action will result in an increase in fishing effort as compared to the No Action alternative. As a result, there may be increased impacts on other species that are caught by vessels fishing for groundfish. These impacts will not be significant.

6.3.1.3 Impacts on Bycatch

The M-S Act defines bycatch as "…fish that are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards." National Standard 9 requires that 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." Regulatory guidance implementing these provisions is published in the National Standard Guidelines, or NSGs. The NSGs place the emphasis on minimizing bycatch – that is, avoiding the catch of bycatch species. Guidance is also provided for assessing whether management measures minimize bycatch to the extent practicable. Councils must:

(1) Promote development of a database on bycatch and bycatch mortality in the fishery to the extent practicable;
(2) For each measure, assess the effects on the amount and type of bycatch and bycatch mortality in the fishery (qualitative discussions are allowed when quantitative estimates are not available);
(3) Select measures to the extent practicable that will minimize bycatch and bycatch mortality;
(4) Monitor selected measures for impacts on bycatch;
(5) Consider other applicable law (MMPA, ESA, etc.).

The NSGs provide guidance on determining if measures minimize bycatch "to the extent practicable." The NSGs suggest this practicability determination should be based on such factors as the ecological changes that result from bycatch of a species, effects on marine mammals and birds, changes in fishing, processing, and marketing costs, changes in research and other administrative costs, and changes in the social and cultural values of the fishing activities. All of these criteria for this making the practicability determination assume the ability to know precisely how particular measures will influence bycatch and fishermen's behavior and what the impacts of those changes will be. This information is not available for the multispecies fishery. As discussed in Amendment 13, most bycatch information currently collected and reported by the NMFS is based on broad gear categories (large mesh otter trawl, gillnet, longline, etc.) without regard to specific fishery. With the possible exception of trawl mesh

selectivity studies and a few studies on specific gear requirements (such as the raised footrope trawl or haddock separator trawl), there is little information with which to estimate the impacts of a specific management measures on bycatch. For example, there is no information available to estimate how a specific area closure might affect bycatch, and what the resulting impacts of that change have on marketing or harvesting costs. Because of these data limitations, the following analysis focuses on identifying whether proposed measures will increase or decrease bycatch as compared to the no action alternative.

The total mortality resulting from bycatch can be reduced in at least three broad ways. First, the **rate** of bycatch can be reduced. As an example, the discard rates of sub-legal fish can be reduced by increasing mesh size, since larger mesh will allow more sub-legal fish (that must be discarded to comply with the minimum size regulations) to escape. Bycatch could also be reduced by allowing retention of smaller fish, though this may have other adverse impacts. Regulatory discards caused by trip limits can be reduced by increasing trip limits or by requiring use of gear that does not catch as much of a particular species. Gear that does not catch as much of a particular species could be required - for example, the haddock separator trawl reduces the catch of flatfish and skates. Second, reducing fishing effort can reduce **total bycatch** (even if the rate remains the same or increases). If, for example, each longline set catches a percentage of juvenile fish that must be discarded, reducing the number of sets would reduce the total catch of juvenile fish even if the percentage caught per set remains the same. Neither the M-S Act nor the NSGs assign a preference to either of these approaches. Finally, the **mortality of species caught** as bycatch may be reduced through changes in fishing techniques. The M-S Act, however, assigns this a lower priority than reducing bycatch.

This action proposes management measures that will affect bycatch. A general overview of techniques available to reduce bycatch is provided in Alverson (1998). While generally complete, the list does not include reductions in effort as a means to reduce total discard mortality. Effort reductions are similar to decreased quotas for target species in that if correctly designed and implemented they reduce the total catch.

- International legislation of suitable gears and areas (not applicable to domestic management of the groundfish fishery)
- Time and area closures
- Establishment of discard quotas
- Use of new technology and operational modes (gear modifications, restrictions on operation, etc.)
- Full use strategies
- Establishment of authorized discard rates
- Marine parks
- Incorporation of bycatch into catch quotas
- Prohibition on retention
- Incentive-based programs
- Decreased quotas for target species

Many of these bycatch reductions strategies are incorporated into the alternatives under consideration. The following table summarizes the strategies used in the proposed action (Table 46).

Bycatch Reduction Strategy	Incidental Catch TACs	CAI Hook Gear SAP
International legislation of suitable gears and areas		
Time and area closures		
Discard quotas		
Use of new technology and operational modes		X –use of specific bait to avoid cod
Full use strategies		X (Hook sector retention of cod; prohibition on discard of legal sized cod by non-sector vessels)
Establishment of authorized discard rates		
Marine parks		
Incorporation of bycatch into quotas	X (groundfish)	X (groundfish)
Prohibition on retention		
Incentive-based programs		X
Decreased quotas for target species		
Decreased effort		

Table 46- Summary of bycatch reduction strategies used in proposed action

The previous discussions of the biological impacts of the proposed action on groundfish and other species include estimates of the impacts on discards, or bycatch. This section compiles this information in one location and qualitatively analyzes the overall impacts of the alternative on bycatch.

Category B DAS Incidental Catch TACs

Establishing incidental catch TACs for groundfish stocks caught by vessels using Category B DAS programs does not affect bycatch. The programs using these TACs could change fishermen's behavior in ways that affect bycatch. These possible changes are discussed in the following sections.

Closed Area I Hook Gear/Haddock SAP

The CAI Hook Gear Haddock SAP implemented by FW 40A allows for a small increase in effort (about 440 days) by vessels using hook gear to target haddock in get in CAI and as a result was expected to increase discards. An experimental fishery conducted in 2003 preceded this proposed measure. The results of that experiment show that about eight percent of the catch in this fishery is likely to be discarded, with most discards likely to be non-groundfish species. Estimates of the discards that may result from this fishery are provided in Table 45, but there are no estimates on discard mortality. In this fishery, every individual hooked fish must be released, making it possible to reduce discard mortality through careful handling. The proposed action does not change the impacts on discards from the No Action alternative. This SAP has already been implemented and this action merely increases the number of vessels that can participate, without changing the number of DAS that may be fished. There is no evidence that suggests allowing non-sector vessels to participate in the SAP will increase or change discard rates.

Summary

Because the proposed action only increases the number of participants in the SAP, but does not change the limits on that activity (i.e. the haddock TAC is not increased), it will probably not result in increased bycatch of groundfish and other species. Measures are included to minimize bycatch to the extent practicable (see Table 46 for a general description of the strategies used in each alternative).

6.3.2 Habitat Impacts

Incidental Catch Total Allowable Catch

The benefits of TACs and trip limits on habitat are not clear. While these management tools may reduce fishing in specific areas in which species with TACs or trip limits are commonly caught, they could increase effort in other areas.

In a macro sense, the positive impacts of TACs on habitat are mitigated somewhat by the likelihood that once the TAC is achieved, fishing will occur on other (non-TAC) species, or that effort will shift into other fisheries. These changes may or may not have impacts upon EFH similar to the impacts of fishing for the species regulated by the TAC. The impacts upon EFH of targeting different geographic areas or different fisheries as a result of reaching a TAC are unknown. TACs impact EFH by controlling effort on specific fish stocks. Because these stocks are often found in specific geographic locations or habitats, the benefits to EFH are dependent upon the species being regulated. For example, cod are typically found in areas of proportionally higher bottom complexity, while yellowtail flounder are typically caught in regions with sandy sediments. Consequently, TACs for cod may protect habitats in geographic regions containing complex bottom-types, while TACs for yellowtail flounder may protect habitats in areas containing sandy sediments.

Potential habitat benefits provided by TACs – like DAS reductions - are derived from reductions in fishing effort. While these benefits are not quantifiable at this time, the single -species nature of the TAC is likely to provide benefits to specific bottom types or geographic areas, as opposed to the more general EFH protection afforded by DAS reductions. If there are habitat benefits of TACs, they would be somewhat reduced by the likelihood that once the TAC is achieved, fishing will shift to other (non-TAC) species, or into other fisheries. These negative impacts may or may not be equivalent to the positive impacts associated with limiting fishing for the species regulated by the TAC. There is no way of predicting which geographic areas or fisheries might be affected by shifts in fishing effort as species or area-specific TACs are reached. However, because this framework adjustment proposes to implement incidental TACs for the use of Category B DAS and the TAC on species that typically occupy more complex habitats, like cod, are set at only two percent of the overall TAC, the habitat impacts of using hard TACs in this case will likely be negligible.

Closed Area I Hook Gear/Haddock SAP

The Hook Gear/Haddock SAP boundaries overlap the Habitat Closed Area within Closed Area I, which is closed to all bottom-tending mobile gear (Level 3 closure). Bottom longlines are categorized as a bottom-tending static gear and, therefore, are not subject to the fishing restrictions in the Level 3 closures. Longlining for bottom species on continental shelf areas and offshore banks is undertaken for a wide range of species including cod, haddock, dogfish, skates, and various flatfishes (Sainsbury 1996). A 9.5 m (31 ft) vessel can fish up to 2500 hooks a day with a crew of one and twice that number with 2 crew members. Mechanized longlining systems fishing off larger vessels up to 60 m (195 ft) can fish up to 40,000 hooks per day (Sainsbury 1996). In the Northeast up to six individual longlines are strung together, for a total length of about 460 m (1500 ft), and are deployed with 20-24 lb (9 - 11 kg) anchors.

The mainline is parachute cord or sometimes stainless steel wire. Gangions (lines from mainline to hooks) are 38 cm (15 inches) long and 1-2 m (3-6ft) apart. The mainline, hooks, and gangions all come in contact with the bottom. Circle hooks are potentially less damaging to habitat features than other hook shapes. These longlines are usually set for only a few hours at a time (NREFHSC 2002). Longlines used for tilefish are deployed in deep water, may be up to 40 km (25 miles) long, are stainless steel or galvanized wire, and are set in a zig-zag fashion (NREFHSC 2002). These activities are managed under federal fishery management plans.

Bottom longlining during 1995-2001 was most commonly reported from ten minute squares (TMS) in sandy bottom areas, but in relation to the areal extent of each sediment type present in the NE region, longlining was more closely associated with gravelly sand and gravel (See Figure 249 in Amendment 13). Longlining was reported from a very low proportion of mud in the GOM and GB sub-regions, and from a high proportion of sand in the GOM and gravelly sand and gravel areas in the GB sub-region (See Figure 248 in Amendment 13). The low number of trips in SNE were more strongly associated with gravelly sand than with any other sediment type.

This SAP area is predominately comprised of gravelly sand (Figure 14) and contains a high degree of species and life stages that have been determined to be vulnerable to bottom tending mobile gear (Figure 13) (See Amendment 13 for full gear effects evaluation). Relative to other gears assessed, however, the Gear Effects Workshop report categorized longlines as having low impact to the benthic environment (NEEFHSC 2002). Based on the results of the experimental fishery for the hook gear access program, an increase in 440 DAS is expected as a result of this SAP to harvest haddock. As such, the impacts to habitat will be minimal and the effects temporary in nature and will not impact the baseline level of protection afforded to EFH by Amendment 13 (approximately 43,000 DAS were allocated under Amendment 13 as A DAS).

The mandatory VMS measure is a critical step in getting high-resolution data on the distribution of fishing effort. The collection on the location, frequency and intensity of fishing activities has direct application and relevance to understanding potential impacts to habitat.

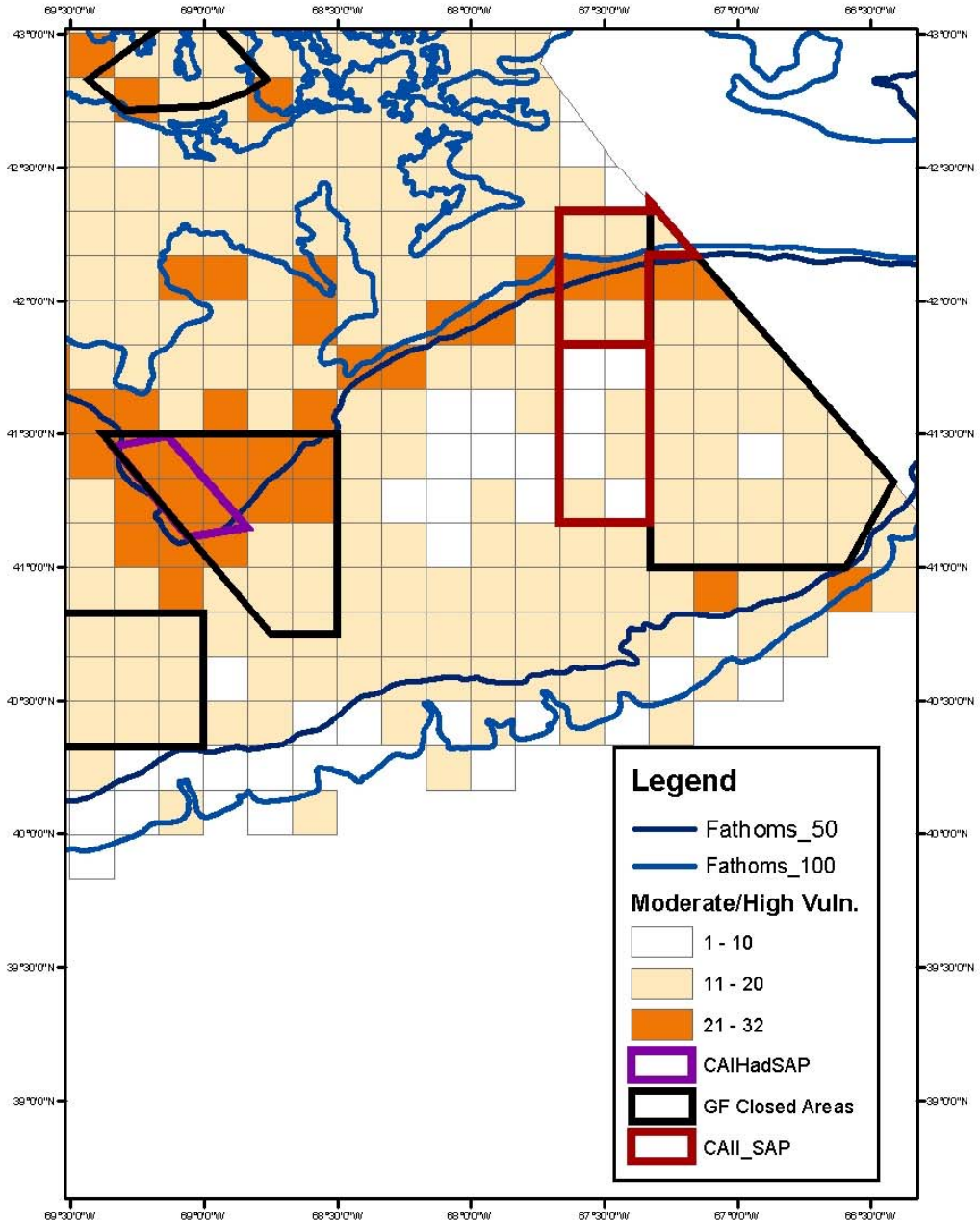


Figure 13 - Range of moderately and highly vulnerable species within Special Access Program (C.1 and C.2) boundaries.

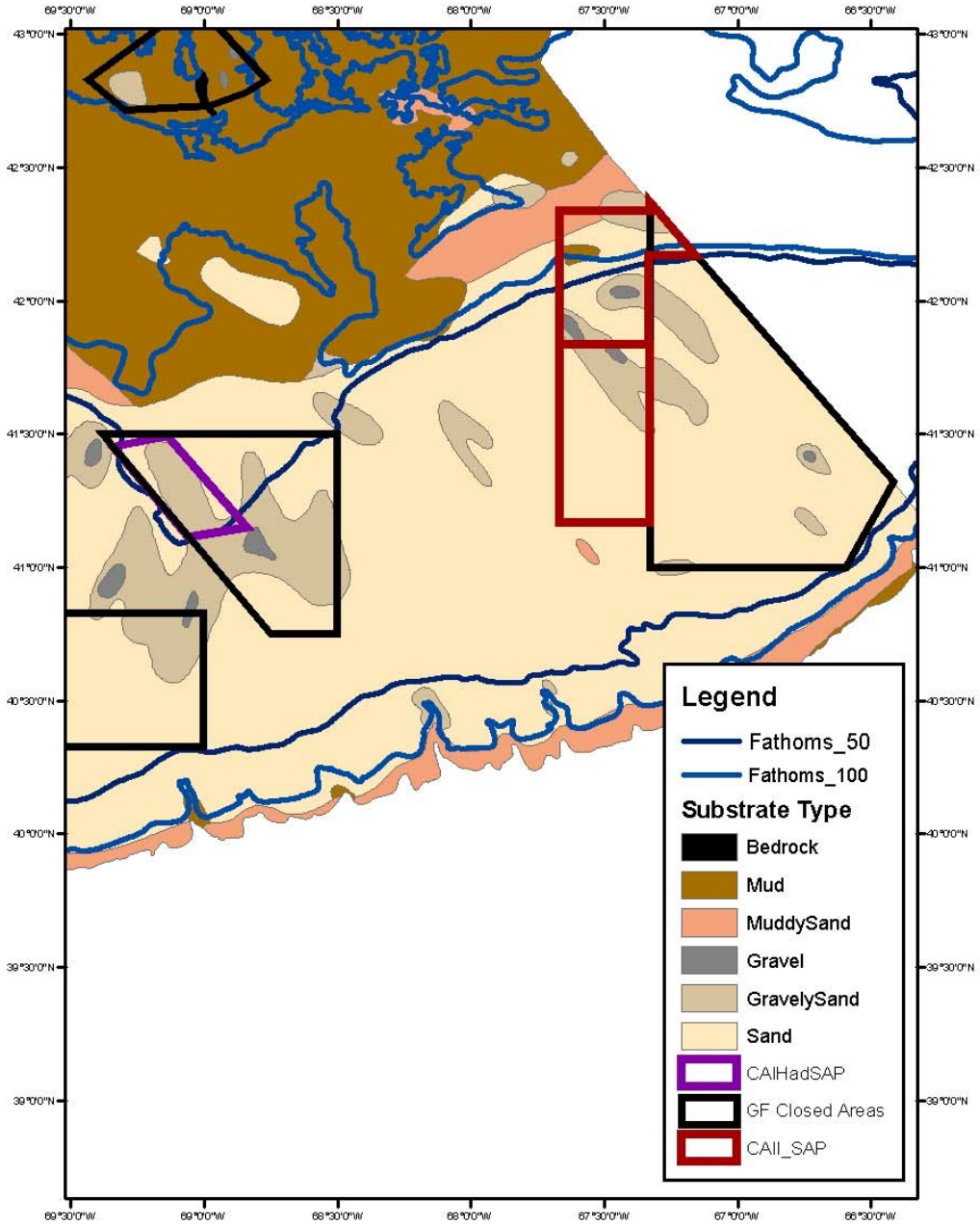


Figure 14 - General sediment type information within the Special Access Program boundaries from Poppe et al. database.

