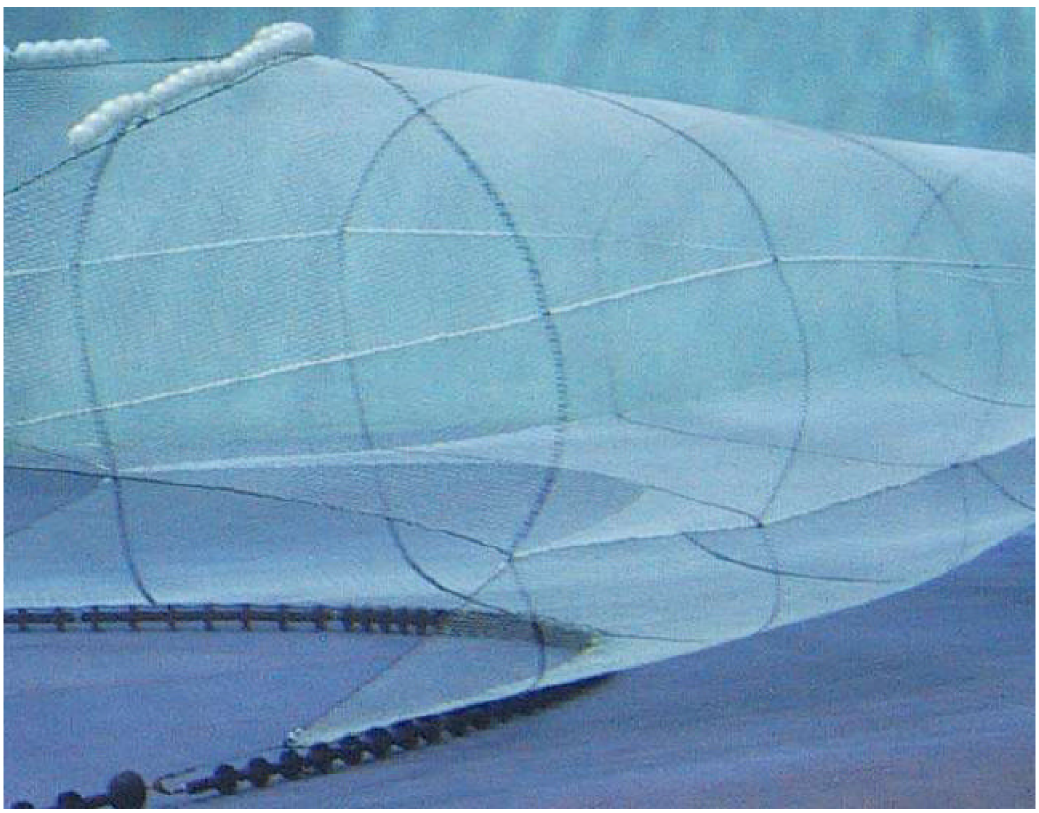
Framework Adjustment 40A to the Northeast Multispecies Fishery Management Plan

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

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Cover photograph: Haddock separator trawl, courtesy of Manomet Center for Conservation Sciences.

1.0 EXECUTIVE SUMMARY

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Act (M-S Act). The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, 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 change, 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 sweep of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act.

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

In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. The **primary purpose** of this action is to adopt programs that will provide additional opportunities to target healthy stocks in order to achieve optimum yield. Without these programs, the fishery will not achieve optimum yield and the commercial fishing industry and communities will suffer economic losses. These programs will also mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

A **secondary purpose** of this framework is to revise a measure adopted by Amendment 13 that is believed to be overly restrictive and that may unintentionally shift fishing effort onto unhealthy stocks. Amendment 13 adopted a system to coordinate management with Canada of cod, haddock, and yellowtail flounder on eastern Georges Bank. As part of this system, under certain conditions vessels are restricted to fishing in two defined areas. There is a concern that this restriction is so onerous that vessels will not choose to fish in one of the areas and will instead fish in inshore areas on unhealthy stocks.

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 five 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 4.0.

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 of 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. In this action, the only stock that is allocated in this manner is Georges Bank cod, because data show the proposed SAPs are likely to catch only this one stock in any quantities. 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.

		Incidental Catch TAC		
	Percentage of Total Target 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

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

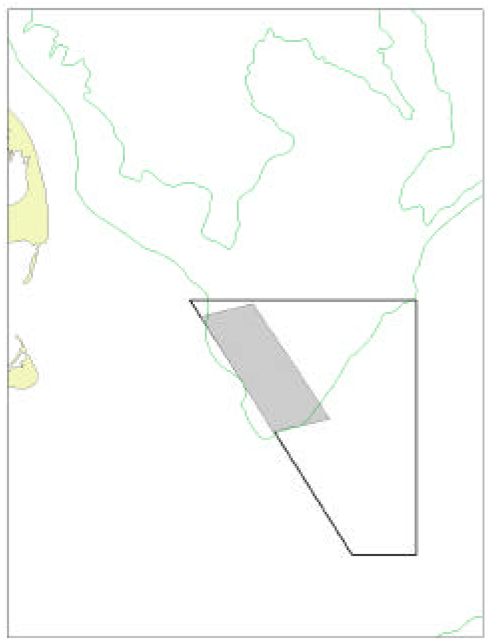
	Category B (regular) DAS Pilot Program	CAI Hook Gear SAP	CAII Haddock SAP
GOM cod	100%	NA	NA
GB cod	50%	16%	34%
CC/GOM yellowtail	100%	NA	NA
Plaice	100%	NA	NA
White Hake	100%	NA	NA
SNE/MA Yellowtail	100%	NA	NA
SNE/MA Winter Flounder	100%	NA	NA
Witch Flounder	100%	NA	NA

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

Category B (regular) DAS Pilot Program: This program is designed to test the concept of using Category B (regular) DAS for a one-year period (November 1, 2004 through October 31, 2005). The Pilot Program allows the controlled use of Category B (regular) DAS to target healthy stocks. Vessels can use Category B (regular) DAS to target healthy stocks, but are subject to a number of reporting requirements and are limited to very small catches of stocks of concern. Legal-sized regulated groundfish cannot be discarded while using a Category B (regular) DAS. If a vessel exceeds the low landing limits for a stock of concern, it must "flip" to a Category A DAS – that is, notify NMFS and fish on a Category A DAS for the entire trip. There are strict reporting requirements, including the requirement that all participants have a Vessel Monitoring System (VMS). While vessels must comply with the minimum gear requirements of Amendment 13, there are no other specific gear requirements for participation.

The program is controlled both by the incidental catch TACs for stocks of concern and by a limit on the total number of Category B (regular) DAS that can be used. The incidental catch TACs are allocated by quarter. If a TAC is caught, the use of Category B (regular) DAS in that stock area is ended for that quarter. Once the TAC is caught for the year, the program is ended for that year. There is one exception: if the white hake TAC is caught, the possession of white hake is prohibited while participating in this program. Only 1,000 Category B (regular) DAS can be used in each of the four quarters of the Pilot Program. For this program, DAS are counted on a calendar day basis.

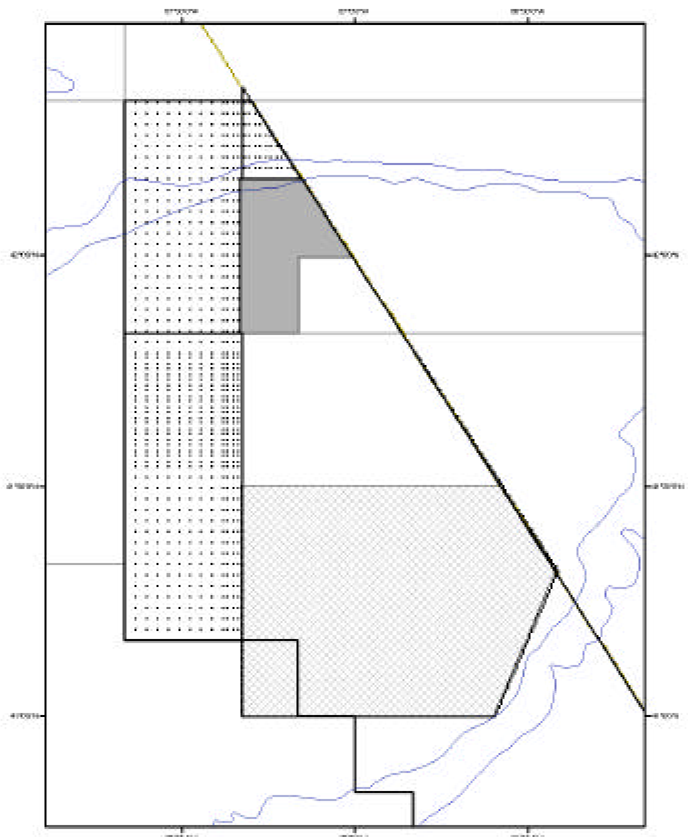
Closed Area I (CAI) Hook Gear Haddock SAP: This SAP allows vessels using longline or tub trawl gear to harvest 1,000 metric tons of haddock while fishing in a small area located in the northwest corner of CAI. Fishing in the SAP is only allowed from October 1 through December 31. All vessels participating 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 500 lbs./DAS of cod, with a maximum of 4,000 lbs./trip. Cod catches by non-sector vessels fishing on a Category B (regular or reserve) DAS are counted against the GB cod incidental catch TAC for this SAP. Vessels not in the hook sector can use any type of DAS to fish in the SAP. If fishing on a Category A DAS, they can fish inside and outside the SAP area on the same trip but must comply with the most restrictive regulations in effect for the area fished and must report catches when leaving the SAP area. 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.



CAI hook gear haddock SAP area (shaded)

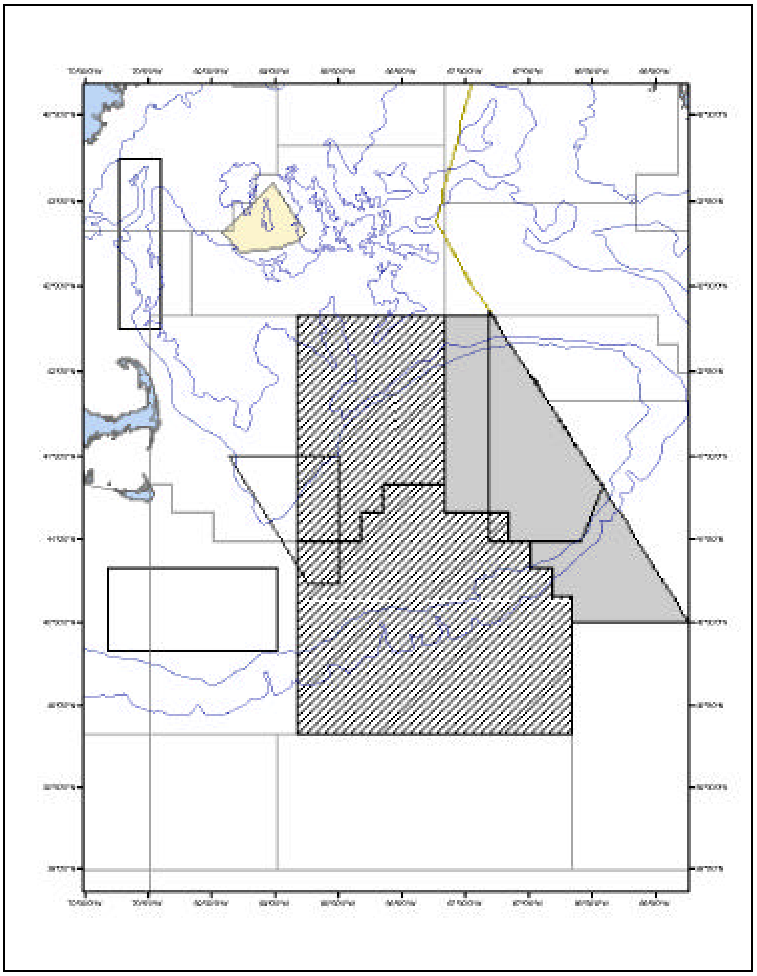
Closed Area II (CAII) Haddock SAP: This SAP provides an opportunity to target haddock while fishing on a Category B DAS in, and near, CAII using gear that does not catch stocks of concern. The Pilot Program will be in effect for two years from the date of implementation. Catches of haddock and cod count against the U.S./Canada Resource Sharing Understanding TAC. In addition, catches of cod while fishing on a Category B DAS are applied against the GB cod incidental catch TAC. If the incidental catch TAC is caught, fishing in the SAP on a Category B DAS is ended. Gear must be used that reduced the catch of cod and other stocks of concern. At present, the only approved gear is a haddock separator trawl, but the Regional Administrator may approve other gear in the future. Vessels are limited to a cod possession limit of 1,000 lbs., regardless of length of the trip. Legal-sized cod cannot be discarded while fishing in this SAP on a Category B DAS; if the possession limit is exceeded, the vessel operator must notify NMFS and change the DAS to a Category A DAS. This same possession limit is adopted for the

CAII Yellowtail Flounder SAP in order to simplify compliance and administration of the cod limit for trips that participate in both SAPs.



Closed Area II haddock SAP area (stippled). Crosshatched area is the CAII yellowtail flounder SAP area; shaded area is the cod Habitat Area of Particular Concern (HAPC).

Combined Trips to the Western U.S./Canada Area: Regulations implementing Amendment 13 prevent vessels from fishing in the Western U.S./Canada area and other areas on the same trip. This measure would allow a vessel to fish in the Western U.S./Canada area, and outside the area, on the same trip. Vessels would still not be allowed to fish in the eastern U.S./Canada area on the same trip. Vessels must comply with additional reporting requirements so that catches can be correctly assigned to the proper statistical area and the U.S./Canada GB yellowtail flounder TAC can be monitored on a daily basis.



Western U.S./Canada Area (cross hatched) and eastern U.S./Canada area (shaded)

Summary of Environmental Consequences

The environmental impacts of this action are discussed in detail in section 7.0. Biological impacts are described in section 7.2.1, impacts on essential fish habitat are described in section 7.2.2, impacts on endangered and other protected species are described in section 7.2.3, the economic impacts are described in section 7.2.4, and social impacts are described in section 7.2.5. Cumulative effects are described in section 7.7.

Biological Impacts

Overall, this action is not expected to have significant biological impacts. The proposed action will create opportunities for fishermen to target healthy groundfish stocks. These opportunities could increase fishing effort by between 2,500 and 4,400 DAS per year. As a result of this action, fishing mortality is expected to increase on GB haddock primarily as a result of the two SAPs. Fishing mortality is also expected to increase on other healthy groundfish stocks targeted through the Category B (regular) DAS pilot program. The stocks that are most likely to be targeted in this program include GOM haddock, GOM winter flounder, pollock, GB haddock, GB winter flounder, and GB yellowtail flounder. While redfish is another stock that could be targeted, the minimum mesh regulations will make it difficult to target redfish and so mortality for that stock is not likely to increase. Based on the analysis in

Amendment 13 and in this document, 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 this document, the risk of exceeding rebuilding targets will be small.

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. Fishing mortality may increase on monkfish and skates if vessels use the Category B (regular) DAS pilot program to target those species. There may also be increased mortality on other species, such as skates, that are caught while targeting groundfish. This action will promote the use of selective gear (e.g. the haddock separator trawl) on Category B DAS that actually reduces catches of skates, lobster, and scallops.

The proposed action may result in increased discards compared to the No Action alternative, but measures are included to minimize discards to the extent practicable. Three of the measures allow for a small increase in fishing effort. All of these measures, however, provide incentives for selective fishing practices. Because the Category B (regular) DAS Pilot Program, the CAI Hook Gear Haddock SAP, and the CAII Haddock SAP have constraints on the incidental catch of regulated groundfish stocks of concern, the development of selective fishing practices will allow fishermen more opportunities to target healthy stocks. The CAII Haddock SAP also requires vessels to use selective fishing gear to participate.

Essential Fish Habitat Impacts

The proposed action is not expected to have a substantial impact on essential fish habitat (EFH). While the action will result in a small increase in fishing effort as compared to the No Action alternative, this increase will not adversely effect EFH. The two SAPs either use gear that has little effect on habitat (e.g. longline gear in the CAI Hook Gear Haddock SAP) or takes place outside of areas restricted to mobile gear to reduce impacts on EFH.

Impacts on Endangered and Other Protected Species

The small effort increases authorized by the proposed action are not expected to have a substantial impact on endangered and other protected species.

Economic Impacts

The proposed action is expected to increase revenues for groundfish fishing vessels. It is difficult, however, to estimate the magnitude of these impacts. There is a great deal of uncertainty over what will be caught and landed in the Category B (regular) DAS Pilot Program and the CAII Haddock SAP. Neither of these programs has been preceded by an experimental fishery that could be used to estimate the likely catches. Indeed, while it is possible to identify target stocks for the Category B (regular) DAS Pilot Program, there is uncertainty over how fishermen will target these species. In the case of the CAI Hook Gear Haddock SAP, there is some information available but the exact mix of species that will be caught and landed is unknown. At the least, overall groundfish revenues are expected to increase by $2.3 million if all of the incidental catch TACs are caught.

Social Impacts

The proposed action will have positive social impacts, but these impacts will be limited to specific communities that have vessels that can target healthy stocks. For example, benefits from the CAI Haddock SAP will be limited to communities that have larger vessels that can safely prosecute this offshore fishery. The Category B (regular) DAS Pilot Program will only benefit those communities that have vessels that can target healthy stocks. Since few healthy stocks are located in the southern New England/Mid-Atlantic Region, ports in those areas are less likely to benefit from this program.

Cumulative Effects

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

2.0 CONTENTS

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APPENDICES

2.2 List of Tables

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2.4 List of Acronyms

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

MRFSS	Marine Recreational Fishery Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	maximum sustainable yield
NAA	No Action Alternative
NAPA	National Academy of Public Administration
NAS	National Academy of Sciences
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NFMA	Northern Fishery Management Area (monkfish)
NLCA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSTC	Northern Shrimp Technical Committee
NT	net tonnage
NWA	Northwest Atlantic
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SAP	Special Access Program
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SFMA	Southern Fishery Management Area (monkfish)
SIA	Social Impact Assessment
SNE	southern New England
SNE/MA	southern New England-Mid-Atlantic
SSB	spawning stock biomass
SSC	Social Science Committee
TAC	total allowable catch
TED	turtle excluder device
TEWG	Turtle Expert Working Group
TMGC	Trans-boundary Management Guidance Committee
TMS	ten minute square
TRAC	Trans-boundary Resources Assessment Committee
TSB	total stock biomass
USCG	United States Coast Guard

USFWS	United States Fish and Wildlife Service
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
WGOM	Western Gulf of Maine
WO	weighout
YPR	yield per recruit

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3.0 INTRODUCTION AND BACKGROUND

3.1 Background

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

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

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the M-S Act. The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout) off the New England and Mid-Atlantic coasts. Commercial and recreational fishermen harvest these species -in some cases sub-divided into different stock areas. The FMP has been updated through a series of amendments and framework adjustments. The most recent change, 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 sweep of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act.

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. FW 40A addresses a **need** (mandated by the M-S Act) to achieve optimum yield from the Northeast Multispecies fishery.

In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. The

primary purpose of this action is to adopt programs that will provide additional opportunities to target healthy stocks in order to achieve optimum yield. Without these programs, the fishery will not achieve optimum yield and the commercial fishing industry and communities will suffer economic losses. These programs will also mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

The programs proposed in this action create opportunities for vessels to use additional DAS to target healthy stocks. Amendment 13 categorized the DAS for every permit into one of three groups: Category A DAS that can be used to target any groundfish stock, Category B DAS that can only be used to target healthy stocks, and Category C DAS that cannot be used at this time. Category B DAS were further defined as either Category B (regular) or Category B (reserve) DAS. The proposed action creates programs that allow vessels to use Category B DAS (both regular and reserve). These programs either detail the specific time, area, and other requirements to use them in a Special Access Program, or SAP, or create a pilot program that only restricts the use of these DAS with very low trip limits for unhealthy stocks.

A **secondary purpose** of this framework is to revise a measure adopted by Amendment 13 that is believed to be overly restrictive and that may unintentionally shift fishing effort onto unhealthy stocks. Amendment 13 adopted a system to coordinate management with Canada of cod, haddock, and yellowtail flounder on eastern Georges Bank. As part of this system, under certain conditions vessels are restricted to fishing in defined areas. There is a concern that this restriction is so onerous that vessels will not choose to fish in this area – where catches of healthy stocks of haddock, winter, and yellowtail flounder would predominate - and will instead fish in inshore areas on unhealthy stocks. This action proposes to change the restrictions that limit vessels to fishing only in this area so that they will use their effort to target the healthy stocks. Without this change, the shifts in effort that may occur will prevent the fishery from achieving optimum yield because healthy stocks in the area will not be harvested and the shift in effort to other stocks may result in catches exceeding optimum levels.

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.

3.4 National Environmental Policy Act (NEPA)

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

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4.0 PROPOSED ACTION

The proposed action is a suite of management measures that will:

- Adopt Total Allowable Catch (TAC) limits for stocks of concern (unhealthy stocks) that can be caught while using Category B DAS;
- Implement a pilot program for the use of Category B (regular) DAS;
- Implement a Special Access Program for two years to target GB haddock using hook gear in Closed Area I (CAI);
- Implement a Special Access Program to target GB haddock in and near CA II;
- Allow vessels to fish in both the Western U.S./Canada area and other areas on the same trip.

4.1 Category B DAS Incidental Catch Total Allowable Catch (TACs)

In order to ensure that any catch (landings and discards) of stocks of concern taken while using a Category B (regular or reserve) DAS does not threaten the mortality objectives of Amendment 13, catches of those stocks taken on a Category B DAS 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 1. 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 incidental catch TACs will be allocated to programs developed to use Category B (regular or reserve) DAS where appropriate. The percentage of the TAC allocated to these programs can be adjusted through a management action such as a framework or amendment. The allocations proposed for this action are shown as percentages of the incidental catch TAC in Table 2.

		Incidental Catch TAC		
	Percentage of Total Target 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
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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	CAII Haddock SAP
GOM cod	100	NA	NA
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CC/GOM yellowtail	100	NA	NA
Plaice	100	NA	NA
White Hake	100	NA	NA
SNE/MA Yellowtail	100	NA	NA
SNE/MA Winter Flounder	100	NA	NA
Witch Flounder	100	NA	NA

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)

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

A two-tier approach 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 7.2.

Where appropriate, the incidental catch TACs are allocated to the programs that use Category B (regular or reserve) DAS. An incidental catch TAC for a specific stock is only allocated to a program if there is likelihood that stock will be caught in the program. If an incidental catch TAC were defined for each program regardless if that stock were likely to be caught, it would add administrative complexity without providing any conservation benefit. For example, a program that takes place on Georges Bank need not be allocated a TAC for a stock that is only located in Southern New England. Similarly, a program limited to hook gear is not likely to need a TAC for yellowtail flounder, since they are rarely taken on hooks. For this action, allocations only need to be made for GB cod since this is the only major stock of concern caught in the two proposed Special Access Programs (SAPs). Data supporting this decision can be found in the analysis of biological impacts, sections 7.2.1.1, and includes the results from an experiment in CAI and haddock separator trawl experiments. The rationale for each allocation is explained in the sections describing each SAP.

4.2 Category B (regular) DAS Pilot Program

Amendment 13 categorized DAS into A, B (regular or reserve), and C DAS. While the amendment (as approved) specified the requirements for using Category A DAS, and created one Special Access Program (SAP) for the use of Category B DAS, the amendment did not adopt a program for using Category B (regular) DAS outside of a SAP. This alternative proposes a limited pilot program to test the Category B (regular) DAS concept.

Season: The Category B (regular) DAS pilot program will take place for six months in fishing year 2004 and six months in fishing year 2005. The program will be authorized for November, 2004 through October, 2005.

Rationale: By conducting this pilot program over a twelve-month period, the Council will collect information on whether this program can be pursued in any season. Ending the program in October, 2005, will provide the Council a limited opportunity to review the results of the program prior to making a decision on whether to extend the program into the future.

DAS Limit: The Category B (regular) DAS pilot program is limited to 1,000 Category B (regular) DAS in each quarter (a total of 4,000 Category B (regular) DAS). These DAS are not apportioned to individual permits. The number of DAS is based on the number of DAS on trips that finish as a Category B (regular) DAS – that is, if a DAS is "flipped" from a Category B DAS to a Category A DAS, it does not count against the limit of Category B (regular) DAS. The pilot program will end in each quarter when 1,000 Category B (regular) regular DAS are used. The pilot program could also be suspended in a quarter once the incidental TACs for stocks of concern have been met.

Rationale: Because this is a pilot program, the Council is using both a limit on DAS and an incidental catch TAC for stocks of concern to reduce the possibility that the program may have unforeseen impacts on Amendment 13 mortality objectives. This limit on DAS is a secondary control that will limit the damage that could result if it proves difficult to monitor the incidental catch TACs. The Council chose not to apportion the DAS to individual permits because of uncertainty over which vessels will choose to participate in this program. While there is a possibility this may create a derby to use the DAS, the information collected will help to design future Category B (regular) DAS programs.

DAS Counting:

(1) For the Category B (regular) DAS pilot program, Category B (regular) DAS will be charged at the rate of a full twenty-four hours for each calendar day fished.

Example:
(a) A vessel fishing a trip of less than 24 hours on one calendar day is charged a full 24-hours of Category B (regular) DAS.
(b) A vessel fishing a trip of 26 hours on two calendar days is charged a full 48-hours of Category B (regular) DAS.
(c) A vessel fishing that leaves one minute before midnight and fished for one minute after midnight - fishing for two minutes on two different calendar days - is charged a full 48-hours of Category B (regular) DAS.

(2) DAS flipping: When a vessel begins its trip, it will notify NMFS that it is fishing on a Category B DAS. If a vessel exceeds the landing limit for a stock of concern, the operator must retain the excess catch and "flip" the DAS to a Category A DAS. This change must take place

prior to the vessel crossing the VMS demarcation line enroute to port. (Once the DAS is "flipped" and the vessel is on a Category A DAS, it must comply with the landing limits that apply to Category A DAS). Category A DAS use is counted as under existing regulations and not on a calendar day basis.
(3) The number of Category B (regular) DAS that can be used on a trip cannot exceed the number of Category A DAS a vessel has at the start of the trip.
(4) A Category B DAS can be used to meet any requirement established by other FMPs to use a groundfish DAS to fish (for example, by a Monkfish Limited Access Category C or D permit holder using a monkfish DAS). Vessels must comply with all other requirements of that FMP (permits, landing limits, gear requirements, etc.).

<u>Rationale</u>: Counting DAS based on a calendar day simplifies calculating appropriate landing limits and minimizes the possibility that a number of short trips could quickly catch the incidental catch TAC. The DAS flipping provision provides a way for fishermen to land most, if not all, of their catch should they exceed the low possession limits required for using a Category B (regular) DAS. The requirement to have Category A DAS available at the start of a Category B (regular) DAS trip ensures the vessel has enough Category A DAS available to account for any landing limit overages. Allowing the use of a Category B (regular) DAS to meet requirements of other FMPs to use a groundfish DAS is in recognition of the fact that those FMPs have measures in place to control mortality and that Amendment 13 DAS restrictions were not designed to control mortality in other fisheries.

Target stocks: Category B (regular) DAS can be used to target healthy groundfish stocks – that is, those stocks that are not stocks of concern. A vessel operator is not required to identify the stock targeted when beginning a Category B (regular) DAS. A Category B (regular) DAS can also be used to target other, non-groundfish stocks, consistent with regulations implemented by other management plans. Based on analyses in Amendment 13, the list of regulated groundfish stocks that can be targeted is:

- GOM haddock
- Pollock
- Redfish
- GOM winter flounder
- GB haddock
- GB yellowtail flounder
- GB winter flounder

<u>Rationale</u>: This list identifies the stocks that, based on Amendment 13, can support additional fishing effort. This list is provided for information purposes only.

Incidental Catch TACs:

(1) The use of Category B (regular) DAS, outside of a SAP, will be constrained by a "hard" incidental catch TAC for stocks of concern. These TACs are reduced by the amount of the total incidental catch TAC that is assigned to SAPs. All catches (landings and discards) of the stock of concern from a Category B (regular) DAS will be applied to this TAC. The incidental catch TACs will be equally apportioned to the four quarters for this pilot program. The TACs are shown by quarter in Table 8. The differences between Table 3 and Table 1 reflect the allocation of incidental catch TACs to Special Access Programs (SAPs) proposed by this action.

	FY 2004 3rd Quarter (November – January)	FY 2004 4th Quarter (February – April)	FY 2005 1st Quarter (May – July)	FY 2005 2nd Quarter (August - October)
GOM cod	48.5	48.5	63.5	63.5
GB cod	19.75	19.75	24.25	24.25
CC/GOM yellowtail	9	9	12.5	12.5
Plaice	92.5	92.5	90	90
White Hake	38.5	38.5	38	38
SNE/MA Yellowtail	17.5	17.5	49.5	49.5
SNE/MA Winter Flounder	71.5	71.5	89	89
Witch Flounder	129.5	129.5	175	175

Table 3 – Proposed incidental catch TACs for the Category B DAS pilot program (mt)

(2) With the exception of white hake, when projections indicate the TAC for a stock of concern will be caught in a quarter, the use of Category B (regular) DAS in the stock area will not be allowed. When the white hake incidental catch TAC is caught, the possession of white hake on a Category B DAS will be prohibited. The areas that will be closed to the use of Category B (regular) DAS when a TAC is caught for a specific stock are listed in Table 4 (based on current stock area definitions). These areas could change if stock areas are redefined.

Stock	Statistical Area
GOM Cod	510-515
GB Cod	520s, 530s, 540s, 561, 562, 600s
GB Haddock	520-526, 537-539, 551-562
GOM Haddock	510-515
GB Yellowtail Flounder	522,525,551,552,561,562
Cape Cod/GOM Yellowtail Flounder	510-515, 521
SNE/MA yellowtail flounder	526, 537-539, 611-639
American Plaice	500-526,533-539,541-543,551-562,600's
Witch Flounder	510-526, 551-562
Gulf of Maine Winter Flounder	510-515
GB Winter Flounder	522,525,551,552,561,562
SNE/MA Winter Flounder	521,526,537-539,600's
Acadian Redfish	500-562
White Hake	All areas
Pollock	464-562
Windowpane Flounder (North)	464-467,510-515,521-525,542,543,551,552,561,562
Windowpane Flounder (South)	526,53-539,541,600's

Table 4 – Areas that will be closed to the use of Category B DAS when the incidental catch TAC is caught (see Figure 1).

Rationale: The incidental catch TACs are the primary control adopted to prevent this pilot program from affecting the mortality objectives of Amendment 13. TACs are divided equally between quarters to provide opportunities to vessels that may fish at different times of the year. Prohibiting the use of Category B (regular) DAS in a stock area when the incidental catch TAC is intended to reduce possible overages of the TAC. The sole exception to this requirement is white hake because of the extended range of that stock.

Landing limits:

(1) The landing limit for CC/GOM yellowtail flounder and SNE/MA yellowtail flounder is 25 lbs./DAS. The landing limit for Atlantic halibut is one fish of legal size per trip. The landing limit for any other stock of concern shown in Table 8 and including southern windowpane flounder and ocean pout is 100 lbs./DAS. The landing limit for any healthy stock is the same as under other provisions of Amendment 13.
(2) A vessel cannot discard legal sized groundfish while fishing on a Category B (regular) DAS in this pilot program. If a vessel exceeds the landing limit for a stock of a concern, the DAS must be "flipped" to a Category A DAS. Once the DAS is "flipped," the vessel must comply with the landing limits for Category A DAS.

Rationale: The very low landing/possession limits are meant to encourage fishermen to develop selective ways of fishing for healthy stocks. As a further incentive, discards of legal size fish are prohibited and vessels must immediately "flip" the DAS if the catch limit is exceeded. Once on a Category A DAS, a vessel must comply with landing restrictions for Category A DAS.

> Example: A vessel begins a planned twelve-hour trip using Category B DAS in the GOM. The vessel catches 900 lbs/ of legal-sized cod in one tow. All legal sized cod must be retained while on a Category B DAS. Since the vessel will only be underway for twelve hours, the vessel "flips" to a Category A DAS. It must discard 100 pounds of cod to comply with the Category A DAS landing limit. Alternatively, the vessel could remain underway longer to account for the cod overage.

Gear requirements: Vessels must comply with the Amendment 13 gear restrictions with respect to mesh size, numbers of nets, numbers of hooks, etc. There are no other gear requirements or restrictions for this pilot program. For example, a vessel could use a haddock separator trawl of unusual design, with a minimum mesh consistent with Amendment 13 requirements, while fishing on a Category B (regular) DAS.

Rationale: This provision provides fishermen flexibility to develop gear that can fish selectively as long as they do not use gear prohibited by Amendment 13.

Monitoring:

(1) All vessels using a Category B (regular) DAS must use an approved Vessel Monitoring System (VMS).
(2) The targeted level of observer coverage will be sufficient to ensure the program is working as designed.
(3) Vessel operators must provide the observer program three days (72 hours before departure) advance notice of a Category B (regular) DAS trip. This notification will include reporting the broad area or areas (Gulf of Maine, Georges Bank, Southern New England/Mid-Atlantic) where the vessel plans to fish. The information on area to be fished will be used by NMFS only for planning observer coverage and a vessel operator is not limited to fishing in these

areas and need not provide an additional notification should plans for the area that will be fished change.

(4) Vessels beginning a trip as a Category B (regular) DAS Pilot Program trip must report their catch of stocks of concern daily through VMS, whether a trip is completed as a Category B (regular) DAS trip or not. Catches will be reported as kept or discarded catch and must be reported by statistical area.

Rationale: These requirements improve the ability to monitor the program and enforce the incidental catch TACs. The VMS requirement will facilitate the use of the flipping provision – vessels can communicate the change before entering port, and enforcement agents can verify the catch upon arrival. The reporting requirements will enable NMFS to closely monitor the small incidental catch TACs and more accurately predict when they will be caught. Observer coverage is necessary to verify the catch rates for vessels on a Category B DAS. The no discard provision will encourage fisherman to fish selectively so that they can use Category B (regular) DAS.

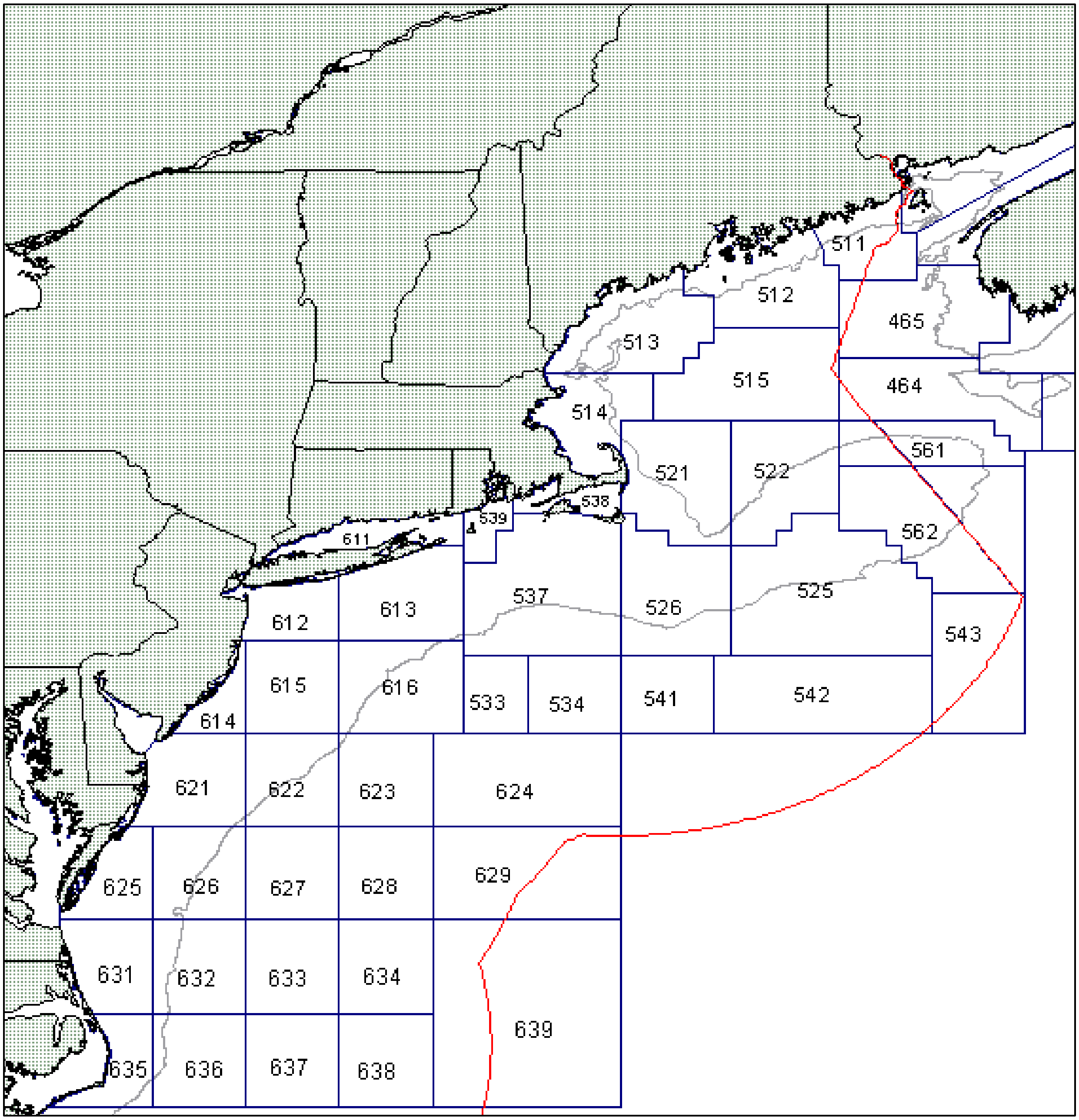

Figure 1 – Northeast Region statistical areas

4.3 Special Access Programs

4.3.1 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. 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.

4.3.1.1 General Provisions

Participants: Vessels possessing a commercial multispecies permit.

Location: On implementation of FW 40A, this SAP will be allowed to take place in that part of CAI bounded by the following coordinates (see Figure 2):

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.

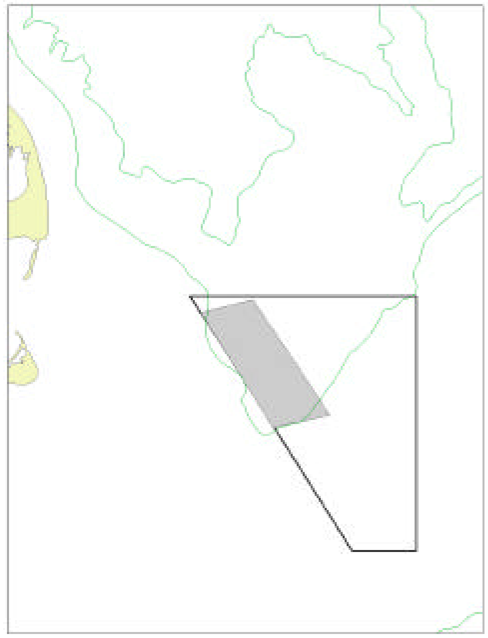

Figure 2 – Initial CAI hook gear haddock SAP area (shaded)

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 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. 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.

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 7.2.1.1, this allocation provides an opportunity for hook fishermen to catch haddock while preventing the catch from causing overfishing.

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. Vessels must identify the type of DAS being using for that trip.

(3) If a vessel is participating in the SAP while using a Category B (regular or reserve) DAS, it 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 will be adjusted by the RA for fishing year 2004 because the final regulations may not be published by September 1, 2004). 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.

(6) A vessel cannot fish in this SAP while making a trip under the Category B (regular) DAS Pilot Program.

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. 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.

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.

4.3.1.2 Requirements for Vessels in the Hook Sector

Incidental catch restrictions: All cod caught by members of the GB hook sector in this SAP will be counted against the hook sector GB cod allocation.

Rationale: Under the sector provisions of Amendment 13, a group of vessels that forms a sector is given a portion of the resource to harvest. Since the quota they are given limits their harvest, the members of the sector can devise their own measures to control catches rather than be subject to the same effort controls as vessels not in the sector. For example, vessels in the GB hook sector may decide not to fish under DAS restrictions. Counting all cod caught against the sector's cod allocation prevents the sector's cod catch from threatening mortality objectives.

Observer coverage: If funding is not available, the hook sector will pay the additional funding required for specified levels of observer coverage for its vessels.

Rationale: The hook sector has developed a plan to fund additional observer coverage if necessary so that their access to this SAP will not be constrained by a lack of federal observer funding. Preliminary information from the sector is that a fee will be charged for each pound of fish in order to fund necessary observer coverage.

Possession Limits:

(1) All cod of legal size must be landed (i.e. there is a 100 percent retention requirement for legal sized cod).
(2) Landing/possession limits for haddock and other species cannot exceed that required under Amendment 13 regulations.

Rationale: The requirement to land all legal sized cod prevents discards from threatening mortality objectives of Amendment 13, and eliminates the possibility that vessels will engage in high-grading of cod. By requiring full-retention of cod, selective fishing practices are encouraged: the more successful the sector is in avoiding cod in the SAP, the more fishing effort they will be able to use. Sector vessels cannot exceed the landing limits for other species specified by Amendment 13, but could be limited to lower landing limits if the sector chooses to adopt the same.

Landings monitoring: The Hook Sector will implement a system of real-time landings monitoring as a requisite to formation of the sector. The sector manager will provide NMFS with daily reports of cod and haddock landings. All vessels participating in the program must use a VMS.

Rationale: The hook sector has developed a system to provide reports to NMFS of landings and will use that system rather than report through VMS. (Because cod cannot be discarded, it is not necessary to report the catch as kept or discarded).