6.3.3 Impacts on Endangered and Other Protected Species

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. The Framework 41 discussion focuses on the measures proposed and associated with longline 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.

6.3.3.1 CAI Hook Gear Haddock SAP

This SAP does not allow fishing with gillnet gear, 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 these measures. Hook gear has accounted for interactions with threatened and endangered sea turtles, although those species occur only rarely in CAI, making negative impacts an unlikely scenario. Additionally, this SAP is scheduled to operate from October through December, further reducing the likelihood of interactions with endangered turtles because of their water temperature preferences. While there is overlap with right whale critical habitat, hook gear is not implicated in entanglements with this species, which is most abundant in the area from April through June. Further, experimental fishery data that preceded the establishment of this SAP showed no interactions with any protected species.

6.3.3.2 Summary

To summarize, the measures described in this alternative 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.

6.3.4 Economic Impacts

This alternative, if adopted, would allow non-sector vessels to participate in the GB cod Hook Gear Haddock SAP. This alternative also modifies the incidental catch TACs for stocks of concern in order to allow non-sector vessels to participate in the CAI Hook Gear Haddock SAP. Only the TAC for GB Cod is changed.

6.3.4.1 Incidental Catch Total Allowable Catch

The incidental catch TACs effectively limit the potential economic benefits that may be derived from any proposed SAP or the use of B regular DAS. This fact places a premium on judicious use of these incidental catch TACs to maximize the potential benefits. Factors that may affect net benefit includes selection of a suite or combination of SAPs and B regular DAS that maximizes potential revenue by targeting higher valued species, taking advantage of seasonal differences in prices, by identifying fisheries with lowest bycatch rates, and by taking advantage of lower cost gears.

The proposed method for managing the incidental catch TACs have both short term and longer term economic implications. In the short term, the fact that none of the SAPs or the pilot B DAS program has any built-in means of allocating fishing opportunities among potential participating vessels makes derby style fishing for incidental TACs or Category B (regular) DAS likely to emerge. In this environment, vessels may or may not have a strong incentive to avoid stocks of concern since there may be no assurance that a given SAP or stock area would continue to remain open. Overall, this effect would not be likely to create significant market distortions since neither the proposed SAPs nor the Category B (regular) DAS pilot program represents a significant source of total seafood supplies. Nevertheless, derby effects would compromise the potential economic benefits that could be garnered from Category B DAS use.

The longer-term implication of the proposed allocation process adopted by FW 40A is that any new or additional uses for either a Category B (regular) DAS or an SAP would require a reallocation of incidental catch to accommodate the new fishery. That is the exact situation that takes place in this alternative. In order to accommodate the participation of non-sector vessels in the CAI Hook Gear Haddock SAP, the allocation of GB cod to the Category B (regular) DAS program is reduced. The allocation is the same as was proposed in FW 40A. This reallocation of incidental TAC could result in increased economic benefits if the new SAP results in higher yield at lower cost than the Category B (regular) DAS program. However, unless the same vessels are the beneficiaries of the reallocation, allowing participation by non-sector vessels in this SAP will result in a transfer of benefits from one group of vessels to another.

Evaluating the impacts of this change is complicated by the timing of this action. The incidental catch TAC for the Category B (regular) DAS Pilot Program distributed evenly to each of the first two quarter of FY 2005. Since it is not likely that FW 41 will be approved and implemented prior to May 1, 2005, the first quarter TAC for that program will not reflect the re-allocation of the incidental catch TACs that is proposed in this alternative. As a result, the entire reduction in the Category B (regular) DAS program incidental catch TAC will occur during the second quarter of FY 2005. The impacts of the decision on FW 40B and the implementation date for FW 41 are shown in Figure 15. As shown, the August-October GB cod incidental catch TAC for the Category B (regular) DAS Pilot Program could range from 32 mt (if FW 40B and FW 41 are not approved) to 14.9 mt. There is no data available to determine the impacts of this change on the Category B (regular) DAS program and the fishery as a whole. The reduced incidental catch TAC may constrain the use of Category B (regular) DAS in the GB

cod stock area during the second quarter of FY 2005. This may be partially mitigated by the proposal to allow any underage of the GB cod TAC in the first quarter (May – July) of the Category B (regular) DAS Pilot Program to be shifted to the second quarter. This mitigation will only occur if the entire first quarter TAC is not caught.

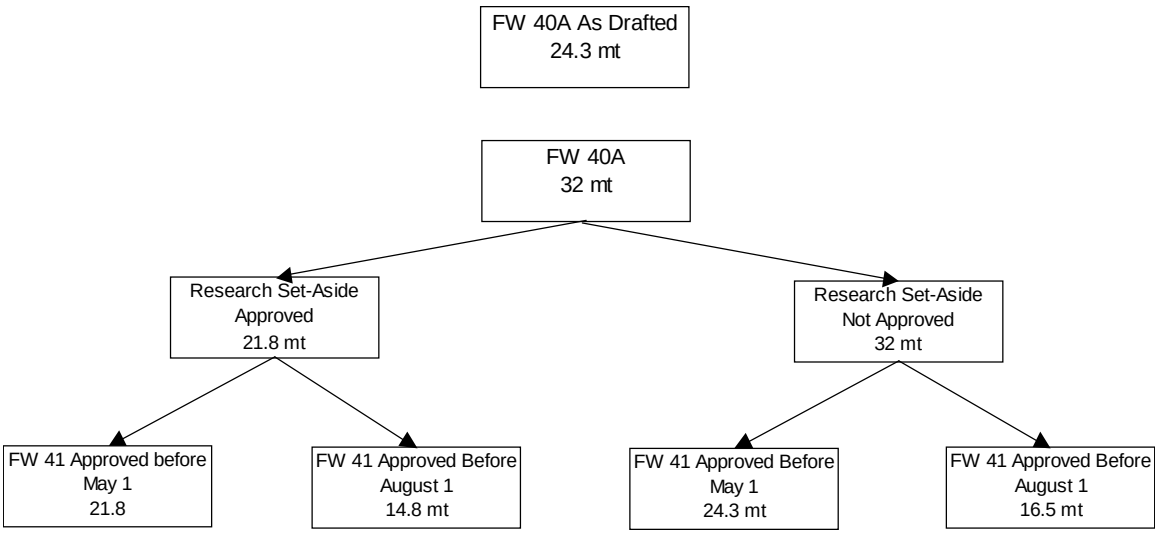


Figure 15 – Possible Category B (regular) DAS Pilot Program incidental catch TAC (August – October 2005) for GB cod under various scenarios

6.3.4.2 Closed Area I Hook Gear/Haddock SAP

This SAP will allow vessels using hook gear to target haddock in a small section of CAI. The overall TAC for Georges Bank haddock will remain unchanged; this SAP merely allows more hook vessels to harvest part of the TAC in an area which was previously inaccessible. From a national perspective, this will not change the net benefits previously estimated as part of Amendment 13. However, since more vessels will be sharing the revenues from a fixed amount of haddock, this may reduce profitability for vessels allowed to access the haddock. While the SAP provides a benefit to regulated entities under the Regulatory Flexibility Act (RFA), this alternative may distribute the benefits to more vessels (compared to No Action) and reduce the benefit to each individual vessel. An additional impact that cannot be quantified could result if increasing the number of possible participants in this SAP results in a derby fishery, or a race to catch the haddock TAC as quickly as possible. This may reduce the economic benefits from this SAP, could shorten the season for the SAP, and may result in gear conflicts if a large number of vessels compete for space in the relatively small area of the SAP.

The analysis in FW 40A assumed that non-sector vessels would participate in this SAP, but it is uncertain how many vessels will choose to do so. There were 70 vessels with recorded groundfish landings using hook gear in calendar year 2003, and it was estimated that 50 of these vessels would likely participate in the hook sector plan. Of the 20 vessels that would not join the hook sector plan, it was estimated that 10 of those may be able to fish in the closed area. Anecdotal information suggests that the number of non-sector participants may be higher than this estimate (about 20), but the number of sector participants may be about 35 vessels. Since the total number of vessels based on anecdotal information (55) is similar to the number of vessels assumed in the FW 40A analysis (60), the analysis was not

revised. Mean haddock kept per trip was assumed to be 5,000 pounds, or 2.27 metric tons (mt), based on calendar year 2003 sea sampling data. This is similar to the observed catch rates in the SAP in FY 2004. Given an overall TAC for haddock of 1,000 mt, vessels could make approximately 441 trips into the closed area. Average haddock price was assumed to be $2,315 per metric ton, based on calendar year 2003 Massachusetts landings. Crew share was assumed to be 45% of gross daily revenue. Average variable costs were estimated to be $364 per day and are deducted from crew share. These averages were based on sea sampling data and may have changed or may differ if larger vessels participate in the SAP, particularly given increases in fuel prices that have occurred during the past two years. Additionally, variable costs are subtracted from the crew share, when in fact they may be shared between the crew and the vessel in some ports.

The likely financial impact on vessels was estimated for all 60 vessels jointly, and then estimated separately for sector and non-sector vessels. Separating the haddock TAC by sector was difficult because the amount of haddock which could be taken by non-sector participants depends on the incidental cod TAC they are allocated and the measures that are adopted to reduce the likelihood of a derby fishery between sector and non-sector vessels. Vessels that are part of the hook sector have their cod catch count against the overall sector allocation. For vessels that are not part of the hook sector, the overall incidental cod TAC was divided by the average cod catch rate to estimate the number of trips that could occur in the closed area before the incidental catch TAC was met. Average cod catch rate was based on 2003 sea sampled trips in the closed area. The estimated number of trips was then used to estimate the total haddock which would be taken by non-sector vessels, and this amount was then subtracted from the 1,000 mt haddock TAC to yield the amount which could then be taken by hook sector vessels.

Results showed that the maximum potential revenue from fishing in the closed area was $2.5 million, and after subtracting variable costs and crew share the estimated vessel profit was $1.5 million (Table 47). Dividing this among 60 potential hook vessels resulted in a vessel profit of $25,729. If all vessels needed to purchase a VMS system at a cost of $3,995 installed, the profit would be reduced to $22,829 per vessel. Operating costs for the VMS system would be $3 per day when the vessel is at sea. These estimates assume that the entire haddock TAC is taken.

The benefits that will accrue to sector and non-sector vessels depend in part on whether measures are adopted to prevent a derby fishery. Without measures in place to prevent a derby, the constraining factor on the catch of non-sector vessels may be the GB cod incidental catch TAC. For the purposes of this analysis, it is assumed that the non-sector hook vessels take the entire GB cod incidental bycatch TAC in the CAI hook gear haddock SAP and the sector vessels harvest all of the remaining haddock TAC. Assume that the amount of incidental cod TAC allocated to non-sector hook vessels is 14 mt. As discussed above, assuming cod catch rates are similar to those in the experimental fishery, this incidental catch TAC will constrain the catch of haddock by non-sector vessels. If the actual TAC is higher or if cod catch rates are lower, then benefits will be more than estimated in the following discussion. This will give an upper bound on the maximum revenue which could be earned by non-sector vessels participating in the SAP, and will also reveal differences in what vessels participating in the hook sector could earn.

Assume that 40 sector vessels and 20 non-sector vessels participate in the fishery. The estimated revenue earned by sector participants is $1.9 million, while non-sector participants would earn $605 thousand (Table 48). Crew wages for sector participants would be $737 thousand, while non-sector crew wages would be $234 thousand. Total vessel surplus (profit) for sector vessels would be $1.2 million, or $29,304 per vessel. For non-sector vessels, total surplus (profit) would be $333 thousand, or $16,649 per vessel. These results are shown in Table 48 in the column labeled “No measures to prevent derby fishery.” This analysis above makes a number of assumptions about how the TACs will be divided between sector and non-sector vessels – most significantly, that the catch by each group is determined only by the size of the GB cod incidental catch TAC. In reality, the catch of each group will be the result

of such factors as the catch rates of individual vessels and any competitive advantages that a group may possess.

In order to reduce derby effects in this SAP, the proposed action divides the SAP season into two periods, and allows only sector vessels to fish in one period and only non-sector vessels to fish in the second period. The maximum haddock catch in each period is capped at 500 mt (1.1 million pounds)(half the current TAC). This option eliminates any derby between sector and non-sector vessels, but does not eliminate the possibility of a derby within those groups. It is likely that sector members can work cooperatively to reduce derby effects. While possible, such cooperation among non-sector participants may be more difficult to accomplish because of a lack of organization. Since this approach reduces the number of vessels making trips into the area during any given period, it will partially mitigate any derby effects, will likely reduce the possibility of gear conflicts and eases the coordination of observer coverage. The estimated revenue earned by sector participants is $1.26 million, while non-sector participants would earn $605 thousand (Table 48). Crew wages for sector participants would be $486 thousand, while non-sector crew wages would be $234 thousand. Total vessel surplus (profit) for sector vessels would be $772 thousand, or $19,297 per vessel. For non-sector vessels, total surplus (profit) is still $333 thousand, or $16,649 per vessel. This is a considerable increase in groundfish revenues for longline gear, as can be determined by comparison with Table 29 and Table 31. The expected nominal revenues from the SAP are more than total groundfish revenues (in constant 1999 dollars) for longline vessels in FY 2002 or 2003.

Economic impacts of the proposed action are described in Table 48 in the column labeled "Proposed Action." The results show that by dividing the SAP into two time periods, and limiting fishing in each period to either sector or non-sector vessels, the benefits to sector vessels are reduced but the benefits to non-sector vessels remain the same. This is because while the non-sector vessel haddock catch is limited by the GB cod incidental catch TAC (if cod catch rates are the same as in the experimental fishery), the sector vessels are limited to a 500 mt cap if the season is divided into two periods. If the season is not divided, sector vessels could catch more than 500 mt as long as the catch of both groups does not exceed the overall haddock TAC. The analysis also suggests that only 746 mt of haddock will be caught if the incidental catch TAC constrains non-sector vessels – 500 mt by the sector, and 254 mt by non-sector vessels. If cod catch rates are less than in the experiment, non-sector vessels may catch more haddock and benefits will be higher than shown. Non-sector vessels would have to achieve a 35:1 haddock/cod ratio to harvest the entire haddock TAC before the cod incidental catch TAC is taken (note that sector vessels achieved a ratio of over 50:1 in FY 2004; see section 5.5.2.7).

Dividing the season into two periods does have other allocation implications. As noted in an earlier paragraph, during the experimental fishery haddock catch rates were highest at the beginning of the season and declined until the end of the season. The group fishing in the first period is likely to have reduced costs as a result. Average prices, however, tend to increase in the later months (see Figure 16), which will help mitigate the advantage that higher catch rates proved. There is insufficient data to incorporate these seasonal differences in costs and prices. Finally, on average weather in the second period is likely to be worse, though there is less risk of hurricanes impacting New England waters after November. Figure 17 summarizes weather characteristics approximately 60 nautical miles southwest of Closed Area I. In order to account for these differences between periods, each year the group that is able to fish in a period is alternated.