4.3.1.3 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 16 percent of the total GB cod incidental catch TAC. Current estimates of this limit are shown in Table 9 for FY 2004 through 2006. Only cod caught on a Category B (regular or reserve) DAS will count against this incidental catch TAC. When this TAC is caught, vessels that are not in the hook sector cannot participate in the SAP while using a Category B DAS. TACs will be recalculated every two years during the periodic adjustment process.

Fishing Year	TAC
2004	12.6
2005	15.5
2006	20.3

Table 5 – 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 16 percent of the GB cod incidental catch TAC is similar to the percentage of GB cod landed by hook gear in recent years. Any cod caught on a Category A DAS have been accounted for by the design of Amendment 13 management measures and thus do not need to count against the incidental catch TAC.

Possession limits:

(1) The cod landing limit for vessels participating in this SAP is 500 lbs./DAS with a maximum of 2,000 lbs./trip. This landing limit applies for the entire trip of any vessel participating in the SAP, whether using a Category A or Category B (regular and reserve) DAS.
(2) Possession/landing limits for haddock and other species will be the same as required under Amendment 13 regulations.

Rationale: Analysis in section 7.2.1.1 shows that during the experimental fishery, cod catch rarely exceeded 500 lbs./DAS. Setting the landings limit at this level will encourage vessels to avoid cod while not increasing regulatory discards.

Observer coverage: Vessels not in the hook sector will not be required to pay for additional observer coverage if federal funding is not available.

Rationale: Unlike the hook sector, a mechanism has not been developed by the Council for these vessels to fund observers. It is not clear how a lack of observer funding will affect vessels not in the hook sector.

Gear: For a vessel using Category B (regular or reserve) DAS to fish in this SAP, there are no limits on the number of hooks that can be set while fishing in the SAP. For a vessel using a Category A DAS, the vessel is limited to setting the number of hooks authorized by Amendment 13.

Rationale: Since the catch of cod and haddock while on a Category B DAS is limited by TACs, gear restrictions would merely impose unnecessary inefficiencies for fishermen that are using a Category B DAS. Because vessels on a Category A DAS can fish both inside and outside the SAP, and the management program relies on effort controls outside the SAP area, vessels fishing on a Category A DAS must comply with all effort control restrictions, including gear limitations.

Trip length: Vessels may fish a maximum of four DAS in the SAP area on a single trip.

Rationale: This provision allows vessels to make multi-day trips, but by limiting the length of trips it spreads out the effort among more vessels.

Other provisions:

(1) Vessels that participate in this SAP using a Category A DAS may fish in the SAP area and in open areas outside the SAP area on the same trip. When the regulations for the SAP and the open area differ, a vessel using a Category A DAS is bound by the more restrictive measures for the entire trip. Vessels fishing on a Category A DAS must report their catch of haddock and stocks of concern via VMS daily while in the SAP area, and when leaving the SAP area. Catches of haddock and stocks of concern will be reported as kept or discarded (estimated). (While catches of stocks of concern on a Category A DAS are not limited by an incidental catch TAC, reporting requirements are kept the same for both Category A and B DAS to simplify administration and compliance).
(2) Vessels that participate in this SAP using a Category B (regular or reserve) DAS 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 of haddock and stocks of concern 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: Because the SAP area is a small area and Amendment 13 severely restricts the number of Category A DAS each permit has available, vessels using a Category A DAS are allowed to fish in the

SAP and outside the SAP on the same trip. In order to do so, however, they must comply with the more restrictive regulations for the area fished. Vessels on a Category B DAS are not allowed to fish inside and outside the SAP area on the same trip because it would make it more difficult to attribute catches to the appropriate TACs. Daily reporting via VMS will facilitate monitoring of the TAC.

4.3.2 Closed Area II Haddock SAP Pilot Program

The area subject to the U.S./Canada understanding is well offshore. DAS reductions adopted in Amendment 13 may discourage U.S. fishermen from transiting to this area. A possible result is that U.S. fishermen would not harvest their share of haddock (there are very low limits on GB cod catches due to the need to rebuild that stock, so it is unlikely a SAP will be needed to harvest the U.S. allocation of cod). This SAP facilitates taking of the U.S. share of haddock as allocated under the U.S./Canada Resource Sharing Understanding. Only vessels with limited access permits will be allowed to participate in this program. Limits on where fishermen can fish on these trips are intended to prevent confusion attributing catches to a particular stock, and because vessels are not charged DAS when outside of the area. Allowing fishing in the northern part of CAII is designed to provide access to haddock. The requirement to use either a haddock separator trawl or a flounder net will reduce cod bycatch. In any case, the U.S./Canada understanding includes a hard TAC on GB cod taken in this area, so participation in this SAP will not harm cod rebuilding as long as catches (both landings and discards) can be adequately monitored. Vessels are still allowed to fish in the eastern U.S./Canada area outside CAII while on a Category A DAS and not participating in a SAP.

Location: The following coordinates bound this SAP, as shown in Figure 3.

42º 22' N 67º 20' W (U.S./Canadian maritime boundary)
42º 20' N 67º 20' W
42º 20' N 67º 40' W
41º 10' N 67º 40' W
41º 10' N 67º 20' W
42º 10' N 67º 20' W
42º 10' N 67º 10' W (U.S./Canadian maritime boundary)

Rationale: The area proposed for this SAP is larger than that proposed in Amendment 13 for a similar SAP. This larger area will provide more flexibility to fishing vessels participating in the SAP area.

Season: May 1 through December 31. The program will expire at the end of the month two years after the effective date of the regulations implementing Framework 40A. The Council may choose to renew this SAP in a future action.

Rationale: The SAP allows fishing through most of the year but does not allow fishing during the key periods for groundfish spawning. While part of the area can be fished under a Category A DAS from January through May (the area outside CAII), because the SAP is not allowed during this period there will be less effort available (no Category B DAS can be used) and fishing will not take place in the small area north of CAII that is north of the cod HAPC. The Council approved this SAP for two years so the impacts of the program can be evaluated and, if necessary, program requirements can be adjusted.

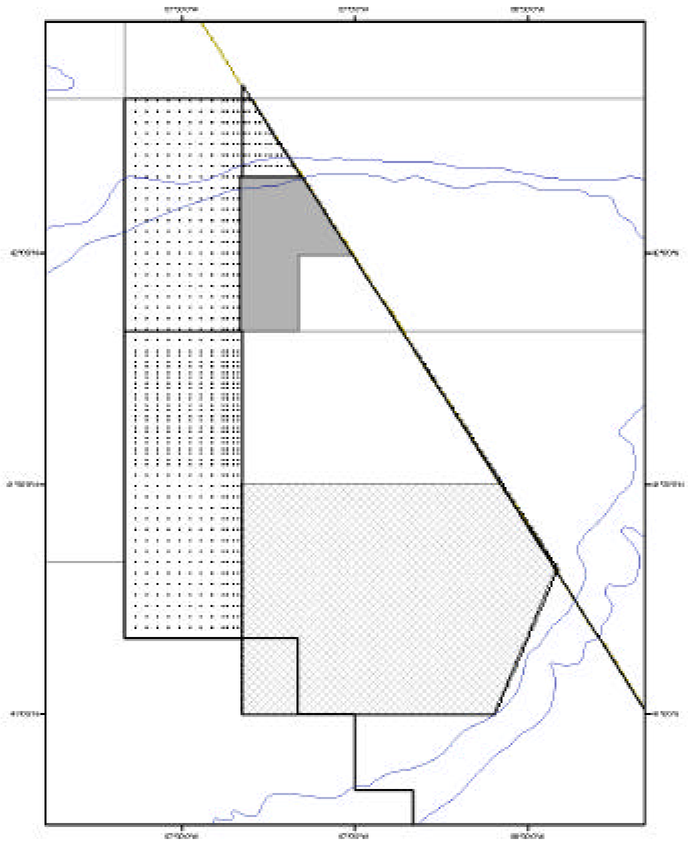

Figure 3 – Closed Area II haddock SAP area (stippled). Crosshatched area is the CAII yellowtail flounder SAP area; shaded area is the cod Habitat Area of Particular Concern (HAPC).

Haddock catch restrictions: All haddock caught in this SAP are counted against the U.S. share of eastern GB haddock as allocated under the U.S./Canada Resource Sharing Understanding. Consistent with that understanding, fishing for groundfish in the SAP area while under a groundfish DAS (as well as fishing for haddock and cod under a groundfish DAS in the entire eastern U.S./Canada area) is prohibited when the haddock TAC is caught.

Rationale: Amendment 13 adopted a U.S./Canada Resource Sharing Understanding that controls catches in statistical area 561 and 562 through a hard TAC. All catches – including those from the SAP – are applied against this TAC. Amendment 13 allows limited fishing in this area under the CAII yellowtail flounder SAP if the cod and haddock TAC is taken, but all other fishing on a groundfish DAS is prohibited.

Incidental catch restrictions:

(1) All cod caught (landings and discards) in this SAP are counted against the U.S. share of eastern GB cod TAC as allocated under the U.S./Canada Resource Sharing Understanding. Consistent with the understanding, fishing on a groundfish DAS in the SAP area is prohibited

in the eastern U.S./Canada area when the cod TAC is caught (with the exception of vessels participating in the CAII Yellowtail Flounder SAP).

(2) Cod caught in this SAP while using Category B (regular or reserve) DAS are counted against the incidental GB cod TAC. All cod caught on a SAP trip – regardless of location caught – will be applied against this TAC. This SAP is allocated 34 percent of the GB cod incidental TAC. When this TAC is projected to be caught, vessels cannot participate in this SAP while using a Category B (regular or reserve) DAS.

Fishing Year	TAC
2004	27
2005	33
2006	43

Table 6 – CAII haddock SAP incidental cod TAC. (TACs are rounded to the nearest mt)

Rationale: Amendment 13 adopted a U.S./Canada Resource Sharing Understanding that controls catches in statistical area 561 and 562 through a hard TAC. All catches – including those from the SAP – are applied against this TAC. Amendment 13 allows limited fishing in this area under the CAII yellowtail flounder SAP if the cod and haddock TAC is taken, but all other fishing on a groundfish DAS is prohibited. The cod incidental catch TAC will prevent this SAP from threatening mortality objectives for this stock as a result of vessels shifting effort from this are a to other areas. The amount of the incidental GB cod TAC allocated to this program divides the TAC evenly between the two proposed SAPs and the Category B (regular) DAS Pilot Program.

Landing/Possession Limits:

(1) The cod possession limit for vessels fishing in the CAII Haddock SAP and the CAII Yellowtail Flounder SAP is 1,000 lbs./trip, regardless of trip length. This possession limit applies for the entire trip of a vessel that participates in one of these two SAPs.
(2) Vessels are not allowed to discard legal sized cod while participating in the CAII Haddock or Yellowtail Flounder SAPs on a Category B (regular or reserve) DAS. If a vessel exceeds the possession limit while using a Category B DAS for these SAPs, it must "flip" to a Category A DAS, notifying NMFS through VMS. Vessels may continue to fish in the eastern U.S./Canada area after flipping to a Category A DAS and must comply with any landing limits that apply to a Category A DAS.
(3) The number of Category B DAS that can be used on a trip cannot exceed the number of Category A DAS available to the vessel at the start of the trip.
(4) Landing limits for haddock and other species will be the same as required under Amendment 13 regulations.

Rationale: The possession limit is set at a level that will deter vessels from targeting cod without increasing discards. Requiring vessels to "flip" to a Category A DAS will further reduce discards, as vessels will be able to retain more of their cod catch and can still finish a fishing trip. The possession limit is applied to both the CAII Haddock SAP and the CAII Yellowtail Flounder SAP, simplifying administration and compliance of cod limits for trips that participate in both SAPs.

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

Rationale: Because of the need to carefully control cod catches in order to comply with the U.S./Canada Resource Sharing Understanding, only gear that demonstrates low cod catch rates can be allowed in this SAP. In order to treat different gear types equitably, the demonstrated performance must be similar to that of a haddock separator trawl.

Observer Coverage: The target level of observer coverage will be sufficient to ensure the goals of the program are met. The industry will not be required to fund additional observer coverage.

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, but also so that it is 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) The Regional Administrator can adjust possession limits, months authorized, and gear requirements if necessary to control (increase or decrease) the catch to the TACs authorized under the U.S./Canada Resource Sharing Understanding.
(2) A vessel participating in this SAP and using any type of DAS (Category A or Category B (regular or reserve)) can fish in the haddock SAP area, in the CAII yellowtail flounder SAP area, or outside the SAP areas but in the eastern U.S./Canada area on the same trip, as long as the areas are open to fishing.
(3) A vessel fishing in the CAII Haddock SAP area but not participating in the CAII yellowtail flounder SAP can transit the CAII yellowtail flounder SAP area as long as gear is properly stowed in accordance with current regulations and the vessel provides notice of the transit to NMFS via VMS.
(4) As specified by Amendment 13, vessels fishing in the entire eastern U.S./Canada area are not charged DAS for steaming time both to and from the area.
(5) Vessels must comply with reporting requirements for fishing in the U.S./Canada Resource Sharing Understanding Area as specified in Amendment 13.
(6) Vessel operators must provide the observer program three days (72 hours before departure) advance notice of a CAII haddock SAP trip.
(7) A vessel must notify NMFS via VMS when beginning a trip to the SAP. The vessel must identify the type of DAS being used on the trip (Category A, Category B (regular), or Category B (reserve)).

Rationale: These provisions provide flexibility to the NMFS in implementing this program, consistent with the measures adopted for the U.S./Canada Resource Sharing Understanding adopted by Amendment 13. They also clarify the ability of vessels to move within the eastern U.S./Canada area while participating in SAPs in the area. Fishermen will only make the long transit to this area if the y have the flexibility to move within the area to search for fish. If they are confined to small zones in the eastern U.S./Canada area, there is too great a risk they will not be able make a profitable trip.

4.4 Combined Trips to the Western U.S./Canada Area

Vessels can fish both inside the western U.S./Canada area and outside the western U.S./Canada area on the same trip (but not in the eastern U.S./Canada area) (Figure 4). This practice is called fishing a "combined" trip. If a vessel fishes both inside and outside the area on the same trip, it is bound by the more restrictive regulations for the area fished. In addition, the vessel must report its catch by statistical area via VMS. Reports must be submitted daily and when crossing the boundary between the Western U.S./Canada area and other areas.

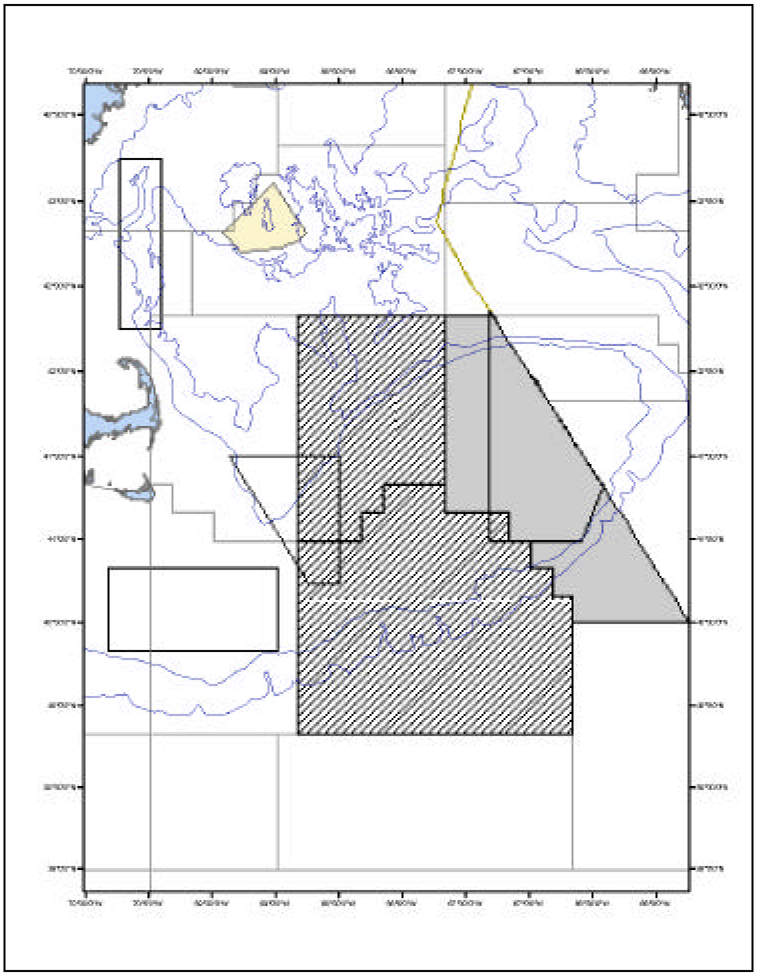

Figure 4 – Western U.S./Canada Area (cross hatched) and eastern U.S./Canada area (shaded)

Rationale: The regulations implementing Amendment 13 do not allow vessels fishing in the western U.S./Canada area from fishing outside that area on the same trip. This restriction unnecessarily restricts fishing operations on Georges Bank. Vessels have historically fished the entire area on the same trip as they search for fish. For example, vessels targeting haddock – a healthy stock and one that the Council is trying to encourage vessels to target - often fish the entire length of the northern boundary of CAI. Half of this northern boundary is within the western U.S./Canada area, while half is outside this area. Under existing regulations, vessels are not able to fish along the entire boundary, but must choose which area they will stay in. Other vessels fish on Stout's Swell (inside the Western U.S./Canada Area) and Wright Swell on the same trip. Trawlers and gillnetters fishing these two areas target monkfish on Stout's and pollock on Wright without catching yellowtail flounder in these deep-water areas. The Council is concerned that faced with this restriction, vessels will avoid the western U.S./Canada area in order to have more flexibility in their fishing operations. Finally, the Council is concerned that restricting vessels to the to the Western U.S./Canada area may result in unsafe vessel operations. Vessels facing bad weather may continue to fish or "ride out" bad weather in this area rather than move closer to shore.

The proposed measure provides fishermen some flexibility to fish in a wider area, while addressing concerns over monitoring the U.S./Canada Resource Sharing Understanding TAC for GB

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5.0 ALTERNATIVES TO THE PROPOSED ACTION

During development of this framework adjustment, the Council identified a suite of management measures that it was considering, but did not assemble these measures into distinct alternative packages. The individual measures that were originally considered are shown below. While at first glance these measures may appear identical to those in the proposed action, in every case there are differences.

5.1 No Action

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

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

Of the Amendment 13 management measures that would not be changed if the No Action alternative were selected, the ones that bear most directly on the proposed action are the rebuilding programs, measures that categorize and restrict DAS use, the SAPs that were adopted, and regulations implementing the U.S./Canada Resource Sharing Understanding. In order that the No Action alternative can be clearly contrasted with the proposed action, these Amendment 13 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.

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. If the No Action alternative were selected, this would be the only opportunity to use Category B DAS, and other healthy stocks could not be targeted with Category B DAS.

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

Amendment 13 also adopted measures to implement a U.S./Canada Resource Sharing Understanding. Vessels from both countries fish on the same stocks of GB yellowtail flounder, cod, and haddock. In order to coordinate fishing on those stocks, the understanding establishes a process to set appropriate limits on catch, and then allocates part of that catch to each country. Amendment 13 established measures to ensure that the U.S. catch does not exceed its allocation. These measures control the catch of the stocks covered by the understanding through the application of a hard TAC. Because only fish caught in certain areas apply to the catch limited by the agreement, it is critical to know with a high degree of certainty where cod, haddock, and yellowtail flounder are caught. The regulations implementing Amendment 13 identified two areas – an eastern U.S./Canada area and a western U.S./Canada area (Figure 4). If a vessel makes a trip into one of those two areas, it can only fish in that area. For example, a vessel that chooses to fish in the western U.S./Canada area can only fish in that area. If the proposed action is not implemented, this restriction will remain in effect. The proposed action will not change the provision that limits vessels fishing in the eastern U.S./Canada area to that area on a trip.

5.2 Category B DAS Incidental Catch TACs (A)

This measure is similar to the Category B DAS incidental catch TACs in the proposed action (section 4.1). The difference is that this measure does not allocate the incidental catch TACs to different Category B DAS programs, as does the proposed action.

5.2.1 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 7. 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.

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

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 7.0.

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.

5.3 Category B (regular) DAS (B)

There are a number of difference between Measure B.1 (described below) and the proposed action. The primary differences are:

- Measure B.1 would have been implemented for six months, while the proposed action implements the Category B DAS pilot program for a full year.
- While Measure B.1 included a limit on the number of DAS that could be used in the program, they were not limited by quarter. The proposed action limits the number of DAS that can be used to 1,000 DAS per quarter.
- The proposed action prohibits discards of legal-seize regulated groundfish while on a Category B (regular) DAS. This requirement was not included in Measure B.1.
- Measure B.1 included a range of possible incidental catch TACs for stocks of concern, while the proposed action adopts specific TACs.

5.3.1 Measure B.1: Category B (regular) DAS Pilot Program

Amendment 13 categorized DAS into A, B (regular or reserve), and C DAS. While the amendment specified the requirements for using Category A DAS, and created one Special Access Program (SAP) for the use of Category B DAS, the amendment did not adopt a program for using Category B (regular) DAS outside of a SAP. This alternative proposes a limited pilot program to test the B regular DAS concept.

Season: The Category B (regular) DAS pilot program will take place in the final two quarters of fishing year 2004 (November, 2004 through April, 2005).

DAS Limit: The Category B (regular) DAS pilot program is limited to 2,000 Category B (regular) DAS. These DAS are not apportioned to individual permits. The number of DAS is based on the number of DAS on trips that finish as a Category B (regular) DAS – that is, if a DAS is “flipped” from a Category B DAS to a Category A DAS, it does not count against the limit of Category B (regular) DAS. The pilot program will end when 2,000 Category B (regular) regular DAS are used. However, the pilot program would be suspended in quarter 3 once the incidental TACs have been met. If the incidental TACs are met in both quarter 3 and quarter 4 before 2,000 Category B (regular) DAS have been used, then the pilot program will be terminated for the remainder of FY2004.

DAS Counting:

(1) For the Category B (regular) DAS program in FY 2004, Category B (regular) DAS will be charged at the rate of a full twenty-four hours for each calendar day fished.

Example:
(a) A vessel fishing a trip of 15 hours is charged a full 24-hours of Category B (regular) DAS.

(b) A vessel fishing a trip of 26 hours is charged a full 48-hours of Category B (regular) DAS.

(2) DAS flipping: When a vessel begins its trip, it will notify NMFS that it is fishing on a Category B DAS. If a vessel exceeds the possession limit for a stock of concern, the operator has the option to retain the excess catch and "flip" the DAS to a Category A DAS. This change must take place prior to the vessel crossing the VMS demarcation line enroute to port.
(3) A Category B DAS can be used to meet any requirement established by other FMPs to use a groundfish DAS to fish.

Target stocks: Category B (regular) DAS can be used to target healthy groundfish stocks – that is, those stocks that are not stocks of concern. A vessel operator is not required to identify the stock targeted when beginning a Category B regular DAS. A Category B DAS can also be used to target other, non-groundfish stocks, consistent with regulations implemented by other management plans. Based on analyses in Amendment 13, the list of regulated groundfish stocks that can be targeted is:

- GOM haddock
- Pollock
- Redfish
- GOM winter flounder
- GB haddock
- GB yellowtail flounder
- GB winter flounder

Incidental Catch TACs:

(1) The use of Category B (regular) DAS, outside of a SAP, will be constrained by a "hard" incidental catch TAC for stocks of concern. These TACs are reduced by the amount of the total incidental catch TAC that is assigned to SAPs. All catches (landings and discards) of the stock of concern from a Category B (regular) DAS will be applied to this TAC. The incidental catch TACs will be equally apportioned to the final two quarters of fishing year 2004. The TACs are shown by quarter in Table 8.

(2) There are three options shown for GB cod. The Council is considering two SAPs on Georges Bank that will be allocated part of the GB cod incidental catch TAC. The amount of this TAC available for Category B (regular) DAS plus the amount allocated to SAPs cannot exceed the total GB cod incidental catch TAC. The Council is considering several options for allocating cod to these two SAPs. The Council's choices will determine how much is available for the Category B (regular) DAS program.

(3) With the exception of white hake, when projections indicate the TAC for a stock of concern will be caught in a quarter, the use of Category B (regular) DAS in the stock area will not be allowed. When the white hake incidental catch TAC is caught, the possession of white hake on a Category B DAS will be prohibited. The areas that will be closed to the use of Category B (regular) DAS when a TAC is caught for a specific stock are listed in Table 4.

	2004	**3rd Quarter (November – January)**	**4th Quarter (February – April)**
GOM cod	97	48.5	48.5
GB cod	79 (0) 79 (30) 79 (53.8)	0 15 26.9	0 15 26.9
CC/GOM yellowtail	18	9	9
Plaice	185	92.5	92.5
White Hake	77	33.5	33.5
SNE/MA Yellowtail	35	17.5	17.5
SNE/MA Winter Flounder	143	71.5	71.5
Witch Flounder	259	128.5	128.5

Table 8 – Proposed incidental catch TACs for the Category B DAS pilot program. Three options are shown for GB cod. The incidental catch TAC for GB cod is reduced by the amount allocated to the CAI hook gear haddock SAP and the CAII haddock SAP. Sections 5.4.1 and 5.4.2 include two options for this allocation. (mt)

Possession limits: The possession limit for CC/GOM yellowtail flounder and SNE/MA yellowtail flounder is 25 lbs./DAS. The possession limit for Atlantic halibut is one fish of legal size per trip. The possession limit for any other stock of concern shown in Table 8 and including southern windowpane flounder and ocean pout is 100 lbs./DAS. The possession limit for any healthy stock is the same as under other provisions of Amendment 13.

Gear requirements: Vessels must comply with the Amendment 13 gear restrictions with respect to mesh size, numbers of nets, numbers of hooks, etc. There are no other requirements or restrictions for this pilot program. For example, a vessel could use a haddock separator trawl of unusual design, with a minimum mesh consistent with Amendment 13 requirements, while fishing on a Category B (regular) DAS.

Monitoring:
(1) All vessels using a Category B (regular) DAS must use an approved Vessel Monitoring System (VMS).
(2) The targeted level of observer coverage for the Category B (regular) DAS program is 20 percent of the DAS fished (400 DAS).
(3) Vessels using a Category B regular DAS must report their catch of stocks of concern daily through VMS. Catches will be reported as kept or discarded catch.

5.4 Special Access Programs (C)

The two SAPs included in the proposed action differ from the measures shown in this section in the following ways:

Measure C.1: Closed Area I Hook Gear Haddock SAP

- Measure C.1 would have authorized the Regional Administrator to change the geographic boundaries and months for the SAP. The proposed action does not include this authorization.

- Measure C.1 would have required a specific level of observer coverage, while the proposed action says that observer coverage will be sufficient to monitor the SAP.
- Measure C.1 included options for the GB cod incidental catch TAC, while the proposed action adopts a specific TAC.

Measure C.2: Closed Area II Haddock SAP

- Measure C.2 would have authorized the SAP without an expiration date, while the proposed action adopts the SAP for two years.
- The SAP season in measure C.2 is from May through February, while in the proposed action the season is May through December.
- Measure C.2 considered options for the GB cod incidental catch TAC< while the proposed action adopts a specific TAC.
- The proposed action does not allow discards of legal sized regulated groundfish while fishing in the SAP on a Category B DAS, while Measure C.2 did not include this requirement.
- The proposed action requires a vessel to change to a Category A DAS if the possession limit for GB cod is exceeded, while Measure C.2 did not include this requirement.
- Measure C.2 would have adopted a landing limit of 100 lbs./DAS for the entire eastern U.S./Canada area, while the proposed action adopts a possession limit of 1,000 lbs. of cod only for the CAII haddock SAP.

5.4.1 Measure C.1: Closed Area I Hook Gear/Haddock SAP

This SAP allows vessels using hook gear to target haddock in a small area of CA I. The specifics of the program are as follows:

5.4.1.1 General Provisions

Location: On implementation of FW 40A, this SAP will be allowed to take place in that part of Closed Area I bounded by the following coordinates (see Figure 5):

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)

The Regional Administrator is authorized to expand the area of the SAP if the results of an experimental fishery demonstrate that haddock can be caught without adversely affecting the Amendment 13 mortality goals. In making this determination, the RA will consider the ratio of haddock caught compared to cod, and will consider catch rates of other species (including non-groundfish species).

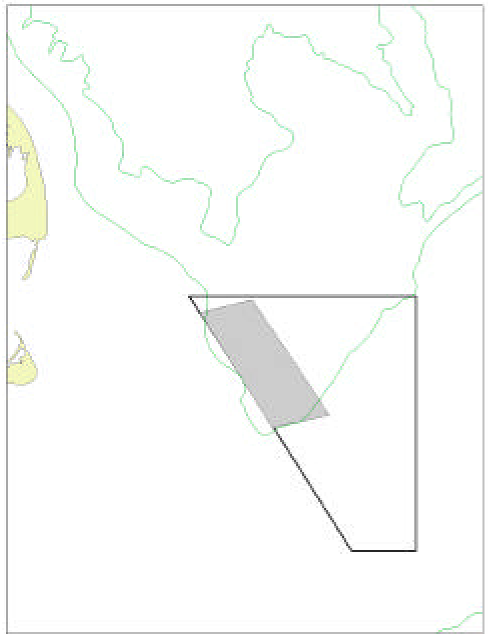

Figure 5 – Initial CAI hook gear haddock SAP area. The RA may consider adjustments to this area in the future based on the results of an experimental fishery.

Season: October 1 through December 31. The Regional Administrator may consider extending the season based on the results of an experimental fishery (EFP-DA-338 or other) if it can be demonstrated that haddock can be caught without adversely affecting Amendment 13 mortality goals. The season may be extended into the months of January, February, May, June, July, August and September. The season cannot be extended into March or April in order to protect spawning aggregations of haddock. In making this determination, the RA will consider the ratio of haddock caught compared to cod, and will consider catch rates of other species (including non-groundfish species). In addition, the RA will consider the spawning condition of other species that are caught to determine the possibility that extending the season will adversely affect groundfish spawning.

Haddock catch limitation: 1,000 mt. 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.

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.

(3) If a vessel is participating in the SAP while using a Category B (regular or reserve) DAS, it is not allowed to fish outside the area of the SAP on the same trip. No gear may be set outside the SAP area while fishing in the SAP.

(4) Vessels must declare their intent to partic ipate in the SAP by September 1. 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 are SAP participants.

Observer Coverage: Observer coverage will target 20 percent of the DAS fished in this SAP.

5.4.1.2 Requirements for Vessels in the Hook Sector

Incidental catch restrictions: All cod caught by members of the sector in this SAP will be counted against the hook sector GB cod allocation.

Observer coverage: If funding is not available, the hook sector will pay the additional funding required for specified levels of observer coverage for its vessels.

Possession Limits:

(1) All cod of legal size must be landed (i.e. there is a 100 percent retention requirement for legal sized cod).
(2) Possession limits for haddock and other species will be the same as required under Amendment 13 regulations.

Landings monitoring: The Hook Sector will implement a system of real-time landings monitoring as a requisite to formation of the sector. The sector manager will provide NMFS with daily reports of cod and haddock landings. All vessels participating in the program must use a VMS.

5.4.1.3 Requirements for Vessels not in the Hook Sector:

Incidental Catch Restrictions:

Option C.1.a: The catch (landings and discards) of GB cod will be limited to a "hard" incidental catch TAC of 31 percent of the total GB cod incidental catch TAC. Current estimates of this limit are shown in Table 9 for FY 2004 through 2006. Only cod caught on a Category B (regular or reserve) DAS will count against this incidental catch TAC.

Option C.1.b: The catch (landings and discards) of GB cod will be limited to a "hard" incidental catch TAC of 16 percent of the total GB cod incidental catch TAC. Current estimates of this limit are shown in Table 9 for FY 2004 through 2006. Only cod caught on a Category B (regular or reserve) DAS will count against this incidental catch TAC.

Fishing Year	Option C.1.a	Option C.1.b
2004	24.5	12.6
2005	30	15.5
2006	39.4	20.3

Table 9 – Proposed GB cod incidental catch TACs for the CAI hook gear haddock SAP (mt)

Possession limits:

(1) The cod possession limit for vessels participating in this SAP is 500 lbs./DAS with a maximum of 2,000 lbs./trip. This possession limit applies for the entire trip of any vessel participating in the SAP, whether using a Category A or Category B (regular and reserve) DAS.
(2) Possession limits for haddock and other species will be the same as required under Amendment 13 regulations.

Observer coverage: Vessels not in the hook sector will not be required to pay for additional observer coverage if federal funding is not available.

Gear: For a vessel using Category B (regular or reserve) DAS to fish in this SAP, there are no limits on the number of hooks that can be set while fishing in the SAP. For a vessel using a Category A DAS, the vessel is limited setting the number of hooks authorized by Amendment 13.

Trip length: Vessels may fish a maximum of four DAS in the SAP area on a single trip.

Other provisions:

(1) Vessels that participate in this SAP using a Category A DAS may fish in the SAP area and in open areas outside the SAP area on the same trip. When the regulations for the SAP and the open area differ, a vessel using a Category A DAS is bound by the more restrictive measures for the entire trip. Vessels fishing on a Category A DAS must report their catch of cod and haddock (kept and discarded) via VMS when leaving the SAP area.
(2) Vessels that participate in this SAP using a Category B (regular or reserve) DAS 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 of haddock and cod daily through VMS. Catch of haddock and cod will be reported as kept or discarded (estimated).

5.4.2 Measure C.2: Closed Area II Haddock SAP

This SAP is proposed to facilitate taking of the U.S. share of haddock as allocated under the U.S./Canada Resource Sharing Understanding. Only vessels with limited access permits will be allowed to participate in this program. Access will be provided to Closed Area II to facilitate catching haddock.

Location: the following coordinates bound This SAP, as shown in Figure 6.

42º 22’ N 67º 20’ W (U.S./Canadian maritime boundary)
42º 20’ N 67º 20’ W
42º 20’ N 67º 40’ W
41º 10’ N 67º 40’ W
41º 10’ N 67º 20’ W
42º 10’ N 67º 20’ W
42º 10’ N 67º 10’ W (U.S./Canadian maritime boundary)

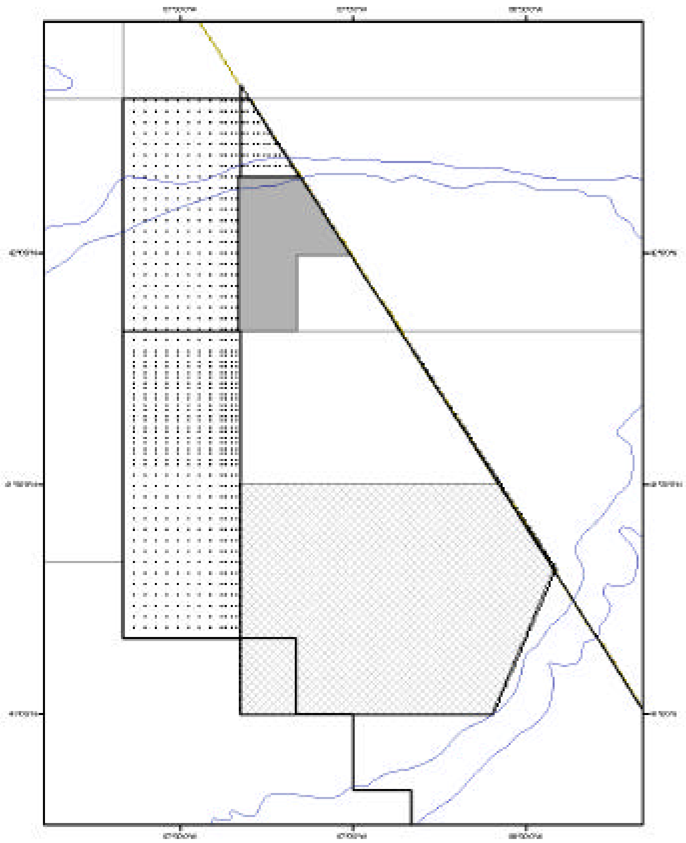

Figure 6 – Closed Area II haddock SAP area (stippled). Crosshatched area is the CAII yellowtail flounder SAP area; shaded area is the cod Habitat Area of Particular Concern (HAPC).

Season: May through February

Haddock catch restrictions : All haddock caught in this SAP are counted against the U.S. share of eastern GB haddock as allocated under the U.S./Canada Resource Sharing Understanding. Consistent with that understanding, fishing in the SAP area is prohibited when the haddock TAC is caught.

Incidental catch restrictions :

(1) All cod caught in this SAP are counted against the U.S. share of eastern GB cod as allocated under the U.S./Canada Resource Sharing Understanding. Consistent with the understanding, fishing in the SAP area is prohibited when the cod TAC is caught.

(2) Cod caught in this SAP while using Category B DAS are counted against the incidental GB cod TAC. This SAP is allocated a share of the GB cod incidental catch TAC as shown in – Options for the CAII haddock SAP incidental cod TAC. These options interact with the CAI hook gear haddock SAP incidental cod TAC, and the Category B regular DAS GB Cod incidental catch cod TAC.. Two options are considered:

a. Option C.2.a: The entire GB cod incidental catch TAC is allocated to the CAI hook gear haddock SAP and the CAII haddock SAP. Based on the percentages considered for the

CAI hook gear haddock SAP, the CAII SAP is allocated either 84 percent or 69 percent of the GB cod incidental catch TAC. (If this option were selected, none of the GB cod incidental catch TAC would be available for the Category B regular DAS pilot program).

b. Option C.2.b: The CAI hook gear haddock SAP and the CAII haddock SAP are allocated the same percentage of the GB cod incidental catch TAC. Based on the percentages being considered for the CAI hook gear haddock SAP, the CAII haddock SAP is allocated either 1 percent or 16 percent of the GB cod incidental catch TAC. The remainder is available for other Category B DAS programs.

Year	Option C.2.a	Option C.2.b
2004	66.4 54.5	24.5 12.6
2005	81.5 67	30 12.5
2006	106.7 87.6	39.4 20.3

Table 10 – Options for the CAII haddock SAP incidental cod TAC. These options interact with the CAI hook gear haddock SAP incidental cod TAC, and the Category B regular DAS GB Cod incidental catch cod TAC. (mt)

Possession Limits:

(1) The cod possession limit for vessels fishing in this are is 100 lbs./DAS with a maximum of 1,000 lbs./trip. This possession limit applies for the entire trip of any vessel fishing in the eastern U.S./Canada area, whether participating in the SAP or not, and whether using a Category A or Category B (regular and reserve) DAS.

(2) Possession limits for haddock and other species will be the same as required under Amendment 13 regulations.

Gear: Vessels fishing in the SAP must use gear that has been demonstrated not to catch significant amounts of cod. At implementation of this framework, the only gear authorized for participation in this SAP is trawl gear using a haddock separator trawl or a flounder net as described in 50 CFR 648.85(a)(3)(iii)(A) and (B). The Regional Administrator is may expand the list of gear allowed to participate in this SAP based on the results of an experimental fishery that demonstrates the gear can be fished without catching significant amounts of cod.

Observer Coverage: The target level of observer coverage for this SAP is 20 percent of the DAS. The industry will not be required to fund additional observer coverage.

Other provisions:

(1) The Regional Administrator can adjust possession limits, months authorized, and gear requirements if necessary to control (increase or decrease) the catch to the TACs authorized under the U.S./Canada Resource Sharing Understanding.

(2) A vessel participating in this SAP and using any type of DAS (Category A, Category B (regular or reserve) can fish in the haddock SAP area, in the CAII yellowtail flounder SAP area, or outside the SAP areas but in the eastern U.S./Canada area on the same trip, as long as the areas are open to fishing.

(3) A vessel participating in this SAP while using a Category A DAS can fish in the SAP area, in the CAII yellowtail flounder SAP area, or in other open areas of the eastern U.S./Canada area on the same trip.
(4) A vessel fishing in this area but not participating in the CAII yellowtail flounder SAP can transit the CAII yellowtail flounder SAP area as long as gear is properly stowed in accordance with current regulations and the vessel provides notice of the transit to NMFS via VMS.
(5) As specified by Amendment 13, vessels fishing in the entire eastern U.S./Canada area receive a credit for steaming time both to and from the area.
(6) Vessels must comply with reporting requirements for fishing in the U.S./Canada Resource Sharing Understanding Area as specified in Amendment 13.

Rationale: The area subject to the U.S./Canada understanding is well offshore. DAS reductions proposed in Amendment 13 may discourage U.S. fishermen from transiting to this area. A possible result is that U.S. fishermen would not harvest their share of haddock (there are very low limits on GB cod catches due to the need to rebuild that stock). This program will provide incentives for U.S. fishermen to transit to the area and target haddock, while protecting cod stocks. Limits on where fishermen can fish on these trips are intended to prevent confusion attributing catches to a particular stock, and because vessels are not charged DAS when outside of the area. Allowing fishing in the northern part of CAII is designed to provide access to haddock. The requirement to use either a haddock separator trawl or a flounder net will reduce cod bycatch. In any case, the U.S./Canada understanding includes a hard TAC on GB cod taken in this area, so participation in this SAP will not harm cod rebuilding as long as catches (both landings and discards) can be adequately monitored.

5.5 U.S./Canada Resource Sharing Understanding (D)

This measure does not differ from the proposed action.

5.5.1 Measure D.1: Combined Trips to the Western U.S./Canada Area

Vessels can fish both inside the western U.S./Canada area and outside the western U.S./Canada area on the same trip (but not in the eastern U.S./Canada area). If a vessel fishes both inside and outside the area on the same trip, it is bound by the more restrictive regulations for the area fished. In addition, the vessel must report its catch in an area via VMS. Reports must be submitted daily and when crossing the boundary between the Western U.S./Canada area and other areas.