Because the vessels are being allowed to access haddock stocks that are in areas previously closed to haddock, they will benefit financially, and are being relieved of some of the negative aspects of Amendment 13. There is uncertainty on how the hook sector vessels will manage themselves, and whether the non-sector vessels will take advantage of the SAP, and how much they will harvest of both the cod and haddock TAC. Because of this uncertainty, the above analysis assumes all hook vessels

which are geographically located in New England will take advantage of the SAP. The results which show positive gains for all hook vessels will likely hold no matter how the TAC is taken.

This alternative is not expected to increase costs for the observer program when compared to No Action. The number of days fished should remain constant since the haddock TAC does not change. As a result, the number of observer days necessary for a given rate of coverage will not change and observer costs will remain constant. If the possibility of a derby is not addressed, however, it may complicate management of the observer program should a large number of trips take place immediately after the opening. This could result in a lower level of observer coverage than is desired.

Two other options were considered in an attempt to minimize derby effects in this SAP. The first option would not have imposed any limits on the number of trips or the length of trips – in other words, no effort would be made to minimize the impacts of a derby fishery. Experimental data showed that haddock catch rates were higher in October (5,626 lbs./trip) and declined in November (4,416 lbs./trip) and December (4,210 lbs./trip). All trips in the experiment took place during one day, including transit time. At the higher catch rates experienced in October, approximately 392 trips would be needed to harvest the haddock TAC. Since the actual number of participants in the SAP is not known, assume sixty vessels choose to participate (consistent with the analysis above). If sixty vessels chose to fish in the SAP and took one-day trips, the SAP would end before each vessel could make seven trips. Given suitable weather and market conditions, the SAP could close one week after opening. Other possible impacts of this approach are that the local price of haddock may decline due to increased supply, reducing the benefits of the program. In addition, if all sixty vessels attempt to fish in the area at the same time, it is likely that there would be gear conflicts which would potentially lead to lost gear, further reducing the benefits from the SAP. Some vessels may change their normal fishing practices in order to stay in the SAP area for a longer period, raising safety concerns. Finally, if all vessels began trips on the same day, it creates a difficult management problem for the observer program since it leads to a high demand for observers followed rapidly by no demand at all when the SAP closes. This leads to increased cost and inefficient use of training funds for this program.

The second option would have limited the same group of vessels to two trips per week. This would extend the SAP for at least three weeks. The season would be shorter if some vessels take multi-day trips or catch rates were higher than the experimental results. This measure mitigates to some extent the impacts of a derby fishery, as it slows catch rates and spreads the haddock TAC over a longer period. At the same time, it may lead to safety concerns as vessels may take longer trips in order to maximize fishing time during a week. Many of the vessels likely to fish in this SAP typically fish day trips and a shift to longer trips raises safety concerns. This approach also imposes an additional burden on sector vessels that was not in place for the SAP during FY 2004 and may affect revenues.

All Vessels Combined	
Average Haddock Catch per trip (mt)	2.27
Average Cod Catch per Trip (mt)	0.13
Total Haddock Catch CA 1	1000
(M.T.'s)	
Estimated Trips Allowed	441
Average Haddock Price per mt	$2,315
Average Cod Price per mt	$3,439
Potential Revenue	$2,515,012
Estimated crew wages	$971,261
Estimated VC	$160,495
Estimated Surplus	$1,543,752
Number of Vessels	60
Estimated Surplus per Vessel	$25,729

Table 47 - Estimated catch, revenue and costs associated with fishing in the hook vessel CA 1 SAP

	No Measures to Prevent Derby	Proposed Action
SECTOR PARTICIPANTS		
Estimated Trips Allowed	335	220
Potential Revenue	$1,909,610	$1,257,506
Estimated crew wages	$737,463	$485,630
Estimated VC	$121,861	$80,247
Estimated Surplus	$1,172,147	$771,876
Number of Vessels	40	40
Estimated Surplus per Vessel	$29,304	$19,297
NON-SECTOR PARTICIPANTS		
Cod TAC (M.T)	14	14
Mean Cod Catch per Trip	0.13	0.13
Estimated Trips	106	106
Estimated Revenue		
Cod	$48,146	$48,146
Haddock	$557,256	$557,256
Total	$605,402	$605,402
Costs		
Estimated crew wages	$233,797	$233,797
Estimated VC	$38,634	$38,634
Total Surplus	$332,971	$332,971
Number of Vessels	20	20
Surplus per Vessel	$16,649	$16,649

Table 48 - Estimated catch, revenue and cost divided between sector and non-sector vessels given incidental GB Cod quota of 14 mt

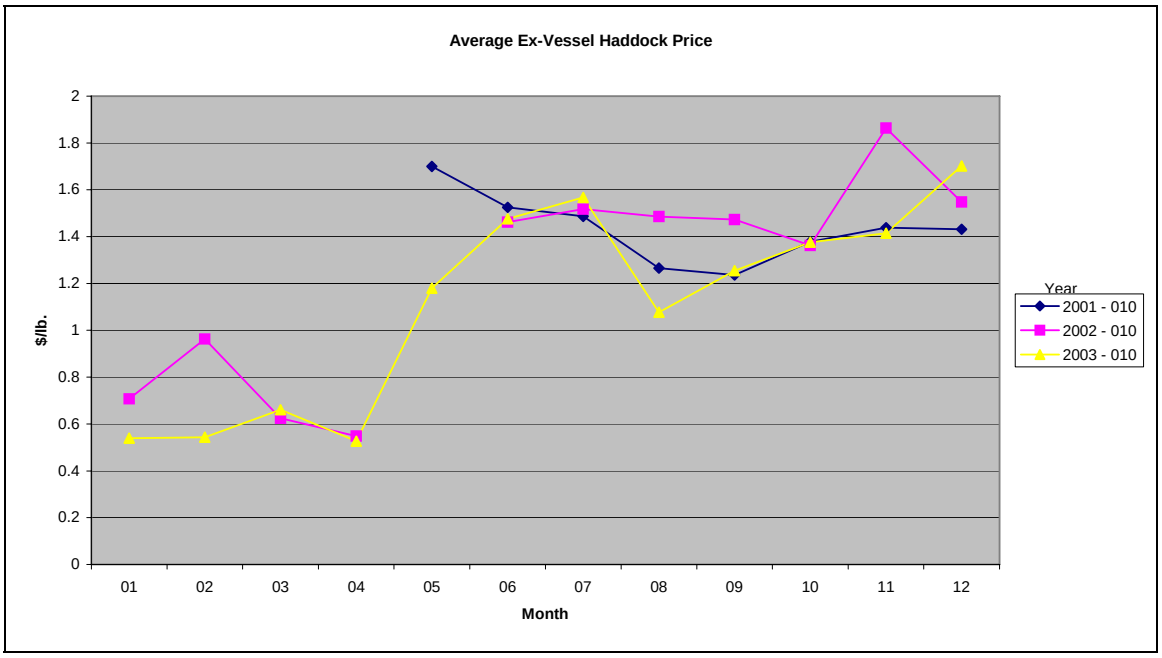
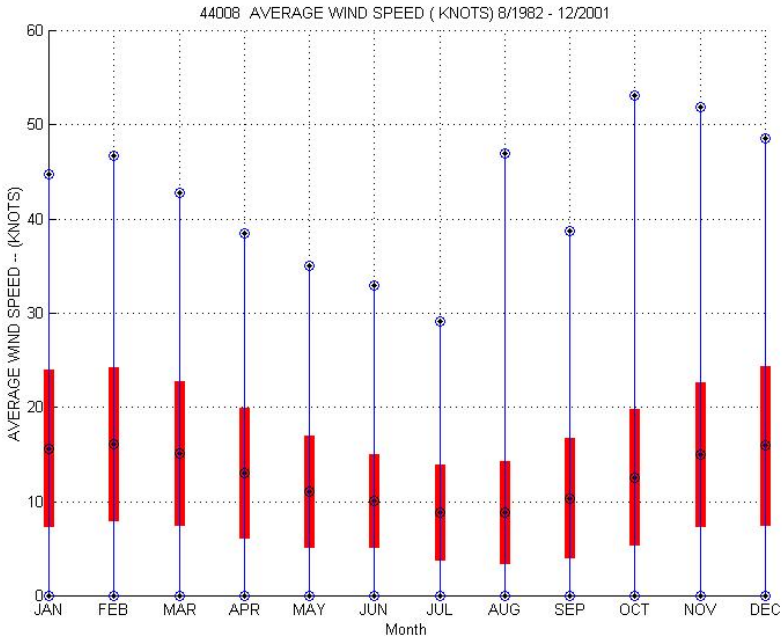


Figure 16 – Average monthly price/lb. (total lbs./total dollars) for longline caught haddock, CY 2001- 2003, by month (nominal dollars) (Source (NMFS Commercial Fisheries Database, unpublished data)



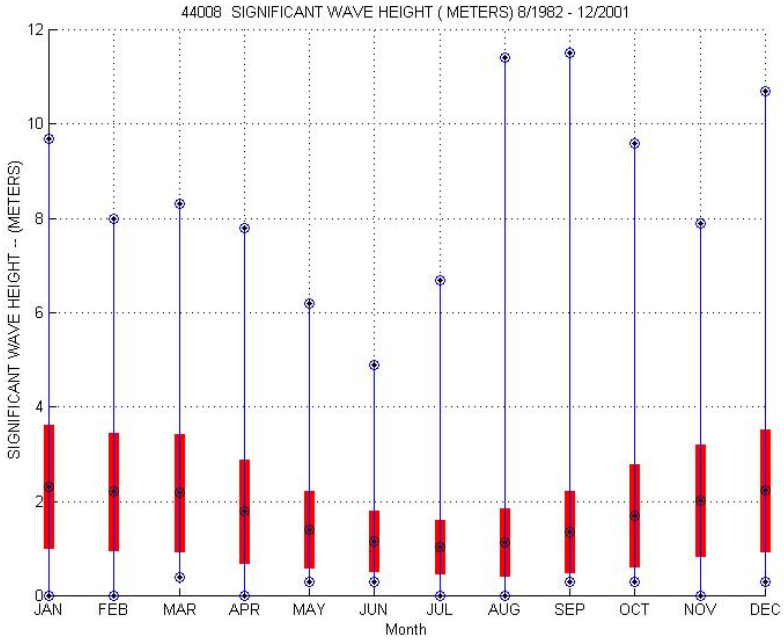


Figure 17 – Average wind speed and wave height records by NOAA buoy 44008 (40-50N 69-43W) (http://seaboard.ndbc.noaa.gov/station_history.php?station=44008)

6.3.5 Social Impacts

The need to assess social impacts emanating from federally mandated fishing regulations stems from National Environmental Protection Agency (NEPA) and M-S Act 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 Amendment 13.

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.

6.3.5.1 Category B DAS Incidental Catch TACs

The social impacts, while positive, are likely to be limited by incidental catch TACs that restrict the degree of benefit. Social benefits will maximally accrue to those that qualify to participate in either an SAP or the B regular pilot program. Derby style fishing is likely to occur as there are presently no guidelines for the allocation of DAS. Derby style fishing can negatively impact prices if too much product enters the market at the same time. This may affect occupational opportunities and subsequently community infrastructure if they occur over a long time span. Regulatory discarding can result once TACs have been met. Discarding of lower value fish may occur to maximize profit. The rush to fish may also result in increased safety risks as the inclination to fish in poor weather is increased.

6.3.5.2 Closed Area I (CA I) Hook Gear Haddock SAP

Analysis of this management measure is based on the inclusion of vessels that were most likely to join the hook gear sector (see 6.3.4.2). The potential participant pool included only hook vessels homeported within geographic proximity to the closed area. Of the 50 identified potential participants 47 were homeported in Massachusetts. Gloucester (13, 250) has the greatest number of potential vessels, 13, that reported 250 trips in the calendar year 2003. This was followed by Boston (7, 84), and Chatham (7, 325) with the greatest number of vessels. There were seventeen other vessels from various locations with

the greatest concentration located on the Cape and Island. The remaining vessels were homeported in New Hampshire.

Additional vessels that may benefit from this SAP are those for whom the conversion from another gear type to hook gear may be cost effective. The conversion from gillnet to hook gear may be less complicated and costly than from drag gear to hook gear making the latter gear type a less likely beneficiary. Anecdotal information suggests that some trawl vessels may have already purchased the equipment necessary to fish in this SAP.

This alternative would provide individual vessel owners and their crew with fishing opportunities that taking no action would not afford. The social impacts of the proposed action would extend to the communities and shoreside infrastructure where these vessel owners land their fish and the communities within which they reside. As noted previously, the VMS provision common to all of the proposed action measures seems likely to create differential opportunities to vessels working on Georges Bank as compared to vessels that fish primarily in the Gulf of Maine. Thus, the beneficial social impacts 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.

An additional benefit of this alternative is that it addresses the perception that the CAI Hook Gear Haddock SAP, as implemented, unfairly allocated the benefits of this SAP to members of the GB Cod Hook Sector. Some fishermen believe this allocation decision was made without benefit of an open debate at the Council or in public.

6.3.6 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 action are for:

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

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.

Amendment 13 effort reductions may also result in more vessels entering the General Category fishery for Atlantic sea scallops. This is currently an open access fishery managed by the NEFMC. Vessels are limited to 400 lbs. of scallops while using a small dredge, and can only fish in certain designated areas.

Since the proposed action provides opportunities for more groundfish vessels to use Category B DAS to target healthy groundfish stocks in the CAI Hook Gear Haddock SAP, in theory it could 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. This SAP may actually draw effort out of the other fisheries since there is a limited opportunity to participate – vessels may choose to fish in the SAP rather than participate in the scallop or other fisheries during October through December. This could actually extend the fishing season for some MAFMC fisheries. All of these impacts are likely to be minor. Most MAFMC quota-managed fisheries are trawl fisheries, and the scallop fishery is a dredge fishery, while most of the participants in the SAP are likely to be vessels that have a history of using hook gear. There is little apparent overlap between these two groups.

6.4 Comparison of Alternatives

6.4.1 Comparison of Impacts

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 6.2 and 6.3. 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, FW 40A, and FW 40B. While it is possible that the actual impacts of Amendment 13 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 49.

6.4.1.1 Biological Impacts

Both alternatives will have impacts on groundfish and other species. Groundfish impacts 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 (as implemented), FW 40A, and FW 40B, the No Action alternative would be least likely to increase fishing mortality on any regulated groundfish stock. This is because this alternative does not provide additional opportunities to fish so fishing effort is more likely to be consistent with the analyses of earlier actions amendment. Alternative 1 will not have

any additional biological impacts on GB haddock, the target species, since the TAC for GB haddock caught in the SAP is the same under Alternative 1 and No Action. Alternative 1 should not increase GB Cod mortality as compared to No Action, since the GB Cod incidental catch TAC is the same for both alternatives.

6.4.1.2 Habitat Impacts

As discussed in preceding sections, any adverse impacts on essential fish habitat are unlikely under either alternative. The No Action alternative does not add any increased opportunities to use Category B DAS and thus would have the least impacts on habitat. Alternative 1 expands the CAI Hook Gear Haddock SAP to non-sector vessels. This will not increase the number of trips in this SAP since the limiting factor is expected to be the GB haddock TAC. In addition, this SAP uses longline SAPs, gear that has been found to have few adverse impacts. As a result, the impacts on habitat are expected to be similar if either alternative is adopted.

6.4.1.3 Endangered and Other Protected Species

The No Action and Alternative 1 would likely have similar impacts on endangered and other protected species. This is because while Alternative 1 does allow for increased participation in the CAI Hook Gear Haddock SAP, it should not increase the number of trips and the gear used has little impact on these species.

6.4.1.4 Human Environment

The No Action alternative will result in the expected economic and social impacts described in Amendment 13, FW 40A, and FW 40B. Those documents demonstrated that the effort reduction programs in the amendment would, in the short-term, reduce revenues from groundfish and would have negative impacts on fishing communities that rely on the groundfish fishery. Alternative 1 will expand the benefits of the CAI Hook Gear Haddock SAP to vessels that are not members of the GB Cod Hook Sector. This was the original design of that SAP as submitted in FW 40A. Since the pool of vessels that can participate in the SAP is likely to be larger if Alternative 1 is approved but the available TAC remains the same, the benefits to each vessel are expected to be reduced. In addition, unless care is taken to design the program, it is likely that derby effects will result in reducing the benefits that accrue to all participants.

The No Action alternative, however, will continue the perception that the opportunity represented by the CAI Hook Gear Haddock SAP has been unfairly allocated to a small group of industry members. Alternative 1, on the other hand, expands eligibility to fish in this SAP to all limited access groundfish vessels.

The No Action alternative will have the fewest impacts on other Category B DAS programs that are allocate a share of the GB cod incidental catch TAC. Alternative 1 reduces the GB cod incidental catch TAC for the Category B (regular) DAS Pilot Project so that non-sector vessels can participate in the CAI Hook Gear Haddock SAP. This may result in reduced benefits from the Pilot Project. It is unclear if this change will increase net national benefits or not. Data is not yet available to evaluate the Category B (regular) DAS Pilot Project and determine how this reduced incidental catch TAC may affect the program.