Rationale: The regulations implementing Amendment 13 do not allow vessels fishing in the western U.S./Canada area from fishing outside that area on the same trip. This restriction unnecessarily restricts fishing operations on Georges Bank. Vessels have historically fished the entire area on the same trip as they search for fish. For example, vessels targeting haddock – a healthy stock and one that the Council is trying to encourage vessels to target - often fish the entire length of the northern boundary of CAI. Half of this northern boundary is within the western U.S./Canada area, while half is outside this area. Under existing regulations, vessels are not able to fish along the entire boundary, but must choose which area they will stay in. The Council is concerned that faced with this restriction, vessels will avoid the western U.S./Canada area in order to have more flexibility in their fishing operations.

This measure provides fishermen some flexibility to fish in a wider area, while addressing concerns over monitoring the U.S./Canada Resource Sharing Understanding TAC for GB yellowtail flounder. It is identical to the proposed action.

5.6 Other Measures Not Adopted

During development of Framework 40A, the Council considered numerous other measures. The Council rejected some of these measures because after preliminary review they were determined not to be reasonable. These measures are described as "considered but rejected." The Council has decided to defer consideration of other measures to a later action; these are described as "considered but delayed." A brief summary of these measures is provided below.

5.6.1 Measures Considered but Rejected

5.6.1.1 Directed Lobster Trawl Fishery SAP

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

5.6.1.2 SNE/MA Winter Flounder SAP

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

5.6.2 Measures Considered but Delayed

The following measures were not included in FW 40A because of concerns that the analytic requirements would delay implementation. These measures will be considered in FW 40B or other following action. Any impacts – including cumulative impacts – will be analyzed in the action proposed these measures.

5.6.2.1 Changes to the DAS Leasing and Transfer Program

A future Council action will consider changes to the DAS Leasing and Transfer Programs. These changes include revisions to the conservation tax applied to exchanges of DAS in each program, and the removal of the tonnage upgrading restriction as a limit on the DAS transfer program.

5.6.2.2 Allocation of a Minimum Number of Category B (reserve) DAS

Some limited access permit holders did not receive any Category A or Category B DAS under the Amendment 13 criteria for allocating DAS. A future management action will consider changing ten Category C DAS to Category B (reserve) DAS for these permits. The Category B (reserve) DAS could only be used in specific SAPs.

5.6.2.3 Haddock SAP North of Closed Area I

This SAP would allow vessels to use Category B DAS to target haddock using appropriate gear in a narrow band north of CAI. This SAP will be considered in a future action.

5.6.2.4 Large Mesh Skate and Monkfish Gillnet SAPs

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

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

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

5.6.2.6 WGOM Haddock Gillnet SAP

The Council considered allowing vessels using gillnet gear to fish with 6-inch mesh in the area during certain time periods in order to target GOM haddock. The Council did not submit this SAP because there is a possibility that vessels using this gear may also catch cod. The Council recommended that an experimental fishery be conducted to determine if this SAP is feasible. The Council may consider this SAP in the future.

5.6.2.7 WGOM Closed Area Haddock Rod/Reel SAP

The Council will consider allowing multispecies commercial permit holders to target haddock in the WGOM closed area using rod and reel.

5.6.2.8 Shrimp Trawl Access to the WGOM Habitat Closed Area

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

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6.0 AFFECTED ENVIRONMENT

6.1 Physical Environment

Amendment 13 included a thorough description of the physical environment of the Northeast multispecies fishery, including oceanographic and physical habitat conditions in the Gulf of Maine – Georges Bank region and the area south of New England. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a). The Northeast Shelf Ecosystem (Figure 7) 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 and the CAII Haddock SAP are limited to two well-defined areas. 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 37, 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.

The CAII Haddock SAP will take place in and near CAII. Only a small portion of the SAP – 45 sq. nm., only four percent of the total SAP area – is actually inside CAII (total area 2,650 sq. nm). Depths in the area of the SAP range from under ten fathoms on several ridges to the west of CAII, to over 110 fathoms at the northern end of the area. Much of the sediment in the area is sand. There are, however, a series of gravel and/or gravelly sand ridges that run northwest to southeast in the middle of the area west of CAII (see Figure 37). There is also an area of mud in the deep water at the northwestern corner.

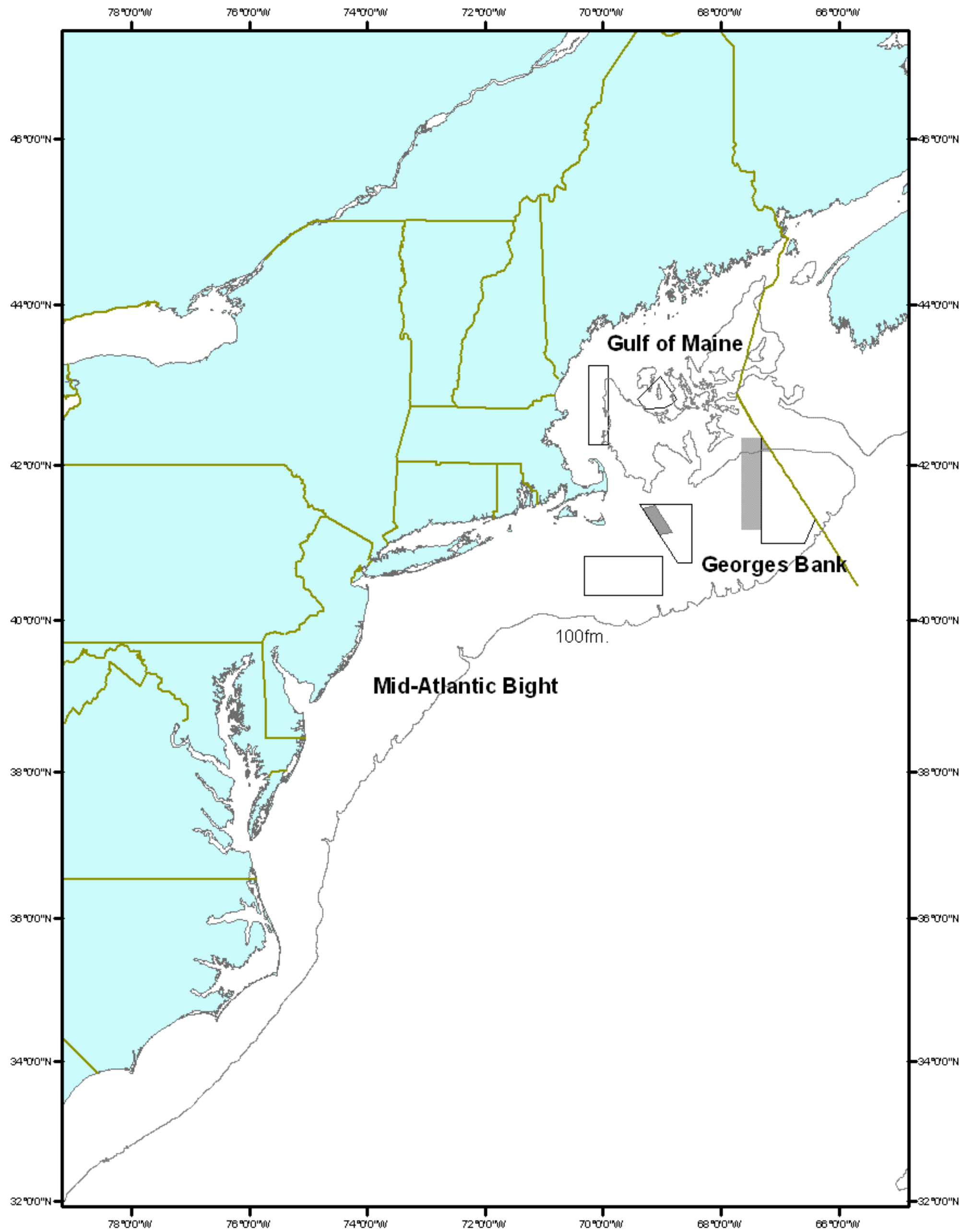


Figure 7 – U.S. Northeast Shelf Ecosystem, showing multispecies year round mortality closed areas and proposed SAP areas (shaded)

6.2 Biological Environment

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

6.2.1 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 11 and Figure 8. It represents the most recent evaluation of the status of groundfish stocks but this updated status information was not formally vetted through a SARC or other independent scientific review process. Assessments of all regulated groundfish stocks will be updated in 2005.

GB yellowtail flounder was assessed in 2003 by the Trans-boundary Resource Assessment Committee (TRAC). The results of this assessment 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, performed another update assessment in June 2004 (results are not yet published), and is planning a benchmark assessment in 2005 in order to provide a more definitive evaluation of stock status.

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

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

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

Although 2003 catch data are not yet available, preliminary estimates suggest that catches of the 8 major groundfish stocks of concern decreased from 2002 to 2003 (Table 42). In particular, catches appear to have decreased for six out eight stocks: Gulf of Maine cod, Georges Bank cod, Cape Cod/Gulf of Maine yellowtail, Southern New England/Mid-Atlantic yellowtail, Southern New England/Mid-Atlantic winter flounder and witch flounder. In addition, preliminary 2003 landings of American plaice are well below 2002 catch (landings + discards) suggesting that it is likely that the 2003 catch of American plaice was below the 2002 catch as well. White hake was the only major stock of concern where the 2003 catch appeared to increase over 2002. Thus, preliminary 2003 catch estimates for the major stocks of concern suggest that catches have decreased since 2002. If it were true that the biomasses of these stocks did not change from 2002 to 2003, then this would imply that fishing mortality rates had decreased for the majority of stocks of concern.

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.

	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 11 – 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.

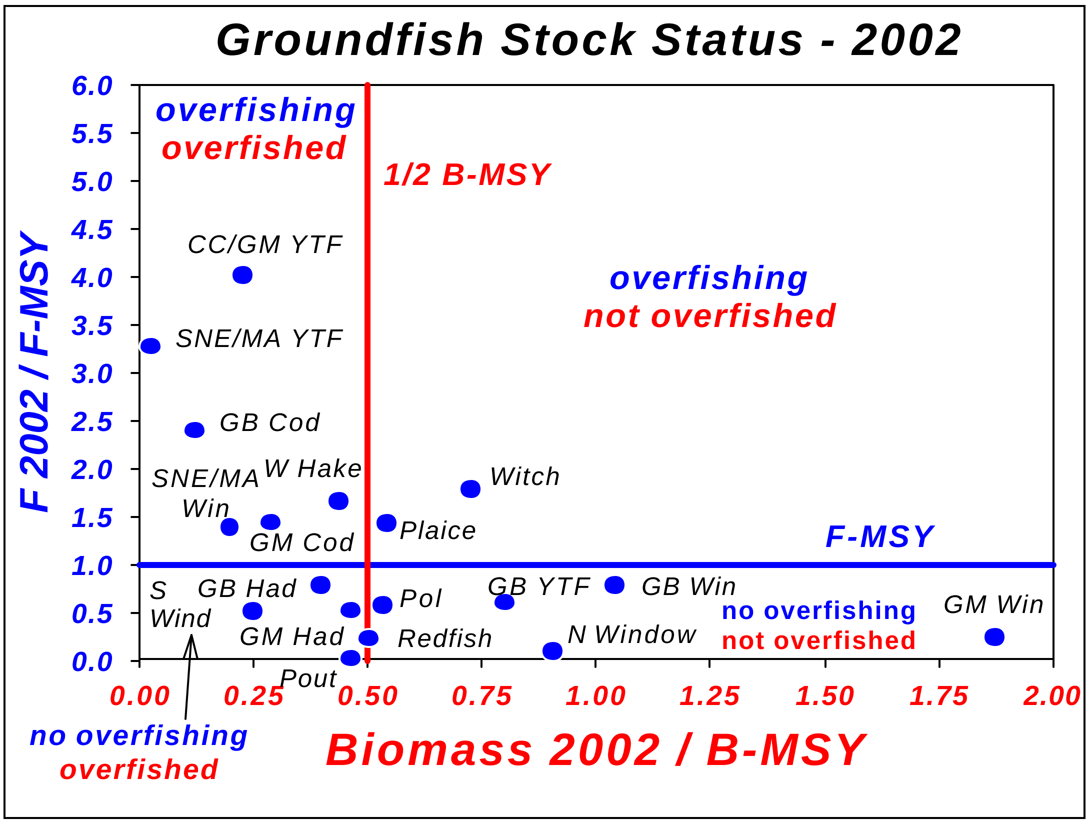


Figure 8 - Groundfish stock status, 2002 (NEFSC, see Table 11 for sources)

6.2.2 Monkfish Stock Status

The Category B (regular) DAS Pilot Program may be used by vessels fishing for monkfish, which is regulated under Monkfish FMP. Monkfish life history and habitat characteristics are also described in an EFH source document available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of the stocks with respect to fishing mortality reference points is unknown, since there are no current estimates of fishing mortality. In 2001 and again this year (2004), NMFS and the industry have cooperated in conducting a monkfish trawl survey. The data generated by these surveys will be analyzed in a Stock Assessment Workshop later this year, and may enable scientists to estimate current fishing mortality rates.

Biomass reference points are based on the NMFS autumn bottom trawl survey indices (weight per tow), and status relative to those reference points is determined by comparison with a 3-year running average. Framework 2 established annual biomass targets for monitoring the progress of the rebuilding program and setting annual target TACs. The following table shows the status of the stocks with respect to the biomass targets (annual and overall) and threshold:

kg/tow	2000	2001	2002	2003	2003 3-yr. Ave.	2003 target	Bthreshold	Btarget
NFMA	2.495	2.052	2.103	1.925	2.030	1.49	1.25	2.5
SFMA	0.477	0.708	1.253	0.828	0.930	1.02	0.93	1.85

Table 12 - Monkfish biomass stock status through 2003.

The stock status, through the fall 2003 NMFS bottom trawl survey, relative to the annual and overall biomass reference points are shown in Figure 9 and Figure 10, for the northern and southern stocks, respectively. Based on the current reference points and estimates of stock status, both stocks are no longer overfished. While the northern stock is ahead of the annual rebuilding targets, the southern stock is still lagging slightly behind the rebuilding schedule although the four-year trend is positive.

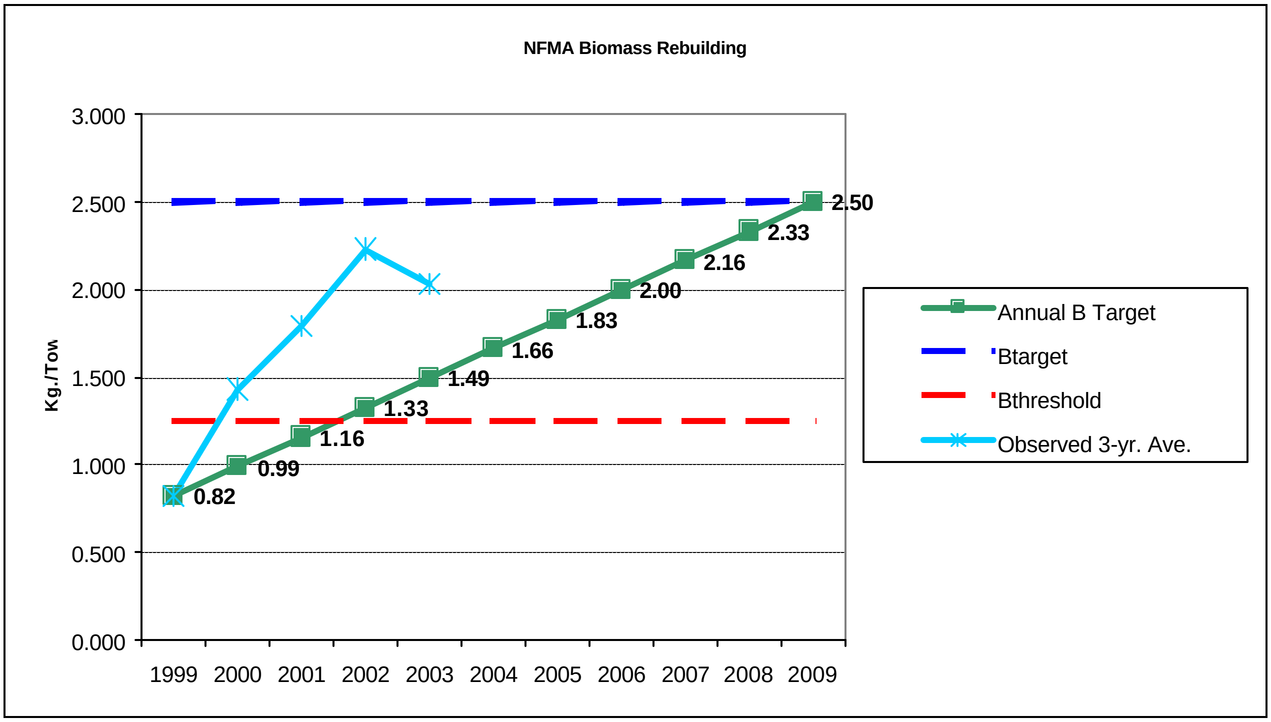


Figure 9 NFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

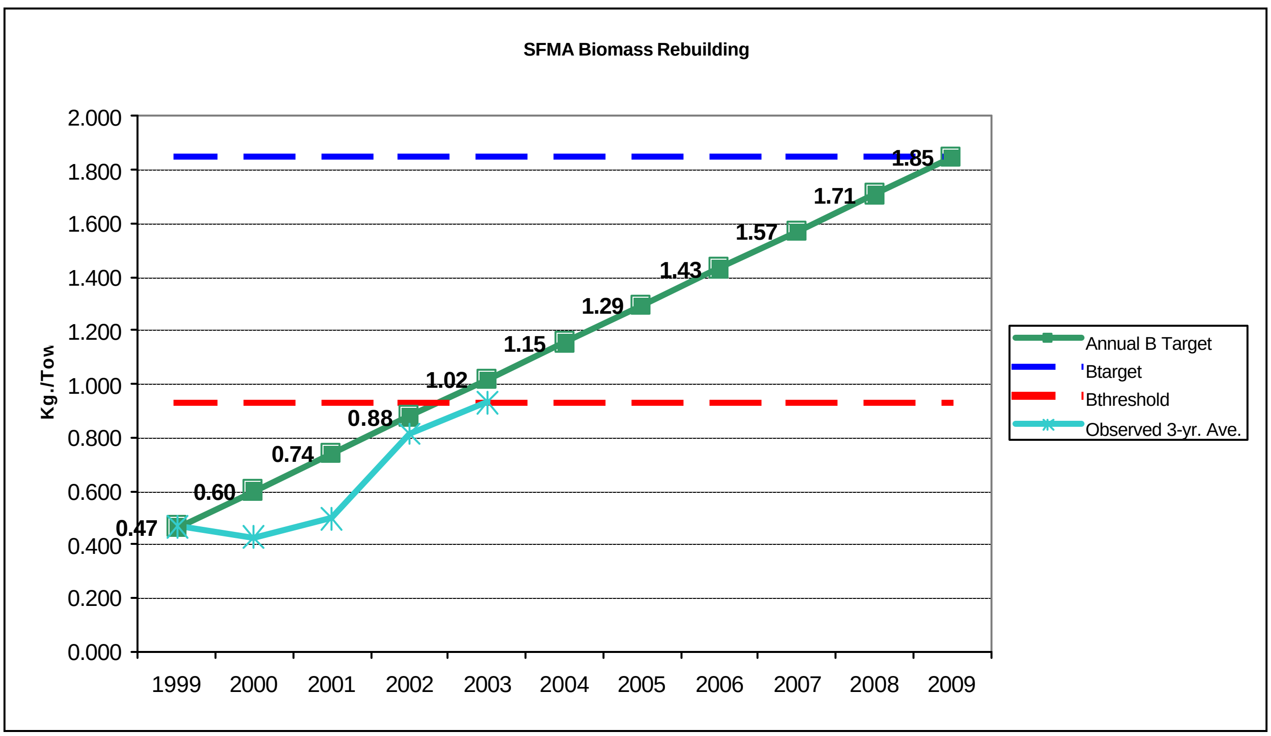


Figure 10– SFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

6.2.3 Skates Stock Status

The Category B (regular) DAS Pilot Program may be used by vessels to target several species of skates, which are managed by the Skate Fishery Management Plan. Skate life history and habitat characteristics are also described in an EFH source document available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Figure 11 summarizes the status of seven skate species. Section 8.1.3 discusses the impacts of proposed action on the skate complex, and includes a discussion of the status of both thorny and barndoor skates, the two skate species that are overfished. Prior to the implementation of the Skate FMP, skate landings and bycatch were not reported by species, and 99% of skates landed were reported as "unclassified". Furthermore, because skates were not formally incorporated into a federal FMP, the fishery information was incomplete. Therefore, the benchmark assessment completed in 1999 concluded that there were insufficient data on age and growth to determine fishing mortality rates or fishing mortality reference points for most of the seven skate species (excluding winter and little skate). Therefore, the Skate FMP established overfishing definitions based on a percentage decline in the NEFSC trawl survey. The overfishing definitions vary for each species, but in general they are based on the three-year moving average of the survey mean weight per tow. The horizontal line for each species that is shown in Figure 11 represents the minimum biomass threshold (a stock is overfished below this line).

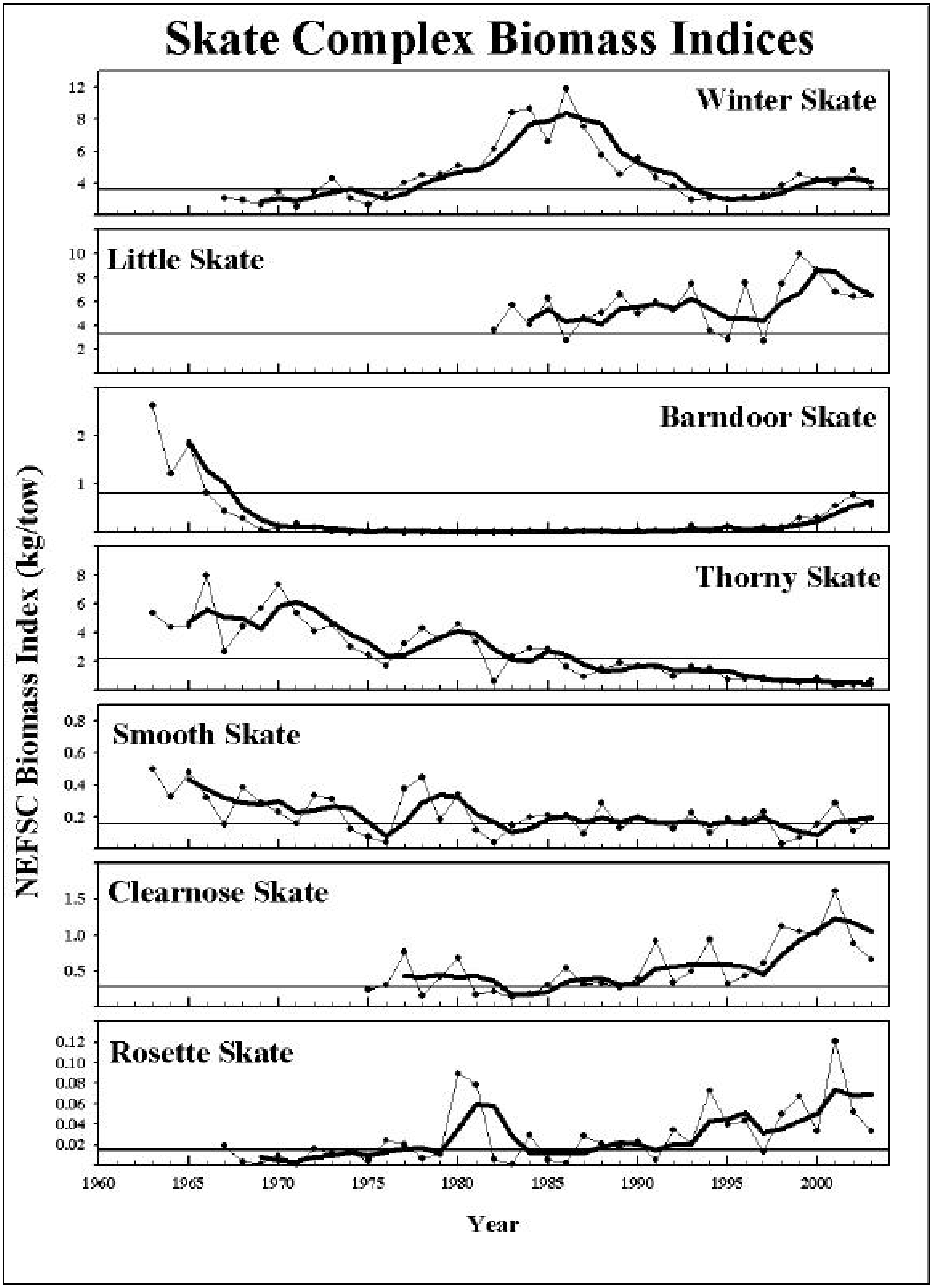


Figure 11 – Status of seven skate species

6.3 Habitat

6.3.1 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 Category B (regular) DAS Pilot Program is not limited to a specific area, the full discussion in the amendment is applicable to the proposed action. Key elements of that discussion are highlighted below. Since the CAI Hook Gear Haddock SAP, the CAII Haddock SAP, and the Western U.S./Canada Area are all on Georges Bank, more detail is provided for that area.

6.3.1.1 Gulf of Maine

The Gulf of Maine's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. The greatest number of invertebrates in this region are classified as mollusks, followed by annelids, crustaceans, echinoderms and other (Theroux and Wigley 1998). By weight, the order of taxa changes to echinoderms, mollusks, other, annelids and crustaceans. Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven types of bottom assemblages. These assemblages are identified in Table 13 and their distribution is depicted in Figure 12. This classification system considers benthic assemblage, substrate type and water properties. Several authors have examined the species assemblages and related them to habitat areas or physical characteristics. For example, Overholtz & Tyler (1985) identified five assemblages for this region (Table 14).

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

Table 13 - Gulf of Maine benthic assemblages as identified by Watling (1998).

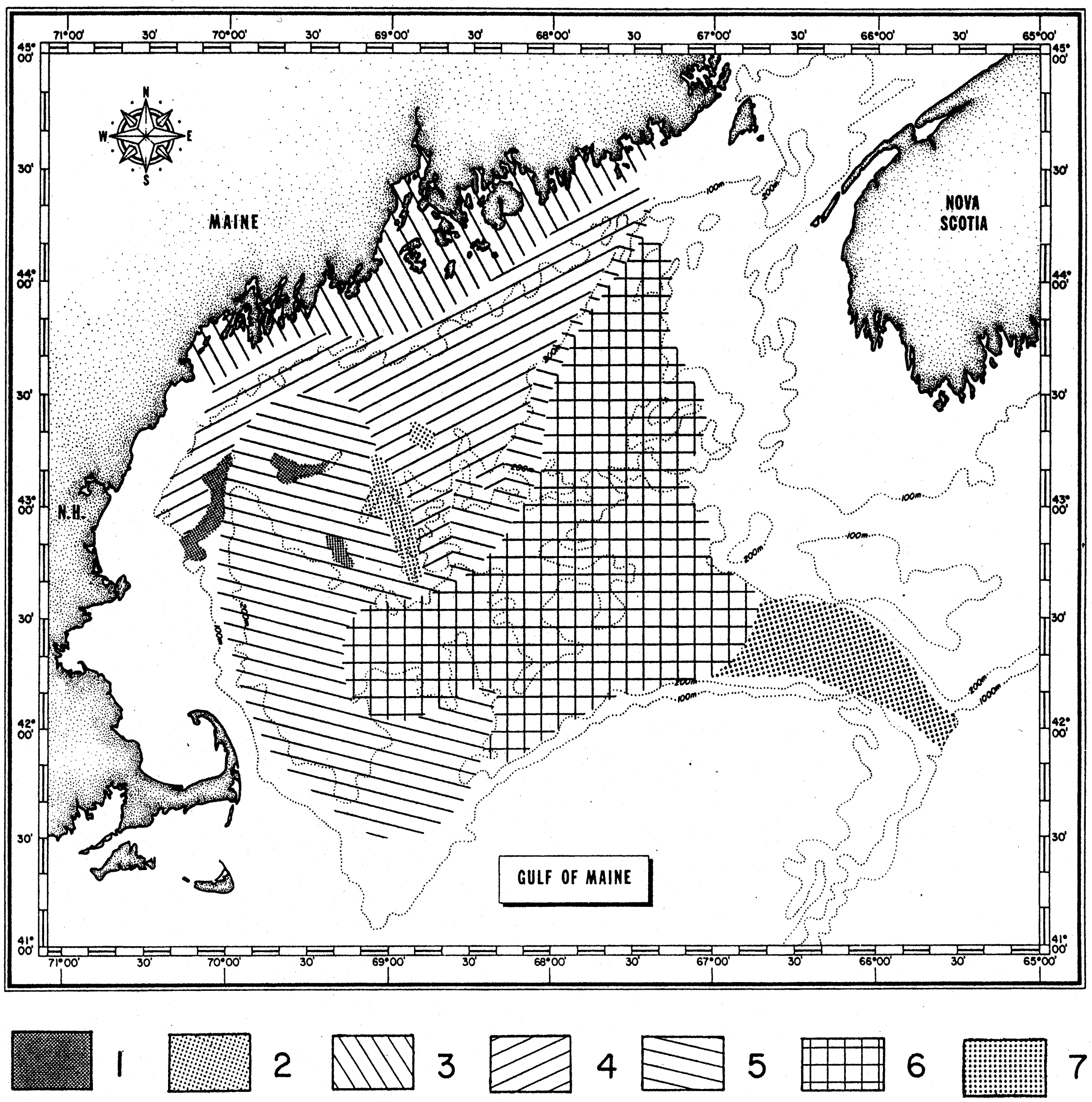


Figure 12 - Distribution of the seven major benthic assemblages in the Gulf of Maine as determined from both soft bottom quantitative sampling and qualitative hard bottom sampling.

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

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

Table 14 - Comparison of demersal fish assemblages of Georges Bank and Gulf of Maine identified by Overholtz and Tyler (1985) and Gabriel (1992).

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

6.3.1.2 Georges Bank

The interaction of several environmental factors including availability and type of sediment, current speed and direction, and bottom topography have been found to combine to form seven sedimentary provinces on eastern Georges Bank (Valentine et al. 1993), which are outlined in Table 15 and depicted in Figure 13.

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 15.

The Western Basin assemblage (Theroux and Grosslein 1987) is found in the upper Great South Channel region at the northwestern corner of the bank, in comparatively deep water (150-200 m) with relatively slow currents and fine bottom sediments of silt, clay and muddy sand. This is the general area of the CAI Hook Gear Haddock SAP. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers. Representative organisms include bivalves (*Thyasira flexuosa, Nucula tenuis, Musculus discors*), annelids (*Nephtys incisa, Paramphinome pulchella, Onuphis opalina, Sternaspis scutata*), the brittle star (*Ophiura sarsi*), the amphipod *Haploops tubicola*, and red crab (*Geryon quedens*). Valentine et al. 1993 did not identify a comparable assemblage; however, this assemblage is geographically located adjacent to Assemblage 5 as described by Watling (1998) (Table 13**,** Figure 12).

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

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

The Southern Georges assemblage is found on the southern and southwestern flanks at depths from 80 m to 200 m, where fine grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids and starfish genus *Astropecten*. Representative organisms include amphipods (*Ampelisca compressa, Erichthonius rubricornis, Synchelidium americanum*), the cumacean *Diastylis quadrispinosa*, annelids

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

Along with high levels of primary productivity, Georges Bank has been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel identified six assemblages, which are compared with the results of Overholtz & Tyler (1984) in Table 14. Mahon et al. (1998) found similar results.

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

Table 15 - 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).

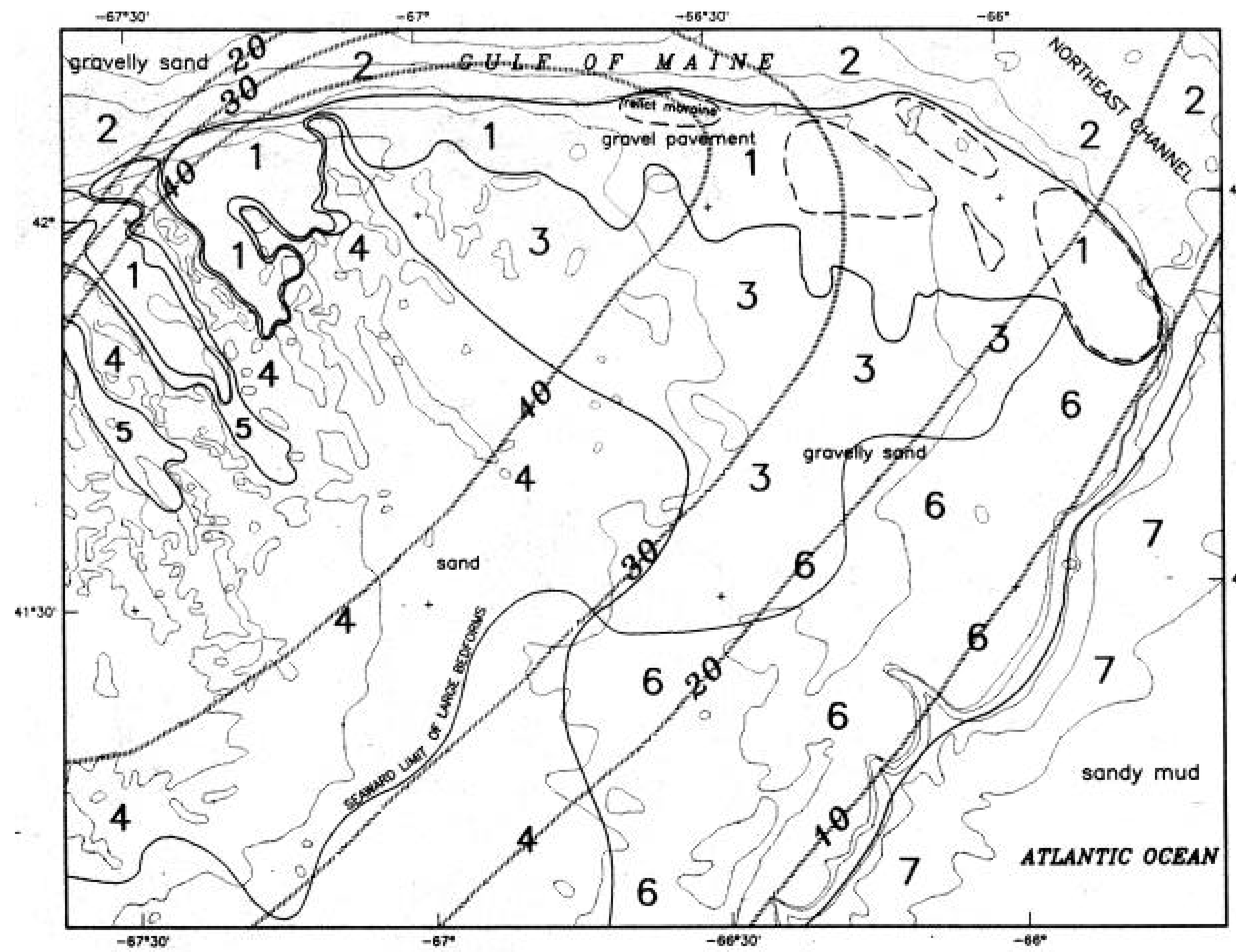


Figure 13 - Sedimentary provinces of eastern Georges Bank based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/sec).

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

6.3.1.3 Southern New England/Mid-Atlantic Bight

Since the two proposed SAPs and the Western U.S./Canada Area are not located in the SNE/MA area, the only measure in the proposed action that could result in impacts to this area is the Category B (regular) DAS Pilot Program. Because both of the main stocks in this area are overfished (SNE/MA winter flounder and SNE/MA yellowtail flounder) there will be few opportunities to use Category B (regular) DAS to target regulated groundfish, though vessels may use the program to target monkfish or skates. The following discussion is abbreviated since there is likely to be little use of Category B DAS in this area as a result of the proposed action.

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

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

Results of these studies were similar to an earlier study confined to the Mid-Atlantic Bight continental shelf (Colvocoresses and Musick 1983). In this study, there were clear variations in species abundances, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. This is especially true for five strongly recurring species associations that varied slightly by season (Table 16). The boundaries between fish assemblages generally followed isotherms and isobaths. The assemblages were largely similar between the spring and fall collections, with the most notable change being a northward and shoreward shift in the temperate group in the spring.

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

Table 16 - Major Recurrent Demersal Finfish Assemblages of the Mid-Atlantic Bight During Spring and Fall as Determined by Colvocoresses and Musik (1983).

6.3.2 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). The following summary of the conclusions reached by these authors is extracted from a recent NOAA report (Johnson 2002). This discussion will focus on the gears likely to be used in the Category B (regular) DAS Pilot Program, the CAI Hook Gear Haddock SAP, and the CAII Haddock SAP: otter trawls, longlines, and gillnets. Most of the discussion relates to mobile gear (otter trawls) since that gear is believed to have more impacts on habitat than fixed gear.

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

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

Collie et al. (2000) analyzed 39 published studies to compile and evaluate current findings regarding fishing gear effects on different types of benthic habitat. They found: (1) 89% of the studies were undertaken at depths less than 60 m; (2) otter trawl gear is the most frequently studied; (3) most studies have been done in Northern Europe and Eastern North America. The authors reached several conclusions regarding the effects of fishing: (1) intertidal dredging and scallop dredging have the greatest initial effects on benthic biota, followed by otter trawling and then beam trawling (although beam trawling studies were conducted in dynamic sandy areas, where effects might be less apparent); (2) fauna in stable gravel, mud and biogenic habitats are more adversely affected than those in less consolidated coarse sediments; (3) recovery appears most rapid in less physically stable habitats (inhabited generally by more opportunistic species); (4) we may accurately predict recovery rates for small-bodied taxa, but communities often contain one or two long-lived, vulnerable species; (5) large-bodied organisms are more prevalent before trawling; and (6) the mean initial response to fishing impacts is negative (55% reduction of individual taxa). Based on these findings, the authors suggested that the scientific community abandon short-term small-scale experiments and undertake larger scale experiments that mimic the timing and frequency of disturbance typical of commercial fishing activities.

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

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

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

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

An additional source of information used to evaluate gear effects on habitat is the report of a gear effects workshop sponsored by the New England and Mid-Atlantic Fishery Management Councils in October 2001 (NREFHSC 2002). This report includes conclusions reached by a panel of experts on the effect of different gears on benthic habitat types in the Northeast U.S. and is summarized in Table 17 below. The results of the workshop have been considered in the next section, which includes a review of the relevant fishing gear effects literature.

Results of a comprehensive review of available gear effect publications on bottom otter trawls that were relevant to the NE region of the U.S. are summarized here. Refer to Amendment 13 for the full gear effects evaluation and list of authors. Positive and negative effects of otter trawls reported in these publications are listed by substrate type in Table 18 to Table 19 below along with recovery times (when known). Without more information on recovery times, it is difficult to be certain which of the negative effects listed in these tables last for, say, more than a month or two. In fact, it is difficult to conclude in some cases (e.g., furrows produced by trawl doors) whether the habitat effect is positive, negative, or neutral. Despite these shortcomings in the information, the scientific literature for the NE region does provide some detailed results that confirm the previous determinations of potential adverse impacts of trawls and dredges that were based on the ICES (2001), NRC (2002), and Morgan and Chuenpagdee (2003) reports.

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

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

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

* This does not represent a consensus among the panel

Table 17 - **Impacts of Otter Trawls on Benthic Habitat**

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

Table 18 – ***Effects and Recovery Times of Bottom Otter Trawls on Mud Substrate in the Northeast Region as Noted By Authors of Eight Gear Effect Studies.***

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

Table 19 - ***Effects and Recovery Times of Bottom Otter Trawls on Sand Substrate in the Northeast Region as Noted By Authors of Twelve Gear Effect Studies.***

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

Table 20 – ***Effects and Recovery Times of Bottom Otter Trawls on Gravel and Rock Substrate in the Northeast Region as Noted By Authors of Three Gear Effect Studies.***

6.4 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. Barndoor skate, a candidate species for listing under the ESA, is discussed in the Skate Baseline Review included in this document.

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

Critical Habitat Designations
Right whale Cape Cod Bay
Great South Channel

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

Protected Species Not Likely to be Affected by the Multispecies FMP

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

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

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. 2002).

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. 2002).

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. 2002). 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. 2002).

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. 2002). NMFS has designated one stock of fin whale for U.S. waters of the North Atlantic (Waring et al. 2002) 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. 2002) 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. 2002). 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 1998). 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. 2002). 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. (2002), 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. 2002). 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. 2002).

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. 2002).

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, bottom longlines, 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, scallop dredge, 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, continentalshelves, 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, 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. (2002) 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 (67FR51234 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. 2002) 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. 2002). NOAA's *2003 MMPA List of Fisheries* lists this species as taken Northeast sink gillnet. 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. (2002) 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. 2002).

Harbor seals are taken in sink gillnet gear used to catch monkfish. Waring et al. (2002) has described the estimated total take of harbor seals in all fisheries to be below the PBR of 1,859 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. 2002). 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 island 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. The groundfish fishery, therefore, is not likely to adversely affect this species.

Harp seal

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans, and have 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. 2002). 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. 2002). Harp seals are also taken in sink gillnet gear used to catch multispecies. Waring et al. (2002) 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. .

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 consultation 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.

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.

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.

NMFS Rule to Conserve Sea Turtles

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

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

6.5 Human Environment

6.5.1 Overview

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

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

Because the proposed action is being submitted within two months of the implementation of Amendment 13, there is little additional information with which to update the human environment discussion of Amendment 13. In particular, it is too early to evaluate, in any detail, the changes to the human environment resulting from Amendment 13. In addition, this proposed action focuses entirely on measures that apply to the commercial harvesting sector, so there is little utility in including an update of the recreational harvesting sector (and, in any case, no new information to do so). This section of the document provides a brief summary of the information in Amendment 13, updated where possible with additional data for FY 2002. Complete data is not yet available for FY 2003.

6.5.2 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. Moratorium - commonly called limited access - permits were granted to vessels based on fishing history during a defined period. No new limited access permits have been granted since 1994, but the ownership of vessels issued permits has changed. Most limited access permits are restricted in the number of DAS that can be fished. Limited access permit holders land most regulated groundfish. In addition, there have been other, open access permit categories. Open access permits 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. Permits are issued in different categories, depending on the activity and history of the vessel. There have been several changes in the defined permit categories, as Amendment 5, Amendment 7, and Amendment 13 all changed the category definitions. For this reason, when examining fishing activity based on permit category, care must be taken to make comparisons to similar permits. Many groundfish vessels have permits, 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. This section will provide a brief overview of that information, updated with data for FY 2002. The addition of FY 2002 not only shows how regulations implemented under *CLF et al. v. Evans* affected the industry, but can also be used to gain a further sense of how the effort reductions adopted by Amendment 13 will affect different sectors.

6.5.2.1 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.

6.5.2.2 FY 2002 DAS Use and FY 2004 DAS Allocations

FY 2002 DAS use by limited access vessels was summarized in Amendment 13; this information is repeated below (Table 21). 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 homeport in New Jersey used 60 percent fewer DAS in FY 2002 than in FY 2001, followed by New Hampshire (-44 percent), Massachusetts (-38 percent), Maine (-37 percent), New York (-35 percent), and Rhode Island (-21 percent).

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 22. 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 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.

339 vessels with a limited access permit do not have any DAS allocated under Amendment 13. 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 both 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. 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 21 – FY 2002 DAS use by various categories of multispecies vessels

By Permit Category	Number of Permits: Without DAS Allocations	Number of Permits: With DAS Allocations	DAS Allocated: Total DAS	DAS Allocated: Category A DAS	DAS Allocated: 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 22 – FY 2004 DAS allocations by various categories

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

6.5.2.3 FY 2002 Landings and Revenues by Permit Category

Adopted in 1996, Amendment 7 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 are:

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

The open access categories are:

- 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 23 through Table 39 summarize landings and revenues by permit category. In FY 2002, the number of vessels that were permitted in the multispecies fishery and landed groundfish declined to 1,152 vessels. This is 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 and 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.

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

Table 23 – Multispecies permit holders landing regulated groundfish, by permit category

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

Table 24 – 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
Individual	33,856	35,450	33,209	34,618	40,498	50,426	40,596
Fleet DAS	36,223	33,813	34,306	33,110	44,309	45,328	37,422
Small vessel exemption	1	1	6	6	23	1	Conf.
Hook gear	703	1,015	987	810	897	1,093	514
Combination vessel	1,082	1,113	1,965	1,920	2,966	3,682	2,719
Large mesh, individual DAS	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	561
Large mesh, fleet DAS	37	499	553	558	721	2,272	1,702
Open Access Combined	248	842	574	481	869	909	569
Unknown Category	235	0	47	12	5	7	12
Total	**72,384**	**72,734**	**71,647**	**71,515**	**90,287**	**103,718**	**84,095**

Table 25 – Regulated groundfish landings (1,000's of pounds) by multispecies permit holders

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

Table 26 – Total revenues (1,000's of 1999 dollars) by multispecies permit holders

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

Table 27 – Groundfish revenues (1,000's of 1999 dollars) by multispecies permit holders

6.5.2.4 FY 2002 Landings and Revenues by Vessel Length

Amendment 13 also summarized landings and revenues by vessel length. These summaries indicate whether the management measures affected large and small vessel fishermen in similar fashion. While length is an imperfect measure of fishing power, it is a readily understandable parameter. 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.

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

Table 28 – 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
less than 30	490	540	521	601	644	491	625	836	400
30 to less than 50	19,483	17,800	18,014	19,007	18,115	16,572	21,538	24,650	18,102
50 to less than 75	28,892	26,345	30,384	29,430	29,718	30,443	37,942	43,645	34,367
75 or greater	26,469	23,094	23,466	23,697	23,171	24,011	30,670	35,194	31,225
Total	**75,334**	**67,779**	**72,384**	**72,734**	**71,649**	**71,517**	**90,775**	**104,325**	**84,094**

Table 29 – 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
less than 30	$2,279	$3,080	$2,276	$1,931	$1,823	$2,005	$1,542	$1,498	$1,172
30 to less than 50	$59,364	$63,978	$55,816	$53,883	$53,789	$61,621	$58,014	$59,303	$53,895
50 to less than 75	$117,354	$110,010	$111,182	$109,945	$104,324	$122,709	$128,030	$123,429	$127,236
75 or greater	$182,481	$171,561	$170,215	$162,079	$158,934	$196,383	$218,410	$204,889	$222,721
Total	**$361,479**	**$348,628**	**$339,489**	**$327,839**	**$318,870**	**$382,718**	**$405,996**	**$389,118**	**$407,026**

Table 30 – 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
less than 30	$679	$663	$557	$682	$884	$689	$789	$941	$577
30 to less than 50	$23,518	$20,801	$18,593	$20,659	$21,311	$19,733	$22,673	$24,154	$22,144
50 to less than 75	$36,681	$34,042	$35,512	$33,855	$36,176	$36,645	$38,787	$40,563	$37,973
75 or greater	$33,146	$29,997	$27,781	$27,048	$29,244	$30,547	$33,057	$34,082	$35,301
Total	**$94,025**	**$85,503**	**$82,444**	**$82,244**	**$87,614**	**$87,615**	**$95,306**	**$99,740**	**$97,997**

Table 31 – Regulated groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by length

6.5.2.5 FY 2002 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.

Gear Type	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bottom trawl*	237,964	228,269	214,830	227,433	242,471	206,073	201,259	198,586	182,732
Bottom longline*	8,965	8,905	7,869	8,970	8,559	6,921	7,083	7,105	4,672
Hook and line*	979	1,404	1,461	2,200	2,018	1,614	1,861	2,032	1,219
Sink gillnet, total*	41,991	53,056	49,983	43,990	46,003	37,854	30,462	35,165	29,323
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
Shrimp trawl	12,438	15,888	15,440	9,491	3,893	6,210	3,665	1,384	3,105
Scallop dredge	16,671	15,482	16,460	14,185	13,993	21,482	30,557	41,879	44,426
Lobster trap	5,532	6,065	6,449	6,229	5,905	7,290	5,391	4,433	4,806
All other	69,730	83,125	71,079	118,584	69,271	74,085	77,029	68,189	49,747
Total	**418,071**	**438,497**	**453,540**	**528,788**	**522,683**	**467,931**	**486,302**	**550,562**	**426,517**

Table 32 – 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
Bottom trawl*	54,237	48,837	54,518	54,232	55,224	56,048	73,622	85,422	71,516
Bottom longline*	5,337	4,120	2,870	3,912	4,068	2,706	2,192	2,767	982
Hook and line*	121	603	711	893	1,079	793	1,420	1,663	770
Sink gillnet, total*	15,172	13,643	13,829	13,280	10,962	11,555	12,653	13,769	10,475
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
Shrimp trawl	23	35	32	41	1	1	24	2	1
Scallop dredge	245	206	176	177	162	165	216	309	147
Lobster trap	29	39	26	19	15	27	72	10	18
All other	171	295	221	179	137	220	576	382	185
Total	**75,334**	**67,779**	**72,384**	**72,734**	**71,649**	**71,517**	**90,775**	**104,325**	**84,094**

Table 33 – 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
Bottom trawl*	$176,972	$168,294	$159,429	$165,551	$167,224	$175,251	$172,571	$162,534	$162,499
Bottom longline*	$10,929	$9,050	$7,403	$8,657	$9,201	$6,700	$5,893	$6,583	$4,786
Hook and line*	$9,082	$10,228	$7,083	$5,848	$5,059	$5,534	$2,605	$2,467	$1,791
Sink gillnet, total*	$26,234	$28,718	$25,881	$23,812	$26,016	$33,820	$30,293	$34,363	$29,761
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
Shrimp trawl	$11,839	$12,352	$12,069	$10,795	$5,110	$9,063	$7,499	$2,999	$4,215
Scallop dredge	$74,222	$70,375	$83,342	$71,085	$65,194	$105,746	$141,604	$141,651	$168,495
Lobster trap	$15,662	$16,309	$17,220	$16,223	$16,004	$21,747	$15,340	$11,717	$12,035
All other	$33,992	$29,182	$22,869	$20,380	$17,710	$18,239	$22,696	$14,930	$14,211
Total	**$361,479**	**$348,628**	**$339,489**	**$327,839**	**$318,870**	**$382,718**	**$405,996**	**$389,118**	**$407,025**

Table 34 – 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
Bottom trawl*	$69,496	$64,315	$64,621	$63,322	$69,001	$69,348	$77,463	$81,747	$80,958
Bottom longline*	$6,593	$4,873	$3,343	$4,724	$5,389	$3,758	$2,912	$3,238	$1,451
Hook and line*	$148	$782	$807	$1,045	$1,456	$1,193	$1,835	$1,922	$1,109
Sink gillnet, total*	$17,233	$14,834	$13,156	$12,648	$11,383	$12,829	$12,272	$12,308	$12,074
Day Gillnet	N/A	N/A	N/A	$7,463	$5,215	$5,893	$5,207	$6,621	0
Trip Gillnet	N/A	N/A	N/A	$2,975	$3,564	$3,987	$4,575	$4,251	0
Midwater trawl	$0	$0	$0	$0	$0	$1	$0	$0	$0
Shrimp trawl	$30	$36	$38	$41	$1	$2	$9	$3	$1
Scallop dredge	$269	$222	$185	$201	$194	$182	$168	$248	$142
Lobster trap	$32	$42	$25	$21	$15	$38	$67	$10	$18
All other	$223	$400	$269	$242	$176	$265	$580	$264	$242
Total	**$94,025**	**$85,503**	**$82,444**	**$82,244**	**$87,614**	**$87,615**	**$95,306**	**$99,740**	**$97,997**

Table 35 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by gear

6.5.2.6 FY 2002 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.

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.

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

Table 36 – 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
ME	15,284	14,180	13,306	13,188	18,047	21,139	15,934
NH	4,279	4,080	4,267	3,232	4,535	5,029	3,351
MA	46,313	46,983	42,312	42,767	50,724	61,687	50,317
RI	2,972	4,213	6,142	6,090	8,486	8,666	8,941
CT	37	3	141	174	820	758	403
NY	1,323	1,369	2,445	2,916	4,096	3,069	2,870
NJ	925	346	952	1,375	1,844	1,095	723
DE	835	882	831	952	988	796	510
MD	1	0	1	0	4	2	2
VA	212	119	398	407	431	829	143
NC	15	321	732	360	798	1,254	898
FL	140	238	121	53	2	0	1
Other	47	0	0	0	0	0	0
Total	**72,384**	**72,734**	**71,648**	**71,517**	**90,775**	**104,325**	**84,093**

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

Table 38 – Total revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by homeport state

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

Table 39 – Groundfish revenues (1,000's of 1999 dollars) for vessels with multispecies permits, by homeport state

6.5.2.7 Summary

Since 1994 and the adoption of Amendment 5, groundfish revenues have increased by four percent (in constant 1999 dollars). The nadir was reached in 1996 and 1997 when revenues had declined by 13 percent from 1994. Since then, groundfish revenues climbed until 2001 before showing the slight decline in FY 2002. The increase in groundfish revenues since 1994 has not been evenly distributed. While bottom trawl vessels have seen an increase in groundfish revenues of 16 percent since 1994, 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.

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

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

6.5.3 Recreational Harvesting Sector

This sector consists of two main components: recreational fishermen who access the resource either from shore or through the use of privately-owned vessels, and recreational fishermen who access the resource by using a vessel that carries passengers for hire. The latter group is referred to as "party/charter" vessels. The distinction between the two is that party vessels carry large numbers of passengers and are generally licensed and inspected by the Coast Guard to carry passengers for hire, while charter vessels are usually smaller vessels that carry up to six passengers. Only party/charter vessels are required to have a permit issue under the multispecies FMP. Recreational fishermen generally target cod, haddock, pollock, and winter flounder, though they catch other regulated groundfish species. The targeted stocks include GOM and GB cod, GOM and GB haddock, and GOM and SNE/MA winter flounder. The recreational groundfish fishery with access to these resources is concentrated between southern Maine and Rhode Island, though winter flounder is targeted by recreational fishermen as far south as New Jersey.

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

6.5.4 Processing and Wholesale Trade Sector

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

6.5.5 Communities

6.5.5.1 Background

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

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

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

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

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

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

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

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

I. DOWNEAST MAINE – WASHINGTON COUNTY

A. Primary Multispecies Port
1. None

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

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

A. Primary Multispecies Ports
1. None

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

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

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

IV. SOUTHERN MAINE – YORK COUNTY

A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports
1. Southern Maine: York, York Harbor, Camp Ellis, Kennebunkport, Kittery, Cape Porpoise, Ogunquit, Saco, and Wells

V. OTHER MAINE – all other coastal Ports in Maine

VI. STATE OF NEW HAMPSHIRE – ROCKINGHAM AND STRAFFORD COUNTIES

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

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

VIII. GLOUCESTER AND NORTH SHORE – ESSEX COUNTY

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

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

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

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

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

XI. NEW BEDFORD COAST – BRISTOL COUNTY

A. Primary Multispecies Ports

1. New Bedford/Fairhaven

B. Secondary Multispecies Ports

1. Other Bristol County: Dartmouth, and Westport

XII. OTHER MASSACHUSETTS – all other coastal Ports in Massachusetts

XIII. STATE OF RHODE ISLAND – WASHINGTON AND NEWPORT COUNTIES

A. Primary Multispecies Ports

1. Point Judith

B. Secondary Multispecies Ports

1. Western RI: Charlestown, Westerly, South Kingstown (Wakefield), and North Kingstown (Wickford)
2. Eastern RI: Newport, Tiverton, Portsmouth, Jamestown, Middletown, and Little Compton

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

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

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Coastal CT: Stonington, New London, Noank, Lyme, Old Lyme, East Lyme, Groton, and Waterford

XVI. OTHER CONNECTICUT – all other coastal Ports in Connecticut

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

A. Primary Multispecies Ports

1. Eastern Long Island: Montauk, Hampton Bay, Shinnecock, and Greenport

B. Secondary Multispecies Ports

1. Other Long Island: Mattituck, Islip, Freeport, Brooklyn, Other Nassau County, and Other Suffolk County

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

XIX. NORTHERN COASTAL NEW JERSEY – MONMOUTH AND OCEAN COUNTIES

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Northern Coastal NJ: Point Pleasant, Belford, Long Beach/Barnegat Light, Barnegat, Highlands, Belmar, Sea Bright, and Manasquan

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

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

1. Southern Coastal NJ: Cape May, Wildwood, Burleigh, Sea Isle City, Ocean City, Stone Harbor, and Avalon

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

XXII. DELAWARE

XXIII. MARYLAND

XXIV. VIRGINIA

XXV. NORTH CAROLINA

6.5.5.2 Expected Impacts of Amendment 13

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

Short-term reductions in fishing vessel gross revenues are expected to have a negative impact 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 14 through Figure 16. 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. The declining status of today's economy exacerbates these problems.

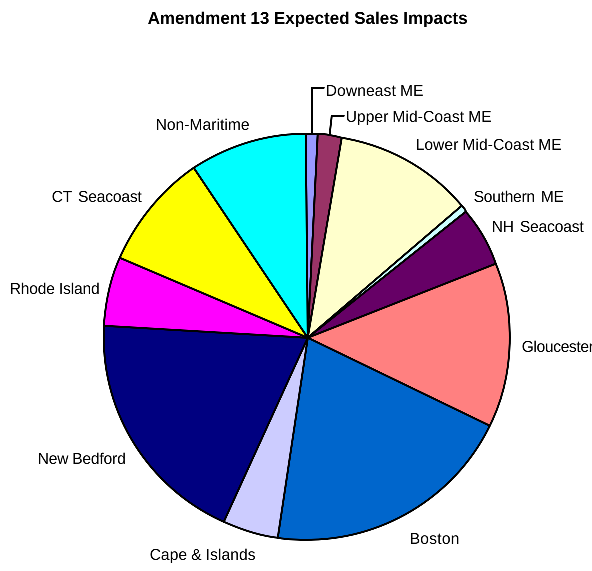


Figure 14 – Amendment 13 expected sales impacts, by port group

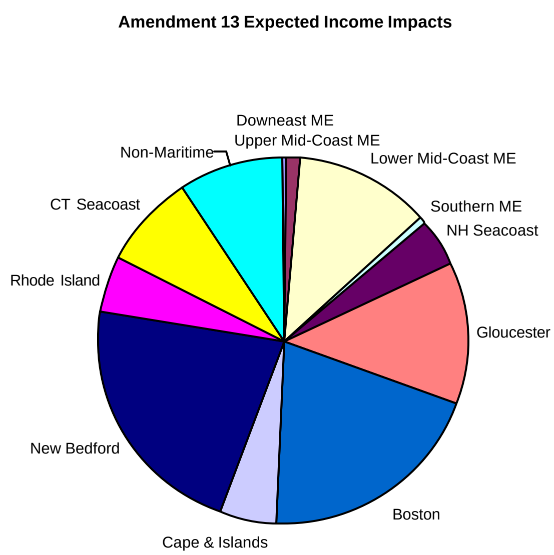


Figure 15 – Amendment 13 expected income impacts, by port group

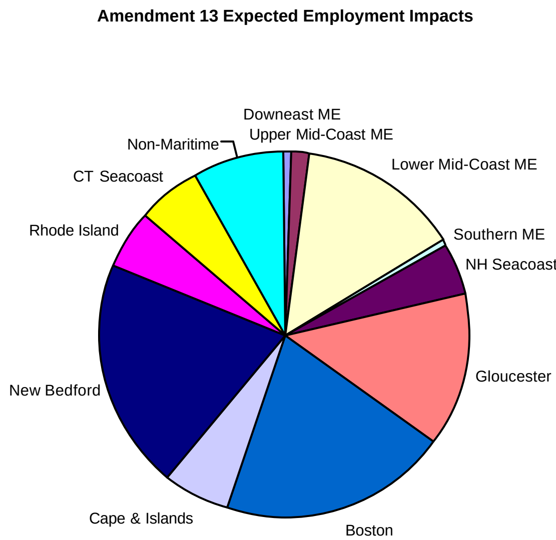


Figure 16 – Amendment 13 expected employment impacts, by port group

7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF IMPACTS

7.1 Introduction

FW 40A includes management measures that appear to be unrelated to each other: one measure would implement a Category B (regular) DAS program, two would implement SAPs to target GB haddock, and one modifies restrictions on areas that can be fished. When analyzing the impacts of these measures, it becomes clear that they interact and the impacts depend on the combination of measures that the Council submits as a proposed action. For example, impacts on the GB haddock stock depend on whether the Council submits one or both of the SAPs, approves the Category B (regular) DAS pilot program, and modifies the restrictions on areas that can be fished. The impacts change if only some of these alternatives are considered. The impacts may not be additive, so it is not appropriate to analyze each measure separately and assume that the overall impacts if more than one measure is proposed is just the sum of the individual impacts. In order to develop an informed decision, the Council and the public must understand how the different alternatives interact with each other. Criticism has been leveled at other recent actions because Council documents did not clearly explain the impacts that would result if different combinations of measures were adopted (Hartley, 2004). The Council's proposed action is analyzed in exactly this manner, since the Council is submitting a package of measures for approval and implementation.

Because of the Council's desire to implement parts of this framework before the end of fishing year 2004, the Council did not have time to identify the combinations of management measures that it expected to choose prior to the final framework meeting. As a result, Section 5.0 - the alternatives to the proposed action - lists each measure separately and does not identify "packages" of measures that may be adopted. As explained in the preceding paragraphs, analyzing measure separately does not provide decision makers with meaningful information if the measures are analyzed as if each was the only one implemented. For this reason, sections 7.3 through 7.5 analyze groups of measures that were the most likely to be selected by the Council. Because these measures are grouped, this section of the document does not parallel Section 5.0. There are three different alternatives to the proposed action that were analyzed:

- No Action: The Council would not choose to implement any of the measures under consideration. This option is required by NEPA in order to establish a baseline for comparison of the other alternatives.
- Alternative 1: The Council would choose to adopt the incidental catch hard TAC measure, the CAI hook gear haddock SAP, the CAII haddock SAP, and would relax the restrictions on areas that can be fished.
- Alternative 2: The Council would choose to adopt the incidental catch hard TAC measure, the Category B (regular) DAS pilot program, the CAI hook gear haddock SAP, the CAII haddock SAP, and would relax the restrictions on areas that can be fished. This alternative is similar to the proposed action, but the Council did alter some of the elements of this alternative.

7.2 Proposed Action

The details of the proposed action are described in section 4.0. To summarize, the proposed action adopts:

- Incidental groundfish TACs to limit the catch of stocks of concern taken by vessels using Category B (regular or reserve) DAS;
- A Category B (regular) DAS pilot program;
- A Closed Area I Hook Gear Haddock SAP;
- A Closed Area II Haddock SAP pilot program;
- A relaxation of restrictions on the area that can be fished by vessels that fish in the western U.S./Canada area.

7.2.1 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.

7.2.1.1 Impacts on Groundfish

Amendment 13 adopted mortality targets for groundfish stocks and a suite of management measures to meet those targets. The mortality targets are designed to harvest optimum yield from the groundfish fishery. Overfishing must be ended for some stocks, and others must be rebuilt in order to achieve OY. The Amendment 13 measures were designed to achieve these targets on the mix of regulated groundfish species. As a result, in some cases the measures are expected to reduce fishing mortality more than is necessary. One of the primary management tools used in Amendment 13 is a restriction on fishing effort through controls on the number of DAS that a vessel can fish. Amendment 13 allocated DAS to each permit as Category A, B (regular or reserve) or C DAS. The amendment designed the measures so that the appropriate number of Category A DAS is allocated to achieve mortality targets.

Amendment 13 established a structure so programs could be developed to target healthy stocks, or stocks that could absorb more fishing pressure, in order to achieve OY from those stocks. With two exceptions, the details of those programs were not specified in the amendment. This framework will establish additional opportunities to harvest healthy stocks, while providing safeguards so that other mortality targets are not exceeded. One of the ways that healthy stocks can be targeted is through the use of Category B (regular) DAS through a pilot program. This alternative also allows for Category B DAS to be used in two additional SAPs. These three programs allow limited increase in the number of DAS that can be fished by groundfish vessels, but those DAS must be used to target healthy stocks. Evaluation of the groundfish impacts of this alternative focuses on determining that the additional catches of the targeted healthy stocks and the incidental catch of other groundfish stocks will not exceed mortality goals.

7.2.1.1.1 Target Stocks

This alternative includes a Category B (regular) DAS pilot program and two SAPs that are designed to target GB haddock. The primary control in the Category B (regular) DAS pilot program on the catch of target stocks is the limitation on the number of DAS fished. For both SAPs, 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 SAPs will cease.

Category B DAS Incidental Catch TACs

This measure limits the catch of stocks of concern taken while using Category B DAS. The proposed TACs are set at very low levels to reduce the risk to Amendment 13 mortality objectives. For some of the proposed Category B DAS programs, these TACs are so low that they may be caught and the program may be ended early, limiting the catch of the target stocks.

Category B (regular) DAS Pilot Program

Category B (regular) DAS are to be used to target the following healthy groundfish stocks:

- GOM haddock
- Pollock
- Redfish
- GOM winter flounder
- GB haddock
- GB yellowtail flounder
- GB winter flounder

The proposed action will authorize the use of 1,000 Category B (regular) DAS per quarter for four consecutive quarters (4,000 DAS total). The increase in effort resulting from the use of these days will increase mortality of these stocks above that estimated in Amendment 13. To evaluate whether this increase will threaten Amendment 13 mortality targets, the fishing mortality expected to result from the Amendment 13 measures is compared to the target fishing mortality for these healthy stocks in Table 40. For all of the healthy stocks, the expected fishing mortality is roughly half the target fishing mortality. For these stocks, considerable additional catch can be supported without threatening Amendment 13 mortality targets.

Stock	Target Fishing Mortality	Expected Fishing Mortality
GB Haddock	0.26	0.14
GOM Haddock (Catch/Index)	0.23	0.07
GB Yellowtail Flounder	0.25	0.087
GOM Winter Flounder	0.43	0.08
GB Winter Flounder	0.32	0.17
Acadian Redfish	0.04	< 0.01
Pollock (Catch/Index)	5.88	2.27

Table 40 – Comparison of target and expected fishing mortality for healthy stocks (based on Category A DAS only)

In broad terms, if all 2,000 DAS are used in each fishing year (FY 2004 and FY 2005) it represents an increase in effort of 5.7 percent over the midpoint estimate of 35,000 DAS used to evaluate the impacts of Amendment 13. A rough approximation is that this increase in effort will translate directly into a similar increase in mortality for this group of stocks, but the impacts for each stock depend on how this effort is distributed. Analysis of recent fishing activity, described in section 7.2.4.2, identified the opportunities for using Category B DAS shown in Table 41. Based on this table, it appears that Category B (regular) DAS use in this pilot program will occur in all areas and will not concentrate on any single stock. Assuming the additional effort is not likely to be concentrated on one stock, it seems unlikely that mortality rates will double with a six percent increase in effort.

	Gear	
Area	**Otter Trawl**	**Gillnet**
Gulf of Maine	skate/winter flounder winter flounder	monkfish
Georges Bank	yellowtail yellowtail/winter/monkfish/skates winter/monkfish/skates	monkfish skates monkfish/skates
Southern New England/Mid-Atlantic	skates fluke/winter/monkfish	monkfish skates monkfish/skates

Table 41 - Summary of Potential Regular B DAS Fisheries by Area and Gear

An additional concern is how this effort increase interacts with the SAPs that target GB haddock and GB yellowtail flounder that were approved in Amendment 13 or may be adopted by this action. These catches are compared to recent landings of these stocks in Table 42. Catches for 2003 were estimated based on preliminary landings statistics through December, 2002. While the two SAPs for GB haddock are bound by a hard TAC on haddock, the binding constraint may prove to be the incidental catch of cod. If the entire haddock TACs are taken, these two SAPs could take 6,100 mt of GB haddock (1,000 mt in CAI, 5,100 mt in CAII). The CAII yellowtail flounder SAP is limited by the number of trips allowed. For GB yellowtail flounder, the CAII yellowtail flounder SAP is expected to land 4,350 mt of yellowtail flounder from 320 trips. Catch including discards may approach 5,000 mt. In addition, participants in this SAP may harvest 952 mt of GB winter flounder while fishing in the SAP area (NEFMC 2003).

The 2002 catch of GB haddock and GB yellowtail flounder was taken on DAS that could be used to target any stocks, analogous to the Category A DAS allocated in Amendment 13. While the analysis in Amendment 13 estimated that fishing mortality would decline for these stocks because of the additional effort reductions in the amendment, landing declines may be partially offset by increased catch rates as a result of stock growth. This comparison shows that catches of GB haddock and GB yellowtail flounder taken using Category B (regular) DAS outside of SAPs must be carefully monitored to make certain that mortality targets are not exceeded. Most vessels will probably choose to target these stocks through the approved SAPs rather than on a Category B (regular) DAS since SAPs provide access to closed areas, allow use of both Category B (regular) and Category B (reserve) DAS, and in some cases provide credit for steaming time. Whether this assumption is accurate will not be known for certain until the Category B (regular) DAS pilot program is evaluated.

	GB Haddock	GB Yellowtail Flounder
2002 U.S. Catch	6,325	3,000
2003 Catch	5,561	2,849
2004 U.S. TAC	14,955	6,000
CAI Haddock SAP	1,000	0
CAII Haddock SAP	5,100	0
CAII Yellowtail SAP	0	5,000

Table 42 – CY 2002 and estimated CY 2003 catch (mt) compared to catch authorized for three SAPs

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 4.3.1. 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 43. Some GB haddock is harvested by Canadian vessels, however, as allocated under the U.S./Canada Resource Sharing Understanding. Allocations under this understanding have only been established for FY 2004. Under the approved Amendment 13 management measures, fishing mortality for GB haddock is expected to decline from that in FY 2001 (see Table 46) to less than F_{MSY} (see Table 47). The target TAC for 2004, reduced by the Canadian share of GB haddock, was compared to recent catches of GB haddock. There is over a 8,000 mt difference between the 2004 target TAC (14,955 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 2004 TAC. Based on these comparisons, it is not likely that the proposed TAC for the CAI hook gear haddock SAP will threaten mortality objectives of Amendment 13.

Year			U.S. Catch
2000			3,366
2001			4,637
2002			6,325
2003			5,561
Year	**A 13 Target TAC**	**CA TAC**	**U.S. TAC**
2004	24,855	9,900	14,955
2005	27,692	Unk.	Unk.
2006	31,866	Unk.	Unk.

Table 43 – Target TACs (mt) for 2004 through 2005 and recent U.S. haddock catches

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 44)(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.

	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 44 - 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.

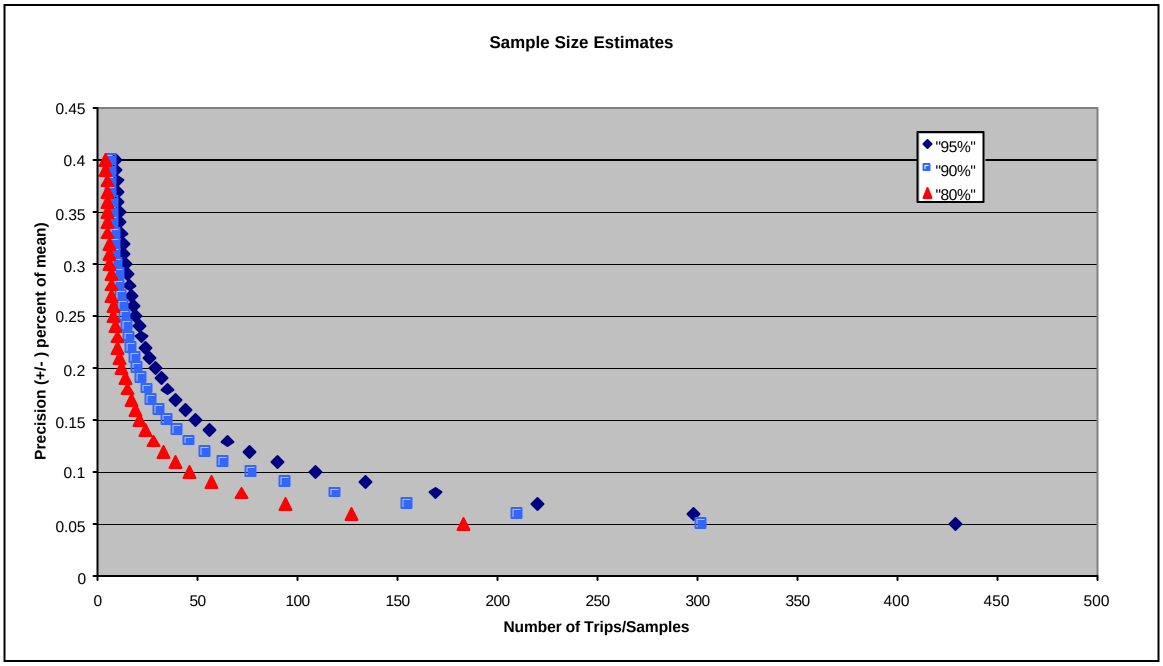


Figure 17 – Estimates of sample size necessary to estimate haddock catch at a given level of precision for the CAI hook gear haddock SAP. Three confidence levels shown.

CAII Haddock SAP

This alternative includes a SAP to target haddock in the eastern U.S./Canada area (statistical areas 561 and 562). Analysis of the impacts on the haddock resource in this section will focus on catches of haddock and haddock spawning activity. The proposed action is a variation of a SAP that was included in Amendment 13 but was not approved by NMFS.

Under the terms of the U.S./Canada Resource Sharing Understanding, a "hard" TAC limits catches of haddock in this area. When the TAC is caught, the only groundfish fishing that can take place is under a SAP for yellowtail flounder in CAII. The TAC is allocated to each country using an agreed upon formula that is applied to an annual assessment and an agreed mortality target. The U.S. allocation for 2004 is 5,100 mt – only 900 mt were landed from this area in 2002. All catches of haddock from this SAP are applied to this TAC, and if the TAC is caught, all fishing for haddock in the area is stopped. This hard TAC ensures catches of haddock under this SAP will not threaten the mortality targets of Amendment 13.

An experiment has not been conducted that provides information on haddock catch rates using a haddock separator trawl in this area. This makes it difficult to determine the number of trips and/or DAS that may be used in this SAP. Amendment 13 estimated catches of haddock using information from trips into SA 561 and 562 (areas included in this SAP). A recent experiment tested a haddock separator trawl on other areas of Georges Bank, but vessels in the experiment did not catch much haddock and it is questionable whether the catch rates that resulted are applicable to his program.

Since an experiment has not been conducted, observer data for calendar years 2001 through 2003 was examined to estimate the likely catch of haddock and the number of DAS that may be used in this SAP. Since most effort in this area targeting haddock is by otter trawl vessels, only those observations were examined. The number of otter trawl tows observed is shown in Table 45. Because there was anecdotal information that catch rates of haddock are higher in statistical area 562 compared to statistical area 561, the number of tows observed is broken down both by statistical area and by quarter. Because only eight tows were observed in 2001 in SA 562, only the data for 2002 and 2003 were analyzed.

	Number of Observed Tows								
	2001			2002			2003		
Quarter	Both	561	562	Both	561	562	Both	561	562
1	68	63	5	29	20	9	192	108	84
2	54	52	2	135	41	94	576	321	255
3	9	9	0	208	58	150	240	67	173
4	30	29	1	72	49	23	189	55	134
Total	161	153	8	444	168	276	1197	551	646

Table 45 – Observed otter trawl tows, calendar years 2001 – 2003, statistical areas 561 and 562 (NMFS OBDBS database)

The average haddock catch for all 444 observed tows in 2002 in these two statistical areas was 79.2 lbs./tow. The difference between SA 561 and 562 was not statistically significant. In 2003, the average haddock catch was 207.5 lbs./tow in these two areas. There was a statistically significant difference (at an $\alpha=0.05$) between catches in SA 561 (average of 77.5 lbs./tow) and SA 562 (average of 318.7 lbs./tow). Observed tows in 2003 were further examined to determine if haddock catches differed for tows that targeted haddock. A total of 194 observed tows in both areas listed haddock as a target species, 70 in SA 561 and 124 in SA 562. Over both areas, the mean catch of haddock per tow was 851 lbs./tow for tows targeting haddock. The mean catch per tow in SA 562 was 1,183 lbs./tow, while in SA 561 it was 264 lbs./tow. This difference is statistically significant at an $\alpha=0.05$.

This SAP requires that vessels use a haddock separator trawl or flounder net in the area. It is most likely that vessels will use a haddock separator trawl when targeting haddock. The haddock separator trawl minimizes the catch of cod through a design that considers the behavior of fish in response to the gear. Generally, haddock swim to the upper part of a net and cod swim to the lower part of the net. By inserting a horizontal mesh panel in the net and using two extensions (see cover photograph), the catch can be effectively divided. The cod escape if the extension on the lower part of the net is left open. This net has been in use for some time by Canadian vessels fishing on Georges Bank under a quota system. Some loss of haddock catch can be expected when using this net. An experiment conducted by the Canadian Department of Fisheries and Oceans found that 88 to 96 percent of haddock was caught in the top cod end, equivalent to a loss of between four and twelve percent (DFO 1992). An experiment conducted in the Barents Sea by Norwegian researchers experienced similar results, with 89 percent of the haddock caught in the upper cod end (Engås et al. 1998). A recent experiment conducted on Georges Bank was inconclusive. Because the experiment encountered small amounts of haddock, it did not detect a significant difference between the top and bottom cod end for haddock (Raymond and Manomet 2004). (See section 7.2.1.1.2 for a discussion of the results of this experiment for other species).

In order to estimate the number of DAS (without respect to category of DAS) that will be used to harvest the haddock TAC in this area, the 2003 catch rates for tows targeting haddock that were documented by the observer program were reduced by ten percent. These estimates were not adjusted for any increase in catch rates that may occur due to increases in stock size or because a small part of the SAP will occur in an area that has been closed to fishing since 1994. Seven tows per day were assumed. For both statistical areas, the resulting estimated catch per day fished is 5,360 lbs. Based on this catch rate, 2,090 DAS would be needed to harvest the 5,100 mt (11.2 million pounds) TAC for this area. Using a similar analysis, the higher catch rates in SA 562 would result in a catch rate of over 7,420 lbs./day, or

1,509 DAS needed to harvest the GB haddock TAC. This analysis does not differentiate between Category A or B DAS.

It is theoretically possible that vessels could use Category B DAS under this SAP to catch the TAC in the U.S./Canada area, and then use Category A DAS to catch additional haddock outside the area. Such a transfer of effort, if large enough, could threaten haddock mortality targets. As shown in Table 43, however, there is a large gap between recent haddock catches and the TAC for FY 2004. Catches would have to more than double to exceed the target TAC for FY 2004. This is unlikely given the restrictions on fishing effort implemented by Amendment 13.

7.2.1.1.2 Incidental Catch Stocks

Category B DAS Incidental Catch TACs

While the main purpose of this action is to create opportunities to target healthy stocks, there may be some catch of groundfish stocks of concern. This alternative establishes hard TACs for the incidental catches (landings and discards) of groundfish stocks of concern that may be caught while using Category B DAS. 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 created in this alternative 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 is 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 Council first examined the expected impacts of the Amendment 13 management. Two tables in the amendment (see below, Table 46 and Table 47) summarize the expected impacts on fishing mortality for the managed groundfish stocks, and compare these impacts to those required to meet the mortality targets of the plan. These tables reflect the results of the Closed Area Model used to evaluate Amendment 13 impacts, and the limitations of that model must be considered when interpreting these results. The model results are indications of likely results, not precise predictions of the fishing mortality that will result. Since these tables are based on the fishing mortality in 2001, the PDT next examined the estimates of fishing mortality in 2002. Court-ordered measures were in place for part of calendar year 2002, and the Council noted declines in the mortality of GOM cod and witch flounder.

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 46 - 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

Stock	2001 Fishing Mortality	Expected Fishing Mortality Assuming a Reduction in DAS Used Of		
		50%	45%	39%
GB Cod	0.38	0.19	0.21	0.22
GOM Cod	0.47	0.25	0.26	0.29
GB Haddock	0.22	0.13	0.14	0.15
GOM Haddock(1)	0.12	0.07	0.07	0.08
GB Yellowtail Flounder	0.13	0.083	0.087	0.09
Cape Cod/GOM Yellowtail Flounder	0.75	0.23	0.26	0.28
SNE/MA yellowtail flounder	0.91	0.32	0.37	0.40
American Plaice	0.43	0.21	0.22	0.25
Witch Flounder	0.76	0.36	0.39	0.44
GOM Winter Flounder	0.14	0.07	0.08	0.09
GB Winter Flounder	0.25	0.15	0.17	0.18
SNE/MA Winter Flounder	0.51	0.26	0.29	0.32
Acadian Redfish(3)	0.01	< 0.01	< 0.01	< 0.01
White Hake(1)	1.36	0.79	0.86	0.93
Pollock(1)	3.55	2.11	2.27	2.44
Windowpane Flounder (North)(1)	0.1	0.07	0.07	0.08
Windowpane Flounder (South)(1)(4)	0.69	< 0.69	< 0.69	< 0.69
Ocean Pout(4)	0.008	NA<0.01	NA	NA
Atlantic Halibut(4)	NA	NA	NA	NA

Table 47 - Expected fishing mortality from Amendment 13 measures under three different assumptions on the reduction in used DAS. Rates shown do not include any impacts due to mesh increases.

(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

Since the exact impact of the Amendment 13 measures are not known, the Council looked for additional indications of the impacts of the measures in place in 2003 as a result of a court order in the lawsuit of *CLF et al. v. Evans*. Amendment 13 measures are more stringent than the court-ordered measures. The third step, then, was to examine the preliminary landings statistics for calendar year 2003, the first full year under the court-ordered management measures. For the major stocks of concern, the Council compared recent catches (calendar years 2000, 2001, 2002) to the proposed Amendment 13 TACs (calendar years 2004, 2005, and 2006). 2003 catches were estimated in a rudimentary way: using the preliminary commercial landings statistics for January through December, the Council calculated a ratio for 2003/2002 and applied that ratio to the total 2002 catch (including discards and recreational catch). In essence, this assumes that discards and recreational harvest change in the same way as commercial landings. The 2003 estimated catch was also compared to the catch projected to occur if fishing mortality in 2003 is the same as fishing mortality in 2002. For all stocks, it appears that the 2003 catch will be less than that projected assuming F2002=F2003. There are four stocks where it appears the 2003 catch will be less than the 2004 median TAC, and four stocks where it will be higher. These stocks are:

- Catch 2003 may exceed 2004 TAC: GOM cod, GB cod, CC/GOM yellowtail founder, white hake
- Catch 2003 may be less than 2004 TAC: plaice, SNE/MA yellowtail flounder, SNE/MA winter flounder, witch flounder

While the Amendment 13 management measures are more stringent than those for fishing year 2003, the Council believes it would be risky to recommend much of an incidental catch TAC for those stocks where the 2003 catch exceeds the 2004 TAC until there is a better understanding of the impact of the Amendment 13 measures. The Council is conservatively limiting the incidental catch of stocks of concern that results from using Category B DAS to two percent of the target TAC for those four stocks where the 2003 catch may exceed the 2004 target TAC, and five percent for those four stocks where the 2003 catch may be less than the 2004 target TAC. Table 50 shows the incidental catch TACs that result.