Type of Impacts	Alternative	
	No Action	**Alternative 1**
Biological		
Groundfish	No difference from A13, FW 40A, FW 40B expected	No difference from A13, FW 40A, FW 40B expected
Other species	No difference from A13, FW 40A, FW 40B expected	No difference from A13, FW 40A, FW 40B expected
Bycatch	No difference from A13, FW 40A, FW 40B expected	No difference from A13, FW 40A, FW 40B expected
Habitat	No difference from A13, FW 40A, FW 40B expected	No difference from A13, FW 40A, FW 40B expected
Endangered/ Protected Species	No difference from A13, FW 40A, FW 40B expected	No difference from A13, FW 40A, FW 40B expected
Human Environment		
Economic	No difference from A13, FW 40A, FW 40B expected	Benefits ($1.8-2.5 million) from CAI SAP will be spread over more vessels
Social	No difference from A13, FW 40A, FW 40B expected	Mixed results: may reduce benefits to some communities, but addresses perception CAI SAP was unfairly allocated to one industry group, extend benefits to other vessels

Table 49 – Comparison of impacts across alternatives

6.4.2 Rationale for Selecting the Proposed Action

Alternative 1 was chosen as the proposed action because it expands access to the CAI Hook Gear Haddock SAP to non-sector vessels, as planned in FW 40A. While this may reduce the overall benefits from this SAP if the haddock catch of non-sector vessels is limited by the GB cod incidental catch TAC, this alternative addresses the need to allow all longline fishermen the opportunity to target GB haddock. If the No Action alternative was selected, the SAP would continue to be limited to members of the GB Cod Hook Sector, a situation that is viewed by some fishermen as a violation of National Standard 4.

Three options were considered to reduce the possibility of a derby fishery in this SAP – in particular, a derby between sector and non-sector vessels. The first option would not have adopted any measures to prevent the development of a derby. This option was not chosen because a derby is widely viewed as inimical to the interests of fishermen and consumers. A derby would probably result in lower prices for fishermen, a short season, gear conflicts, and possible unsafe fishing practices. The second option would have adopted a limit on the number of trips that individual vessels could be made each week in the SAP. While this would slow catch rates somewhat, the SAP would still probably end within a month In addition, fishermen might choose to fish longer trips on small, day boat vessels, increasing personal risks. The proposed action divides the SAP into two periods and assigns sector fishermen to one period and non-sector fishermen to the other. The catch in each period is limited to half the haddock TAC. This measure was selected because it eliminates the possibility of a derby fishery between sector and non-sector vessels. This option was developed by industry participants, including both sector and non-sector fishermen. While some non-sector fishermen oppose this approach, the Council believes it is a reasonable measure that can be quickly adopted so that non-sector fishermen can participate in the SAP in FY 2005. More complicated measures to eliminate derby effects run the risk of preventing the non-sector vessels from fishing in the SAP in FY 2005.

One issue that the Council struggled with was whether to divide the haddock TAC between the two periods, and if so, how to split the TAC. Because the SAP is a new program, and non-sector vessels have not had the opportunity to fish in the SAP, the usual practice of basing the split on recent historic catches could not be used. The Council ultimately divided the TAC in half since each period is equal in length. The Council does not intend this approach to set a precedent for future decisions on this SAP. The Council also does not intend for the catches in this SAP to be considered as part of catch history for vessels in the future.

6.5 Cumulative Effects of the Proposed Action

6.5.1 Introduction to Cumulative Impacts

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed by evaluating each action individually. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section analyzes the potential direct and indirect effects of the proposed action (summarized from Section 7.0) together with past, present, and reasonably foreseeable future actions as well as factors external to the multispecies fishery that affect the physical, biological, and socioeconomic resource components of the groundfish environment. Although predictions of synergistic effects from multiple sources are inherently less certain

than predicted effects of individual actions, cumulative effects analyses are intended to alert decision makers to potential "hidden" consequences of the proposed actions.

The information presented in Section 5.0 (Affected Environment) describes the relevant history, natural history and current status of VECs that helps characterize the environmental baseline against which to evaluate cumulative effects and serves as a starting point for the cumulative effects analysis. The baseline does not represent a static 'snapshot' of the resource. Instead, it represents the trend of the resource, incorporating the past history of influences on the resource. The cumulative past effects of groundfish fishery activity, as well as effects external to the groundfish fishery such as other fishery impacts, human-induced impacts, and climatic events influencing the resource, all contribute to the state of the baseline condition.

Geographic and Temporal Scope

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 in May 2005) and the planned benchmark assessment of the groundfish stocks scheduled for 2008. Unlike other planned assessments that will focus primarily on the status of groundfish stocks, the benchmark assessment could modify the methods used to conduct assessments and result in changes to the management of groundfish 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 5.0 and 6.0). For endangered and protected species the geographic range is the total range of each species (Section 5.4). The geographic range for the human environment is defined as those fishing communities bordering the range of the groundfish fishery (Section 5.5) from the U.S.-Canada border to, and including North Carolina.

Valued Ecosystem Components

The cumulative effects analysis focuses on valued ecosystem components (VECs). For actions prior to Amendment 13, the VECs used are Resource, Habitat, and Community Benefits. For Amendment 13 and later actions, the VECs used are:

1. Regulated groundfish stocks (target and non-target)
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 this action would not likely result in any additional impact to air or marine water quality and thus, are not considered in this analysis.

6.5.2 Past, Present and Reasonably Foreseeable Future Actions

6.5.2.1 Target and Non-Target Species

Multispecies FMP Past and Present Actions

Although management measures for groundfish were first enacted for the EEZ in 1977 under the original Groundfish FMP, 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. The following discussion is limited to those past management actions thought to have had the greatest impact on the New England groundfish fishery, habitat and communities for the purposes of this cumulative impacts assessment; Amendments 5, 7 and 13 to the FMP, the 1994 Emergency Action, Framework Adjustment 9 to the FMP and the Interim Actions of 2002. A brief discussion of Framework Adjustment 40A to the FMP is also included, because measures resulting from that action directly impact the proposed action.

To end overfishing and address the severe decline in the groundfish resources and the influx of more and larger vessels, the Council developed 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.

Despite implementation of Amendment 5, stocks continued to decline rapidly. 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). NMFS implemented the emergency action to close these three areas in December of 1994. These closure areas are thought to have had 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 measures to reduce the discard of groundfish by vessels fishing in non-groundfish fisheries.

Amendment 7, implemented in 1996, accelerated the Amendment 5 DAS effort-reduction schedule and further reduced the bycatch of regulated multispecies. 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. However, the combination of Amendments 5 and 7 to the FMP and Framework 9 reduced fishing effort significantly and provided large areas of year-round protection, especially on Georges Bank,

for several species of groundfish. In response, the status of several groundfish stocks has improved over the past several years and landings have increased as a result.

Following Amendment 7, several framework adjustments were implemented, adding further restrictions to the groundfish fishery. While the combination of measures implemented since the adoption of Amendment 5 improved stock status (increasing biomass and reducing fishing mortality) for many stocks, the improvement has not been achieved for all stocks.

In response to a Federal Court decision in the case of *Conservation Law Foundation, et al. V. Evans, et al*., NMFS, in May and August 2002, implemented management measures consistent with a Settlement Agreement through an interim final rule. Measures contained in the interim rule included a considerable reduction of DAS; 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. It was projected that continuation of the Settlement Agreement for the duration of the 2003 fishing year would result in a 25-35% reduction in fishing effort, further protect several groundfish species, most notably GOM cod, and increased the likelihood of timely stock rebuilding.

Amendment 13, implemented on May 1, 2004, superseded the Settlement Agreement and adopted major changes to groundfish management. The expected impacts of that action are described in detail in the amendment document and briefly summarized as follows: (1) For regulated stocks, end overfishing for all groundfish stocks, rebuild overfished stocks by 2014 for most stocks (2018 for CC/GOM yellowtail flounder, 2026 for GB cod, and 2047 for redfish), reduce discards due to the adoption of an increased mesh size and create opportunities for groundfish vessels to target healthy stocks (SAPS); (2) for other stocks, reduce the bycatch of skates, dogfish and monkfish as a result of effort reductions; (3) no specific measures to protect endangered and other protected species were adopted however, effort reductions for regulated and other stocks would have negligible or possibly beneficial impacts; (4) specific measures to protect habitat include the adoption of areas closed to mobile gear, further benefits could also result from effort reductions on regulated and other stocks; and (5) short-term reductions in revenue will have negative impacts on fishing communities, but over the period of the rebuilding program revenues will increase, however, there is considerable uncertainty over whether current fishery participants will benefit from rebuilding.

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 GB Cod Hook Sector 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). 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.

Summary of Impacts

The cumulative impacts of past and present management actions have resulted in substantial effort reductions in the multispecies fishery. Although this has benefited some stocks (GB haddock), rebuilding has been slow for others (GB cod, SNE/MA and CC/GOM yellowtail flounder). It is anticipated that new effort reductions implemented under Amendment 13 and subsequent actions will end overfishing for all stocks, while also creating new opportunities for groundfish vessels to target healthy stocks.

Other FMPs Past and Present Actions

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 that opens and closes areas that were permanently closed (CA I, CA II and NLSCA) to groundfish and scallop fishing. Although this system permits scallop vessels to fish in areas that were closed to protect groundfish spawning, vessels are not allowed into the areas during peak spawning periods. Further, the portions of the areas that have been opened primarily consist of sandy substrate, which recovers quickly from disturbances. Therefore, impacts to groundfish stocks or EFH are expected to be minimal and temporary in nature, respectively.

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. Therefore, FW 16/39 placed caps 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 was restricted to 100 lbs. (45.4 kg.) of cod per trip for personal use. These measures further mitigated impacts to groundfish as a result of he scallop rotational management system.

Reasonably Foreseeable Future Actions

Several reasonably foreseeable future federal fishery management actions may affect the multispecies fishery. These include:

Framework Adjustment 40B to the NE Multispecies FMP

The Council has submitted FW 40B to NMFS. If approved, FW 40B would implement management measures to improve the effectiveness of the effort control program implemented by Amendment 13, including opportunities developed to target healthy stocks and other measures intended to facilitate adaptation to the amendment's effort reductions. The majority of the measures being considered in FW 40B would not impact overall effort in the multispecies fishery. However, the action does propose to re-categorize ten Category C DAS as Category B (reserve) DAS for approximately 400 vessels that were not allocated either Category A or Category B DAS under Amendment 13. The DAS allocated to these vessels would have to be used in specific SAPs where the amount of effort that can be used is capped by a TAC for target and incidental catch groundfish species. Allocating a minimum amount of effort does not change these TACs and, therefore, is not likely to increase the amount of effort used in these SAPs.

Framework Adjustment 42 to the NE Multispecies FMP

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, Category B (regular) DAS Pilot Project, changes to the DAS transfer program, modifications to other existing SAPs and measures to facilitate experimental fishing permits.

Annual TAC Adjustment for the U.S./Canada Management Area under the NE Multispecies FMP.

This action would establish TACs for Georges Bank cod, haddock and yellowtail flounder for the 2005 fishing year (May 1, 2005, through April 30, 2006) in accordance with the U.S./Canada Resource Sharing Understanding. The proposed 2005 TACs for cod and yellowtail flounder are lower than the

TACs adopted for the 2004 fishing year (cod reduced by 13% and yellowtail flounder reduced by 29%). However, the proposed 2005 TAC for haddock would increase by 49%. Although the increase in the haddock TAC would provide vessels fishing in the Eastern U.S./Canada Area additional fishing opportunities, historically vessels have not reached the haddock quota (as of February 17, 2005, the total haddock catch in the Eastern U.S./Canada Area including estimated discards is only 14% of the 2004 TAC). Therefore, the 2005 TAC for Georges Bank haddock could slightly increase effort; however, it is unlikely that the quota will be obtained.

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.

Amendment 1 to the Herring FMP

The Council is developing the first amendment to the Atlantic Herring FMP. 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.

6.5.2.2 Protected Species

The following summarizes the cumulative impacts to protected species that were included in the Amendment 13 Final Environmental Impact Statement.

Large Whales and Mammals

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.

Sea Turtles

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 negatively 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. Entanglements in debris or ingestion of marine debris are also seen as possible threats.

Summary of Impacts

While reductions in fishing effort as a result of past management actions is thought to have had a slightly positive impact on protected species, gear entanglement continues to be a likely source of injury or mortality. Therefore, 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 framework adjustment are assessed in Section 7.0 and do not appreciably increase impacts discussed and analyzed previously.

Reasonably Foreseeable Future Actions

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 (ALWTRP) Dynamic Area Management (DAM) system; changes to the Harbor Porpoise Take Reduction Plan; the Strategy for Sea Turtle Conservation in Atlantic Ocean and Gulf of Mexico Fisheries to address sea turtle fisheries interactions in state and federal fisheries operating in the Atlantic and Gulf of Mexico through a consistent gear based approach; 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 is not known at this time, their effects cannot be determined.

In addition, regulations to the ALWTRP are proposed to be implemented to address the number of observed Atlantic large whale entanglements. A Notice of Availability for the DEIS for the ALWTRP published in the Federal Register on February 25, 2005. The purpose of the proposed action is to further

reduce the risk of entanglement to Atlantic large whales in fishing gear. The proposed action includes broad-based gear modifications in lieu of seasonal and/or area management requirements. The proposed action would also apply to trap/pot and gillnet fisheries. As a result, vessels using gillnet gear in the multispecies fishery could be required to make modifications to their gear.

6.5.2.3 Habitat

Past and Present Actions

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, such as haddock and cod. 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), such as Georges Bank.

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 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 bottom tending mobile gear are generally moderate to high, depending upon the type of bottom and the frequency of fishing activities, to haddock, cod and other demersal species affected by this action.

The proposed action only involves the use of bottom longline gear. There is little scientific information that evaluates the effects of gill nets and long-lines on benthic marine habitats, and none evaluates these effects in the northeast region. While the mainline, hooks, and gangions all contact the bottom, the vulnerability of EFH for all benthic species and life stages to lines was rated as low by a panel of gear experts (NOAA Fisheries Service, 2003 in press). Circle hooks are potentially less damaging to habitat features than other hook shapes (NREFHSC 2002).

Reasonably Foreseeable Future Actions

Amendment 2 to the Monkfish FMP

A Notice of Availability for the FSEIS prepared for Amendment 2 published in the Federal Register on January 14, 2005. As submitted, the amendment would modify monkfish management but continues to link monkfish and groundfish DAS for vessels with Category C or D monkfish permits. The

Amendment is expected to have only a slightly positive impact on the multispecies fishery, primarily to groundfish EFH as a result of the restriction on roller-gear in the Monkfish Southern Fishery Management Area (just south of Cape Cod, Massachusetts through North Carolina).

EFH Omnibus Amendment

An EFH Omnibus Amendment is currently under development for all of the Council's FMPs. The purpose of the amendment is to review and revise EFH components of the FMPs and to develop a comprehensive EFH management plan that will successfully minimize adverse effects of fishing on EFH through actions that will apply to all Council-managed FMPs. The Council is considering several measures for inclusion in the Omnibus Amendment, including a review and update of the following: (1) description and identification of EFH; (2) non-fishing activities that may adversely impact EFH; (3) identification and consideration of new Habitat Areas of Particular Concern; and (4) integration of alternatives to minimize any adverse effects of fishing on EFH. While it is possible that the Council would recommend measures that could impact multispecies EFH, because the amendment is in the early stage of development, it is not possible to predict impacts to the multispecies fishery with any certainty.

6.5.2.4 Human Communities

Past and Present Actions

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. For both Amendment 5 and Amendment 7, impacts to fishing communities were predicted to be significant, with substantial short-term loses in revenue. Some communities lost access to the resource entirely as vessels left the fishery and stock size contracted. However, as a result of Amendments 5 and 7 stock sizes began to increase, resulting in greater landings and revenues.

Because Amendments 5 and 7 failed to reduce fishing mortality to within legal requirements of the SFA (adopted after the implementation of Amendment 5), additional measures were needed. The Settlement Agreement and Amendment 13 imposed further restrictions on the industry. In the short term, Amendment 13 measures 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 –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. Further, SAPs implemented through Amendment 13 and FW 40A have created opportunities for groundfish vessels to target healthy stocks. While these SAPs are limited in scope, the programs should help mitigate some of the negative impacts on communities that resulted from Amendment 13.

Reasonably Foreseeable Future Actions

Framework Adjustment 40B to the NE Multispecies FMP

The majority of the measures being considered in FW 40B would not impact overall effort in the multispecies fishery. However, FW 40B would implement management measures to provide opportunities to target healthy stocks and to re-categorize ten Category C DAS as Category B (reserve)

DAS for approximately 400 vessels that were not allocated either Category A or Category B DAS under Amendment 13. The DAS allocated to these vessels would have to be used in specific SAPs. Because this requirement limits the use of these B DAS, positive impacts to communities are expected to be minor. Additional measures such as changes to the number of nets that can be fished by trip gillnet vessels and modifications to the DAS transfer and leasing programs would have a very limited impact on communities.

Annual TAC Adjustment for the U.S./Canada Management Area under the NE Multispecies FMP

This action would establish TACs for Georges Bank cod, haddock and yellowtail flounder for the 2005 fishing year. The proposed 2005 TACs for cod and yellowtail flounder are lower than the TACs adopted for the 2004 fishing year (cod reduced by 13% and yellowtail flounder reduced by 29%). However, the proposed 2005 TAC for haddock would increase by 49%. Historically vessels have not reached the haddock quota; therefore, increased opportunities to target haddock may not offset revenues lost due to lower cod and yellowtail TACs.

Liquid natural gas (LNG) terminals.

As discussed further below in Section 6.5.3, there are approximately 11 LNG projects in various stages of the approval process. Depending on the location of the project, a range of impacts can occur, including impacts to communities. Due to the potentially hazardous nature of the facilities (LNG is transported via tanker to specialized terminals), security zones are generally established around LNG facilities. This can restrict access to areas traditionally utilized for fishing and shellfishing, essentially closing some areas to fishing and thus reducing fishing opportunities.

6.5.3 Summary of Non-Fishing Effects

Past and Present Actions

A comprehensive evaluation of non-fishing impacts to the multispecies fishery was conducted 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 50 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 adverse impact to fishery resources and EFH. 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 groundfish stocks, there are several non-fishing threats that could have a direct and/or indirect impact. Several of the items identified as non-fishing threats to fish habitat, identified in Table 50, 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.

THREATS	RIVERI	INSHORE	OFFSHOR
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	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	M	H	
vessel activity	M	H	L
erosion control			
bulkheads	M	M	
seawalls		M	
jetties		M	
groins		M	
tidal restriction	M	H	
dam construction /	H	M	
water diversion			
water withdrawal	H	M	
irrigation	M	M	
deforestation	H	M	
mining			
gravel/mineral	M	M	M
oil/gas mining	L	M	M
peat mining	L		
debris	M	M	M
dredged material	L	M	M
artificial reefs	L	M	M

Table 50- 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

Reasonably Foreseeable Future Actions

Liquid natural gas (LNG) terminals

There are approximately 11 LNG projects in various stages of the approval process (i.e., existing with approved expansions, approved, proposed, or planned) in the northeast region of the U.S. Only two onshore LNG projects have been constructed, one in Everett, MA and one in Cove Point, MD. LNG facilities are currently being proposed or planned for construction in Pleasant Point, ME (onshore); two projects offshore of Boston, MA area and one in Somerset, MA (onshore); Providence, RI (onshore); Long Island Sound, NY (onshore); Logan Township, NJ (onshore); Philadelphia, PA (onshore); and an expansion of an existing facility in Cove Point, MD.

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. Further, the construction of pipelines and fill associated with site construction can have adverse impacts on intertidal habitats and salt marshes in the area.

Offshore wind energy generation projects

Although only two offshore wind energy projects have formally been proposed in the northeast region, at least 20 other separate projects may be proposed in the near future. Cape Wind Associates (CWA) proposes to construct a wind farm on Horseshoe Shoal, located between Cape Cod and Nantucket in Nantucket Sound, Massachusetts. A second project is proposed by the Long Island Power Authority (LIPA) off Long Island, New York. The CWA project would have 130 wind turbines located as close as 4.1 miles offshore of Cape Cod in an area of approximately 24 square miles with the turbines being placed at a minimum of 1/3 mile apart. The turbines will be interconnected by cables, which will relay the energy to shore to the power grid.

The Army Corps of Engineers has developed a DEIS and has completed a scoping process for the proposed Cape Wind Associates (CWA) project on Horseshoe Shoal. If constructed, the turbines would preempt other bottom uses in an area similar to oil and natural gas leases. The potential impacts associated with the CWA offshore wind energy project include the construction, operation and removal of turbine platforms and transmission cables; thermal and vibration impacts; and changes to species assemblages within the area from the introduction of vertical structures.

6.5.4 Cumulative Impacts of the Proposed Action

The following analysis summarizes the cumulative effects of past, present, and reasonably foreseeable future actions in combination with the proposed action on the VECs identified in Section 6.5.1.

6.5.4.1 Cumulative Effects on Regulated Groundfish Stocks

The proposed action would have only a minimal cumulative effect on regulated groundfish stocks. In general, the prior multispecies actions of Amendments 5 and 7 initiated rebuilding of the multispecies stocks. While the pace of rebuilding did not meet the legal 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 implemented measures to increase the pace of rebuilding in order to achieve compliance with the M-S Act. The amendment also created opportunities for vessels to target healthy groundfish stocks, such as haddock, without jeopardizing the rebuilding program. FW 40A adopted the CA I hook gear haddock SAP, which provided GB Cod Hook Sector vessels access to a small portion of CA I to target a limited amount of haddock (1000 mt).

The proposed action would provide vessels using hook gear, that are not members of the GB Cod Hook Sector, access to the CA I hook gear haddock SAP implemented under FW 40A. Although the proposed action would result in an increase in fishing effort (compared to Amendment 13) as a result of the use of B DAS to target groundfish, this minor increase in effort is not expected to threaten the mortality objectives of Amendment 13 because all SAP participants would be restricted by the 1000 mt haddock TAC. Vessels fishing on a Category B DAS would also be constrained by incidental catch TACs for groundfish stocks of concern. For the CA I hook gear haddock SAP, an incidental catch TAC of 14.4% was specified for GB cod only, because the catch of other species of concern (ocean pout, southern windowpane flounder and Atlantic halibut) have be shown to be insignificant (Sections 4.2.1 and 6.2.1.1). In addition, compared to bottom tending mobile gear, employing hook gear and specifying the bait used to target haddock has proved an effective method to minimize bycatch of other groundfish species of concern, such as cod.

Another known threat to groundfish stocks could result from non-fishing impacts. However, in offshore areas such as CA I, with the exception of unplanned events such as an oil spill or algae bloom, the potential for adverse impacts to fishery resources is low and tend to be localized over a small area.

Because this action would continue to support the goals of the FMP and is not expected to threaten the mortality objectives established by Amendment 13, groundfish stock status should continue to improve. Further, future fisheries actions described in Section 6.5.2 are not expected to hinder the rebuilding process, and several would be in support of the Amendment 13 objectives (FW 40B, FW 42 and the Annual TAC Adjustment for the U.S./Canada Area). To afford additional assurance, provisions were included in Amendment 13 that provide for periodic review of the groundfish resource. The first assessment, scheduled for 2005, will review the rebuilding progress and if necessary, provide the information necessary to make sure rebuilding programs remain on track. Therefore, the proposed action, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts.

6.5.4.2 Cumulative Effects on Non-groundfish Species

This action would have only a minimal cumulative effect on non-groundfish species. The overall reduction in groundfish fishing effort begun by Amendment 5, accelerated in Amendment 7, and further controlled by Amendment 13, benefits other stocks by reducing fishing effort and thus, limiting the interaction between vessels fishing for groundfish and other stocks. While the proposed action could result in a small increase in mortality for some non-groundfish species (i.e., thorny and barndoor skate and dogfish), total effort in the groundfish fishery will remain well below the levels observed in FY 2000 and FY 2001. Further, to the extent that other bycatch species mix in the water column with groundfish stocks of concern, limiting the incidental catch of groundfish through the use of TACs may also help reduce bycatch of other species.

Future fisheries actions described in section 6.5.2 are not expected to appreciably increase the bycatch of non-groundfish species. Although FW 40B proposes to allocate additional B DAS for some vessels, the DAS could only be used in specific SAPs and effort for target and non-target groundfish

species would be capped by a TAC. This would both limit bycatch and encourage the pursuit of selective fishing practices to maximize landings of the target species. The Annual TAC Adjustment for the U.S./Canada Management Area would establish 2005 TACs for GB cod, haddock and yellowtail. Among the three species, GB haddock is the only stock that would receive an increased TAC. This could increase effort and bycatch; however, historically the quota has not been obtained. Impacts resulting from other future actions, such as FW 42 and Amendment 1 to the Herring FMP, are in the preliminary stages of development and it is unclear what, if any, impact these actions could have on the bycatch of non-groundfish species.

Because past and future groundfish actions have limited the interaction between vessels fishing for groundfish and non-groundfish stocks and future actions are expected to result in only minimal increases to bycatch, the proposed action, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts.

6.5.4.3 Cumulative Effects on Endangered and Other Protected Species

It is not anticipated that the proposed measures contained FW 41 would adversely impact threatened, endangered or protected species beyond those analyzed and discussed in Amendment 13. Protected species known to have only minimal interactions with hook and line gear include humpback whales, harbor seals, and grey seals. Sea turtles are not known to interact with hook and line gear nor would they be present in the action area (CAI) during the greater part of the period that the SAP would occur (October through December), as hard shelled sea turtles typically inhabit New England waters from June through October.

While anthropogenic activities will continue to adversely impact marine mammals and sea turtles, as summarized in Section 6.5.2.2, elements of the proposed action, specifically the use of hook and line gear and the relatively minor increase in fishing effort from the use of B DAS, would not result in additive adverse impacts to protected species, beyond what is already occurring. Further, although it is not possible to characterize the extent of impacts (e.g., minor, substantial, etc.), it is anticipated that future actions such as modifications to the ALWTRP and measures to protect sea turtles would have positive impacts on large whales and turtles. For these reasons, the proposed action, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts to endangered or other protected species.

6.5.4.4 Cumulative Effects on Habitat

The cumulative effect of this action on habitat is 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 bottom-tending mobile gear and benefits that accrue from the effort reductions and other provisions of the amendment. While the proposed action would allow a small increase in fishing effort, the increase relative to the effort reductions in Amendment 13 would be minor and restricted by haddock and incidental catch TACs.

The proposed action would allow the addition of vessels that are not members of the GB Cod Hook Sector access to the CA I Hook Gear Haddock SAP. The SAP occurs in a portion of CAI, primarily in an area closed to bottom tending mobile gear to protect EFH (Level 3 closure). Bottom longlines (hook gear) are characterized as static gear and thus, are not subject to the fishing restrictions of a Level 3 closure. The SAP also overlaps slightly with a portion of CA I outside of the habitat closure area that has

been the focus of several research projects and that was recently reopened to seasonal commercial scallop fishing.

Aside from short-term research projects and the rotational scallop program, no future actions are anticipated in CA I. Although the Omnibus EFH Amendment could recommend additional measures to minimize the adverse effects of fishing on EFH, because the amendment is in the early stage of development, it is not possible to predict the impact of that action. The only other known threats to habitat or EFH could result from non-fishing impacts. In general, impacts from non-fishing activities are localized, such as in the disposal of dredged material or the possible construction of LNG facilities and wind farms and, in the case of pollution, typically have a greater potential for impacts closer to the coast. Thus, negative non-fishing impacts are less likely to be additive in an offshore area, such as CA I (Table 50).

While the mainline, hooks and gangions used by hook and line gear contact the bottom, the vulnerability of EFH for all benthic species and life stages to lines was rated low by a panel of gear experts (NOAA Fisheries Service, 2003 in press). Therefore, impacts on habitat and the physical environment in CAI as a result of this proposed action in combination with fishing effort from the GB Cod Hook Sector are expected to be less than minimal and no more than temporary. This minor impact, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts to habitat or EFH.

6.5.4.5 Cumulative Effects on the Human Environment

Previous multispecies management actions have had a negative effect on communities. Starting with Amendment 5 and continuing through the implementation of Amendment 13, communities, particularly in Maine, Massachusetts, Rhode Island and New Jersey, have suffered substantial economic loses as a result of effort reductions. The proposed action would provide some slight mitigation of the negative effects on communities as a result of Amendment 13. Because the proposed action would allow a limited increase in fishing effort by permitting the use of B DAS, revenues would be higher than if this action is not implemented. Although the economic returns would be limited by the incidental catch TACs, the action is expected to provide some benefit to hook vessels, which in turn would trickle down to their communities. However, the allocation of the GB cod incidental TAC to the B regular DAS program would be reduced to accommodate the proposed action. Therefore, vessels that participate in the B regular DAS program may realize an economic loss, as a percentage of the GB cod incidental TAC would be shared with the SAP, unless the same vessels participate in both programs (section 6.3.4.1).

The proposed action would expand the benefits of the CAI Hook Gear Haddock SAP to vessels that are not members of the sector. Therefore, the SAP could include a greater number of vessels vying for the same amount of TAC. The potential for derby style fishing under a hard TAC, both between and among the sector and non-sector vessels, could compromise safety in addition to economic benefits that could be realized from the proposed action. However, the two groups helped devise a solution by which the SAP season and haddock TAC would be evenly split (section 6.3.4.2), thereby mitigating the incentive to compete for TAC.

Future actions in the groundfish fishery could have a slightly positive impact on communities. If implemented, FW 40B would provide additional opportunities to target healthy stocks and re-categorize 10 Category C DAS as Category B DAS. Both of these measures would afford slight increases in fishing effort, thus resulting in increased revenues. The Annual TAC Adjustment for the U.S./Canada Management Area would increase the GB haddock TAC; however, the TACs for cod and yellowtail flounder would be reduced. As a result, increased effort and revenues from the haddock resource could

be offset by loses from cod and yellowtail flounder. Further, historically; the haddock quota has not been obtained and it is not clear if vessels would be able to take advantage of additional fishing opportunities. Conversely, proposed LNG facilities could restrict access to areas used for fishing. Although this impact would likely be minor, due to the preliminary nature of the proposed projects, specific impacts are not yet known.

The minor benefits predicted to result from the proposed action are not expected to be significant when compared to the negative short-term impacts of Amendment 13, additional fishing opportunities from future actions or the benefits that will accrue in the future as a result of stock rebuilding. Therefore, the proposed action, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts to the human environment.

6.5.5 Summary of Cumulative Impacts

The cumulative effects of this action are not likely to have a substantial impact on any of the VECs associated with the multispecies fishery. The overall reductions in fishing effort adopted by previous management actions will have a positive biological impact on groundfish and other stocks. While the proposed action may result in a small increase in effort, controls such as hard TACs, DAS and time restrictions are included to ensure that the mortality objectives of the management plan are not threatened. While there may be a small increase in mortality for some stocks (cod, skates and dogfish) as a result of increased access to the CAI Haddock SAP and the use of B DAS, this increase is not likely to have a significant impact. With respect to endangered and other protected species, the proposed measures would have negligible impacts. Impacts on habitat and EFH are also expected to be minimal. Finally, the proposed action would mitigate some of the negative economic and social impacts incurred as a result of Amendment 13. Therefore, the proposed action would not result in significant cumulative impacts to fisheries resources, habitat, protected species or communities.

Table 51 – 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
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	Unknown	Negative, low	Negative, low	Unknown	Negative, low
Past Actions					
• Amendment 5 to the Multispecies FMP • Amendment 7 to the Multispecies FMP • 1994 Emergency Action to the Multispecies FMP • Framework 9 to the Multispecies FMP	Short-term negative, high Long-term positive, low	Positive, moderate-high	Positive, moderate - high	Positive-low	Positive, low
• Interim Actions of 2002 to the Multispecies FMP	Short-term negative, high Long-term positive, low	Positive, high	Positive, low	Positive, low	Positive, moderate
Present Actions					
• Amendment 13 to the Multispecies FMP	Short-term negative, high Long-term positive, low	Positive, high	Positive, low	Positive, low	Positive, moderate
• Framework 40A to the Multispecies FMP	Positive, low	Negative, minimal	Negative, low	Negligible	Negligible
• Amendment 10 to the Scallop FMP • Scallop/Multispecies Frameworks 16/39	Short-term positive Long-term positive	Neutral	Neutral	Negative, low (turtles only)	Negative, moderate
Reasonably Foreseeable Future Actions					
• Framework 40B to the Multispecies FMP	Positive, low	Negligible	Negligible	Negligible	Negligible
• Framework 42 to the Multispecies FMP	Unknown	Unknown	Unknown	Unknown	Unknown
• Annual TAC Adjustment for U.S./CA Management Area	Negligible	Positive, low	Positive, minor/low	Negligible	Negligible
• Experimental Fishing Permits	Negligible	Short-term negative, low Long-term possibly positive	Negative, low	Negative, low/minimal	Negative, low/minimal
• Amendment 1 to the Herring FMP	Unknown	Unknown	Positive, low	Unknown	Unknown
• Amendment 2 to the Monkfish FMP	Negligible	Negligible	Negligible	Negligible	Positive, moderate
• EFH Omnibus Amendment	Unknown	Unknown	Unknown	Unknown	Unknown
• Time/Area Closures under the ALWTRP DAM system • Modifications to the Harbor Porpoise TRP • Strategy for Sea Turtle Conservation • Large-mesh gillnet closures to protect sea turtles	Unknown	Unknown	Unknown	Unknown	Unknown
• ALWTRP DEIS	Short-term negative, low Long-term, negligible	None	None	Positive, high	None

Table 51 – Summary of cumulative effects (cont.)