The target TACs for Amendment 13 represent a point estimate – in this case, the median – of the catch that is expected to result from the target fishing mortality. Because of uncertainty, there is a distribution around this median result – catches that result from the targeted fishing mortality rate could be higher or lower than this median value. One measure of uncertainty is the inter-quartile range – that is, the catches that reflect the fifty percent probability about the median value. Catches outside this range will probably not achieve the target fishing mortality rate. For example, catches that exceed this range have a twenty-five percent or less chance of achieving the target fishing mortality. The proposed incidental TACs were compared to the inter-quartile range. For the stocks with age-based assessments, the suggested incidental catch TACs fall well within the inter-quartile range of the TAC. This suggests these TACs, if caught, will not threaten the mortality objectives of Amendment 13.

The impacts of exceeding the median target TAC by a small percentage were examined for those four stocks where the Amendment 13 measures are expected to just meet mortality objectives. These are the stocks where the incidental catch TAC is set at two percent of the total TAC. For GB cod, GOM cod, and CC/GOM yellowtail flounder, short-term projections were run to determine the impact on the target fishing mortality rate if the catch is equal to 102 percent of the target TACs estimated in Amendment 13. A projection could not be run for white hake because it is not assessed through an age-based method. The projections were not extended into the years beyond 2006 because of uncertainty over how the program may be pursued in the future. The increased catch results in a slight increase in the expected fishing mortality for all three stocks, and the spawning stock biomass trajectory is slightly depressed as a result (Table 51). The impacts are minor in the short-term, but if extended into the future they would be expected to reduce the probability of rebuilding in the defined time period. For stocks using an adaptive rebuilding approach (GB cod, GOM cod), the rebuilding mortality from 2009 through the end of the period would have to be reduced. Phased rebuilding stocks (white hake, CC/GOM yellowtail flounder) would need adjustments as well at some point in the rebuilding period. These adjustments could be made after the update assessment called for by Amendment 13 in 2005, or the baseline assessment called for in 2008.

	Catch			
Stock/Calendar Year	**2000**	**2001**	**2002**	**Estimated 2003**
GOM cod	5,830	8,516	6,684	6,617
GB cod (1)	9,189	12,769	10,375	7,920
CC/GOM yellowtail	2,609	2,988	2,119	1,653
Plaice (landings)	4,213	4,433	4,023	2,736
White Hake	3,214	3,685	3,203	4,036
SNE/MA Yellowtail	1,000	1,100	828	381
SNE/MA Winter Flounder	4,792	5,102	3,438	2.303
Witch Flounder	2,554	3,243	3,465	3,326
Source: GARM or later assessment				

Table 48 – Recent catches of major stocks of concern (mt)

(1) US and Canadian landings. US landings were 7,617, 10,635, 9,100, and 6,582 mt

	TACs					
Calendar Year	**2004**		**2005**		**2006**	
	Median	IQ	Median	IQ	Median	IQ
GOM cod	4,850	4,377/5,382	6,372	5,814/6,978	7,470	6,673/8,470
GB cod	3,949	3,557/4,370	4,830	4,230/5,582	6,361	5,333/7,712
CC/GOM yellowtail	881	796/968	1,233	1,113/1,347	1,034	936/1133
Plaice	3,695	3,449/3,934	3,625	3,402/3,888	3,015	2,775/3,297
White Hake	3,839		3,822		3,805	
SNE/MA Yellowtail	707	531/1,263	1,982	1,157/5,339	3,325	1,616/8,414
SNE/MA Winter Flounder	2,860	2,607/3,130	3,550	3,193/3,955	4,445	3,966/4,999
Witch Flounder	5,174	4,596/5,858	6,992	6,129/7,918	7,667	6,723/8,821

Table 49 – Total TACs (mt) and interquartile range for fishing years 2004 through 2006

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

Table 50 – Recommended incidental catch TACs (mt) for fishing years 2004, 2005 and 2006 ("IQ" is the 25th and 75th percentiles)

		Projected F (median)			Median Projected SSB (A13 in parens)		
	A13 Target F	2004	2005	2006	2004	2005	2006
GOM cod	0.23	0.235	0.236	0.236	27,716 (27,745)	37,276 (37,362	42,408 (42,593)
GB cod	0.21	0.215	0.216	0.217	21,300 (21,360)	27,333 (27,445)	34,043 (34,228)
CC/GOM Yellowtail Flounder	0.26	0.266	0.268	0.176	2,729 (2,739)	3.997 (4,039)	5.285 (5,952)

Table 51 – Comparison of Amendment 13 target mortality (fully-recruited) and projected SSB (mt) to projected mortality and SSB if catch equals 102 percent of Amendment 13 target TAC

The second step in analyzing the incidental catches of stocks of concern is to examine the specific measures proposed to determine if they will make it difficult to monitor and enforce the incidental catch TACs. This is done for the specific details of each measure.

Category B (regular) DAS Pilot Program

This alternative includes a pilot program for the use of Category B (regular) DAS. The details for this program are specified in section 4.2.

Incidental catches (landings an discards) of stocks of concern that result from the use of Category B (regular) DAS are applied against the incidental catch TACs specified in section 4.2. As long as these catches can be adequately monitored, the impacts of this measure fall within the impacts described in the discussion of the incidental catch TACs (see above). The proposed measure includes the following requirements to ensure the incidental catch TACs are adequately monitored:

- Vessel Monitoring Systems (VMS): All participants are required to use an approved VMS system. This provides NMFS the ability to verify vessel location, and for the Coast Guard to verify vessels are fishing in open areas.
- Catch Reporting: Vessels are required to provide daily catch reports of stocks of concern (landings and estimated discards) via VMS. This enables NMFS to track daily progress towards achieving the incidental catch TACs, improving the service's ability to estimate if and when the TACs will be taken. With this ability top forecast achieving the TAC, NMFS will be able to take action to adjust the program (stopping the use of Category B DAS in a stock area) in order to prevent the incidental catch TAC from being exceeded.
- DAS "flip" provision: The proposed measure prohibits discard of legal-sized fish while on a Category B (regular) DAS and requires vessels to change to a Category A DAS if they exceed the daily landing limit. This may reduce discards under the Category B DAS program, reducing the amount of uncertainty over actual catches.
- Increased observer coverage: The measure calls for a targeted observer coverage of 20 percent of the DAS used in the program, or 400 DAS if all of the allocated DAS are used. An experiment has not been conducted that provides information on the precision of catch estimates that will result from this coverage. Based on other analyses of the groundfish observer program, this coverage should result in a precision of approximately (+/-) twenty percent in the estimates of catch (see, for example, sections 7.4.1.2).

In addition to the incidental catch TACs, the proposed measure includes low trip/possession limits for stocks of concern. There are two possible responses for vessels fishing under these low limits: their operators may choose to fish selectively and avoid the stocks of concern, or they may fish in an indiscriminate manner and discard stocks of concern in order to retain healthy stocks (note that the latter response would be illegal under the proposed action). The choice between these behaviors will depend, in part, on whether opportunities exist to target healthy stocks and avoid stocks of concern. The analysis described in section 7.2.4.2 – based solely on past fishing practices where there was no incentive to avoid stocks of concern - concludes that there may be opportunities to fish selectively. Because selective fishing provides an opportunity to use Category B (regular) DAS, fishermen may actually identify more opportunities than those identified.

These two behavioral choices can be used to further refine the likelihood that the incidental catch TACs will be taken. A "perfect" Category B (regular) DAS would be one in which a fisherman's catch of a stock of concern was equal to the possession limit. In that case, the fisherman would have received the revenue from the maximum amount of fish allowed without causing any discards. While it is possible that catches of stocks of concern could be lower than the possession limit, at that point the fisherman is sacrificing revenue from these stocks. If all Category B (regular) DAS are "perfect" DAS, the maximum number of DAS would be used under this program. By grouping the stocks of concern by area, it is possible to develop an estimate of how the different incidental catch TACs may interact and to see if a closure for one stock will preclude catching the incidental catch TAC for other stocks.

Table 52 shows the results of this analysis. In FY 2004, the incidental catch TACs for CC/GOM yellowtail flounder, GB cod, and white hake are likely to be caught before 1,000 Category B DAS are used. If this occurs, the catch of other stocks of concern will also be lower since the stock areas will be closed to Category B DAS fishing.

		TAC per Quarter (mt)	**Days to Catch TAC**	**TAC per Quarter (mt)**	**Days to Catch TAC**
	Daily Limit (pounds)	2004	2004	2005	2005
GOM cod	100	48.5	1,069	63.5	1,400
CC/GOM Yellowtail	25	9	794	12.5	1,102
Plaice	100	92.5	2,039	90.5	1,995
Witch Flounder	100	129.5	2,855	175	3,858
GB cod	100	19.75	435	24.25	535
White Hake	100	38.5	849	38	838
SNE/MA Yellowtail Flounder	25	17.5	1,543	49.5	4,365
SNE/MA Winter Flounder	100	71.5	1,576	89	1,962

Table 52 – Number of DAS before incidental catch TAC is caught, assuming daily catch equals possession limit (Note: GB cod TAC reduced by amount allocated to CAI hook gear haddock SAP and the CAII haddock SAP).

While the preceding analysis may be considered the best-case scenario for the use of Category B (regular) DAS, it is difficult to bound the worst case. Catches of stocks of concern on a Category B DAS could theoretically be unlimited and any amounts over the possession limit could be discarded. This would be most problematic if this activity was not detected and the excessive discards were completely undetected. A more practical approach to the worst-case scenario would be to assume that all unobserved trips have catch rates similar to those in recent years and any amount over the possession limit is discarded. This approach is difficult to use, however, because catch rates vary by gear, season, vessel size, area, changes in stock size, and changes in management measures (mesh size, gear quantities, etc.). In the worst-case scenario, NMFS would not have any indication of any discards of stocks of concern. This would require that all observed trips were "perfect" trips as described above – catches of stocks of concern exactly equal to the possession limit. As a result, NMFS would estimate progress toward the catch of the incidental TAC based on landings equal to the daily possession limit times the number of DAS fished. The maximum number of DAS fished would be equal to the TAC divided by the possession limit.

In order to analyze this scenario, twenty percent of the days fished – the observed days - are assumed to be "perfect" trips and the catch rate is set equal to the daily possession limit. For the unobserved trips, catch rates are assumed to match recent experience. To simplify the analysis, a standardized CPUE (lbs./day absent) was calculated for each species based on catch rates experienced from 1999 through 2001. For unobserved trips, any catch over the possession limit was assumed discarded and the discards not detected or reported. The number of Category B days at sea expected to impact each stock of concern was set to be the minimum days at sea needed to take the entire incidental TAC by stock region. This assumed that the number of Category B DAS could not be set higher than the amount needed to take the entire incidental TAC by stock using the daily limit. This calculation led to projected Category B (regular) DAS use for Gulf of Maine (1,587 days), Georges Bank (870 days), and Southern New England (2,000 days) for the two quarters in FY 2004, and projected Category B (regular) DAS use of 2,000 DAS (Gulf of Maine and Southern New England) and 1,070 (Georges Bank) for FY 2005.

Some of the biases in this approach are:

- The use of the aggregate average CPUE from the CPUE standardization analysis does not account for differences between gear, area, and season that may affect catch rates. However, since the distribution of fishing effort by gear, area and season under the Category B (regular) DAS Pilot Program cannot be predicted in advance, the use of average CPUE provides and overall measure of the central tendency of expected catch rates.
- The standardized CPUE does not include an adjustment for changes in stock size. Since most stocks are increasing in size, this will under-estimate catch rates. This problem increases as the estimates are calculated further into the future.
- The approach assumes that every day used results in additional mortality on every stock, clearly not possible given the range of stocks. This assumption inflates the catch of stocks of concern.
- The standardized CPUEs were calculated based on days absent that were not adjusted for the fact vessels will be charged a full twenty-four hours for any part of a calendar day spent on a Category B (regular) DAS. This will inflate the catch rates compared to what may be expected under the program.

In spite of these limitations, this approach is useful in illustrating the impacts if restrictions in the Category B (regular) DAS program are completely ineffective in controlling the incidental catch of groundfish stocks of concern. It bears repeating that this is not presented as a likely scenario, but as a worst-case scenario. The worst impacts would occur on CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, SNE/MA winter flounder and GB cod. The total catch on Category B (regular) DAS for these stocks is four to ten times higher than the incidental catch TAC. For CC/GOM yellowtail flounder and SNE/MA yellowtail flounder, the catch in this scenario is more than fifty percent of the total TAC. The least impacts are on witch flounder, where the total catch is about ten percent higher than the proposed incidental catch TAC and is only five percent of the total target TAC for 2004.

Stock	Daily Limit (pounds)	TAC (total) (mt)	Days	Standardized CPUE (lbs./day absent)	Total Catch (mt)
GOM cod	100	97	1,587	537	349
CC/GOM Yellowtail	25	18	1,587	608	354
Plaice	100	185	1,587	211.9	249
Witch Flounder	100	259	1,587	144	284
GB cod	100	39.5	870	537	355
White Hake	100	77	870	41	NA
SNE/MA Yellowtail Flounder	25	35	2,000	608	458
SNE/MA Winter Flounder	100	143	2,000	1498	1,158

Table 53 – Estimated catch on Category B (regular) DAS, worst case scenario (FY 2004)

Stock	Daily Limit (pounds)	TAC (mt)	Days	Standardized CPUE (lbs./day absent)	Total Catch (mt)
GOM cod	100	127	2,000	537	444
CC/GOM Yellowtail	25	25	2,000	608	448
Plaice	100	181	2,000	212	262
Witch Flounder	100	350	2,000	144	382
GB cod	100	48.5	1,070	537	218
White Hake	100	76	1,070	NA	NA
SNE/MA Yellowtail Flounder	25	99	2,000	608	522
SNE/MA Winter Flounder	100	178	2,000	1,498	1,193

Table 54 – Estimated catch on Category B (regular) DAS, worst case scenario (FY 2005)

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 4.3.1. 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 44. The distribution of cod to haddock caught is shown in Figure 18. 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 the number of trips was not sufficient to draw valid conclusions. Table 55 and Table 56 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.

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 500 lbs./DAS. 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.

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 19). Based on these results, it is not likely the SAP will result in an excessive catch of juvenile cod.

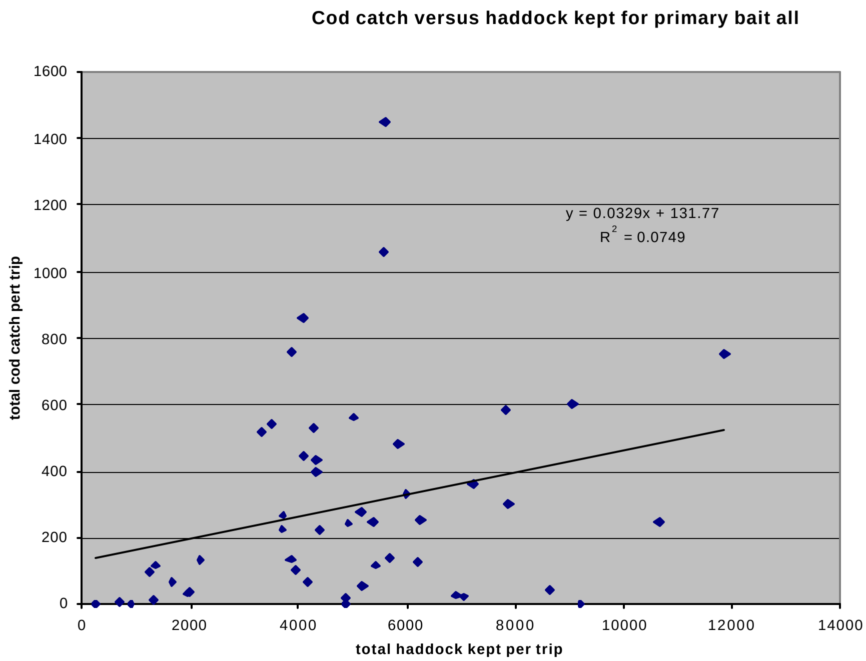


Figure 18 – Cod vs. haddock caught, all trips.

	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 55 – 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 56 – Summary statistics for cod and haddock, bait type = squid

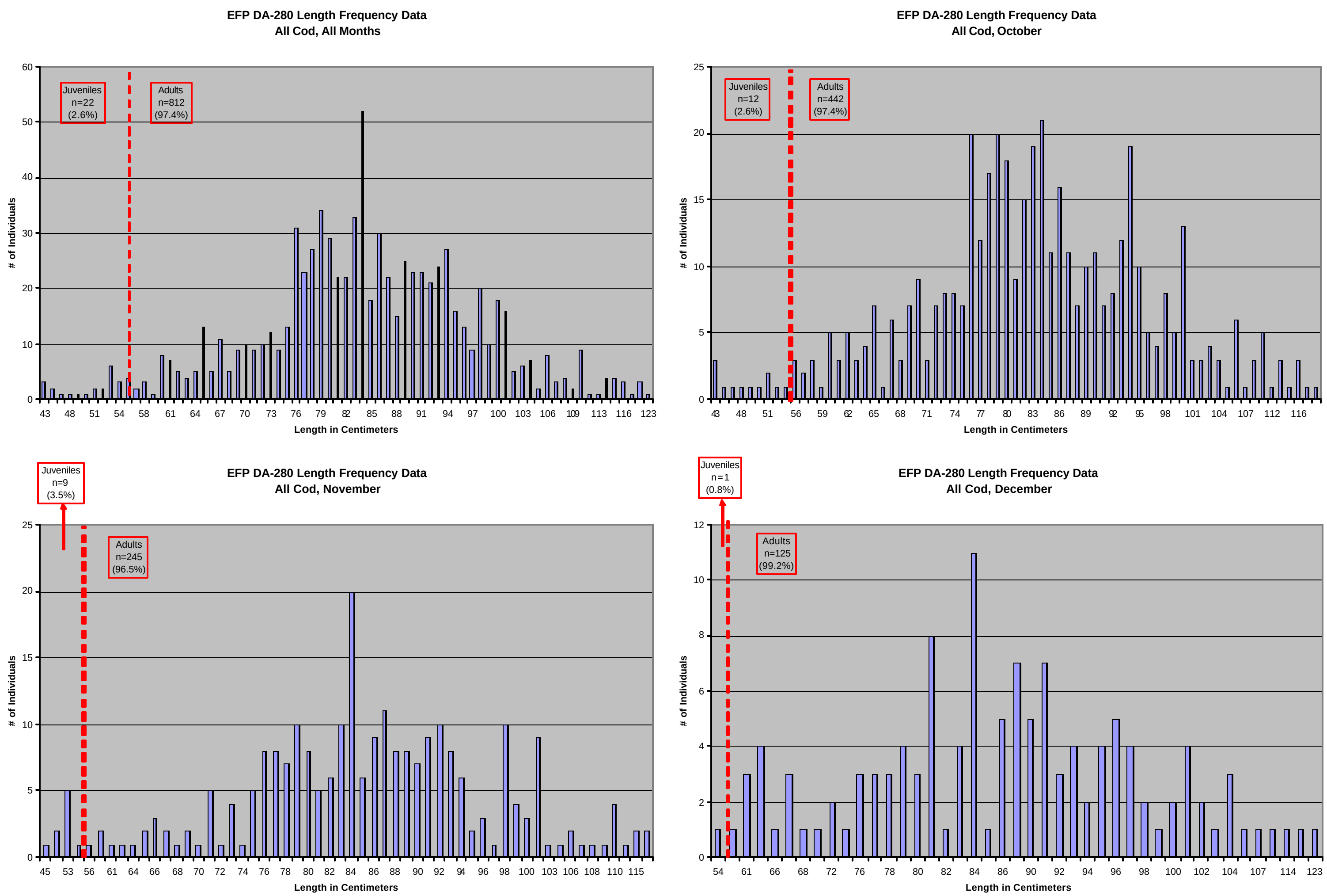


Figure 19 – Length/frequency distribution of cod caught in the CAI hook gear haddock experimental fishery

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 20, 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.

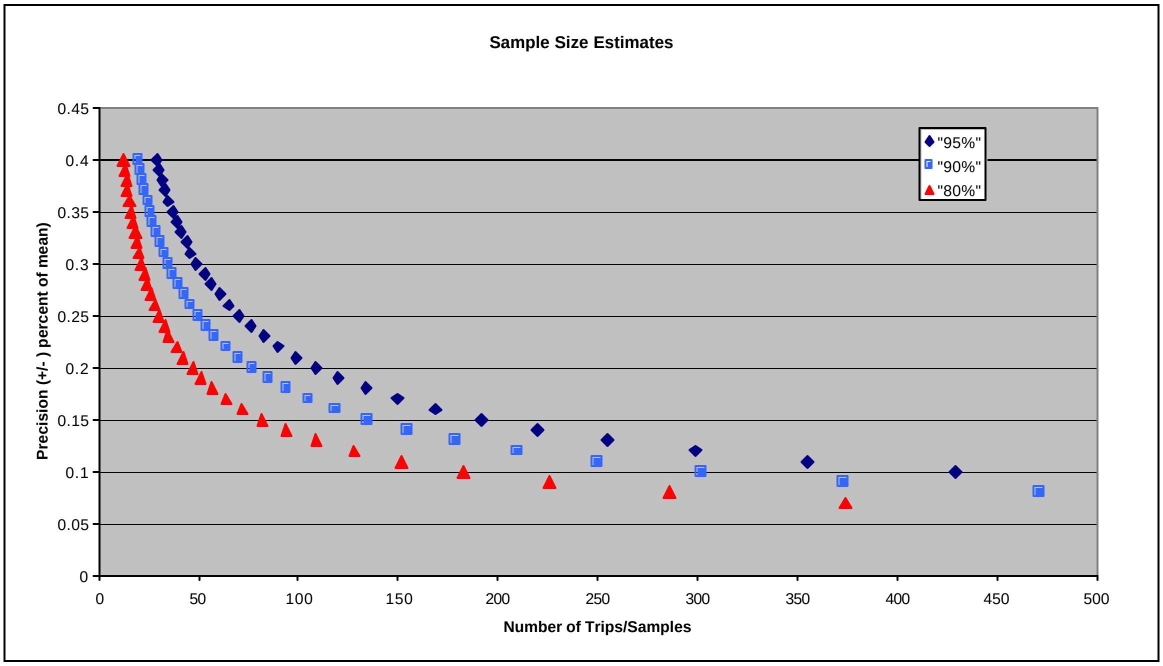


Figure 20 – Estimates of sample size necessary to estimate cod catch at a given level of precision for the CAI hook gear haddock SAP. Three confidence levels shown.

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.

CAII Haddock SAP

An experiment has not been conducted that estimates the incidental catch species that will be taken during the CAII haddock SAP. As a result, this analysis uses recent observer reports from the area and the results of several gear experiments to evaluate the impacts of this SAP on incidental catch species. First examined were observer reports for trawl trips in SA 561 and 562 from calendar years 2001 through 2003. A summary of observed tows by area and quarter is provided in Table 45. The analyses focus on 2002 and 2003 because of the higher level of observer coverage in SA 562. Note that for these tows, there was no requirement to use a haddock separator trawl. Catches of the top fifteen species are shown by statistical area for calendar years 2002 and 2003 in Table 57 and Table 58. Of the regulated groundfish species in this list, the stocks of concern that were caught most frequently in both years were cod, white hake, plaice, and witch flounder. Large quantities of skates were also caught and these catches will be discussed in a following section that analyzes bycatch.

The proposed SAP is allocated a portion of the GB cod incidental catch TAC. The observed trips were examined further to determine catch rates of cod and to estimate the number of days that may be fished before the cod TAC is caught. Cod catches on observed tows in 2002 averaged 109 lbs./tow for the entire area. The difference between the average cod/tow in SA 561 (166) and SA 562 (75) was statistically significant. Catch per tow on observed tows in 2003 was 245 lbs./tow. Once again, the catch per tow in SA 561 (365) was significantly higher than that in SA 562 (141). Catches for plaice, white hake, and witch flounder were less than 25 lbs./tow. 2003 tows were analyzed to determine the mean catch of cod on tows targeting haddock. For both areas, the average cod catch/tow was 235 lbs for tows targeting haddock. The cod catch/tow in SA 561 (457 lbs.) was significantly different than that in SA 562 (110 lbs.). According to the data, catches per tow of cod are higher in SA 561, while catches of haddock are higher in SA 562.

Before estimating total cod catch that could be expected in this SAP, the impacts of the haddock separator trawl requirement must be considered. The haddock separator trawl minimizes the catch of cod through a design that considers the behavior of fish in response to the gear. Generally, haddock swim to the upper part of a net and cod swim to the lower part of the net. By inserting a mesh panel in the net, and using two cod ends, the catch can be effectively divided. If the cod end on the lower part of the net is left open, the cod escape. This net has been in use for some time by Canadian vessels fishing on Georges Bank under a quota system. With low cod quotas, Canadian vessels have had to develop ways to minimize cod catch in order to take advantage of higher haddock quotas. A Canadian DFO project studied the effectiveness of a haddock separator trawl while conducting over 150 tows in 1990 and 1991. These experiments showed about 60% of the cod caught in the bottom of the trawl, with a range from 75 percent to 40 percent. Additional data was collected on pollock, silver hake, plaice, yellowtail, winter flounder, halibut, and mackerel. Nearly all pollock was caught in the top cod end, silver hake was split evenly between the two, and most flounders were caught in the bottom cod end. The report also notes that skates and sculpins were caught almost entirely in the bottom cod end and were nearly completely absent in the top cod end, though data were not reported on numbers and weights of these two species (DFO 1992). Engås et al. (1998) conducted experiments in Norwegian trawl fisheries using a separator panel and found similar results. 90 percent of the haddock were caught in the upper cod end, and between 60 and 70 percent of the cod were caught in the lower cod end. Engås et al. also noted some shifts in size selectivity, and commented that the height of the separator panel was critical and the optimum height may differ from area to area. One Canadian fleet owner recently reported that when effectively tuned, the net caught 95 percent of the haddock in the top end and 60 percent of the cod in the lower end (which would be released with an open cod end) (d'Entremont, per. comm. 2002). An additional experiment was conducted on Georges Bank and in the Gulf of Maine in 2003 (Raymond and Manomet 2004). In this experiment, 21 percent of the cod caught (by weight) were caught in the top cod end, with the remainder in the bottom cod end. While some differences were noted between the performance of the net for large and small vessels, the experiment concluded that the net could be effective in reducing cod catches. In addition, nearly all plaice, white hake, and witch flounder was caught in the bottom cod end in this experiment, suggesting that the trawl will nearly eliminate catches of these species while using the net to target haddock. Finally, the Council was provided raw observer data from Canadian vessels fishing on Georges Bank (under 65 ft. vessels, ITQ fishery) in 2003. For vessels using a haddock separator trawl, the average cod catch per hour was 49.6 lbs., while the average haddock catch was 389 lbs., a haddock to cod ratio of 7.8 to 1 (Giroux, pers. comm. 2004).

Species	**SA 561**		**SA 562**		**Grand Total**
	Discarded	**Kept**	**Discarded**	**Kept**	
ANGLER	955	17,246	479	4,008	22,688
COD	631	27,181	136	20,526	48,473
FLOUNDER, AM. PLAICE	150	5,486	3	13	5,652
FLOUNDER, SUMMER	66	192	4,633	2,399	7,289
FLOUNDER, WINTER	2	30,208	1,695	287,302	319,207
FLOUNDER, YELLOWTAIL	378	25,468	165	41,184	67,194
HADDOCK	292	15,966	758	18,163	35,179
HAKE, WHITE	77	4,823	9	34	4,943
LOBSTER	1,752	5,980	2,272	6,246	16,250
SCALLOP, SEA	261	8	6,514	3,490	10,273
SEA RAVEN	2,021	10	2,150	10	4,191
SKATE, LITTLE	14,428	1,352	111,140		126,920
SKATE, THORNY	2,779		1,883		4,662
SKATE, WINTER(BIG)	12,761	7,228	72,358	13,287	105,634
SKATES	5,980	70	35,401	2,303	43,754
Grand Total	42,532	141,218	239,594	398,962	822,307

Table 57 – Top fifteen species caught by otter trawls on observed tows in SAs 561 and 562, 2002 (pounds) (NMFS OBDBS)

Species	**SA 561**		**SA 562**		**Grand Total**
	Discarded	Kept	Discarded	Kept	
ANGLER	3,787	72,916	1,939	11,309	89,951
COD	11,210	190,872	1,412	89,895	293,388
FLOUNDER, AM. PLAICE	1,210	16,384	53	1,630	19,277
FLOUNDER, WINTER	1,554	85,278	432	354,303	441,566
FLOUNDER, WITCH	1,304	9,192	329	1,181	12,006
FLOUNDER, YELLOWTAIL	954	83,699	4,012	131,763	220,428
HADDOCK	3,313	39,560	6,656	199,215	248,743
HAKE, SILVER	759	243	212	17,111	18,325
LOBSTER	6,581	25,037	3,995	15,038	50,651
POLLOCK	24	19,115		445	19,584
SCALLOP, SEA	2,554	7,268	15,794	12,745	38,360
SEA RAVEN	5,027		7,412		12,439
SKATE, LITTLE	56,812		282,885		339,697
SKATE, WINTER(BIG)	66,581	46,318	330,624	56,742	500,264
SKATES	16,018	14,742	87,040	20,611	138,410
Grand Total	177,687	610,622	742,794	911,986	2,443,089

Table 58 – Top fifteen species caught by otter trawls on observed tows in SAs 561 and 562, 2003 (pounds round weight), 2003 (NMFS OBDBS)

Based on the results of these experiments, catch rates of cod by vessels in the SAP that are using a haddock separator trawl should be reduced by at least sixty to eighty percent compared to those observed in 2003. Additional reductions may be realized as vessel operators hone their use of the net, as has reportedly occurred with Canadian vessels. For trips targeting haddock in both statistical areas (average catch/tow across areas of 235 lbs.), the estimated catch rate is between 47 and 92 lbs./tow after reducing observed catch rates for the effects of the separator trawl. If seven tows per day were assumed, the catch of cod per day in both statistical areas would range from 329 lbs./day to 658 lbs./day. The Council is proposing a GB cod incidental catch TAC for this SAP of 27 mt (59,525 lbs.) in FY 2004 and 33 mt (72,753 lbs.) (see section 4.3.2). If the catch rates estimated are applied to these TACs, the number of days fished before the cod TAC is reached ranges from 90 to 221 (see Table 59 below) in fishing years 2004 and 2005. Given the analysis of haddock catch rates in a previous section, it is likely that participation in this SAP will be constrained by the incidental catch of cod rather than the haddock TAC.

The proposed SAP adopts a cod landing limit of 1,000 lbs. per trip. Based on the observed trips in this area in 2003, and the assumed performance of the haddock separator trawl based on experimental results in other areas, vessels may reach the cod trip limit in one and a half to three days. There is evidence, however, that as fishermen use the haddock separator trawl they can improve its ability to release cod. Canadian fishing vessel operators claim to achieve cod-to-haddock ratios of 40:1, which would result in cod catches of 134 lbs./day if the haddock catch is 5,360 lbs./day as estimated earlier. This report, however, is not entirely consistent with Canadian observer data provided to the Council that shows an average cod catch of nearly 50 lbs./hour of towing (Giroux, pers. comm. 2004). Even with an improvement in performance of the separator trawl, it is likely that this SAP will result in an increase in the cod discard-to-kept ratio compared to that observed in 2003 on Georges Bank (Table 60) for trips in this area that are longer than three days.

CAII Haddock SAP	**Assumed Cod Catch Rates**	
2004 GB Cod TAC	**329 lbs./day**	**658 lbs./day**
27 mt	181 days	90.5 days
2005 GB Cod TAC		
33 mt	221 days	110.6 days

Table 59 – Estimated fishing days before GB cod incidental catch TAC is caught using two different assumed catch rates, FY 2004 and FY 2005

Observer reports also show that this SAP may catch large amounts of winter flounder (Table 57 and Table 58). While GB winter flounder is not a stock of concern, analysis in Amendment 13 showed that considerable quantities of winter flounder may be caught in the CAII yellowtail flounder SAP. That analysis assumed that vessels would “top off” CAII yellowtail flounder SAP trips by targeting winter flounder and haddock in other parts of the eastern U.S./Canada area on the same trip. If this CAII haddock SAP were to result in yet further effort on winter flounder, it is possible that the combined catches could exceed the GB winter flounder target TAC and Amendment 13 mortality objectives. Vessels in this SAP that target haddock are likely to use a haddock separator trawl. Canadian researchers reported that less than 10 percent of winter flounder catches were caught in the lower cod end of vessels using a separator trawl (DFO 1992). While a recent experiment on Georges Bank did not catch significant amounts of winter flounder, that experiment documented that other flatfish were most often caught in the lower codend (Raymond and Manomet 2004). These results suggest that the requirement to use a haddock separator trawl will reduce winter flounder catches and will make it unlikely that this SAP will threaten GB winter flounder mortality objectives.

The proposed action modifies the GB cod landing limit for the CAII Yellowtail Flounder SAP. Under existing regulations, the cod landing limit is 100 lbs./DAS, with a maximum of 1,000 lbs./trip. The proposed action would change this limit to a 1,000 lb. possession limit and requires that vessels “flip” the DAS if this is exceeded. While there is a possibility this will encourage small scale targeting of cod on trips in the CAII Yellowtail Flounder SAP, it will not increase the total catch since the cod catch in this area is subject to the hard TAC implemented as part of the U.S./Canada Resource Sharing Understanding.

Because the likely constraint on the number of days fishing in this SAP will be the cod incidental catch, adequate monitoring of the cod catch (landings and discards) is crucial. The proposed measures include requirements for daily reporting of cod and haddock catches via VMS, helping NMFS to monitor progress to catching the respective TACs. In addition, there is a requirement for sufficient observer coverage to ensure the objectives of the SAP are met. An experiment has not been conducted that would provide data to estimate the level of precision that will result from this observer coverage (as was done for the CAI hook gear SAP). In the absence of an experiment, observed trawl trips on all of Georges Bank in 2003 were examined. The discard-to-kept ratios for cod were broken down by quarter (Table 60). The results were used to calculate the level of precision that will result from different numbers of observed trips (Figure 21).

In order to determine the number of trips in this area that may be sampled by the proposed observer coverage, the total number of days of coverage must be estimated. This estimate is contingent on whether the GB cod or GB haddock TACs prove to be the constraint on the number of days fished in the area, and whether the estimated catch rates are actually observed in the fishery. Because the GB cod incidental TAC is set at 27 mt for FY 2004, and taking into account the differences in cod catch rates between the two statistical areas, the number of days fished in this SAP could be as low as 90 or as high as 180 in FY 2004. Since it takes roughly one day of steaming time each way, the trip length in the area should be about five days based on the average trip length for all Georges Bank trips. The level of precision expected to result from the number of trips observed can be estimated using Figure 21.

GEAR	NEGEAR	QTR	NTOWS	NTRIPS	DK RATIO	SE	CV	AVGTRIPLEN
Otter Trawl	050	1	870	44	0.022276	0.005249	0.23563	7.79545
Otter Trawl	050	2	1007	51	0.057103	0.022352	0.39144	7.56863
Otter Trawl	050	3	629	36	0.021859	0.007097	0.32467	7.41667
Otter Trawl	050	4	620	35	0.042271	0.011776	0.27858	7.34286

Table 60 - 2003 Discard/Kept ratios of Cod from Georges Bank otter trawl (050) & longline (010) trips by quarter

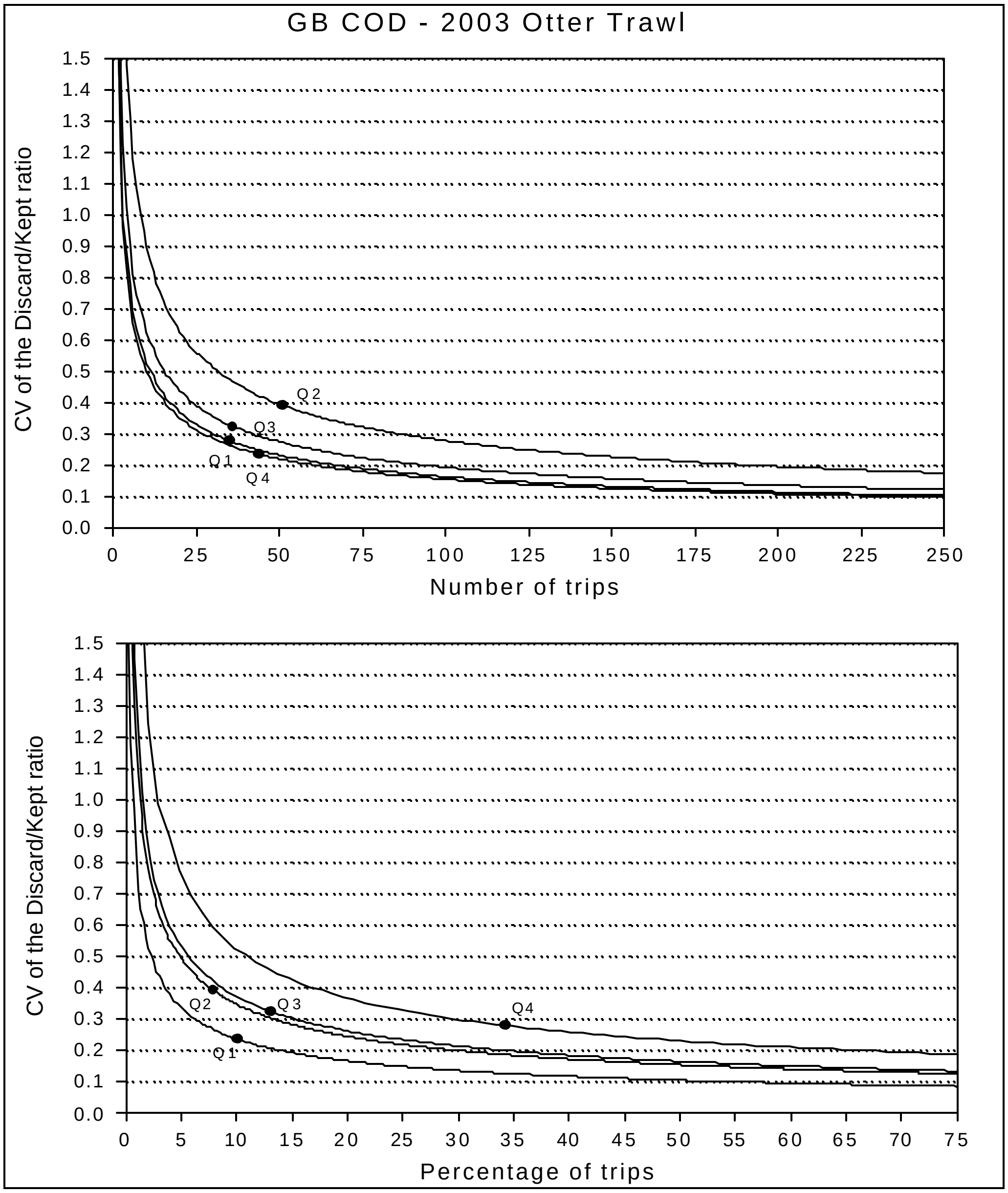


Figure 21 – CV resulting from a given number of observed trips, based on discard/kept ratio for cod as observed in 2003

The proposed season for this SAP is for May through December. Participation in the SAP will not be allowed during January through April in order to minimize interference with groundfish spawning, but some fishing will be allowed during these months in the area to the west of CAII while under a Category A DAS. The primary difference between the No Action alternative and this SAP is that a small area at the northern end of CAII is open to fishing under the SAP conditions. By not allowing this SAP to take place in this area during January through April, there is likely to be little interference with groundfish spawning. The primary concern is over cod spawning given recent poor cod recruitment on Georges Bank. There are three main issues to consider:

(1) The time of spawning activity in the groundfish closed areas (in particular, the northern tip of CAII);

(2) The absence or presence of spawning activity in the groundfish closed areas (in particular, the northern tip of CAII); and
(3) Trawl impacts on groundfish spawning.

For decades, the closed areas on Georges Bank have been recognized as important to groundfish spawning, particularly for cod, haddock, and yellowtail flounder. The two areas were first established as seasonal spawning closures under ICNAF. They continued to be used as spawning closures – primarily to protect cod and haddock - under the groundfish plan until they became year round closed areas in 1994. Prior to their establishment as year round closed areas, however, scallop dredge fishing was allowed in the seasonal spawning closures. Closed area access programs since 1997 limited scallop dredge access to periods outside of peak spawning periods, and a similar restriction was recently submitted by the Council in Scallop Framework Adjustment 16.

Observed spawning periods are described in the Essential Fish Habitat source documents for each species. This information is summarized in Table 63 below for many North Atlantic finfish. For many species, there is a wide range of possible spawning months, but there is also a distinct peak when most spawning activity occurs. The general pattern is for spawning to occur in the southern part of the range for a species earlier in the year, and then move north. For most groundfish species, spawning takes place during the first half of the calendar year. Peak spawning for witch flounder and yellowtail flounder is in the middle of the year. Peak spawning for ocean pout occurs in the fall, while for Atlantic halibut it occurs in November and December.

The seasonal nature of spawning can also be determined by examining distributions of eggs documented by the MARMAP surveys. Table 64 summarizes the distribution of eggs, indicating the periods with the largest observed densities. Charts of egg collections also illustrate the seasonal and geographic distribution of spawning for groundfish stocks (keeping in mind that egg distributions lag actual spawning activity since depending on species and environmental conditions, eggs may require from three days to two weeks to hatch after spawning,). These charts are reproduced in Figure 22 through Figure 28 for those groundfish species that spawn in the vicinity of CAI and CAII. For most groundfish species, eggs are pelagic and thus are dispersed by water currents, so these charts do not precisely indicate the locations of spawning activity. Still, they do give some indication of the general locations of spawning for each species and show that there are high concentrations of eggs – and presumably spawning activity - in the groundfish closed areas. (Winter flounder eggs are demersal and adhesive, though some were collected in the MARMAP surveys. Generally, winter flounder eggs on Georges Bank were collected on sandy bottoms, in depths of one to forty fathoms on Georges Bank and Nantucket Shoals).

In order to provide a subjective summary of the key months for groundfish spawning activity on Georges Bank, the information from Table 63 and Table 64 was used to identify a monthly index of spawning activity and egg distributions. For each groundfish species, a value was assigned for the distribution of eggs or spawning activity: a 1 was assigned for peak activity, a 2 for some activity, and a 3 for no activity. These scores were then averaged, and the months then ranked. A lower score thus means there was more activity observed during that particular month. This ranking suggests that the most important months – taking into account the major groundfish species as a whole - are February through June (Table 62).

Additional indications of the importance of the closed areas to spawning activity can be determined from the spring trawl surveys. While these surveys are not specifically timed to coincide with groundfish spawning, ripe and running fish are caught by the surveys. The number of ripe and running cod and haddock were plotted to determine if these fish are more common in the Georges Bank closed areas. Plots are shown in Figure 29 and Figure 30. Spawning haddock have been caught throughout Georges Bank during the period 1974 through 2003. The highest distribution of ripe and running haddock caught in the spring survey occurs on the eastern part of Georges Bank, in Canadian waters. Other than this area, there are secondary concentrations within CAI and CAII (primarily along the Hague Line), as well as in the Great South Channel west of CAI. Fewer ripe and running cod have been caught by the NMFS spring survey, particularly on Georges Bank in recent years. The plot of locations for where ripe fish have been caught show once again that the northeastern peak of GB is an important spawning area. Other important areas include CAI and the area north of Cultivator Shoals. These figures show that CAI and CAII are important areas for haddock spawning activity. This examination did not provide as conclusive results for cod, but do indicate that CAI may be an important area for cod spawning.

The Canadian spring groundfish survey samples Georges Bank in February. Data from the surveys on the spawning condition of cod was plotted to determine the impacts of allowing trawling in the northern tip of CAII during January and February (Figure 31 through Figure 33). The Canadian survey has more stations in Canadian waters. In general, the greatest concentration of spawning fish is found by these surveys on the Northeast Peak of Georges Bank. Cod are believed to move from the southwest to the northeast to spawn during the winter months, so pre-spawning fish may be in the northern tip of CAII during January and February. The Canadian survey has caught a few pre-spawning and spawning fish in the northern corner of CAII that will be open to fishing under the proposed SAP.

The final question to consider is whether trawl fishing interferes with groundfish spawning. There is evidence that fishing activity can disrupt spawning of cod due to the nature of spawning and the impacts of fishing gear. Cod have been shown to have distinctive spawning behaviors. Male cod compete for females and display for female individuals through circling behavior. Males also form a dominance hierarchy based on size. Female cod descend to the bottom to spawn, select males, and initiate spawning. The females release eggs about five hours after ovulation. If spawning behavior is disturbed, viable eggs may become non-viable if retained too long in the female ovary. (Hutching et al. 1999). Another study has shown that males arrive at spawning areas first and establish territories. Both female and male dominated shoals form. The male dominated shoals tend to be shallower and are where spawning occurs, whereas the female-dominated shoals consist mostly of spent females (Morgan and Trippel 1996). Morgan et al. (1997) reported direct evidence of the disruption of spawning aggregations by bottom trawls. An echosounder transect of a trawl track showed that trawling produced a 300-meter wide hole in spawning aggregations of cod. Densities were very low in an near the trawl track and increased up to a distance of 200-400 meters on each side of the track, with the disturbances observed to last for over an hour. These disturbances extended for a distance greater than the “hole” caused by removal of fish by the net.

In summary, CAI and CAII are important areas for groundfish spawning activity. The peak months for this activity are the period January through June, though the time of spawning varies for each species. There is direct evidence that trawl fishing disrupts the behavior of spawning cod. This is a concern for cod, since spawning biomass in 2002 was only 12 percent of the rebuilding target. While in recent years the Canadian survey has caught some ripe and/or spawning cod in this area, there is more spawning activity to the east on the Northeast Peak. The proposed SAP does not allow fishing in CAI during the peak spawning months and so will not have adverse impacts on groundfish spawning..

Month	Mean score Eggs	Mean score Spawning activity	Mean score both
January	2.22	2.33	2.28
February	2.11	2.22	2.17
March	1.89	2.22	2.06
April	1.89	1.78	1.83
May	1.89	1.67	1.78
June	2.11	2.22	2.17
July	2.33	2.44	2.39
August	2.56	2.44	2.50
September	2.56	2.67	2.61
October	2.56	2.78	2.67
November	2.33	2.22	2.28
December	2.22	2.33	2.28

Table 61 - Mean monthly scores for Georges Bank American Plaice, Atlantic cod, Atlantic halibut, Georges Bank haddock, pollock, red hake, Georges Bank windowpane, winter flounder, Georges Bank witch, and yellowtail. 1=peak month, 2=common month, 3=uncommon or none.

Month	Mean score Eggs	Mean score Spawning activity	Mean score both
January	6	7	6
February	4	3	4
March	1	3	3
April	1	2	2
May	1	1	1
June	4	3	4
July	8	9	9
August	10	9	10
September	10	11	11
October	10	12	12
November	8	3	6
December	6	7	6

Table 62 - Ranking of monthly scores for spawning activity (1=highest ranking, 12=lowest).

spawning months
peak spawning months

Species	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov,	Dec.	Notes
American Plaice			spawning	peak	peak	spawning							
GB Atlantic Cod	peak	peak	spawning	peak	peak						spawning	spawning	*peaks in winter and spring
GOM Atlantic Cod	spawning	spawning	spawning	peak	spawning	spawning	spawning				spawning	spawning	
Atlantic Halibut	spawning	spawning	spawning	spawning							peak	peak	*spawning in late winter early spring
GB Haddock	spawning	spawning	peak	peak	spawning	spawning							
GOM Haddock		peak	peak	peak	spawning								
Browns Bank Haddock			spawning	peak	peak	spawning							
Northern Ocean Pout								spawning	peak	peak	spawning	spawning	
Southern Ocean Pout								peak	peak	peak	spawning	spawning	
Scotian Shelf Pollock	peak	peak	spawning	spawning					spawning	spawning	spawning	peak	
GOM Pollock	spawning	spawning									spawning	peak	
Redfish	spawning	spawning	spawning	spawning						spawning	spawning	spawning	*copulation from Oct-Jan; fertilization from Feb-April; no peak times given
Northern White Hake								spawning	spawning				*no peak times given
Southern White Hake				spawning	spawning								*no peak times given
GB Windowpane					peak	spawning	spawning	spawning					
MAB Windowpane		spawning	spawning	spawning	peak				spawning	spawning	spawning		*split spawning seasons
Winter Flounder	spawning	peak	peak	spawning	spawning						spawning	spawning	
GB Witch Flounder				spawning	peak	peak	peak	peak	spawning	spawning	spawning		
GOM Witch Flounder				spawning	peak	peak	peak	peak	spawning	spawning	spawning		
MAB Witch Flounder				spawning	peak	peak	spawning	spawning					
SNE Yellowtail Flounder			spawning	peak	peak	peak	spawning	spawning	spawning				
MAB Yellowtail Flounder			spawning	peak	peak	peak	spawning	spawning	spawning				
GB Yellowtail Flounder			spawning	peak	peak	peak	spawning	spawning	spawning				
GOM Yellowtail Flounder			spawning	peak	peak	spawning	spawning	spawning	spawning				
Yellowtail Flounder			spawning	spawning	spawning	peak	peak	spawning	spawning				*north into Canadian waters

Table 63 - Spawning periods for North Atlantic finfish. (Source: Essential Fish Habitat source documents)

Species	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Notes
GB Atlantic Herring													
GOM Atlantic Herring													
Nova Scotia Atlantic Herring													
Jefferys Ledge Atlantic Herring													*no peak times given
Nantucket Shoals Atlantic Herring													
Goosefish													
Offshore Hake													*no peak times given
GB Red Hake													
GOM Red Hake													
NYB Red Hake													
GB Silver Hake													
GOM Silver Hake													*no peak times given
SNE Silver Hake													*no peak times given
MAB Silver Hake													*no peak times given
Red Deepsea Crab													*fall - spring; no peak times given
Barndoor Skate													*no peak times given
Clearnose Skate													*no peak times given
Little Skate													
Rosette Skate													*no peak times given
Smooth Skate													*no peak times given
Thorny Skate													*no peak times given
Winter Skate													*no peak times given

Table 63 - Spawning periods for North Atlantic finfish. (Source: Essential Fish Habitat source documents) (cont.)

hatching months
peak hatching months

Species	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Notes
GB American Plaice	hatching	hatching	hatching	hatching	hatching	hatching						hatching	*no peak times given
GOM American Plaice	hatching											hatching	*no peak times given
Atlantic Cod	peak	peak	peak	peak	peak				hatching	hatching	hatching	peak	*peaks winter and spring
Atlantic Halibut	hatching	hatching	hatching	hatching							peak	peak	*same info as spawning adults
GB Haddock	hatching	hatching	peak	peak	hatching	hatching							
GOM Haddock		peak	peak	peak	hatching								
Browns Bank Haddock			hatching	peak	peak	hatching							
Ocean Pout	hatching	hatching							hatching	hatching	hatching	hatching	*no peak times given
Pollock	hatching	hatching	hatching	hatching	hatching	hatching				hatching	peak	hatching	
Redfish													*eggs fertilized internally and released as larvae
White Hake								hatching	hatching				*no peak times given
GB Windowpane					hatching	hatching	hatching	hatching	hatching	hatching			*no peak times given
MAB Windowpane		hatching	hatching	hatching	peak	hatching	hatching		hatching	hatching	hatching		
Winter Flounder	hatching	peak	peak	hatching	hatching								
GB Witch Flounder					hatching	hatching	peak	peak	hatching				
GOM Witch Flounder					hatching	hatching	peak	peak	hatching				
MAB Witch Flounder			hatching	hatching	peak	peak	hatching	hatching	hatching	hatching			
SNE Yellowtail Flounder			hatching	peak	peak	peak	hatching						
GOM Yellowtail Flounder				hatching	hatching	hatching	hatching	hatching	hatching				*no peak times given
Yellowtail Flounder		hatching	hatching	peak	peak	peak	hatching	hatching	hatching				*no stocks given

Table 64 - Observed hatching months for North Atlantic finfish (Source: Essential Fish Habitat source documents)

Species	***January***	***Feb.***	***March***	***April***	***May***	***June***	***July***	***August***	***Sept.***	***Oct.***	***Nov.***	***Dec.***	***Notes***
GB Atlantic Herring													*hatch with 10-15 days of spawning
GOM Atlantic Herring													*hatch with 10-15 days of spawning
Nova Scotia Atlantic Herring													*hatch with 10-15 days of spawning
Jefferys Ledge Atlantic Herring													*hatch with 10-15 days of spawning
Nantucket Shoals Atlantic Herring													*hatch with 10-15 days of spawning
Goosefish													
Offshore Hake													
Red Hake													
GB Silver Hake													
GOM Silver Hake													*no peak times given
SNE Silver Hake													*no peak times given
MAB Silver Hake													*no peak times given
Red Deepsea Crab													*no peak times given
Barndoor Skate													*no peak times given
Clearnose Skate													*no peak times given
Little Skate													*laid in spring; hatched in late fall, winter
Rosette Skate													*no peak times given
Smooth Skate													*no peak times given
Thorny Skate													*throughout entire year; highest in summer
Winter Skate													*no peak times given

Table 64 - Observed hatching months for North Atlantic finfish (Source: Essential Fish Habitat source documents)(cont.)

Figure 22 - Distribution and abundance of Atlantic cod eggs collected during NEFSC MARMAP ichthyoplankton surveys, February through May, 1978-1987 [see Reid *et al*. (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

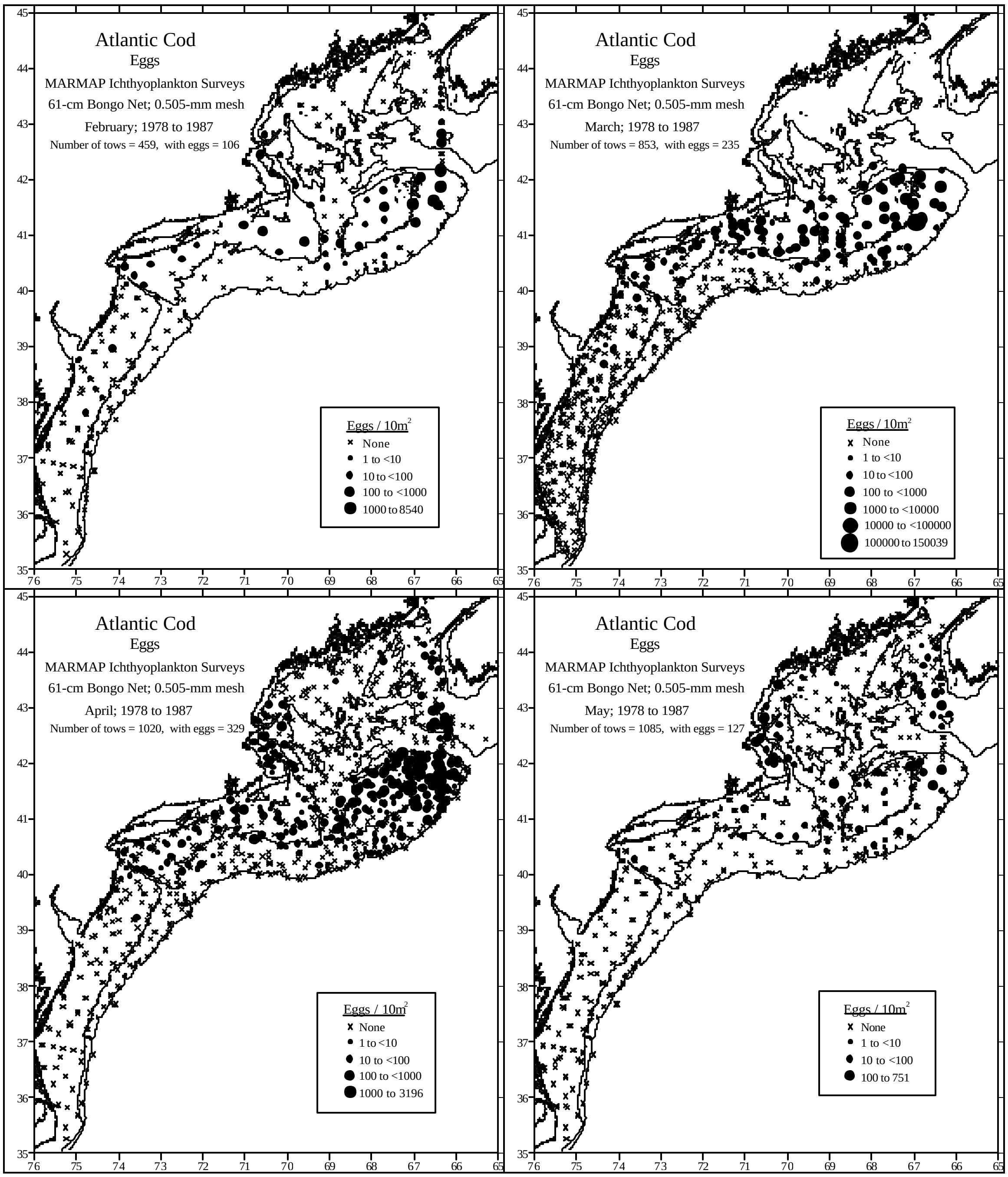


Figure 23 - Distribution and abundance of haddock eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

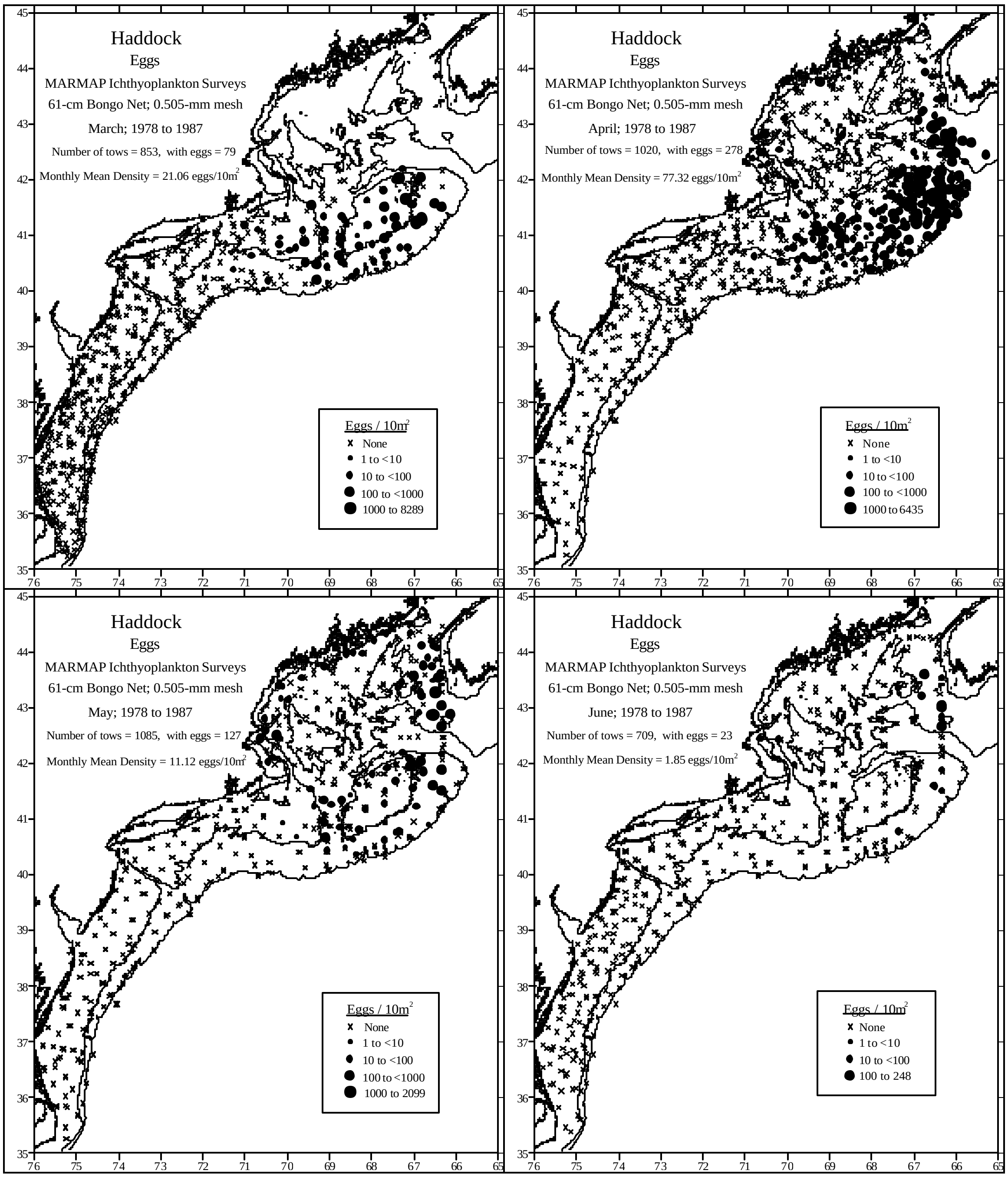


Figure 24 - Distribution and abundance of American plaice eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

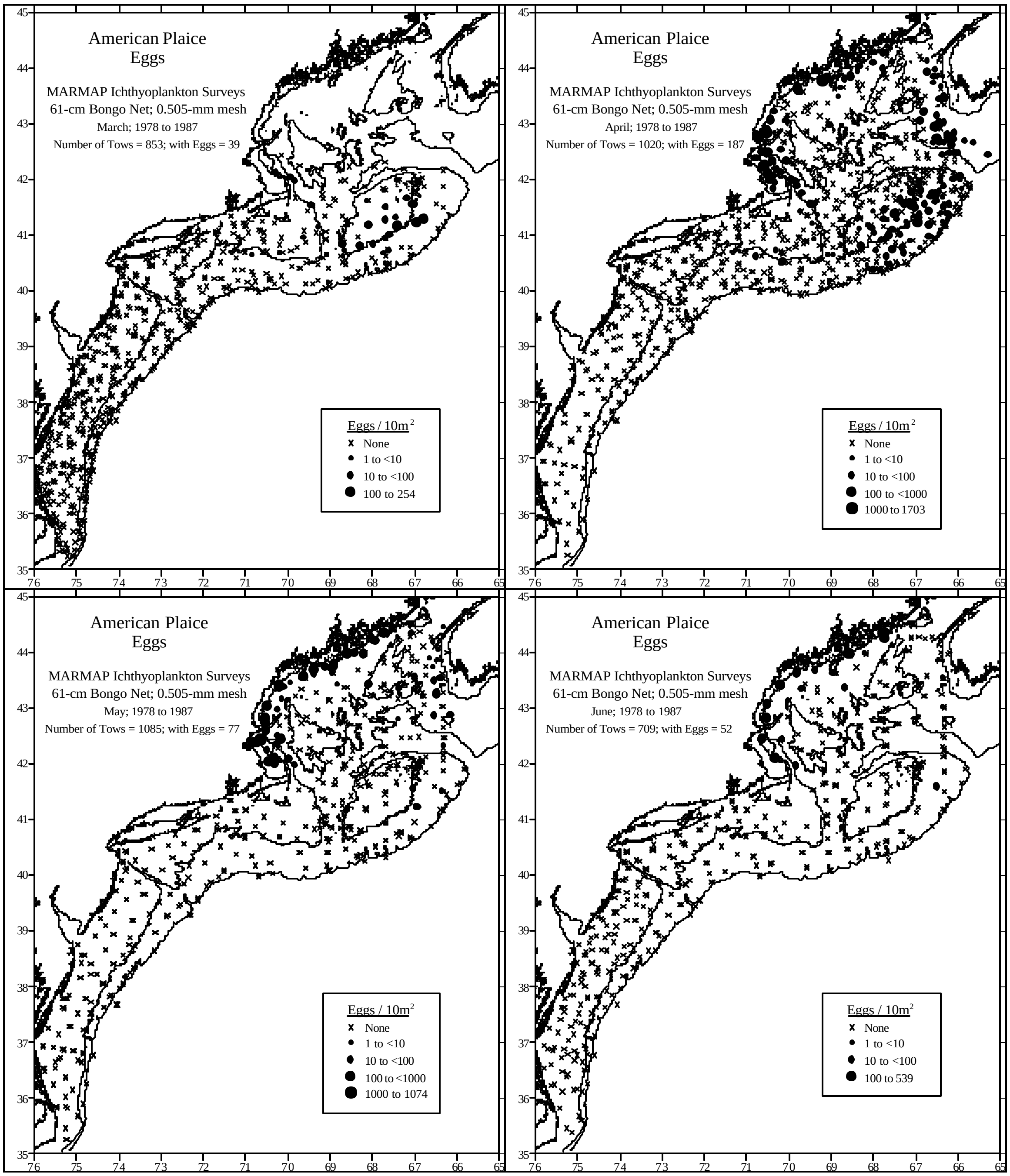


Figure 25 - Distribution and abundance of hake (all spp.) eggs collected during NEFSC MARMAP ichthyoplankton surveys, June through September through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

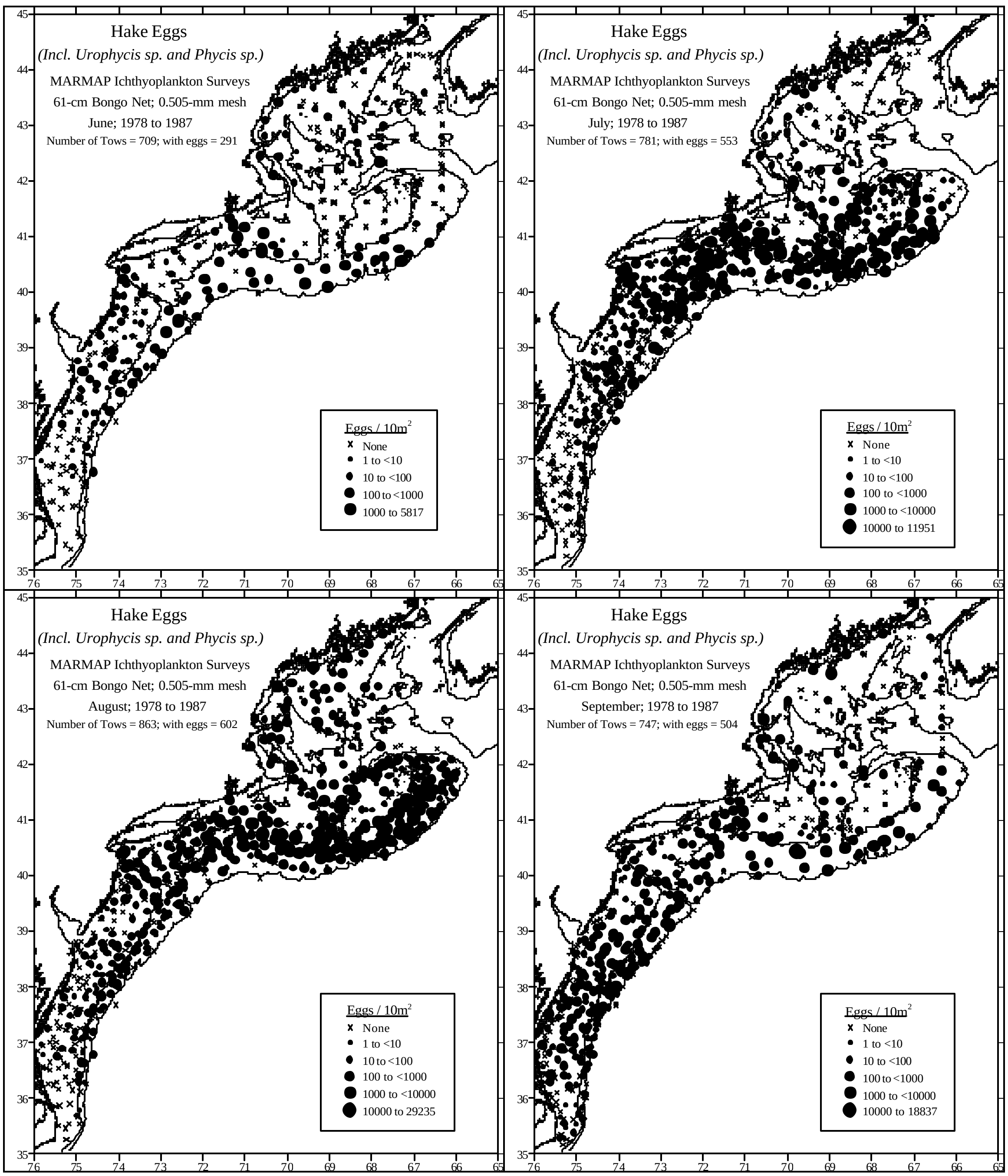


Figure 26 - Distribution and abundance of yellowtail flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

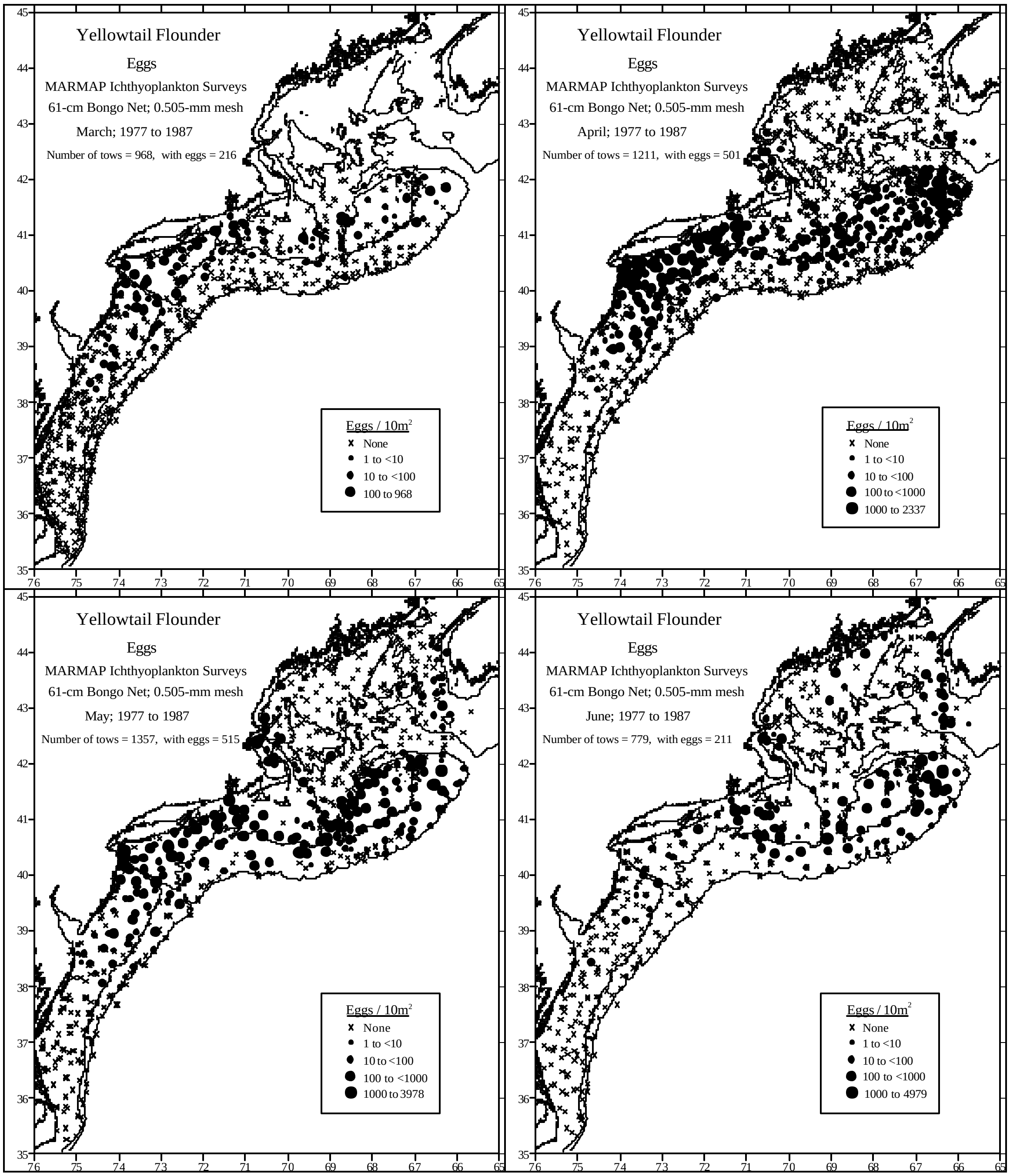


Figure 27 - Distribution and abundance of winter flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, March through June, 1978-1987 [see Reid *et al.* (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.

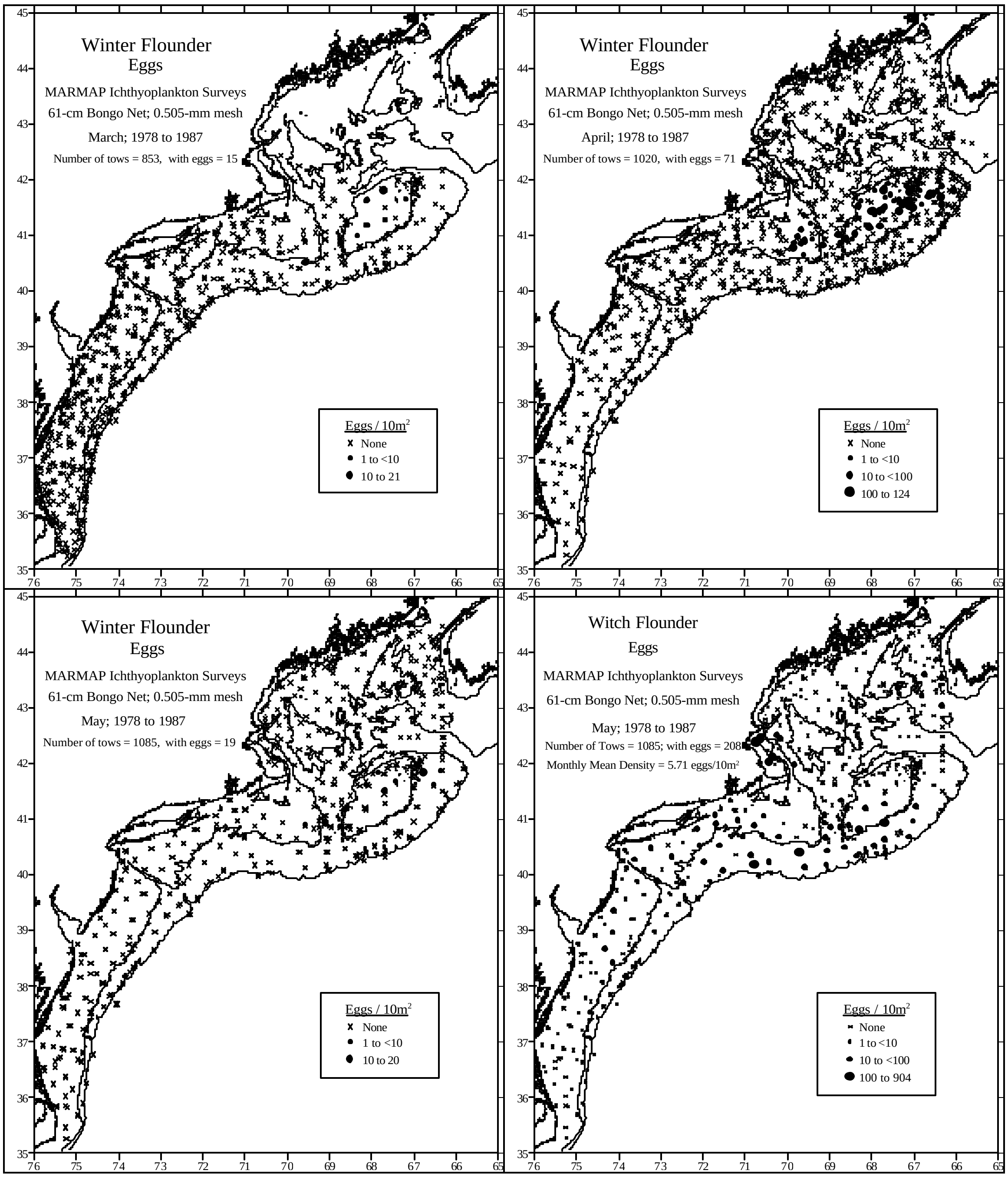
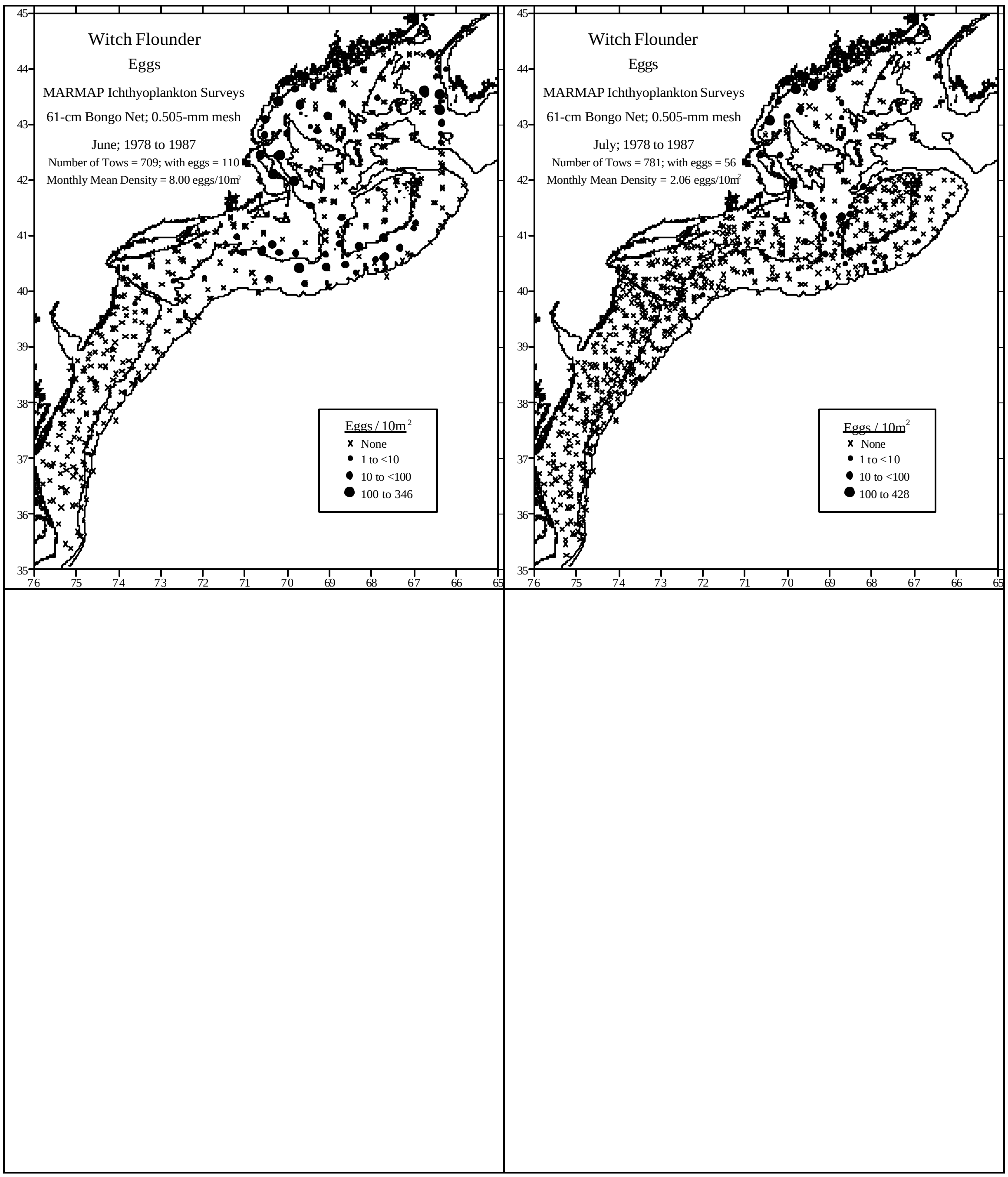


Figure 28 - Distribution and abundance of witch flounder eggs collected during NEFSC MARMAP ichthyoplankton surveys, June and July, 1978-1987 [see Reid *et al*. (1999) for details]. Abundance is represented by dot size, and sampling effort is indicated by small x.