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
• LNG Terminals	Unknown, possibly negative	Unknown, possibly negative	Unknown, possibly negative	Unknown	Short-term negative, moderate Long-term unknown
• Offshore Wind Energy Generation	Possibly negative	Negligible	Negligible	Short-term negative Long-term negligible	Short-term negative, moderate Long-term negligible
Impacts of the Proposed Action					
• Incidental Catch TACs	Positive, minor for non-Sector Hook Gear SAP participants Negative, minor for Cat B (regular) DAS participants	Negligible	None	None	None
• Access to the CA I Hook Gear Haddock SAP for non-Hook Sector Participants	Positive, low	Negligible	Negative, minimal	Negligible	Negligible

Intentionally Blank

7.0 APPLICABLE LAW

7.1 Magnuson-Stevens Fishery Conservation and Management Act

7.1.1 Consistency with National Standards

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

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

Amendment 13 to the FMP adopted status determination criteria for regulated groundfish species, formal rebuilding programs for overfished stocks, and management measures to comply with those criteria and programs. The measures in Amendment 13 are designed to prevent overfishing and achieve optimum yield on a continuing basis. The management measures in this action are designed to be consistent with Amendment 13. The modifications to the Closed Area I Hook Gear Haddock SAP will allow more participants in the SAP but will not change the allowable catches of any regulated groundfish species. The haddock TAC for the SAP is set at a level that will not threaten mortality targets and will not result in overfishing. Catches of cod in the SAP are controlled through the use of TACs. For sector vessels, this catch of cod counts against the sector cod allocation. For non-sector vessels, catches of cod count against an incidental catch TAC that is designed to reduce the risk that overfishing will result (section 6.2.1.1).

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

This action is based on the most recent estimates of stock status. These include the GARM (2002) and recent evaluations of survey indices for groundfish stocks (section 5.2.1). Information to evaluate the SAP is based on an experimental fishery conducted in the area in 2003.

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 primary regulated groundfish stocks that are affected by this action are GB cod and GB haddock. The small area of the SAP lies entirely within the stock area for these two stocks. As a result, the measures proposed by this action do not conflict with the requirement to manage these stocks as a unit.

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.

This action does not discriminate against residents of different states. Indeed, this action is designed in part to remedy the perception that the opportunity to fish in the CAI Hook Gear Haddock SAP was unfairly awarded only to members of the GB cod hook sector, whose members primarily reside in Massachusetts though residents of any state can join the sector. By allowing non-sector participation, this action will facilitate participation by fishermen from other states. While it is possible that some states

may have an advantage due to geography, this action does not discriminate against residents of different states.

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

The proposed measures do not restrict the amount of gear that can be fished in the SAP; fishermen can thus choose the most efficient way to operate.

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

This action provides a limited opportunity to harvest haddock in a closed area using hook gear. The requirement to use hook gear is based on experimental results that demonstrate it is possible to catch haddock – a healthy stock – with very little bycatch of cod. In addition, most of the area is contained within an area that is closed to mobile gear in order to minimize the adverse effects of fishing on essential fish habitat. As a result, this action provides limited opportunities to take into account variations in fisheries and catches. Vessels are, however, allowed to make trips of any length and use the amount of gear deemed appropriate by the operator. Without the requirements for gear, the opportunity to target haddock in CAI would not be possible.

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 a regulated groundfish stock that were conceived, but not explicitly developed by, Amendment 13. The revise measures adopted in FW 40A. While the proposed measures do duplicate reporting requirements for vessels that choose to participate in the, 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.

The proposed measures create additional opportunities for fishermen to target healthy GB haddock stocks. By expanding access to the CAI Hook Gear Haddock SAP to non-sector vessels, more communities will be able to benefit from this resource. This will help mitigate the economic impacts of the effort reductions adopted by Amendment 13.

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 4.2.1). These limits promote the use of selective fishing practices, since vessels can only fish for GB haddock as long as the incidental catch TAC has not been met. In order to monitor fishing practices and make sure that unreported discards do not result in the TACs being exceeded, the proposed SAP will have sufficient observer coverage to accurately monitor catches. The CAI hook gear haddock SAP is restricted to gear that demonstrated a low catch rate for non-targeted species in an experiment conducted in the area.

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

The proposed measure restricts fishing in the CAI Hook Gear Haddock SAP to October 1 through December 31. In addition, some participants (non-sector vessels in FY 2005) are prevented from fishing in the SAP until November 16. Average winds and seas in this area increase in the late fall and winter months (see Figure 17). Vessels that wish to participate in the SAP must carefully balance weather conditions with the economic benefits they will receive from the SAP. Complicating this decision for vessel operators is that ex-vessel prices also tend to increase late in the calendar year, creating an additional incentive to fish in spite of weather conditions. The restriction on season was adopted in FW 40A because an experimental fishery demonstrated that haddock could be caught with little catch of cod during those months – data is not yet available for other periods. The choice is thus not whether the SAP could be opened during months with better weather, but rather to authorize or not authorize the SAP. The Council believes the benefits of increased revenue for vessels participating in the SAP outweighs the safety concerns of fishing late in the year. Increased revenues may yield some safety benefits as vessel operators are likely to spend at least par t of this income on vessel maintenance and safety equipment.

Other provisions of the SAP were also designed to improve vessel safety. There is no daily limit on the catch of haddock, the target stock, since in recent years the daily haddock limit during this period (5,000 pounds per day) is the same as the catch experienced in the fishery in FY 2004 and, in any case, has been lifted by this time in recent years. The cod possession limit is based on a trip, rather than the number of days fished, removing any incentive for vessels to continue fishing to qualify for additional cod catch. Most vessels participating in this SAP are likely to fish one day at a time. AS a result, they are able to closely monitor weather conditions and are less likely to be caught offshore in rapidly changing conditions.

1.1.2 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;

This action proposes management measures for hook-gear vessels fishing in a SAP in CAI to target haddock. The measures are described in section 4.2. There is no foreign fishing for groundfish, so no measures for foreign vessels are specified. The measures are designed to allow the harvest of haddock without threatening the mortality objectives of any groundfish stock.

(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 5.5.

(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 5.5, while information on landings and revenues from the fishery is in section 9.4 of Amendment 13. 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 6.0.

(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.

(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 section 4.2.

(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. This action does not change those definitions.

(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 6.0 described the impacts of the proposed action on the multispecies fishery. Impacts of the alternatives on other fisheries are described in sections 6.3.6.

(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 CAI hook gear haddock SAP. It also adopts additional daily electronic reporting requirements of catch (kept and discarded) for the programs implemented by this action. A recent court ruling determined that Amendment 13 did not comply with the bycatch reporting requirements of the M-S Act for three reasons: (1) it fails to evaluate reporting methodologies (2) it does not mandate a standardized reporting methodology and (3) it fails to respond to potentially important scientific evidence. The Council will be evaluating standardized bycatch reporting methodologies in response to this ruling and will bring the management program into compliance with the M-S Act in a future action.

This action adopts gear and effort controls that will minimize bycatch. It also adopts incentive programs that will encourage the development of selective fishing practices. These programs are based on the use of incidental catch TACs for regulated groundfish stocks of concern that are caught while fishing in Category B DAS programs. If vessels operators successfully avoid these stocks of concern, reducing

bycatch, they will be able to pursue the healthy stocks for a longer period. An analysis of the measures adopted to minimize bycatch is included in section 6.3.1.3.

(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 5.5.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

The proposed action creates opportunities to target healthy groundfish stocks. The CAI Hook Gear Haddock SAP allocates the ability to target GB haddock to specific gear types. Only longline gear is allowed to target haddock in CAI since an experiment demonstrated that this fishery can occur with no harm to other regulated groundfish stocks.

(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

(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 6.5 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).

7.1.2 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

7.1.2.1 Description of Action

The proposed action expands access to the CAI Hook Gear Haddock SAP by allowing non-sector vessels to participate. Details of the proposed action are in section 4.2.

7.1.2.2 Assessing the Potential Adverse Impacts

Incidental Catch TACs

This measure increased the incidental TACs for stocks of concern to accommodate the expansion of the CAI Hook Gear Haddock SAP to include non-sector vessels. This will reduce the amount of the GB cod incidental catch TAC that is available to the Category B (regular) DAS program, and could

APPLICABLE LAW
Magnuson-Stevens Fishery Conservation and Management Act

Deleted: APPLICABLE LAW
Deleted: APPLICABLE LAW
Deleted: Magnuson-Stevens Fishery Conservation and Management Act
Deleted: Magnuson-Stevens Fishery Conservation and Management Act

conceivably result in a minor reduction of effort in this program. Preliminary indications after only four months are that most fishing in this program on GB has been by trawl vessels. This action could have a small positive benefit on habitat since it may result in less trawl fishing under the Category B (regular) DAS program during the second quarter of FY 2005.

Changes to the CAI Hook Gear Haddock Special Access Program

Deleted: *WGOM Closed Area Rod/Reel*

Habitat impacts of this special access program for the Georges Bank cod hook sector were analyzed in FW 40a. The SAP is located entirely within the Area I Groundfish Mortality Closed Area. This analysis concluded, however, that longline gear has a low impact on benthic habitats compared to mobile, bottom tending gear, and that any impacts to habitat would be minimal and temporary in nature. Expansion of this SAP to include additional longline fishing by non-sector vessels is not expected to impact EFH in a manner that is more than minimal or temporary in nature.

7.1.2.3 Minimizing or Mitigating Adverse Impacts

Section 6.3.2 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. This action only affects vessels fishing with longline gear that has been determined to have minimal impacts on EFH. It does not expand the area, season, or amount of effort. Therefore, measures to mitigate or minimize adverse effects on EFH are not necessary.

7.1.2.4 Conclusions

The action proposed under this framework adjustment should have no more than a minimal adverse effect on EFH of federally managed species. Because there are no substantial adverse impacts associated with this action, an abbreviated consultation may be the only required action.

7.1.3 Skate Baseline Review

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.

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). Since Framework 40 proposes to allow access for multispecies vessels into portions of the groundfish mortality closed areas for several different special access programs, the Skate PDT must evaluate the potential impacts of this change. In general, this section will evaluate whether the proposed SAP 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.

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 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 in this framework action that could indirectly increase or decrease skate mortality, the baseline review is only required to evaluate the seven identified categories of measures. This baseline review will assess only one of the seven categories of management measures: a change in the groundfish mortality closed areas. The No Action alternative clearly does not change measures. In addition, Alternative 1 does not change the season, area fished, or amount of fishing effort expected to occur in the CAI Hook Gear Haddock SAP – it only changes the number of vessels that are eligible to participate in this SAP. The skate baseline review for this SAP was conducted in FW 40A. The following discussion is based on that analysis, updated with more recent information on the stock status for thorny and barndoor skates.

7.1.3.1 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 52 shows the Autumn survey indices for the two species of skate that are in a formal rebuilding program. Updated values for 2004 have been added to the bottom of the table, as well as a new three-year average (2002-2004) for each species. According to the respective three-year average updated through 2004, barndoor biomass has increased and is no longer considered overfished, while thorny biomass has increased slightly. Figure 20 shows 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 54 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 55 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 recent updates.		
2002	0.78	0.44
2003	0.55	0.74
2004	1.30	0.71
2002-2004 Three-year average	**0.88** *(+ 0.07 above threshold)*	**0.63** *(1.57 below threshold)*
SAW 30 Biomass Threshold	0.81	2.20
CURRENT STATUS	**NOT OVERFISHED**	**OVERFISHED**

Table 52 – NEFSC Autumn survey indices and updated status of Barndoor and Thorny skates
Number of skates in the entire survey area

7.1.3.2 Summary of potential impacts on skate mortality

Figure 18 depicts the distribution of both skate species and the special access areas. There are very few skates distributed within the boundaries of the haddock SAP in and around Closed Area II. There are a larger number of both thorny and barndoor skates recorded within the Closed Area I hook gear haddock SAP, but neither seems to be distributed heavily in this area as compared to areas outside the SAP.

Potential impacts on skate mortality from the Closed Area I Hook Gear/Haddock SAP

This SAP allows vessels using hook gear to target haddock in a small area of Closed Area I. The area may expand if the results of an experimental fishery demonstrate that haddock can be caught without adversely affecting the Amendment 13 mortality goals. There are several declarations and additional requirements vessels must comply with in order to participate in the SAP. The No Action alternative does not change any of the SAP elements (as implemented), while Alternative 1 increases the number of vessels eligible to participate in the SAP. Based on recent experiments (September through October 2003), it was demonstrated that longline vessels in Closed Area I could effectively target haddock. It is estimated that about 440 trips will be taken in this area. Table 42 summarizes the catch of all species in the experimental hook fishery. Thorny skate catch levels were among the top five species caught. A mean of 168 pounds of thorny skates were caught per trip based on 49 experimental trips, thus an estimated 74,000 pounds of thorny skate bycatch may be impacted if 440 trips are taken in this SAP. Barndoor skate was caught in the experimental fishery as well, but at a lower rate (mean of 46 pounds per trip). To put the catch of skates in perspective as compared to the directed haddock catch from this experiment, haddock catch was a mean of 4,918 pounds per trip, about 79% of the total catch for the experimental fishery. It is not possible to determine if the projected skate bycatch levels within this SAP are high compared to skate bycatch levels already being discarded in outside areas. The level of overall skate bycatch and discard mortality under the No Action alternative is unknown. However, under the Skate FMP (pre-Amendment 13), the baseline of fishing mortality on skates within Closed Area I was essentially zero, since no fishing was allowed within that area. Under this proposed SAP a limited number of hook trips will be permitted in part of the closure, thus mortality on skates in that area may increase. The Skate PDT does not expect the level of skate bycatch within the SAP to exceed the overall baseline mortality defined in the FMP since overall effort in the groundfish fishery has decreased significantly as a result of DAS reductions implemented under Amendment 13.

Table 53 summarizes the number and weight of both thorny and barndoor skate found within the boundaries of the proposed SAP from all survey years combined (1963-2003). Very few barndoor skates have been recorded on the survey from the proposed access areas within Closed Area I. Only 16 barndoor skates have been recorded in that area for the entire 41-year time series as compared to 727 for the entire survey area (2.2%). About 328 thorny skates have been recorded in this area out of a total 10,586 thorny skates caught in the entire survey area (3.1%). More thorny and barndoor skates have been recorded from the NMFS survey within this proposed SAP as compared to the proposed SAP in and around Closed Area II; however, neither barndoor nor thorny seem to be heavily distributed within the boundaries of this SAP.

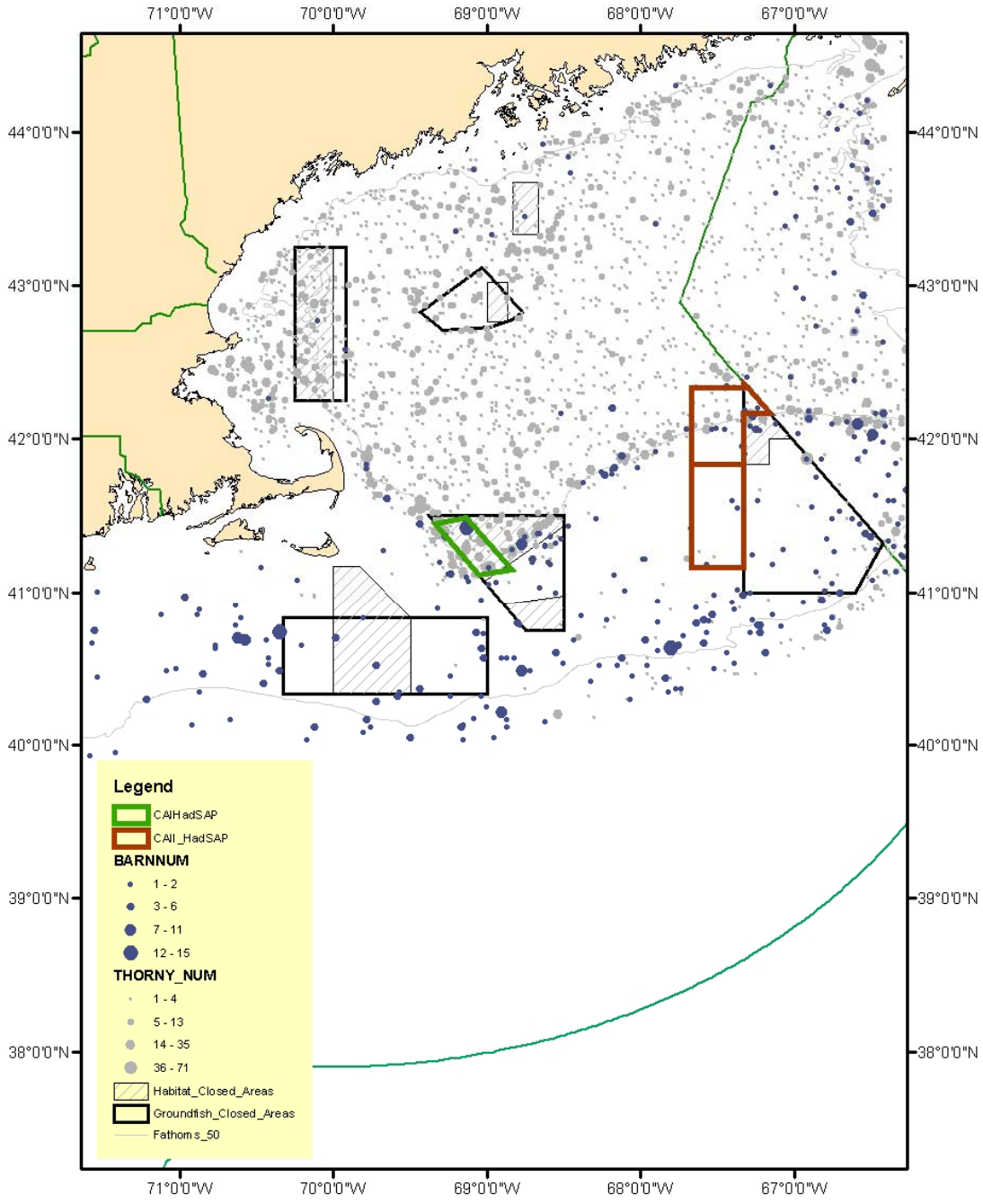


Figure 18 – Distribution of both thorny and barndoor skate based on the NMFS Autumn Survey (1963-2003) as well as the boundaries of the two proposed Special Access Programs.