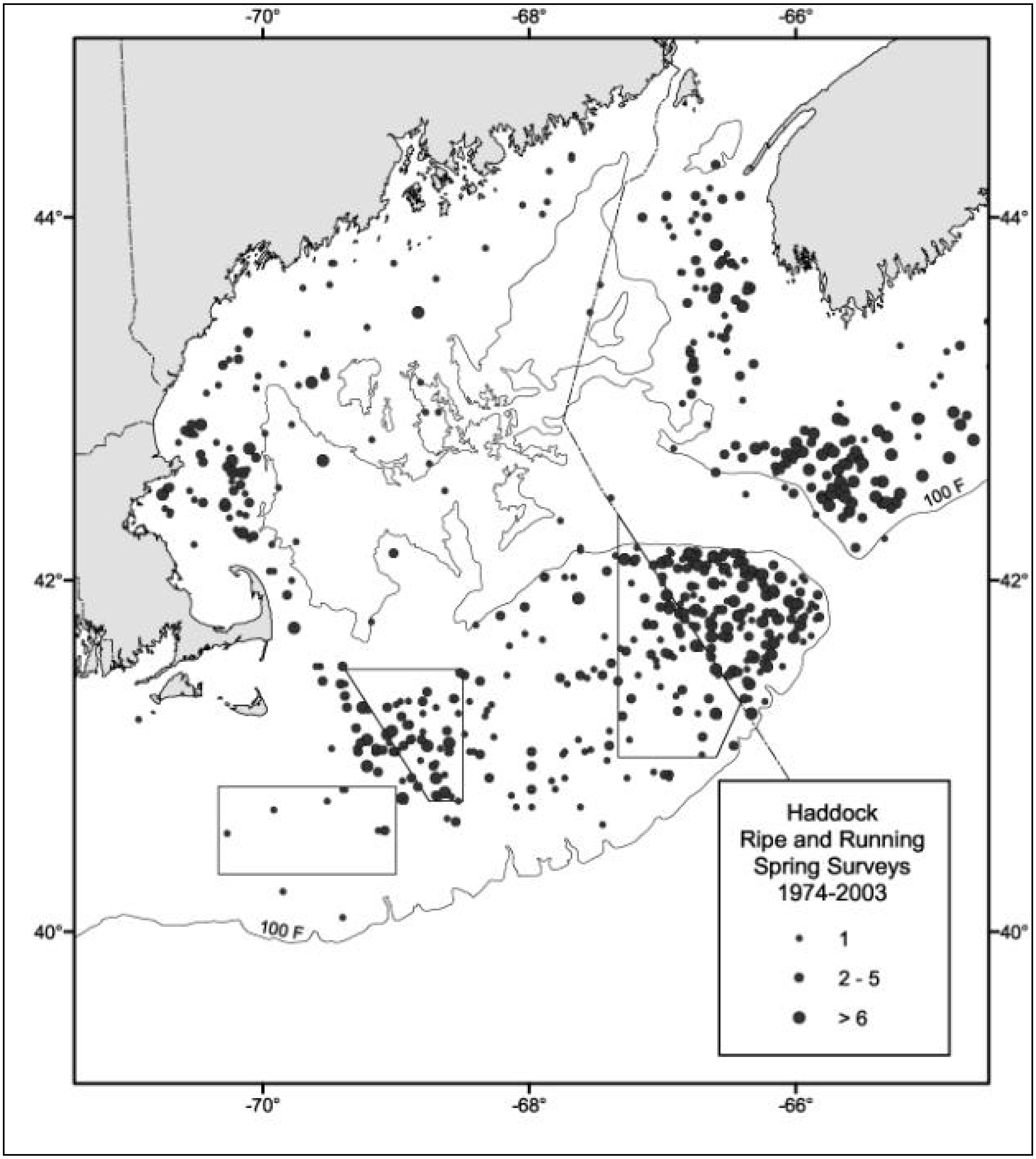


Figure 29 - Catch of ripe and running haddock in the spring trawl survey, 1974-2003

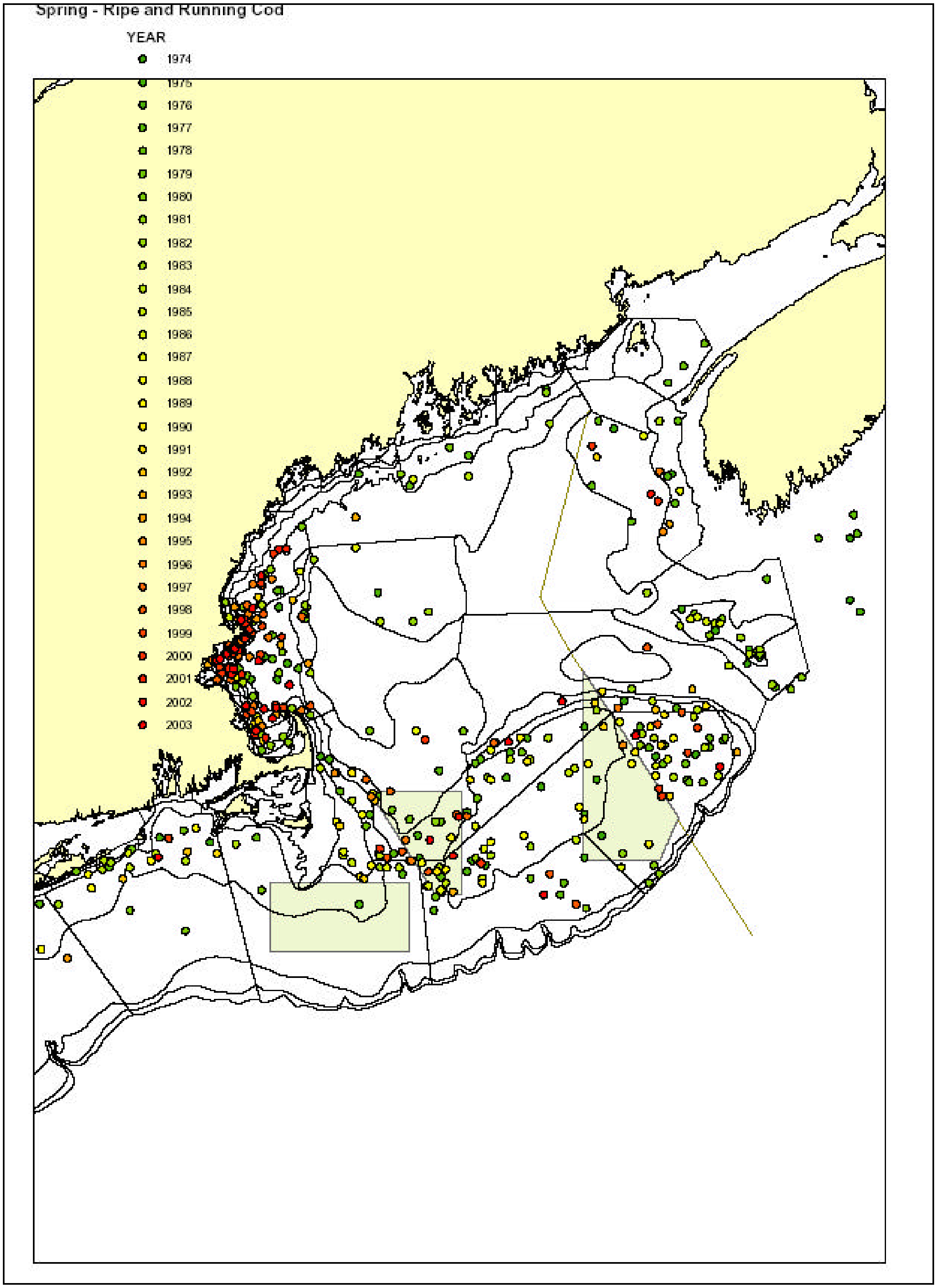


Figure 30 - Ripe and running cod caught by the spring trawl survey

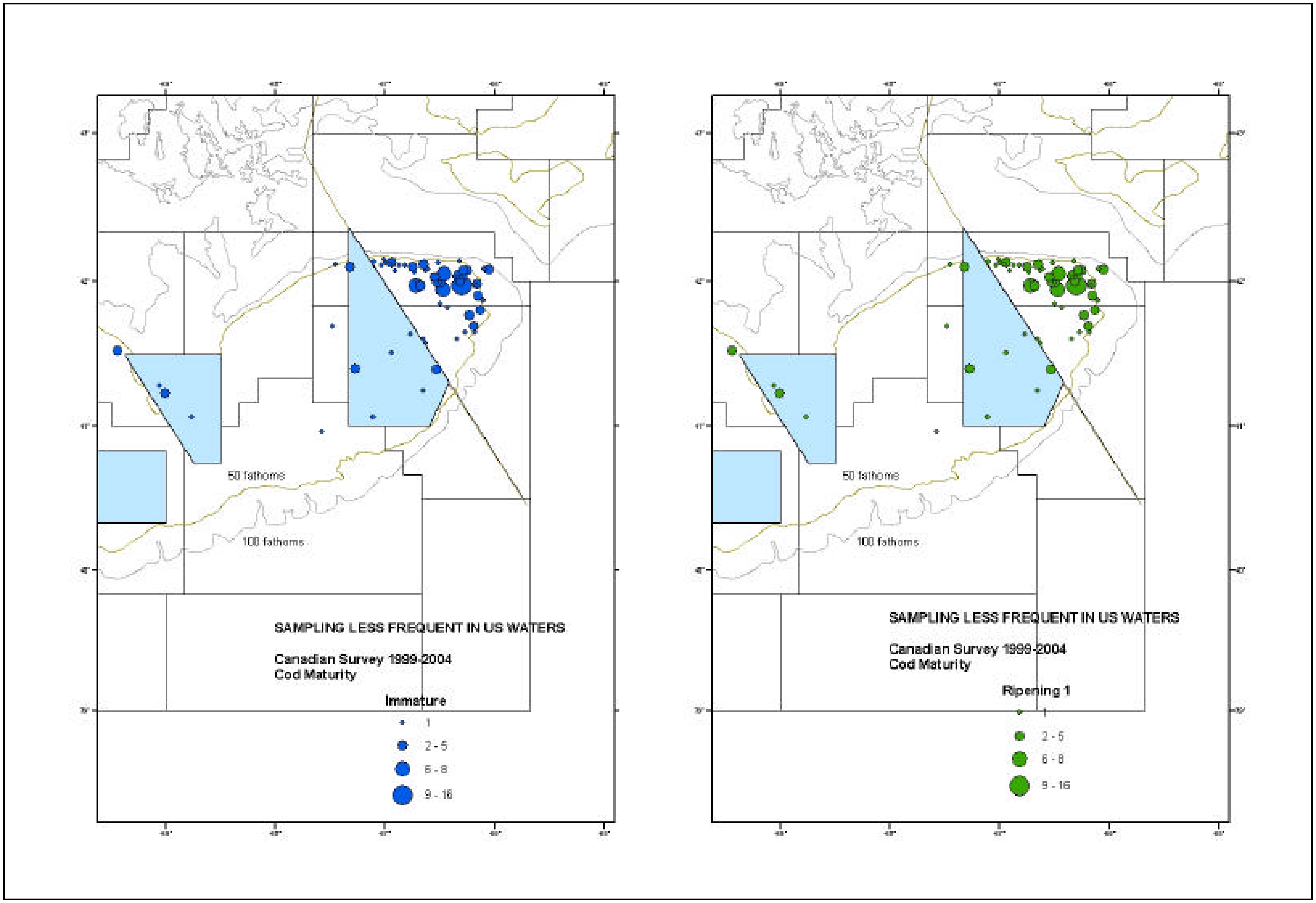


Figure 31 – Immature and ripening cod in Canadian spring trawl survey, 1999-2004

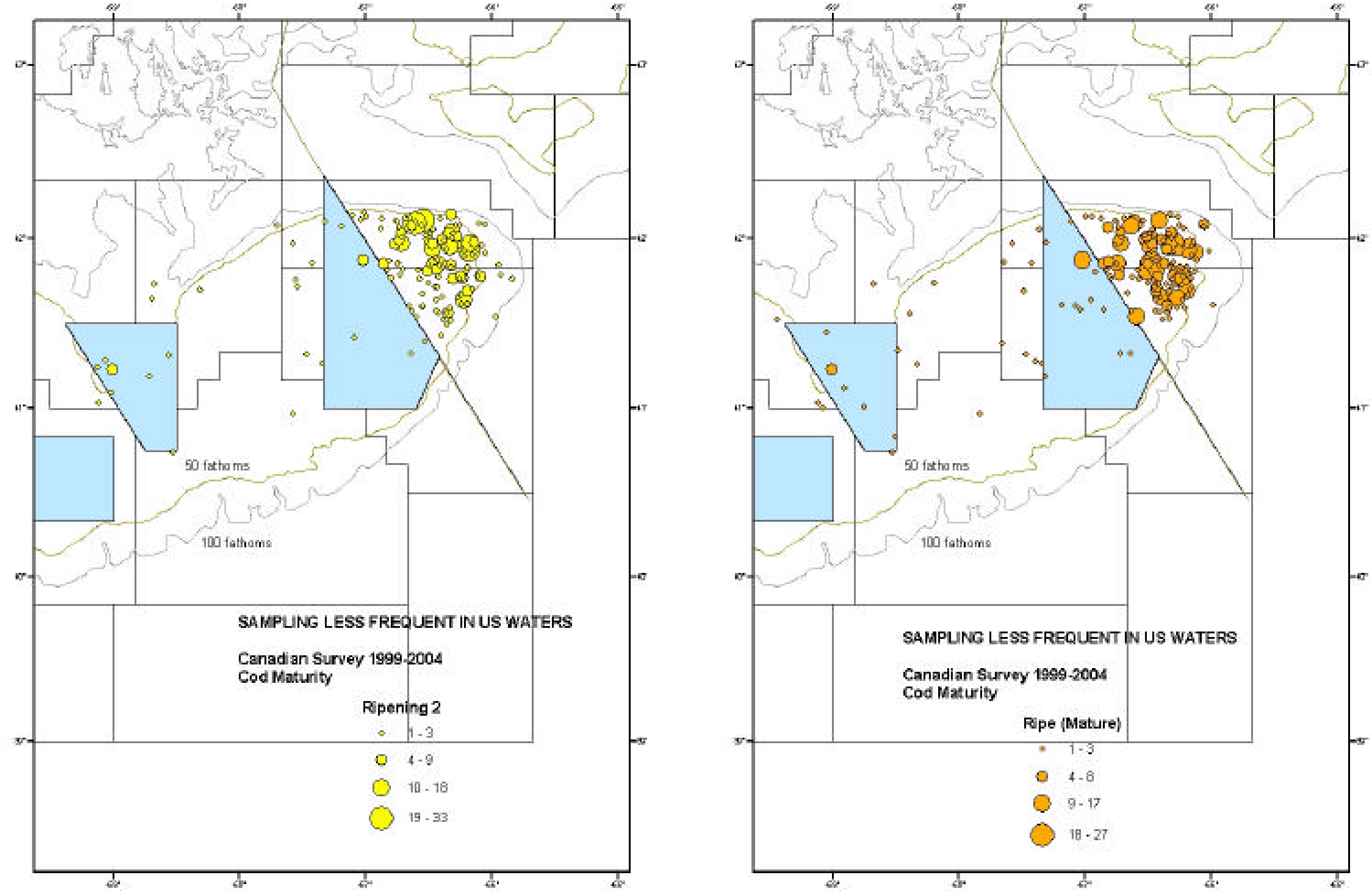


Figure 32 - Ripening and mature cod, Canadian spring trawl survey, 1999-2004

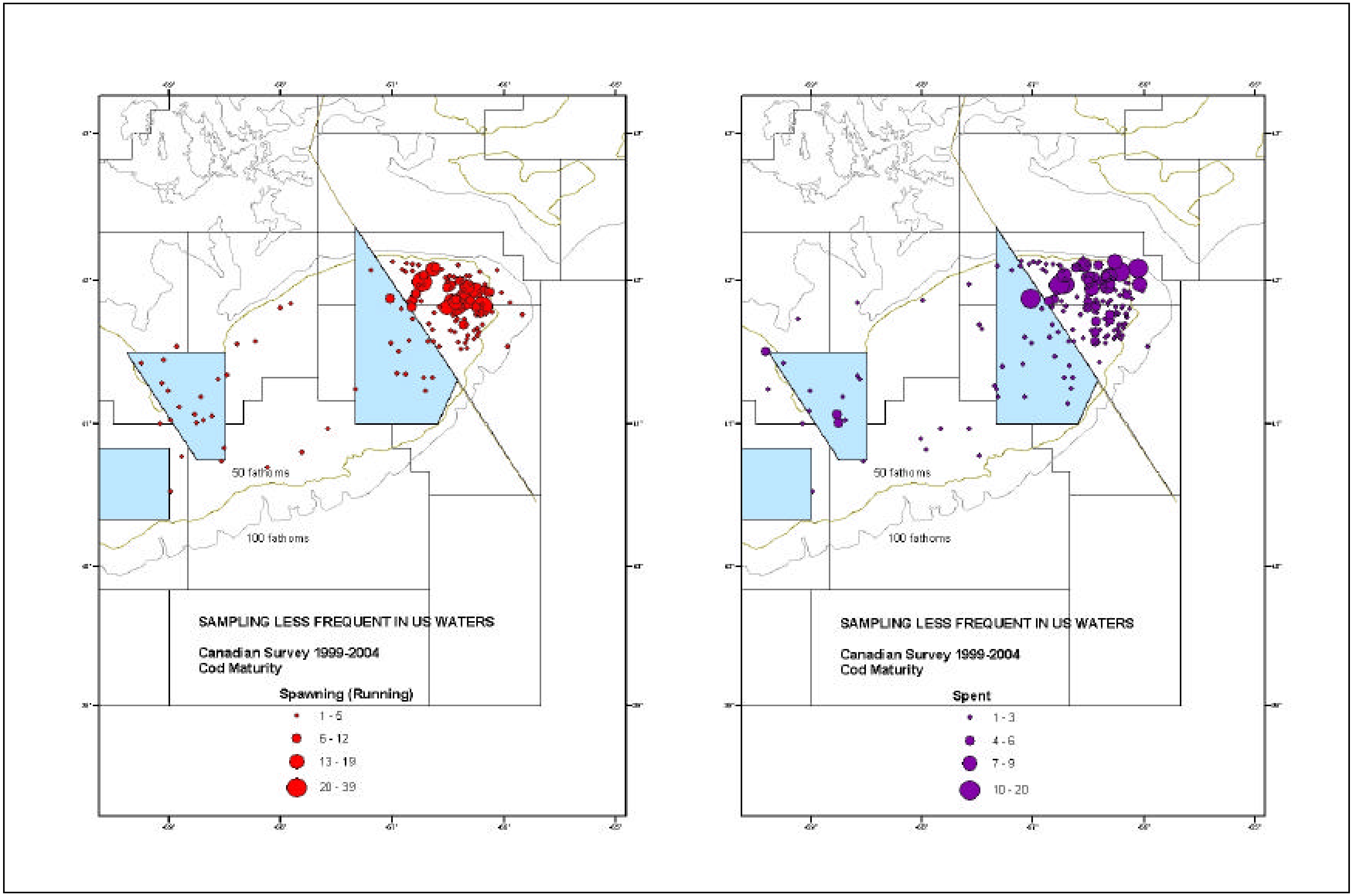


Figure 33 – Spawning and spent cod from the Canadian spring trawl survey, 1999-2004

Combined Trips to the Western U.S./Canada Area

Amendment 13 adopted a U.S./Canada Resource Sharing Understanding. In order to implement the understanding, two areas were defined: a western U.S./Canada area and an eastern U.S./Canada area. Regulations implementing the amendment require vessels to declare into one of these areas. Vessels are not allowed to fish in any other area on the same trip. This measure would relax these restrictions: vessels would be allowed to fish in the western U.S./Canada area and outside the western U.S./Canada area, on the same trip. They would not be allowed to fish outside the eastern U.S./Canada area on a trip.

Biological impacts of this change are difficult to estimate. Vessel operators have said that with this restriction in place, they cannot afford to risk fishing in the western U.S./Canada area. If this behavior results, it may reduce fishing mortality on GB yellowtail flounder, GB winter flounder, and GB haddock. At the same time, effort that would be used in this area may move inshore and increase fishing mortality on stocks of concern such as GB cod, GOM cod, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, plaice, and SNE/MA winter flounder. Removing the restriction may encourage vessels to target the healthy GB haddock, winter and yellowtail flounder found in this area, and avoid targeting stocks of concern outside this area.

An additional concern is whether the proposed change will make it difficult to attribute catches of yellowtail flounder on combined trips to the appropriate stock area. Under the provisions of the U.S./Canada Resource Sharing Understanding, GB yellowtail flounder is subject to a hard TAC. The western U.S./Canada area is part of the GB yellowtail flounder stock area. Adequate monitoring must be in place to make certain that this stock is accurately reported. The proposed SAP addresses this issue by requiring reports of the catch both daily and when a vessel crosses the area boundary, submitted through VMS. In addition, if a vessel chooses to fish combined trips, it will be restricted to the lowest yellowtail flounder trip limit for the areas fished. These combined measures will slow the landings of yellowtail flounder from this area and will provide the ability to monitor catches on a daily basis. With these controls in place, the GB yellowtail flounder TAC can be adequately monitored so that it is not exceeded. It should also be noted that the 2004 TAC for this stock is 6,100 mt and recent catches have not exceeded 4,500 mt. Given the additional effort reductions adopted by Amendment 13, absent a tremendous increase in catch rates it will be difficult for U.S. vessels to catch the entire GB yellowtail flounder TAC. This provides a further safeguard as a form of buffer against misreporting of the catch by stock area. With respect to catches of yellowtail from the CC/GOM and SNE/MA stock areas, the daily reporting and VMS requirements will also help assign catches to the correct stock areas.

In addition to these reporting requirements, there is evidence that large catches of yellowtail flounder in the western U.S./Canada area are restricted to specific times and locations. Analyses examined whether vessels fishing in SA 522 and 525 would be able to comply with the low CC/GOM or SNE/MA yellowtail flounder landing limits that they must observe if they choose to fish outside the area. In calendar year 2003, observer coverage on groundfish trips was increased as the result of a court order. Observer reports were examined for trips that fished in the western U.S./Canada area (statistical areas 522 and 525). Almost all trips that met this criterion in 2003 were otter trawl trips fishing for groundfish (there was one mid-water trawl trip targeting herring). The majority of the 117 observed trips fished in two or more statistical areas (Table 65). It should be noted the behavior on these observed trips is not consistent with the information in vessel trip reports (VTRs) submitted by vessel operators. VTRs were also examined for calendar year 2002 and 2003. According to VTR reports, ninety-two percent of the otter trawl trips to either SA 522 or 525 only fished in one statistical area. It is not known whether it is the observed trips or the VTRs that do not represent how the trawl fishery in this area is actually conducted.

The observed trips that fished in either SA 522 or 525 generally fished in either the Gulf of Maine or other parts of Georges Bank, but most of the observed effort (in terms of number of tows) was on Georges Bank - less than one hundred tows each were observed in statistical areas that are not on Georges Bank. In addition to fishing in SA 522 or 525, the most common SAs fished were SA 521, 561, and 562. The average number of tows in each SA per trip are lower in the SAs that are not on Georges Bank. This suggests that in some cases the tows that are not on Georges Bank may reflect either exploratory fishing or "topping off" enroute homeport or the fishing grounds.

The total catch on these observed trips shows distinct differences by statistical area. Most of the catch of yellowtail flounder was in SA 525 (fifty-one percent) or SA 562 (thirty-one percent). Haddock was also an important component of the catch from SA 525. In contrast, monkfish (angler), cod, and haddock dominated the groundfish catch in SA 522 with little yellowtail flounder caught on the observed tows. While there were not many trips that fished in the GOM in addition to SA 522 and 525, yellowtail flounder catches were only a small component of the catch on trips that fished in the CC/GOM yellowtail flounder stock area (510-515, 521).

Observed catches of yellowtail flounder per tow were plotted by calendar year quarter to determine if there were spatial and seasonal differences in catch rates. Catches per tow were binned into three categories: 0 – 30 pounds, over 30 to 100 pounds, and over 100 pounds. These bins were chosen because, assuming seven tows per day fished, they give an indication if a vessel can remain under the seasonal CC/GOM and SNE/MA yellowtail flounder trip limits of either 250 pounds per trip or 750 lbs. per DAS. While this is a preliminary analysis because differences in vessel size, tow length, etc. were not considered, and it represents only one year of data, the plots in Figure 34 and Figure 35 show distinct seasonal and area differences. Yellowtail catch rates are high in all four quarters along the boundaries of CAII – particularly the southern half of the western side. While catch rates along the southern boundary of CAII were high in the first quarter, in other quarters they declined and during the third quarter little yellowtail was caught in this area. Many of the observed tows near CAII were in SA 561 or 562, two areas that vessels will not be able to fish while on trips to the western U.S./Canada area if the proposed measure is adopted. Catches of yellowtail were also high south of CAI in the first quarter but not during the rest of the year. There is a small area of high catch rates in all four quarters along the western boundary of CAI in SA 521. In all four quarters the catch of yellowtail was nearly non-existent on the many tows deeper than the 50-fathom curve (which would be expected given the distribution of yellowtail flounder).

These data indicate that fishermen may be able to fish in SA 522 and 525 and avoid high yellowtail flounder catches in order to comply with the low landing limits included in this measure. Based on the observed trips in calendar year 2003, the only season/area of concern is in SA 525 during January through March. High catch rates of yellowtail flounder from SA 525 can be avoided by not fishing south of CAI and east of the NLCA in these months, or south of CAII. This analysis suggest other species can be successfully targeted without catching yellowtail flounder by fishing deeper than 50 fathoms in the northern half of SA of 521 and 522, or by fishing away from the western boundary of CAI.

SAs Fished	Number of Trips	Cumulative %
0	0	0%
1	9	8%
2	37	39%
3	39	73%
4	20	90%
5	10	98%
More	2	100%
Total	117	

Table 65 – Number of statistical areas fished by trips for observed trips that fished in SA 522 or 525, calendar year 2003 (NMFS observer database, unpublished data)

SAREA	Trips	Tows	Percent of Observed Tows	Average Observed Tows/Trip per Area
512	1	1	0%	1.0
513	4	14	0%	3.5
514	5	17	0%	3.4
515	7	57	2%	8.1
521	77	771	21%	10.0
522	98	1187	33%	12.1
525	38	529	15%	13.9
526	24	77	2%	3.2
537	1	1	0%	1.0
561	46	476	13%	10.3
562	41	477	13%	11.6

Table 66 – Number observed trips and tows, by statistical area, for observed trips that fished in SA 522 or 525 in calendar year 2003 (NMFS observer database, unpublished data)

Common Name	512	513	514	515	521	522	525	526	537	561	562	Total
ANGLER	1,330	9,154	16,184	39,409	182,936	690,942	34,041	781		74,302	11,314	1,060,392
COD		955	580	451	137,443	108,058	65,319	8,231		170,942	73,227	565,204
CRAB, JONAH		351	1,869	2,726	4,767	21,048	1,043	9		1,619	130	33,561
CRAB, NK					3,079	24,987	121	1		261	16	28,464
DOGFISH SPINY		842	1,636	6,266	41,911	33,341	9,282	2,845		5,667	2,405	104,193
FLOUNDER, AM. PLAICE	210	895	2,268	10,635	23,402	74,101	4,478	23		17,484	1,485	134,981
FLOUNDER, SAND-DAB			10		759	2,615	24,764	1,466		1,142	9,258	40,014
FLOUNDER, SUMMER					136	12,136	17,947	1,123		133	3,660	35,134
FLOUNDER, WINTER			80		61,736	71,793	19,999	7,511	15	63,298	288,951	513,382
FLOUNDER, WITCH	80	944	4,550	2,894	50,445	84,689	8,063	58		10,191	1,093	163,007
FLOUNDER, YELLOWTAIL		1	141		13,229	7,326	178,453	4,696		38,195	107,651	349,693
HADDOCK	40	229	1,234	8,318	178,397	110,324	157,098	17,010		42,292	94,264	609,204
HAKE, SILVER		26	98	148	1,221	3,602	49,939	2,247		992	17,322	75,594
HAKE, WHITE	650	236	2,781	12,821	17,427	26,333	5,922	515		10,305	164	77,152
LOBSTER		479	106	1,084	7,266	52,893	1,597	443		27,720	12,283	103,872
POLLOCK	100	394	486	5,456	26,573	29,415	240	2,268		18,470	445	83,845
REDFISH	20	209	60	1,361	15,431	14,303	1	9		784		32,177
SCALLOP, SEA					1,195	3,853	99,843	458		3,533	26,998	135,880
SEA RAVEN		4		25	10,659	5,849	5,349	784		4,588	6,499	33,755
SKATE, LITTLE			50	150	65,295	230,733	256,211	9,386	5	56,290	228,418	846,538
SKATE, THORNY		843	10	1,760	14,950	25,149	2,808			1,860	375	47,754
SKATE, WINTER (BIG)		660	45	999	244,069	402,018	243,064	19,730		102,665	279,413	1,292,663
SKATES					88,921	202,124	221,642	13,382		30,610	74,868	631,546
SQUID (LOLIGO)				3	3	52	27,833	14,349		22	24	42,286
Various		188	152	733	25,824	60,354	14,014	4,480		12,288	5,402	123,436
Grand Total	2,430	16,408	32,339	95,238	1,217,074	2,298,031	1,449,069	111,804	20	695,648	1,245,664	7,163,725

Table 67 – Catch by statistical area for observed trips that fished in either SA 522 or 525, calendar year 2003 (top twenty-five species, round weight, pounds) (NMFS observer database, unpublished data)

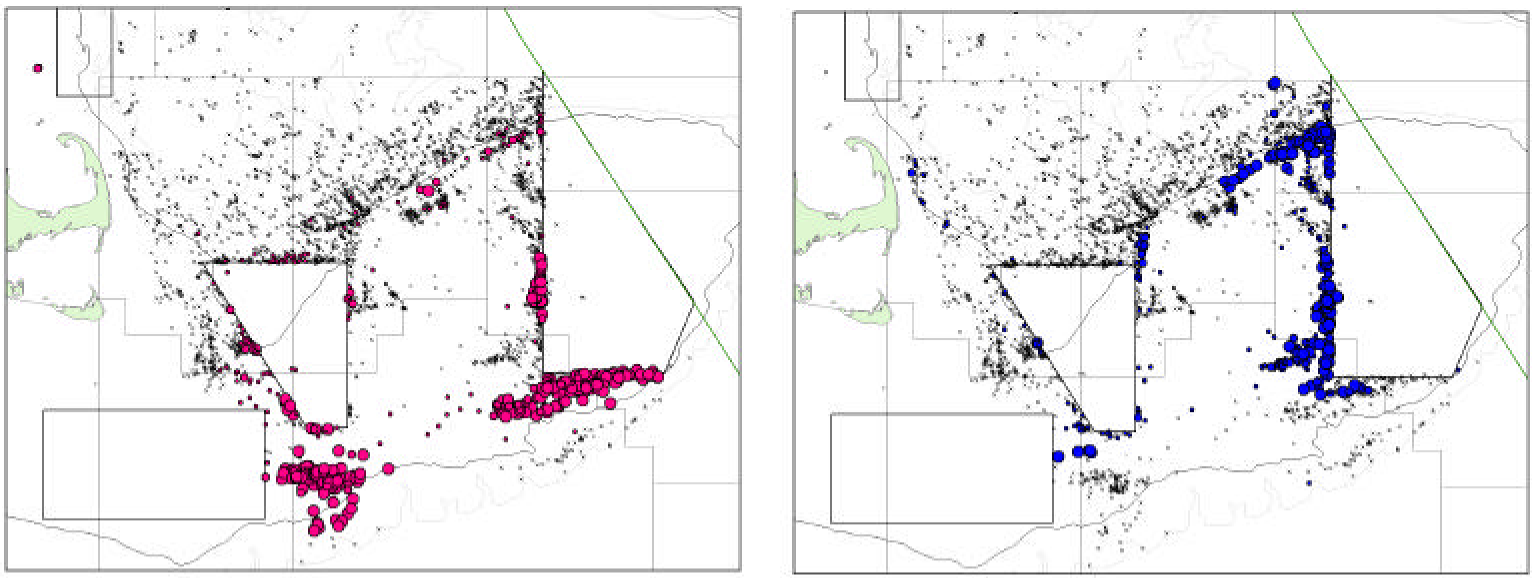


Figure 34 – Yellowtail flounder catch on observed tows, calendar year 2003 quarters 1 and 2.

Size of circle indicates yellowtail catch: 0-30 pounds (small), 30 – 100 pounds (medium), over 100 pounds (large)
Tows with no yellowtail caught shown as "x" symbol.

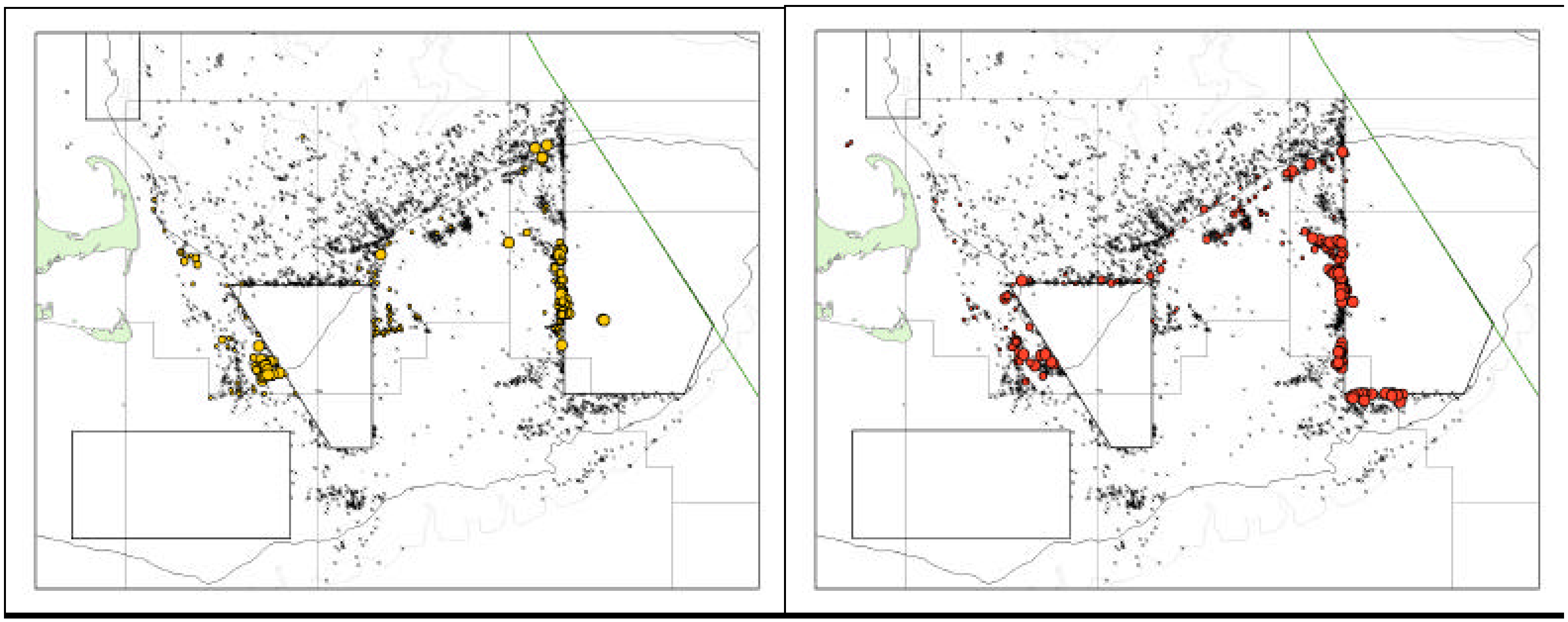


Figure 35 – Yellowtail flounder catch on observed tows, calendar year 2003 quarters 3 and 4

Size of circle indicates yellowtail catch: 0-30 pounds (small), 30 – 100 pounds (medium), over 100 pounds (large)
Tows with no yellowtail caught shown as "x" symbol.

7.2.1.1.3 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 fishermen to target healthy groundfish stocks. These opportunities could increase fishing effort by between 2,500 and 4,400 DAS. As a result of this action, fishing mortality is expected to increase on GB haddock primarily as a result of the two SAPs. Fishing mortality is also expected to increase on other healthy groundfish stocks targeted through the Category B (regular) DAS pilot program. The stocks that are most likely to be targeted in this program include GOM haddock, GOM winter flounder, pollock, GB haddock, GB winter flounder, and GB yellowtail flounder. While redfish is another stock that could be targeted, the minimum mesh regulations will make it difficult to target redfish and so mortality for that stock is not likely to increase. Based on the analysis in Amendment 13 and in this document, 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 this document, the risk of exceeding rebuilding targets will be small. For four stocks, the calendar year 2003 preliminary landings statistics suggest that there is little risk of exceeded the target TAC or mortality targets adopted by Amendment 13 as long as the incidental TACs are adequately monitored and in force. There are four other stocks (GB cod, GOM cod, white hake, CC/GOM yellowtail flounder) where the incidental catch TAC was set at a lower level to reduce the risk that the proposed programs will threaten rebuilding plans.

7.2.1.2 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.

Category B (regular) DAS Pilot Program

The proposed action will allow the use of Category B (regular) DAS, increasing the amount of effort that can be used in the groundfish fishery by roughly five percent in FY 2004 and 2005. Increases in effort would be expected to result in an increase in catch of other (non-groundfish) species if the catch rates remain constant. It is not clear, however, that catch rates of other species will be unchanged. In order to use Category B (regular) DAS, vessel operators will need to fish selectively on healthy groundfish stocks. They may develop fishing practices that reduce the catches of other species. For example, trawlers that wish to target haddock may use a separator trawl to reduce incidental catches of cod and flounders. This type of net also eliminates or reduces the catch of skates, monkfish, lobsters, and other species, so an increase in effort that uses this type of gear may not increase the catches of other species. The observer coverage requirement will provide additional information on the catches of other species that results from the use of Category B DAS.

The proposed measure also allows vessels to use a Category B (regular) DAS to fill the requirement to use a groundfish DAS as required by other management plans. The primary fishery that this provision will affect is the monkfish fishery. Vessels that possess both a groundfish and monkfish limited access Category C or D permit are required to use a groundfish DAS for every monkfish DAS. In addition, in the Monkfish Northern Fishery Management Area, monkfish limited access vessels are allowed to target monkfish without a trip limit while fishing on a groundfish DAS and using groundfish gear. A second non-groundfish species that could be targeted using Category B (regular) DAS are skates. The impacts of using these DAS to target skates is discussed in the skate baseline review (section 8.1.3).

Allowing vessels to use a Category B (regular) DAS to meet the monkfish requirement to use a groundfish DAS could increase effort on monkfish compared to the No Action alternative. Under the No Action alternative, vessels with a limited access Category C or D monkfish permit must evaluate whether to use a limited number of Category A DAS to target monkfish. There are approximately 660 monkfish Category C or D permits, allocated over 8,100 Category B (regular) DAS in FY 2004. By allowing these vessels to use a Category B (regular) DAS additional effort could enter the fishery as compared to the No Action alternative, but the total DAS available (the total of Category A and Category B (regular) DAS) is less than what was available when this requirement was adopted by the monkfish FMP. The 660 permits have 32,600 Category A and B (regular) DAS in FY 2004, while they had 49,600 DAS allocated when the monkfish plan was adopted. Monkfish rebuilding has been taking place even with the higher level of DAS that were available prior to implementation of Amendment 13. A second way this provision may increase effort on monkfish is if it attracts more effort into the monkfish fishery by monkfish permit holders. Vessels that in the past fished primarily for groundfish, but that qualified for a monkfish permit, may choose to fish their Category A DAS on groundfish and use their Category B (regular) DAS to target monkfish. The monkfish resource in the Northern Fishery Management Area is almost completely rebuilt and any short-term increase in effort caused by this pilot program should not affect rebuilding. Additional effort may be more problematic in the Southern Fishery Management Area because the stock is not rebuilding as quickly, but the monkfish FMP includes provisions for controlling monkfish mortality.

Other species that may be targeted while using Category B (regular) DAS are skates. The impacts of this program on skates are discussed in the skate baseline review (section 8.1.3).

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 44 summarizes the catch in this experimental fishery. Those species that accounted for one percent or more of the total catch are shown in Table 68, 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 8.1.3).

It is not possible to determine if these catches of other species represent 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 68 – Species that accounted for one percent or more, by weight, of the total catch in the CAI hook gear haddock experiment.

CAII Haddock SAP

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips in SAs 561 and 562 were examined and interpreted in light of the results of several haddock separator trawl experiments in other areas. The catch (kept and discarded) for the top eight species caught on observed trawl tows in 2003 is shown in Table 69. These eight species comprised forty-seven percent of the total catch on observed tows in both areas. While some of these species were retained, they accounted for ninety-six percent of the discards. Three skate species (little, winter, and not further specified) accounted for eighty-four percent of the discards on observed trips. Discards of these skates were highest in SA 562. Barndoor and thorny skates were also caught, but in smaller numbers. Total barndoor skate catches on these observed tows were 2,708 lbs., and 2,973 lbs. of thorny skates were also caught and discarded.

Species	SA 561		SA 562		Grand Total
	Discarded	Kept	Discarded	Kept	
ANGLER	3,787	72,916	1,939	11,309	89,951
HAKE, SILVER	759	243	212	17,111	18,325
LOBSTER	6,581	25,037	3,995	15,038	50,651
SCALLOP, SEA	2,554	7,268	15,794	12,745	38,360
SEA RAVEN	5,027	0	7,412	0	12,439
SKATE, LITTLE	56,812	0	282,885	0	339,697
SKATE, WINTER(BIG)	66,581	46,318	330,624	56,742	500,264
SKATES	16,018	14,742	87,040	20,611	138,410
Grand Total	158,119	166,524	729,901	133,556	1,188,097
Total (all species)	199,361	626,003	797,243	914,722	2,537,329
Percent of Total	79%	27%	92%	15%	47%

Table 69 – Non-groundfish species caught on observed trawl tows in SAs 561 and 562, 2002 (lbs. round weight) (NMFS OBDBS)

Many of the species in Table 69 are not likely to be caught by vessels using a haddock separator trawl to target haddock, as required by this SAP. DFO (1992) noted an almost complete absence of skate species in the top cod end during an experiment in 1992. Raymond and Manomet (2004) found a highly significant difference between skates caught in the top and bottom cod ends, with only six percent of the skate catch for the entire experiment caught in the top cod end. This same experiment demonstrated that most monkfish, sculpins, and sea ravens, and all lobster, were caught in the bottom cod end. While neither experiment document scallop catches, it is likely that scallop catches will mimic other sessile species and will also be caught by the bottom cod end.

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter large numbers of skates and other species. While the high-value species may be retained (if caught) consistent with regulatory limits (monkfish, lobster, scallops, etc.), most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches of most of these species, including the skates. Because this net has been proven to be so effective in reducing catches of these species, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

Combined Trips to the Western U.S./Canada Area

The impacts on other species of allowing vessels to fish inside and outside the western U.S./Canada area on the same trip are uncertain. Some fishermen claim that they will not fish in the western U.S./Canada area under the restrictions adopted by Amendment 13 because there is too great a risk that a trip restricted to this area will not be profitable. Because the Amendment 13 regulations were implemented on May 1, 2004, it is not clear that this behavior will occur and what the impacts will be if it does. For example, if groundfish vessels avoid the Western U.S./Canada area and shift fishing effort into the GOM, it could increase bycatch of thorny skates. If this were to occur, allowing vessels to combine trips to different areas might encourage effort to return to the Western U.S./Canada area, reducing thorny skate bycatch. This is speculation, however, since it is not yet known how vessel operators will adjust to the Amendment 13 regulations.

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. Fishing mortality may increase on monkfish and skates if vessels use the Category B (regular) DAS pilot program to target those species. There may also be increased mortality on other species, such as skates, that are caught while targeting groundfish. This action will promote the use of selective gear (e.g. the haddock separator trawl) on Category B DAS which actually reduces catches of skates, lobster, and scallops.

7.2.1.3 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 70).

Bycatch Reduction Strategy	Incidental Catch TACs	Category B DAS Pilot Program	CAI Hook Gear SAP	CAII Haddock SAP	Combined Trips to the Western U.S./Canada Area
International legislation of suitable gears and areas					
Time and area closures					
Discard quotas					
Use of new technology and operational modes			(X – optional use of bait to avoid cod)	X (Separator Trawl)	
Full use strategies			X (Hook sector retention of cod)		
Establishment of authorized discard rates					
Marine parks					
Incorporation of bycatch into quotas	X (groundfish)	X (groundfish)	X (groundfish)	X (groundfish)	
Prohibition on retention					
Incentive-based programs		X	X	X	
Decreased quotas for target species					
Decreased effort					

Table 70- 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.

Category B (regular) DAS Pilot Program

This proposed measure will allow for a small increase in groundfish fishing effort. An increase in effort could increase bycatch. As discussed, the design of this program will encourage selective fishing practices that may reduce bycatch rates from those observed on Category a DAS. The proposed measure includes a no discard provision that should minimize bycatch of legal sized fish, but will not have an effect on sub-legal fish.