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	16
	Total weight of barndoor caught	14.9
	Number of tows in the proposed access area that caught barndoor	3
	Average number of barndoor skates caught per year	0.39
THORNY	Number of thorny skates	328
	Total weight of thorny caught	589.4
	Number of tows in the proposed access area that caught thorny	31
	Average number of thorny skates caught per year	8.0

Table 53 - Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the proposed Closed Area I Hook Gear/Haddock SAP (1963 through 2003).

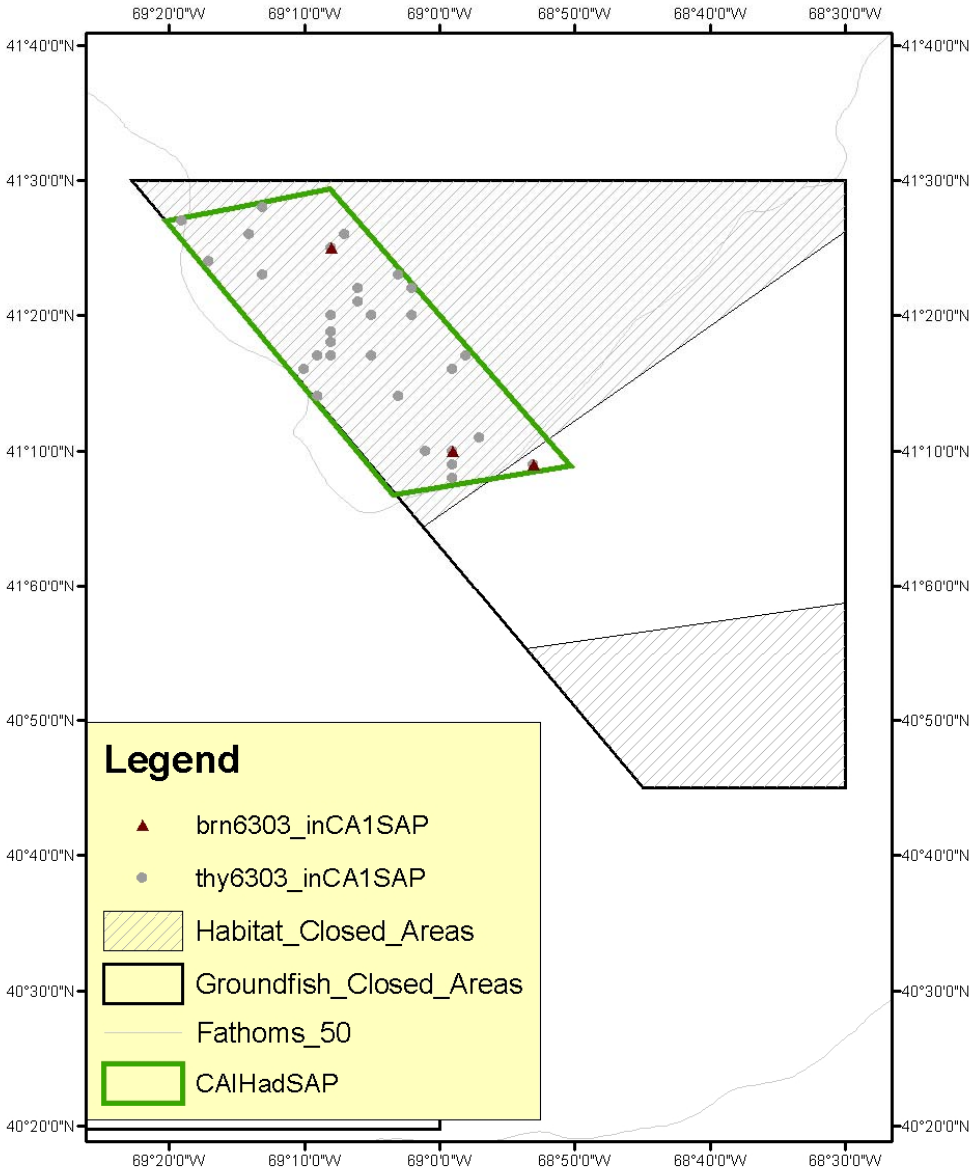


Figure 19 - Locations of where thorny skate (circles) and barndoor skate (triangles) were caught within the proposed Closed Area I SAP on the NMFS trawl survey from 1963-2003.

7.1.3.3 Conclusions

Both the No Action alternative and Alternative 1 will continue a modification to the groundfish mortality closed areas in terms of access into portions of areas that have been identified as having beneficial impacts on skate mortality. The impacts on overall skate mortality from the CAI Hook Gear Haddock SAP is expected to be minimal under either alternative. While the SAP modifications do

initiate a skate baseline review, it is important to point out that as a result of Amendment 13, the overall DAS available to the groundfish fleet has reduced significantly. The baseline of groundfish effort described in the Skate FMP is based on effort levels under the interim action (about 62,000 DAS available to the entire fleet). Amendment 13 categorized DAS into A, B (regular and reserve), and C DAS. Amendment 13 is expected to allocate about 43,000 DAS, about 19,000 less DAS as assessed in the skate baseline review. While Closed Area I SAP is projecting about 440 trips, this potential additional effort is still significantly less than levels assessed under the skate baseline within the Skate FMP. 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.

There is some overlap of skate distribution and the haddock/hook gear SAP in Closed Area I. While this access may increase interactions with skates found in that area, the overall level of effort available to the fleet is greatly reduced as compared to the level assessed in the skate baseline review. Furthermore, recent experiments have demonstrated that haddock can be effectively targeted by this gear sector. Table 42 summarizes the total catch composition from the experimental hook fishery conducted in the area in 2003 and the experiment found that about 79% of the total catch was haddock, about 3% was thorny skate, 2% unidentified skate, and about 1% of the total catch observed was barndoor skate. Data is not yet available from the commercial fishery in FY 2004.

The cumulative impacts of this action on overall skate mortality, in addition to measures proposed in Framework 16/39, Monkfish Amendment 2, Multispecies Amendment 13 and Scallop Amendment 10 will be evaluated this summer in the Skate Annual Report.

Recommendations

The Skate PDT does not expect overall negative impacts on skate mortality as a result of either alternative considered in this action. Even though effort may increase as compared to Amendment 13 allocations, and portions of the mortality closed areas will be opened to limited fishing effort, the overall 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.

		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 54 – 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 55 – Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the Groundfish closed areas (1963 through 2003).

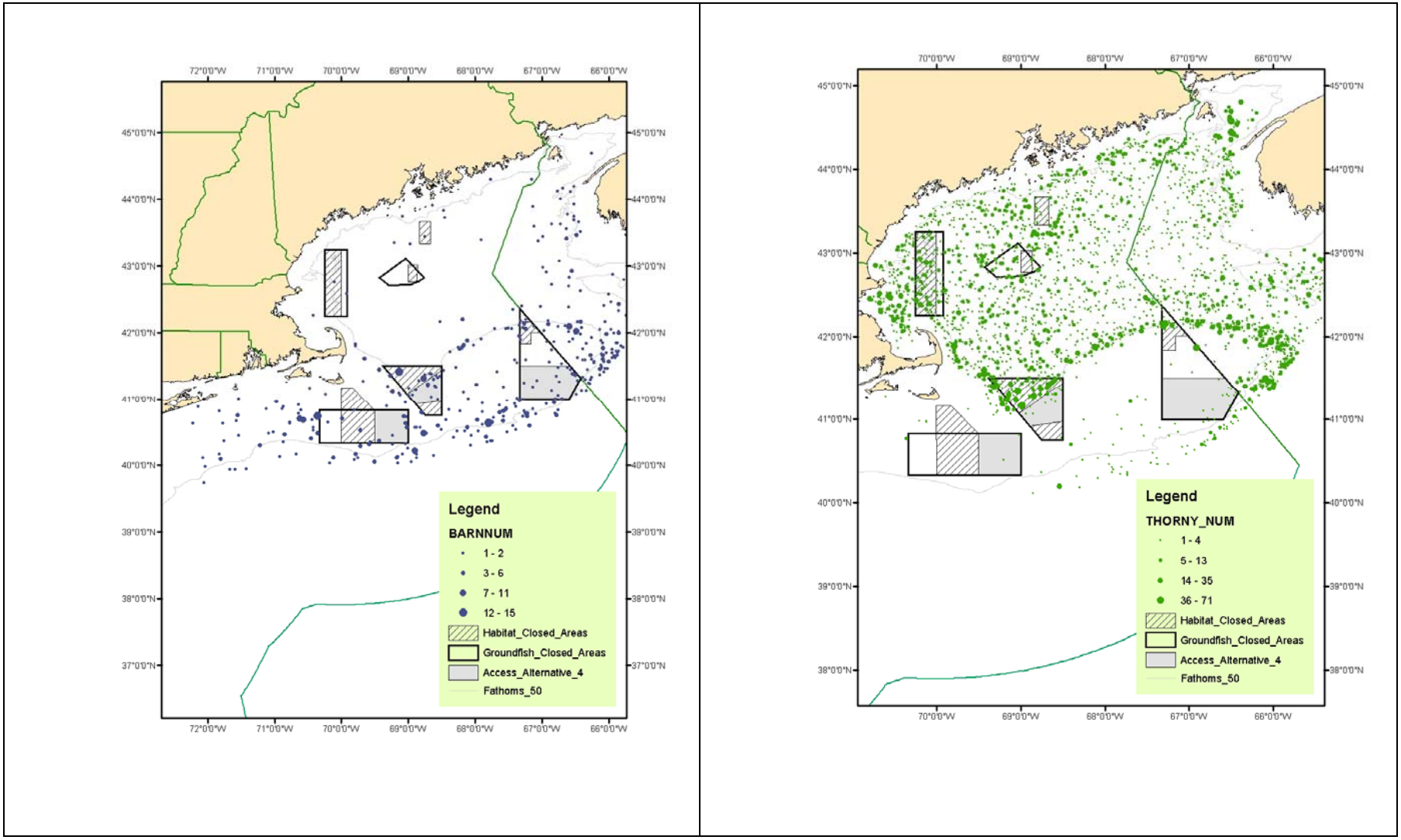


Figure 20 - Distribution of Barndoor skate (left) and Thorny skate (right) from NMFS Autumn trawl survey data (1963 – 2003)

7.2 National Environmental Policy Act (NEPA)

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

7.2.1 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 section 4.0 (alternatives including the proposed action);
- The environmental impacts of the proposed action are described in section 6.0;
- The agencies and persons consulted on this action are listed in section 7.2.4.

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 5.0.
- Cumulative impacts of the proposed action are described in section 6.5.
- A determination of significance is in section 7.2.2.
- A list of preparers is in section 7.2.3.
- The index is in section 8.3.

7.2.2 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 expands participation in the CAI Hook Gear Haddock SAP to non-sector vessels. Catches of haddock are limited by a TAC that was chosen so that it would not

threaten mortality targets. Incidental catches of cod are also limited by a TAC for both sector and non-sector vessels. These cod TACs are also established so they are consistent with mortality targets.

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 final action cannot be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or EFH as designed under the M-S Act. The conclusion of the EFH assessment in section 7.1.2 is that there are no substantial adverse impacts associated with this action.

3. Can the final action be reasonably expected to have a substantial adverse impact on public health or safety?

The proposed action cannot be reasonably expected to have a substantial adverse impact on safety. The proposed action continues to use DAS as a primary effort control in the groundfish fishery. DAS allow fishermen the flexibility to plan fishing operations around bad weather. This action expands the use of DAS in that it also controls the CAI Hook Gear Haddock SAP through hard TACs on the catch of target and incidental catch regulated groundfish. These measures may encourage development of a derby fishery – that is, a fishery where fishermen feel obligated to participate as early in the season as possible because of the concern the fishery will close. Derby fisheries can adversely impact vessel safety because they create an incentive for fishermen to take increasing risks in order to get a share of the fishery before it closes. In order to reduce the likelihood of a derby fishery, the SAP is divided into two periods and fishing in each period is limited to either sector or non-sector vessels. This helps reduce the number of vessels fishing at a given time, which will reduce derby effects.

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?

The final 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 5.4 for a listing). The impacts of the action on these species are described in section 6.3.3. 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.

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?

Cumulative effects of the action are described in section 6.4.2. The cumulative effects are not expected to have a substantial effect on target or non-target species.

6. Can the final action be reasonably expected to jeopardize the sustainability of any non-target species?

Due to the limited programs being adopted, this action is not expected to jeopardize the sustainability of any non-target species. Gear requirements in these programs may actually reduce the catches of non-target species.

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.

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 expand fishing opportunities to target healthy groundfish stocks. 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 and in the SEIS for Amendment 13 to the Northeast Multispecies Fishery Management 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

7.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

Mr. Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 10950
(978) 465-0492

This document was prepared by:

Jennifer Anderson, Northeast Region, National Marine Fisheries Service (NERO)
Amy Van Atten, Northeast Fisheries Science Center (NEFSC)
Deirdre Boelke, New England Fishery Management Council (NEFMC)
Dr. Jon Brodziak, NEFSC
Douglas Christel, NERO
Dr. Lisa Colburn, NEFSC
Steven Correia, Massachusetts Division of Marine Fisheries (MA DMF)
Sarah Gurtman, NERO
Brian Hooker, NERO
Dr. Kevin Kelly, Maine Department of Marine Resources (ME DMR)
Leslie-Ann McGee, NEFMC
Susan Murphy, NERO
Thomas Nies, NEFMC (plan coordinator)
Loretta O'Brien, NEFSC
Dr. David Potter, NEFSC
Dr. Eric Thunberg, NEFSC
John Walden, NEFSC
Stanley Wang, NERO
Thomas Warren, NERO

7.2.4 Agencies Consulted

The following agencies were consulted in the preparation of this document:

Mid-Atlantic Fishery Management Council
New England Fishery Management Council, which includes representatives from the following additional organizations:
- Connecticut Department of Environmental Protection
- Rhode Island Department of Environmental Management
- Massachusetts Division of Marine Fisheries
- New Hampshire Fish and Game
- Maine Department of Marine Resources

National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

7.2.5 Opportunity for Public Comment

The proposed action was developed during the period January 2005 through March 2005 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Council Meeting	Marriott Hotel, Portsmouth NH	02/02/2005
Groundfish Oversight	Holiday Inn, Mansfield, MA	3/14/2005
Council Meeting	Hotel Viking, Newport, RI	3/31/2005

7.3 Endangered Species Act

Section 7 of the ESA 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 Council has concluded, and NOAA Fisheries Service has concurred, that FW 41 and the prosecution of the associated fisheries is not likely to result in jeopardy to any ESA-listed species under NOAA Fisheries Service jurisdiction, or alter or modify any critical habitat, based on the discussion in this document and in the Section 7 Consultation Biological Opinion dated June, 2001. For further information on the potential impacts of the fishery and the proposed management action on listed species, see section 6.3.3 of this document.

7.4 Marine Mammal Protection Act

The Council has reviewed the impacts of the FW 41 on marine mammals and concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management units of the subject fisheries. 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, see section 6.0.

7.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The Council reviewed the approved coastal zone management plans of the following states to determine the consistency of the FW 41 with the enforceable policies of the state programs: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The Council has determined that the proposed action is consistent to the maximum extent possible with the enforceable policies of the coastal zone management programs of these states and has notified them of this determination, providing them also with a copy of this document. A list of the specific state contacts and a copy of the letters are available upon request.

7.6 Administrative Procedure Act

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access

to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

7.7 Data Quality Act

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

7.7.1 Utility

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

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

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

7.7.2 Integrity

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

7.7.3 Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat

Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the proposed action were conducted using information from the most recent complete calendar years, through 2003. Complete data for 2004 were not available at the time during which these analyses were conducted. The data used in the analyses provide the best available information on catches by hook gear in CAI. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the groundfish fishery.

The policy choices are clearly articulated in section 4.0 of this document as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in section 6.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

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

7.8 Executive Order 13158 (Marine Protected Areas)

The Executive Order on MPAs requires Federal agencies 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 developed and maintained by the Departments of Commerce and Interior. As of the

date of submission of this document, however, the List of MPAs has not yet been developed. No further guidance related to this E.O. is available at this time.

7.9 Executive Order 13132 – Federalism

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in the FW 41. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

7.10 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 positive 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.

7.11 Paperwork Reduction Act

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

FW 41 contains collection of information requirements subject to the PRA, including:

- 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.

The PRA package prepared in support of this action and the information collection identified above, including the required forms and supporting statements, is submitted under separate cover.

7.12 Regulatory Impact Review

7.12.1 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.

Framework 40A was developed by the Council and submitted to the NMFS on July 2, 2004. As submitted, the proposed Framework included a measure that would have approved a SAP to target Georges Bank haddock inside a limited portion of Closed Area I. Further, participation in this SAP would have been open to any limited access multispecies permit holder under certain prescribed conditions. The SAP was partially disapproved on November 19, 2005 due to concerns over the ability of NMFS to monitor the incidental catches of Georges Bank cod by vessels that had not joined the Georges Bank Cod Hook Sector. Specifically, non-sector vessels would have been allowed to use a Category A DAS that would enable them to fish inside and outside of the SAP on the same trip complicating tracking of where cod were caught.

This proposed action would prohibit non-sector vessels from using Category A DAS inside the SAP making an accurate accounting of catches of Georges Bank cod possible (a detailed description of the proposed action may be found in section 4.2.2). The proposed action would open participation in the SAP up to any limited access vessel subject to meeting the gear and reporting requirements of the SAP. However, unlike as originally proposed in Framework 40A, the SAP would be split into two "seasons" the first being reserved exclusively for participation only be the hook gear sector and the second being reserved exclusively for non-sector participants. The rationale for the split was based on concerns over competitive derby-style fishing for the limited haddock TAC of 1,000 metric tons. This proposed action would split the haddock TAC equally between the two seasons.

The potential economic impacts of the proposed action are described in detail in section 6.3.4.2. Assuming catch rates are similar to what they were in an experimental fishery conducted in the area the estimated value of the SAP would be an increase of $1.9 million in gross sales; $1.3 million to sector participants and $0.6 million to non-sector participants. The lower estimate in gross sales for the non-sector participants is because the incidental catch TAC of 14.8 metric tons for Georges Bank cod is expected to be reached before the non-sector participants will be able to take the allotted haddock TAC

(500 MT). If non-sector participants are able to reduce incidental catches of cod then the economic gains would be larger than estimated.

Overall, total revenue from combined regulated groundfish in fishing year 2003 was $91 million. Bottom longline gear (approved gear for the SAP) accounted for less than 2% of this total, of which 80% ($1.2 million) were landed in Barnstable County (Cape Cod), Massachusetts; home to the majority, if not all, of the hook gear sector participants. The proposed action would yield only a small increase in terms of the total value of Northeast region groundfish sales, but at $1.3 million would double what was landed in Cape Cod ports in FY2003. This means that the potential impacts of the proposed action would likely be highly localized and would have broader economic impact on Cape Cod communities in general. By contrast, the proposed action would also provide economic opportunities to non-sector participants, but it is uncertain how many will participate or where individuals owning or operating these vessels may come from. For this reason, the economic gains to non-sector participants would still be realized but would not have a broader community impact if their home ports are more dispersed.

The proposed action would have a beneficial economic impact of approximately $2 million. This impact would likely be localized for the sector participants but less so for non-sector participants. Nevertheless, the proposed action would not have a $100 million annual effect on the economy nor would it have an adverse material affect on any sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities. Therefore, economic effects of the proposed action would not be considered a significant action for purposes of the Executive Order.

7.12.2 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 operating unit do not exceed this threshold. While it is known that many individuals own more than one vessel, ownership control is extremely difficult to track under current record keeping procedures. For this reason, each operating unit was treated as a separate entity for purposes of the RFA.

The proposed action would change existing regulations that prohibit limited access multispecies permit holders that are not members of the Georges Bank Cod Hook Gear sector from participating in the Closed Area I Hook Gear SAP. Under the proposed action there are a total of about 1,000 limited access permit holders that are allocated DAS and can fish for groundfish. However, since the majority of these permit holders do not use hook gear the affected participants would be limited to those individuals that already use longline gear and individuals for whom conversion to bottom longline is believed to be a worthwhile business decision. When first proposed in Framework 40A, a total of 50 vessels including sector and non-sector participants were deemed likely to fish in the SAP. Subsequent testimony and anecdotal reports suggest that the number of participating vessels may be higher. Contemporary estimates suggest that approximately 40 sector vessels and 20 non-sector vessels would be likely to take advantage of the economic opportunity to fish in the SAP. Therefore, for purposes of analysis the economic impacts of the proposed action were based on an assumed total of 60 participating small entities.

Under Amendment 13, Special Access Programs provide small entities with an economic opportunity to fish for groundfish that would not otherwise exist. As such they represent opportunities to mitigate the anticipated short term adverse effects on small entities associated with the DAS reductions under Amendment 13. As the resource rebuilds increases in catch rates may be expected to more than

offset these DAS reductions resulting in improving financial position of the groundfish fishery over time even as fishing mortality rates and DAS allocations are held to required levels. Nevertheless, in the immediate term even small changes in fishing opportunities will be important to the profit and competitive position of individual fishing businesses that are able to avail themselves of the opportunity represented by this proposed action.

Under existing regulations, participation in the SAP is limited to hook gear sector participants. The season length is limited to October 1 to December 31. Participants must use bottom longline gear but no limit on the amount of gear that may be set is imposed. The SAP is limited by a 1,000 mt TAC on Georges Bank haddock. Discarding of cod is prohibited and any cod that is caught counts against the sector's total cod TAC. Participants must also comply with reporting, notification, and observer requirements including the use of a vessel monitoring system (VMS).

The proposed action would implement several changes to existing regulations that would affect sector and non-sector participants and may affect small entities that participate in the Category B (regular) B DAS pilot program on Georges Bank. The following discussion identifies the potential impacts on each of these affected user groups.

Georges Bank Hook Gear Sector Participants

The proposed action would split the season (October 1 to December 31) and the haddock TAC of 1,000 MT into two equal halves. The rationale for this approach was based on concerns over the potential adverse impacts of derby-style fishing that could arise if all vessels were competing for the limited haddock TAC. Separation of the season into sector and non-sector components represents an industry-based solution to mitigate these potential effects. The economic impact of this strategy is discussed in detail in section 6.3.4.2. That analysis shows that separation of the season and TAC may compromise the economic benefit to the hook gear sector participants. Specifically, based on an assumed 40 sector participants and catch rates similar to that observed during the experimental fishery the expected value of total revenues was estimated to be $1.3 million. After accounting for trip costs and payments to crew, the expected net return for the proposed action was estimated to be just over $19 thousand per vessel. In this scenario, the sector participants are expected to harvest their 500 mt share of the haddock TAC. However, given incidental catch rates for Georges Bank cod that were observed during an experimental fishery, non-sector participants are expected to be constrained by the incidental cod TAC meaning that the haddock TAC reserved for non-sector participants may not be taken. The difference between the 500 mt haddock TAC and the amount of haddock actually taken by non-sector participants represents a potential loss of economic opportunities to sector participants. The realized magnitude of this potential loss will depend on the extent to which non-sector participants may be able to reduce cod catch rates below observed levels but may be as much as $650 thousand in gross revenue or nearly $10,000 in net return per vessel.

In spite of the potential loss in economic opportunity, it is notable that this approach was suggested and agreed upon by both sector and non-sector participants. Further, the economic analysis did not take into account expected price effects should derby-style fishing actually emerge, the costs of unsafe fishing practices that could result during a derby, and the possible loss of gear through gear conflicts between sector and non-sector vessels. The actual price effect that would be realized is not known. Within the context of the Northeast region market for groundfish in general or even haddock in particular the price effect of the quantities of haddock involved in the SAP would probably be inconsequential. This does not necessarily mean that local markets would be unaffected as local infrastructure may not have the capacity to absorb comparatively large quantities of haddock landed in a short period of time.

In essence, sector participants are trading off potential economic gains for assurance that they will be able to prosecute the SAP in a manner that will avoid any derby effects. Potential gear conflicts would

also be avoided as fewer vessels may be expected to be fishing at any one time. Last, compared to gross groundfish sales in all Cape Cod ports of $1.2 million by anyone using bottom longline gear in FY03, even one-half of the allowable 1,000 MT of haddock still represents a doubling of expected revenues to Cape Cod ports.

Non-Sector Participants

The number of participating small fishing entities that may choose to fish in the proposed SAP is uncertain as the number of individuals that have a history of using the required gear (bottom longline) that are not already members of the Georges Bank Cod Hook Gear sector is quite small. Nevertheless, anecdotal reports indicate that approximately 20 fishing entities may participate some of which would have to refit their vessel and gear in order to fish inside the SAP. Although voluntary, such an investment would likely be substantial.

Non-sector participants would be subject to the same general requirements as hook gear sector participants. That is, non-sector participants would be required to have an approved VMS; would have to declare their intent to fish in the SAP on a B DAS through the VMS; would not be able to fish outside the SAP in the same trip; would be required to declare intent to participate by September 1, 2005; and would be required to notify the observer program. In addition, non-sector participants would also be subject to an incidental catch TAC for Georges Bank cod; would be limited to a 1,000 pound possession limit for cod; would not be permitted to discard any legal-size cod; would be required to terminate a trip once the possession limit has been reached; would be subject to limits on the type of bait used; would be required to report daily all haddock and cod caught; and would not be able to posses any gear other than what is allowable in the SAP. Although seemingly restrictive, the intent of these conditions is to provide maximum assurance that incidental catches of cod will remain low by adopting measures that have been shown to increase cod catches (i.e. the bait limitation) while providing disincentives to target cod (i.e. the possession limit) while participating in the SAP. In so doing, these measures increase the likelihood that the full economic benefit from the 500 mt of haddock set aside for the non-sector season will be obtained.

Based on an assumed 20 non-sector vessels participating in the SAP, the expected average return per vessel was estimated to be $16.6 thousand. Note that this estimate could be much higher if realized incidental catch rates of Georges Bank cod turn out to be lower than observed during the experimental fishery originally conducted to establish the SAP. That is, at observed catch rates for cod the non-sector season would be curtailed after having landed only about one-half of the available haddock TAC. If non-sector vessels are indeed able to reduce incidental catches of cod, and take all of the available haddock the estimated net return per vessel would double.

Impacts on the Regular B DAS Pilot Program

As originally developed under Framework 40A, part of the GB cod incidental catch TAC was allocated to non-sector vessels so they could fish in the CAI Hook Gear Haddock SAP. When access to the SAP by non-sector vessels was disapproved, this part of the GB cod incidental catch TAC was shifted to the Category B (regular) DAS Pilot Program. Had the SAP been approved as originally submitted and assuming the research set aside submitted under Framework 40B will be approved, the FY05 Georges Bank cod incidental catch TAC for the pilot program would have been 21.8 MT in each quarter (May to July and August to October). However, since participation by non-sector vessels was not approved, the incidental TAC for Georges Bank cod was given to the B-DAS pilot program. This means that the Georges Bank cod incidental catch TAC for the May to July period of the B-DAS pilot program would be 28.8 mt (assuming approval of the research set-aside). The second period Georges Bank cod TAC would be reduced to 14.8 MT to account for the incidental catch TAC that will now be needed for the non-sector component of the Closed Area I Georges Bank Cod Hook Gear SAP.

The scenario described above is contingent on approval and implementation of the proposed action by August 1. If the proposed action is not approved then there would be no impact on the Category B (regular) DAS pilot program participants. If the proposed action is approved and implemented after August 1 then the Georges Bank cod incidental catch TAC would start the quarter at 28.8 mt and then be reduced when FW 41 is implemented. An in-season adjustment would need to be made to this set aside. The magnitude of this adjustment would depend on whether carry-over from the first period was available and how much of the incidental TAC had already been caught in the second quarter.

Assuming implementation on or before August 1, the economic impact on vessels that may participate in the pilot B-DAS program is difficult to assess. As implemented, the pilot program started during the third quarter of FY04 and will end in the second quarter of FY05. The pilot program was developed because where and when individuals may be able to fish for groundfish without exceeding bycatch limits for stocks of concern was not known. To date, there have been 200 trips taken by 72 different participating vessels. These trips were almost equally divided between the third and fourth quarter of FY2004 but the majority were taken and the majority (almost 91%) were fished in the Western US/Canada resource sharing area. Although it is not known where fishing activity on Category B (regular) DAS will take place in the second quarter of FY 2005, if activity to date is any guide fishing on Georges Bank may be expected to continue to be desirable. This means that the reduced incidental catch allowance of Georges Bank cod to the Category B (regular) DAS pilot program could have an adverse affect in fishing opportunities to vessels that may be participating now (most vessels have taken multiple trips in the pilot program) or may plan on participating in the future. Unfortunately the potential magnitude of this effect cannot be reliably estimated since data are not yet available to assess catch rates of Georges Bank cod on pilot program trips to date and it is not possible to ascertain what they may be in the August to October period.

Non-Selected Alternatives

One alternative to the proposed action was considered. Under the No Action alternative, the regulations for the CAI Hook Gear haddock SAP would not be changed and only vessels in the GB cod hook sector would be allowed to fish in the SAP. Under the No Action alternative, it is likely that the entire haddock TAC would be caught by sector vessels. The maximum revenues form the SAP would be earned, and sector vessels would have increased benefits. While the economic benefits for sector vessels would be greater under No Action, no benefits would accrue to vessels that are not members of the sector.

In addition to this alternative, two additional options were considered to address derby effects that could result if the SAP is opened to non-sector vessels. The first option would have implemented the SAP without the split season or the split TAC between sector and non-sector vessels while the second option would have attempted to control a possible fishing derby by adopting limits on the number of trips that could be taken in a week's time.

Non-Selected Alternative 1: No Derby Controls

This alternative would implement a suite of measures that would have been equivalent to what had been submitted in Framework 40A. No measures would have been adopted to control or slow down catch rates to avoid a fishing derby. There is a possibility that this alternative would have yielded higher economic benefit than that of the proposed action. This possibility is predicated on whether or not non-sector participants are able to reduce cod catch rates below what had been experienced during the experimental fishery. If not, the proposed action would leave about 25% of the potential value that could be derived from the SAP untapped. However, as noted previously, avoidance of possible derby effects was considered a compelling reason to trade off potential aggregate economic benefits to assure that both user groups (sector and non-sector) have a reasonable opportunity to prosecute their component of the fishery in as orderly a fashion as possible. The assumption of increased benefits under this option also

does not consider the possibility of depressed prices due to a derby, increased costs as a result of gear conflicts, and possible safety concerns resulting form vessels fishing under derby conditions.

Non-Selected Alternative 2: Control Derby Effects by Limiting Trips

This non-selected alternative would have limited all participating vessels to taking no more than two trips in a calendar week. The purpose of this alternative would have been to impose constraints on the number of trips which would slow down catch rates over time. However, a substantial number of participating vessels normally take trips of relatively short duration (day-trips). Limiting vessels to only two trips per week would create a potential competitive disadvantage between vessels that may take longer trips or would encourage individuals to try to take longer trips. The latter was deemed a potential safety concerns for some vessels that may not be adequately equipped to take longer trips. Limitations on the number of trips was also viewed as favoring vessels that take multi-day trips, giving them an unfair advantage over smaller vessels.

8.0 REFERENCES

8.1 Glossary

Adult stage: One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect: Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation: A group of animals or plants occurring together in a particular location or region.

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual 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.

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

Surplus production: Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Surplus production models: A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers

alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Two-bin (displacement) model: a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

8.2 Literature Cited

Alverson, Dayton L. 1998. Discarding practices and unobserved fishing mortality in marine fisheries: an update. Sea Grant, Washington, DC.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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 Marx, M. K. 1990. Surface foraging behaviour of the North Atlantic right whale, *Eubalaena 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.

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.

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 Research Council. 2002. Effects of Trawling and Dredging on Seafloor Habitat. National Academy Press. 126 p.

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). 1998. Amendment 11 to the Northeast Multispecies Fishery Management Plan – Omnibus Essential Fish Habitat Amendment.

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.

New England Fishery Management Council (NEFMC). 2005. Framework Adjustment 40B 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.

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.

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.

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., Schele, J.S., Butnum, 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. 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.

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.

Sherman, K., Grosslein, M., Mountain, D., Busch, D., O'Reilly, J., and Theroux, R., 1996. The northeast shelf ecosystem: an initial perspective. In: *The northeast shelf ecosystem: assessment, sustainability, and management*. Sherman, K., Jaworski, N.A., Smayda, T.J.(Eds), Blackwell Science, p.103-126.

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.

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, and K. Maze-Fole (eds.). 2003. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2002. NOAA Technical Memorandum NMFS –NE-182.

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.

8.3 Index

Intentionally Blank

Intentionally Blank