Closed Area I Hook Gear/Haddock SAP

This program will allow 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 can be 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 68, 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.

Closed Area II Haddock SAP

This measure will allow an increase in fishing effort and as a result would generally be expected to increase discards, but vessels participating in this SAP are required to use a haddock separator trawl. This trawl has been demonstrated to nearly eliminate the catch of skates, monkfish, lobster, scallops, flounder, and other bottom dwelling species. Based on analyses in a previous section, it is possible that this program could result in a small increase in cod discards but it is unlikely that discards of other species will increase. The measure includes a no-discard provision for legal-sized cod while fishing on a Category B DAS, which should help minimize the discards of cod.

Summary

Because the proposed action will increase groundfish fishing effort, it will probably result in increased bycatch of groundfish and other species. Measures are included to minimize bycatch to the extent practicable (see Table 70 for a general description of the strategies used in each alternative).

7.2.2 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.

Category B (regular) DAS Pilot Program

The Category B (regular) DAS Pilot Program will allow the use of up to 2,000 Category B (regular) DAS in FY 2004 and FY 2005. This represents an increase in fishing effort over the levels implemented by Amendment 13. It is not certain where these DAS will be fished, but they are likely to be fished by vessels using the three gears that are primarily used in the multispecies fishery: otter trawls, bottom longlines, and gillnets. From the perspective of impacts on habitat, the use of otter trawls is of the greatest interest. Since Amendment 13 reduced fishing effort, it is important to understand the impacts on habitat of fishing activity and how changes in effort may increase or decrease the impacts. This information can then be used to evaluate the increases in effort that will occur with the Category B (regular) DAS Pilot Program.

There are a number of factors that will affect the speed and degree of habitat recovery in areas where bottom tending mobile gear use is reduced. These include: 1) the degree, duration, and extent of fishing in the area; 2) any other anthropogenic sources of habitat disturbance (e.g., contamination of bottom sediments in coastal waters); 3) the natural disturbance regime (e.g., frequency and intensity of storms, bottom currents, etc.); 4) the type of substrate or sediment; 5) depth; 6) the type of benthic organisms that inhabit the area; and 7) the length of time that the area remains undisturbed by fishing. Improvements in habitat quality would most likely occur in areas where trawling and dredging activity was minimal to begin with and is totally eliminated, or substantially reduced; in deeper, low-energy locations not exposed to storm events or strong bottom currents; in hard-bottom areas (in shallow or deep water) that support prolific growth of large, attached epifauna, or in other bottom habitat types that provide food and cover for demersal fish; and in areas populated by benthic organisms that grow faster and reproduce quickly. For some benthic environments that have been altered by fishing activity, complete recovery could take years. For others, recovery might only take a few months. If reductions in bottom trawling activity in marginal areas are temporary and increase after a year or two as stock abundance increases, habitat recovery in certain areas may never be complete.

A useful conceptual model for understanding the relationship between changes in fishing effort and the degree of habitat modification described in the National Research Council report on trawling and dredging effects (NRC 2002). Starting from zero fishing effort with no habitat impact, a change in fishing effort will change the degree of habitat modification, but as effort continues to increase habitat alteration reaches its maximum point and levels off even as effort continues to increase. For heavily modified habitats exposed to high levels of fishing activity, effort must be reduced substantially before any improvement in habitat quality is realized. Although there is much uncertainty regarding the relationship between fishing effort and habitat alteration at low effort levels, it is probably not linear as depicted in NRC 2002. A more realistic relationship, at least for certain habitats exposed to mobile bottom-tending gear, is curvilinear since the first few tows in an undisturbed habitat would be expected to produce the greatest relative change in habitat conditions (e.g. three-dimensional structure), with reduced effects as fishing effort increases to the point of maximum habitat modification. In this scenario, reductions in effort would have to be even more severe (approaching zero effort) in order to achieve, say, a 50% habitat recovery.

Most of the available studies of gear effects for mobile gear types used in the Northeast region examine the effects of single or multiple tows in previously fished or un-fished locations within some defined time period, with control plots in nearby undisturbed locations. There are a few studies that compare benthic communities or physical habitat features in areas exposed historically to different levels of fishing effort.

One of them (Frid et al. 1999) compared periods of low, medium, and high otter trawling activity at two sites in the North Sea over a 27-year period. At the heavily-fished, mud-bottom, site, benthic organisms that were predicted to increase as fishing effort did increase in abundance, but organisms that were expected to decrease in abundance did not. At the lightly fished, sand-bottom site, there was a correlation with primary production, but no correlation with fishing effort. In a similar study, Kaiser et al. (2000b) compared benthic communities exposed to high, medium, and low fishing intensity by otter trawls, beam trawls, toothed scallop dredges, and lobster pots in the English Channel (sand substrate) and found no significant effects of increased effort on the numbers of benthic organisms or species, but did find reductions in the abundance of larger, less mobile, emergent epifauna and increased abundance of more mobile invertebrate species, fewer larger organisms, and more smaller organisms in high effort areas. Two factors that complicate this kind of research are the effects of different habitat conditions (e.g., depth, sediment type) that may exist at low and high-effort sites, and temporal changes in environmental conditions (e.g., changes in sediment composition or water temperatures) that occur over the time period being investigated.

More direct evidence of the effects of changes in bottom fishing effort is provided by studies that relate progressive increases in disturbance to changes in benthic community structure and seafloor topography and sediment composition. Jennings et al. (2001) documented effects of increasing beam trawling activity on sand and muddy sand-bottom communities in the North Sea. Thrush et al. (1998) did the same for 18 stations (mud and sand bottom) in Hauraki Gulf, New Zealand, that were fished at varying levels of effort by otter trawls, Danish seines, and toothed scallop dredges. Unfortunately, these studies examine the combined effects of a number of gear types, including toothed scallop dredges and beam trawls that are not used in the Northeast region of the U.S. Nevertheless, a number of significant impacts to benthic communities are identified which can probably, to some extent, be generalized to dredging and otter trawling on similar habitat types in the Northeast region. These included decreased infaunal and epifaunal biomass (North Sea), decreased densities of large epifauna, echinoderms, and long-lived surface dwellers, and increased densities of small, opportunistic species (New Zealand).

There are three experimental studies of the habitat effects of increasing otter trawling effort in commercially un-exploited areas. Two of these were performed in mud-bottom habitats, one in Sweden (Hansson et al. 2000) and the other in Scotland (Tuck et al. 1998). Another (Moran and Stephenson 2000) was conducted in Australia on sandy substrate.

In the Swedish study, two tows were made per week for a year in an area closed to fishing for six years. During the last six months of the experiment, 61% of the infaunal species were negatively affected (i.e., they decreased more or increased less in the trawled sites compared to the control sites), and there were significant reductions in brittle stars (compared to a control area), but not in polychaetes, amphipods, or mollusks. In the Scottish study, multiple tows were made during a single day for 16 consecutive months in an area closed to fishing for more than 25 years. Increased bottom trawling produced door tracks, increased bottom roughness, but had no effect on sediment composition. There were significant increases in the number of infaunal species after 16 months of disturbance, but no changes in biomass or total number of individuals; community structure, however, was altered after five months and community diversity declined six months after trawling ceased. Effects on species groups varied: polychaetes increased in abundance while bivalves decreased in abundance five months after trawling began.

In the Australian study, four tows were made at 2-day intervals on the same area of bottom. Underwater video surveys showed that the first tow reduced the density of large (>20 cm) benthic organisms by 15% and four tows by 50%. Sainsbury et al. (1997), working in the same general area, reported that a single pass of a trawl footrope removed 89% of sponges larger than 15 cm.

Although there is some information (summarized above) that documents habitat modifications that result from increasing fishing effort by mobile bottom-tending gear, there is no corresponding evidence of the effects of progressive reductions in fishing effort on benthic marine habitats. There are, however, a number of studies that document the recovery of benthic habitats following the cessation of bottom fishing. These have been performed in areas that have been closed to various types of fishing activity, mostly by mobile bottom-tending gear.

Tuck et al. (1998) monitored the recovery of a mud-bottom benthic habitat for 18 months in a closed area in Scotland after 16 months of bottom trawling and found that door tracks were still visible after 18 months, and that the infaunal community had recovered completely within the same period. This is the only directed study of recovery from simulated commercial trawling activity that has been conducted. Other observations have been made by a number of authors who have monitored the recovery of benthic habitats from single trawl or dredge tows, or following multiple tows in a single day.

Kenchington et al. (2001) did note that infaunal organisms that were reduced in abundance during one of three years of experimental fishing in a closed area on the Grand Banks had recovered by the time experimental fishing resumed a year later. Schwinghamer et al. (1998), working on the same project, noted that door tracks lasted up to a year and seafloor topography recovered within a year's time.

Sainsbury et al. (1997) compared historical survey data – collected before and after commercial fishing started – to data collected in an area in Australia that remained open to trawling and another area that was closed for five years and reported increased catch rates of fish associated with large epifauna and small benthic epifaunal organisms (but not large ones) within the five-year period.

Management measures that reduce fishing effort and contact of gear on the bottom will most certainly provide the greatest protection to habitat. Of the measures adopted by Amendment 13, 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, while the habitat closed areas prohibit all mobile, bottom tending gear types. Year-round closures also 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. However, with the potential for increased utilization of allocated DAS in the fishery, DAS restrictions may provide only limited or negligible benefits to habitat.

However, because the proposed DAS use for the pilot project will be limited to approximately 2,000 DAS in FY 2004 and 2,000 DAS in FY 2005, for a total of 4,000 DAS, the impacts to habitat will be minor. It is difficult to say exactly where the increased effort will occur. 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.

These DAS will be restricted by a hard incidental catch of species of concern and by a limit on the number of DAS that can be used in the program. Category B (regular) DAS can be used to target healthy groundfish stocks only (GOM haddock, Pollock, Redfish, GOM winter flounder, GB haddock, GB yellowtail flounder, and GB winter flounder). Due to the limits on mesh sizes and the historical fishing on these stocks, it is likely that GOM haddock, GB winter flounder, GB haddock, GB yellowtail flounder, and redfish will likely be targeted by trawlers while Pollock may be targeted by gillnets.

Amendment 13 described the distribution of fishing activity on various habitats by gear type (see Affected Environment Section of Amendment 13). The descriptions of use by bottom gillnets and bottom otter trawls are included here for completion and to get a sense of the types of habitats the additional DAS allotted to the pilot program may affect:

Bottom gillnets: Bottom gill net trips were made primarily in the GOM. In none of the other three sub-regions did gill net trips exceed 25% of the total number of gill net trips reported for the entire Northeast region. Gill net trips were reported from a larger area of federal waters in the Northeast region than pot or longline trips. Ten minute squares (TMS) where 90% of the gill net trips were made extended over a larger proportion of the GOM and a smaller proportion of GB, with intermediate values in SNE and the MA sub-regions. Gill net trips were most common in coastal waters in the southwestern portion of the GOM, with some trips reported offshore in the central portion of the gulf. No gill net fishing was reported in coastal waters of central and eastern Maine. Outside the GOM, gill net trips were reported along the western edge of the Great South Channel, in Rhode Island coastal waters, along the south shore of Long Island, and off New Jersey, the Delaware-Maryland-Virginia (DelMarVa) peninsula, and North Carolina. A few trips were also made in three TMS along the 100 f contour at the shelf break in SNE and (apparently) in a single TMS in even deeper water southeast of Hudson Canyon. Gill net trips were more numerous during 1995-2001 than bottom longline trips, but not as numerous as pot trips. Ten minute squares that accounted for 90% of the gill net fishing trips during 1995-2001 were associated with a higher percentage of sand, gravelly sand, and gravel in the Northeast region than was the case for the other two fixed gear types. All three fixed gear types were used to a much greater extent on mud bottom in the GOM and on sand in the other three sub-regions, reflecting the distribution of sediment types by sub-region. Gill net trips were more strongly associated with coarser sediments in the GOM, SNE, and the MA and with mud and muddy sand in the GB sub-region.

Bottom otter trawls: Bottom trawling in federal waters in the Northeast region during 1995-2001 accounted for more than twice as many days absent as scallop dredging and was represented in more than twice as much area. Significant areas were closed to bottom trawlers during the seven-year period (15% of GB and 5% in SNE). These areas account for the large gaps in the distribution of trawling activity on GB and SNE. Bottom trawling, more than any other gear type, was also conducted to a greater extent in deeper water in the GOM, north of GB, and along the shelf break in SNE and the mid-Atlantic. A continuous area of high trawling activity occurred from the central GOM west to the coast, then through the southwestern GOM, down the west side of the Great South Channel and east across the top of Closed Area I on GB. Trawling was also reported west and south of Closed Area II on eastern GB, on the southern portion of GB, throughout most of SNE in inner, mid, and outer shelf waters, along the shelf break in the mid-Atlantic, and in North Carolina coastal waters. There was a large area with no significant amount of trawling in the middle and inner portions of the mid-Atlantic shelf from the New York Bight south to the North Carolina border. Analysis of VTR data by region showed that trawling activity was fairly evenly distributed among the four regions of the Northeast shelf. The GOM and GB regions, however, ranked somewhat higher than SNE and the mid-Atlantic in most cases. In terms of the area included in TMS that accounted for 90% of the reported number of days absent from port, a larger proportion of the SNE region was trawled than was trawled in any of the other regions and the mid-Atlantic region the least affected. Trawling was distributed over a high proportion of total area in all regions except the mid-Atlantic where it was no more extensive than scallop dredging and only slightly more extensive than hydraulic clam dredging. Bottom trawling was widely distributed on a variety of substrates in the NE region, but appeared to be more widespread on mud bottom in the GOM and on sand and gravel in the other three regions where coarser substrates are more common. Analysis of VTR data according to sediment type indicated that bottom trawling was less common on sandy substrates in the NE region than dredging and more common on mud and muddy sand than the other two mobile gear types. In terms of the total amount of each sediment type present in the NE region, trawling was distributed over a much higher percentage of mud and muddy sand bottom than dredges and also ranked higher than dredges on sand and gravel and about the same as scallop dredges on gravelly sand. Trawling activity was extensively distributed over all five sediment types in the GOM, GB, and SNE regions. In the mid-Atlantic region, a much smaller proportion of sand and gravelly sand was trawled and no trawling was reported in the very small amount of gravel present in this region.

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 37) and contains a high degree of species and life stages that have been determined to be vulnerable to bottom tending mobile gear (Figure 36) (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.

Closed Area II Haddock SAP

According to the fishery description in Amendment 13, otter trawls are the predominate gear type used to harvest haddock in the northeastern U.S. and will be the primary gear used to prosecute the CAII Haddock Pilot Program SAP.

Trawls are classified by their function, bag construction, or method of maintaining the mouth opening. Function may be defined by the part of the water column where the trawl operates (e.g., bottom, midwater) or by the species that it targets (Hayes 1983). There is a wide range of otter trawl types used in the Northeast as a result of the diversity of fisheries prosecuted and bottom types encountered in the region (NREFHSC 2002). The specific gear design used is often a result of the target species (whether they are found on or off the bottom) as well as the composition of the bottom (smooth versus rough and soft versus hard). There are two three components of the otter trawl that come in contact with the sea bottom: the doors, the ground cables and bridles which attach the doors to the wings of the net, and the sweep (or foot-rope) which runs along the bottom of the net mouth. Bottom trawls are towed at a variety of speeds, but average about 5.5 km/hr (3 knots or nm/hr).

Bottom trawling in federal waters in the Northeast region during 1995-2001 accounted for 150% more days absent from port than scallop dredging and 23 times more days absent than days spent fishing with clam dredges. Significant areas were closed to bottom trawlers on GB and in SNE (See Figure 241 in Amendment 13). Bottom trawling, more than any other fishing activity, was conducted to a greater extent in deeper water in the GOM, north of GB, and along the shelf break in SNE and the Mid-Atlantic (MA) region. A continuous area of high trawling activity occurred from the central GOM west to the coast, then through the southwestern GOM, down the west side of the Great South Channel and east across the top of Closed Area I on GB. Trawling was also reported west and south of Closed Area II on eastern GB, on the southern portion of GB, throughout most of SNE in inner, mid, and outer shelf waters, along the shelf break in the MA, and in North Carolina coastal waters. There was a large open access area with no, or minimal, trawling in the middle and inner portions of the MA shelf from the New York Bight south to the North Carolina border. Trawling activity was fairly evenly distributed among the four sub-regions of the Northeast shelf

Effects of trawls on major physical features in mud (deep-water clay-bottom habitats) and gravel bottom were described as permanent, and impacts to biological and physical structure were given recovery times of months to years in mud and gravel. Impacts of trawling on physical structure in sand were of shorter duration (days to months) given the exposure of most continental shelf sand habitats to strong bottom currents and/or frequent storms. See Amendment 13 for a complete description of the effects of bottom trawls on benthic environments and more specifically, essential fish habitat.

The special access program is predominantly outside of Closed Area II, with the exception of the small triangle north of the cod Habitat Area of Particular Concern / Level 3 Habitat Closed Area. It does contain a high degree of moderately and highly vulnerable EFH in the northern part of the SAP area between 42°00'N and 42°10N (Figure 36, Table 71). Additionally, the northern portion of the SAP area outside CAII contains large patches of more complex habitats indicated by gravel areas Figure 37).

However, these areas are currently available (open) by bottom-tending mobile gears and are being fished by gears that disrupt the seafloor habitat (see analysis in Amendment 13). The analysis of increased DAS suggests that between 400 and 2,090 DAS may be used to target GB haddock in and near Closed Area II in the SAP. The range of the DAS is wide due to the hard TAC for incidentally caught cod. The biological impacts section of the proposed action suggests that it is unlikely that the higher end of the range of DAS will be used to target haddock, as it will be limited by the catch of cod. At the lower end of the range a 0.93% increase in DAS will be used and at upper end a 4.86% increase will be realized. Therefore, the limited increase in effort would not result in new habitat impacts beyond what is occurring in the SAP area already 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).

As such, the habitat impacts are minimal due to the limited extent and degree of the increased effort. The area in the SAP that is inside Closed Area II (north of the HAPC/HCA) has not been disturbed by gear capable of catching groundfish since 1994. Part of the area in the southern portion of the triangle includes the steep shelf break and contains a moderate amount of species moderately or highly vulnerable to bottom-tending mobile gears (Figure 36, Table 71). The southern portion of this triangle in the SAP is predominately sand and the northern part is predominantly mud unlike the HAPC immediately to the south with gravel pavement (Figure 37). While it may be preferable from a habitat perspective to not have an area that has been closed to fishing reopened to bottom-tending gears, especially areas that abut a Habitat Closed Area/HAPC, the triangle area is very small and will not cause effects that will jeopardize the protections afforded to essential fish habitat in Amendment 13.

Species	Lifestage	Otter Trawl Vuln.	Scallop Dredge Vuln.	Clam Dredge Vuln.
American Plaice	**A**	**High**	**High**	**None**
American Plaice	**J**	**Mod**	**Mod**	**None**
Atlantic Cod	**A**	**Mod**	**Mod**	**Mod**
Atlantic Cod	**J**	**High**	**High**	**None**
Atlantic Halibut	**A**	**Mod**	**Mod**	**None**
Atlantic Halibut	**J**	**Mod**	**Mod**	**None**
Barndoor Skate	A	Mod	Mod	Low
Barndoor Skate	J	Mod	Mod	Low
Black Sea Bass	A	High	High	High
Black Sea Bass	J	High	High	High
Clearnose Skate	A	Mod	Mod	Mod
Clearnose Skate	J	Mod	Mod	Mod
Haddock	**A**	**High**	**High**	**Low**
Haddock	**J**	**High**	**High**	**Low**
Little Skate	A	Mod	Mod	Mod
Little Skate	J	Mod	Mod	Mod
Ocean Pout	A	High	High	High
Ocean Pout	J	High	High	High
Ocean Pout	L	High	High	High
Ocean Pout	E	High	High	High
Pollock	**A**	**Mod**	**Mod**	**Low**
Red Hake	A	Mod	Mod	Low
Red Hake	J	High	High	High
Redfish	**A**	**Mod**	**Mod**	**None**
Redfish	**J**	**High**	**High**	**None**
Rosette Skate	A	Mod	Mod	Mod
Rosette Skate	J	Mod	Mod	Mod
Scup	J	Mod	Mod	Mod
Silver Hake	J	Mod	Mod	Mod
Smooth Skate	A	High	High	None
Smooth Skate	J	Mod	Mod	None
Thorny Skate	A	Mod	Mod	None
Thorny Skate	J	Mod	Mod	None
Tilefish	A	High	Low	None
Tilefish	J	High	Low	None
White Hake	**J**	**Mod**	**Mod**	**None**
Winter Flounder	**A**	**Mod**	**Mod**	**Mod**
Winter Skate	A	Mod	Mod	Mod
Winter Skate	J	Mod	Mod	Mod
Witch Flounder	**A**	**Mod**	**Low**	**Low**
Witch Flounder	**J**	**Mod**	**Low**	**None**
Yellowtail Flounder	**A**	**Mod**	**Mod**	**Mod**
Yellowtail Flounder	**J**	**Mod**	**Mod**	**Mod**

Table 71 - Species and life stages with EFH that is moderately or highly vulnerable to mobile, bottom-tending gears. ***Bold** rows indicate species in the Northeast Multispecies FMP management unit.*

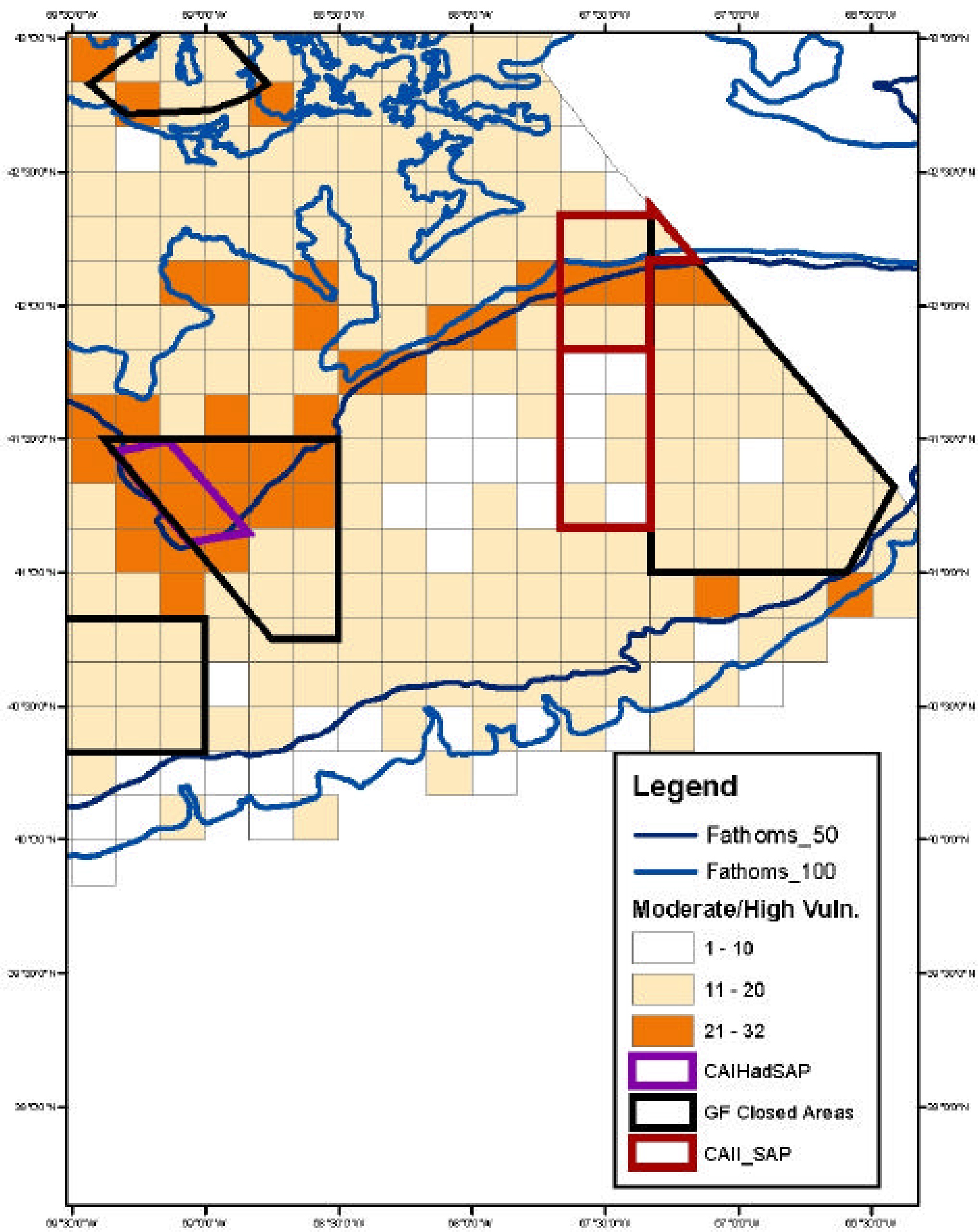


Figure 36 - Range of moderately and highly vulnerable species within Special Access Program (C.1 and C.2) boundaries.

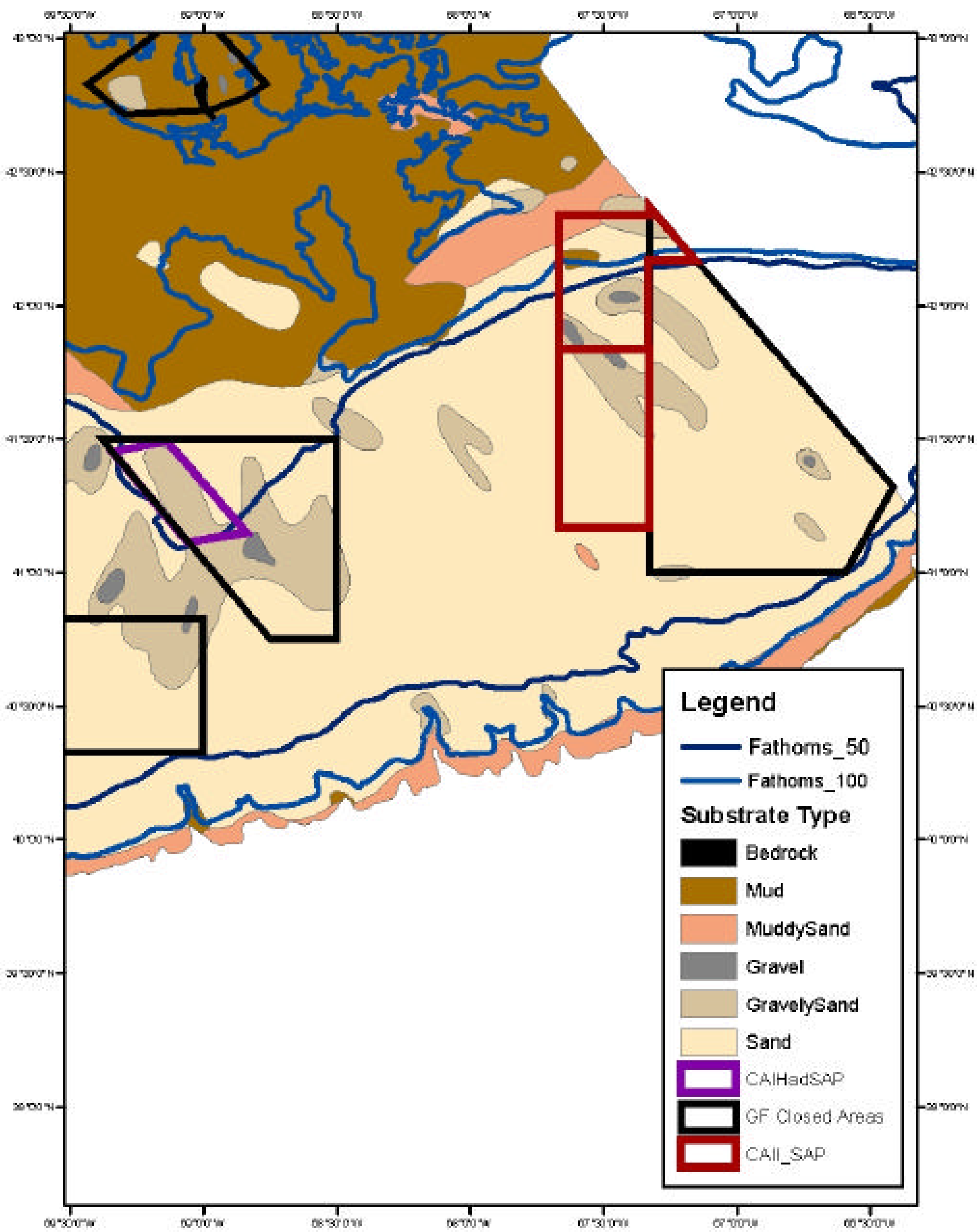


Figure 37 - General sediment type information within the Special Access Program boundaries (C.1 and C.2) from Poppe et al. database.

Combined Trips to the Western U.S./Canada Area

The impacts on habitat of allowing combined trips to the Western U.S./Canada Area are uncertain. Analyses in Amendment 13 did not indicate that there would be any changes in the amount of effort in this area due to the adoption of the U.S./Canada Resource Sharing Understanding (other than due to overall effort reductions). As a result, Amendment 13 did not expect any reduction in habitat impacts as a result of an effort reduction in this area. Some fishermen, however, have argued that the regulations implementing this understanding are so onerous that they will not choose to fish in the area. Since Amendment 13 was only implemented on May 1, 2004, it is not clear if this behavior is will actually occur to such a degree that there will be additional reductions in effort greater than those due to the overall effort reductions in Amendment 13. This area is already open to bottom-tending mobile gear, including scallop dredges. As compared to the analysis in Amendment 13, this measure will not result in any different impacts to habitat because Amendment 13 did not assume there would be an effort reduction in this area. Because other bottom trawl activity will continue in this area even if there is a reduction in effort due to the way Amendment 13 was implemented, any additional impacts to habitat will be minimal.

7.2.3 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 further Section 7 consultation actions conducted by NMFS in accordance with the Endangered Species Act. In addition, the Environmental Impact Statements and Environmental Assessments prepared for each multispecies fishery management action have addressed the impacts of existing fishery actions on marine mammals. The conclusions contained in these documents describe the current baseline assessment 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 *List of Fisheries for 2003* and are, therefore, determined to have a remote likelihood of, or no known incidental mortalities and serious injuries of marine mammals. Gillnet gear is a Category I fishery, one that has been determined to have frequent incidental mortality or serious injury of marine mammals. The Framework 40A discussion, therefore focuses on the measures proposed and associated gillnet activity. Other gear types, however, are addressed relative to their potential interactions with protected species such as sea turtles 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 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.

7.2.3.1 Category B (regular) DAS Pilot Program

The proposed action contains a number of measures that could affect but are not likely to result in adverse impacts to the protected species discussed in some detail in Section 7.4. The Category B (regular) DAS program overall could result in effort shifts that affect many of those species, but at this writing any changes in fishing behavior are almost impossible to predict. A five percent effort increase is expected as a result of the pilot program according to the analysis developed for the impacts on groundfish stocks, although it appears likely to occur across areas and will not concentrate on any single stock. As a result of this conclusion, the inference is that concentrations of effort should not occur as the result of the Category B (regular) DAS pilot program, except as discussed below relative to SAPs, and protected species should not be affected beyond the impacts discussed in Amendment 13. The increase in effort itself could affect protected species, but the impact will likely be negligible given the overall reduction in effort, as well as the possession limits and gear restrictions on B DAS use that will curtail effort.

Hard incidental catch TACs for stocks of concern are conservation measures developed to minimize the risk of exceeding the Amendment 13 fishing mortality objectives during the use of Category B (regular) DAS. They should not affect protected species other than they could result in the curtailment of Category B (regular) DAS fishing activities in certain areas. Fishing on Category A DAS could still take place, resulting in little change to the impacts discussed in Amendment 13. Similarly, the "flip" provision is a groundfish conservation measure that should have no discernable impact on protected resources, other than they are part of the larger Amendment 13 program that reduces groundfish fishing effort. Because it does continue to ratchet effort down, the DAS counting measure in the Category B (regular) DAS pilot program could function to potentially further reduce effort and therefore reduce risks to protected species. Increased monitoring in the form of VMS and increased observer coverage could enhance the information available to manage protected resources as well as the groundfish stocks managed through the Northeast Multispecies FMP.

7.2.3.2 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.

7.2.3.3 CA II Haddock SAP

The May through February Closed Area II Haddock SAP, as proposed, is limited to trawl gear operations, but this could change based on results from an experimental fishery. Experimental fishery protocols require an evaluation of impacts to protected resources and would identify any adverse impacts prior to the expansion of the list of allowable gears. While bottom trawl gear has been implicated in turtle entanglements in other areas of the country, takes have not been documented in this gear type in New England waters. Therefore, this SAP is not expected to adversely affect turtles or other protected species, given no demonstrated evidence of sea turtle interactions and its Category III status under the MMPA.

7.2.3.4 Combined Trips to the Western U.S./Canada Area

Evaluating the impacts of this measure on protected species is difficult. Fishermen have said that the regulations that restrict vessels to fishing only in the western U.S./Canada area on a fishing trip are so onerous that fishermen may avoid the area completely. If fishermen do not take advantage of fishing opportunities in this area as result of the Amendment 13 restrictions, effort could move inshore causing potential negative impacts to protected species such as right, humpback, fin and minke whales and harbor porpoise, where they might be more abundant. The modification proposed in this action to allow more flexibility for vessels fishing inside or outside the western U.S./Canada area could allow fishermen to fish inside and outside the area on the same trip. If vessels fish at times and in places with few interactions and reduce inshore effort in high use areas, the impacts could be positive. On the other hand, if effort focuses in the area it could negatively impact protected species. If encounters do occur, they will be limited to pelagic whales and dolphins and not sea turtles, given the offshore location of the defined area. Most of the fishing effort in this area is by trawl vessels or trip gillnet vessels, which have a history of fewer interactions. Because information is lacking to draw any meaningful conclusions at this time, increased monitoring will be important to evaluate the impacts of this measure.

7.2.3.5 Summary

To summarize, the measures described in the proposed action are not likely to adversely affect the protected species conclusions discussed in the Amendment 13 Final Environmental Impact Statement. Overall effort reductions are occurring as the result of reduced effort and other fishing restrictions on groundfish stocks, possibly reducing risks to protected species on the positive end of the spectrum. Most likely, the proposed measures will have a negligible impact because they do not appreciably affect effort beyond Amendment 13 levels in times and places where protected species occur. Fishing in the U.S./Canada area could concentrate effort, including gillnet effort, in an area where marine mammals do occur, but specific information is lacking at this time to draw any meaningful conclusions. An enhanced monitoring program should facilitate a better evaluation of the impacts of this measure in the future.

7.2.4 Economic Impacts

The Proposed Action would implement a set of specified bycatch TACs for stocks of concern as well as an allocation for these TACs to a proposed pilot B DAS program and two proposed SAPs. The specified measures have varying degrees of interaction which may result in impacts that may not necessarily be additive. However, each of the proposed measures do have specific features that may have unique economic impacts and will be discussed separately. This discussion is followed by a summary discussion that identifies the interactive features of the Proposed Action.

7.2.4.1 Incidental Total Allowable Catch

The incidental catch TACs effectively limits 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 shown in Table 2 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, accommodating future SAPs or Category B DAS fisheries requires taking incidental catches away from these programs and giving them to another program. This reallocation of incidental TAC could result in increased economic benefits if the new SAP results in higher yield at lower cost than any other pre-existing program. However, unless the same vessels are the beneficiaries of the reallocation, any new Category B DAS program will result in a transfer of benefits from one group of vessels to another. In effect, the proposed action embedded in this framework will endow vessels that may be able to take advantage of either SAP or the Category B (regular) pilot program with a monetary benefit that will be subject to change in any subsequent action that establishes a new program.

7.2.4.2 Category B (regular) DAS Pilot Program

The Category B (regular) DAS pilot program makes it possible for eligible vessels to increase groundfish revenues for as long as the quarterly bycatch TACs last or the quarterly DAS cap is reached, whichever would come first. As long as the pilot program remains in effect, vessels will be able to fish for allowable stocks with any gear that complies with Amendment 13 requirements for a Category A DAS. However, the types of fisheries that vessel operators may choose to prosecute is not known. A review of past logbook records provides some indication as to what types of fisheries may be possible to prosecute on a regular B DAS (see Appendix A for a description of data and methods). These include otter trawl or gillnet fisheries in the Gulf of Maine, Georges Bank, and Southern New England (Table 72).

	Otter Trawl	**Gillnet**
Gulf of Maine	skate/winter flounder winter flounder	monkfish
Georges Bank	yellowtail yellowtail/winter/monkfish/skates winter/monkfish/skates	monkfish skates monkfish/skates
Southern New England	skates skates/fluke fluke/monkfish	monkfish skates monkfish/skates

Table 72 - Summary of Potential Regular B DAS Fisheries by Area and Gear

The potential revenue per day associated with the fisheries listed in Table 72 was lowest for the Gulf of Maine trawl fishery (winter flounder/skates) ranging from $688 per day in the third quarter (Nov-Jan) to just under $1,100 per day in the first quarter (Table 73). By contrast, average revenues per day for the fisheries that may be prosecuted on Georges Bank using trawl gear was at least $2,200 per day and was nearly $3,000 per day in both quarters 3 and 4.

As noted above, the fact that the fisheries identified in Table 72 may not reflect fishing choices made by vessels that will participate in the pilot program makes quantitative assessment of the realized impacts difficult. In general, the realized impacts will depend what fisheries are actually prosecuted and whether all available DAS in each quarter will be used or whether the incidental catch TACs will preclude a portion of their use.

	May-July	**August-October**	**November – January**	**February-March**
Fishery	Value/Day Absent	Value/Day Absent	Value/Day Absent	Value/Day Absent
GB Gillnet	1525	2446	2511	970
GB Trawl	2273	2562	2936	2923
GOM Gillnet	1980	2293	1982	983
GOM Trawl	1078	812	688	874
SNE Gillnet	1326	3039	2669	1405
SNE Trawl	1557	1108	1273	1507
Average	1707	1995	2276	1768

Table 73 - Average revenue (dollars) on potential regular B DAS fisheries (FY2001 VTR)

At the individual vessel level there are several features of the pilot program that may affect whether a vessel participates. At a minimum, participants will be limited to vessels that both have VMS installed and have enough Category A DAS to cover the intended regular Category B DAS trip duration unless they were to lease additional Category A DAS. As of May 1, 118 multispecies vessels were reporting position information to the NMFS. An unknown number of vessels had purchased VMS systems but were not reporting (because they were not required to do so). The number of Category A DAS that any one of these vessels will have available to allow the use of Category B DAS in the pilot program is not known.

For vessels that do not currently have a VMS system the uncertainty over whether the incidental TACs may be reached before they can use a regular B DAS may discourage investment in a VMS unit. Depending on how the pilot program progresses vessels may have an increased incentive to purchase a unit, particularly as DAS allocations are renewed in FY2005 and the incidental TACs are scheduled to increase.

The proposed action allocates both DAS and incidental TACs equally across all four quarters in which the pilot program would remain in effect. Additionally, the proposed action would not assign pilot program Category B (regular) B DAS to any particular vessel. These two provisions could have an impact on the potential economic benefit from the pilot program. The quarterly allocation of 1,000 DAS is a quota which may result in Category B (regular) DAS derby. The extent to which such a derby will emerge is unknown but it may encourage unnecessary risk taking, less than optimal choices in fishing locations or times, higher catch rates of stocks of concern, and could compromise the ability to obtain adequate observer coverage.

7.2.4.3 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 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, this will improve profitability for vessels allowed to access the haddock, and thus provides a benefit to regulated entities under the Regulatory Flexibility Act (RFA).

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. 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. 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. Average variable costs were estimated to be $364 per day and crew share was assumed to be 45% of gross daily revenue. These averages were based on sea sampling data and may have changed, 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. 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 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 74). 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.

The amount of incidental cod TAC allocated to non-sector hook vessels is 12.6 mt. For the purposes of this analysis, it is assumed that the non-sector hook vessels take all the GB cod incidental by-catch TAC in the CAI special access program. 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.

The estimated revenue earned by sector participants is $1.97 million, while non-sector participants would earn $545 thousand (Table 75). Crew wages for sector participants would be $761 thousand, while non-sector crew wages would be $210 thousand. Total vessel surplus (profit) for sector vessels would be $1.2 million, or $24,186 per vessel. For non-sector vessels, total surplus (profit) would be $300 thousand, or $30,000 per vessel.

The analysis above makes a number of assumptions about how the TACs will be divided between sector and non-sector vessels. 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.

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

SECTOR PARTICIPANTS	
Estimated Trips Allowed	345
Potential Revenue	$1,970,151
Estimated crew wages	$760,843
Estimated VC	$125,725
Estimated Surplus	$1,209,307
Number of Vessels	50
Estimated Surplus per Vessel	$24,186
NON-SECTOR PARTICIPANTS	
Cod TAC (M.T)	12.6
Mean Cod Catch per Trip	0.13
Estimated Trips	96
Estimated Revenue	
Cod	$43,331
Haddock	$501,530
Total	$544,862
Costs	
Estimated crew wages	$210,418
Estimated VC	$34,770
Total Surplus	$299,674
Number of Vessels	10
Surplus per Vessel	$29,967

Table 75 - Estimated catch, revenue and cost divided between sector and non-sector vessels given incidental GB Cod quota of 12.6 mt

7.2.4.4 Closed Area II Haddock SAP Pilot Program

Unlike the Closed Area I Hook SAP described above there are no experimental data available to estimate potential economic impacts. However, the SAP would provide vessels with an economic opportunity to increase fishing income by targeting the healthy GB haddock stock. Given the location of the SAP, participation is likely to be limited to larger vessels with sufficient range to access offshore areas. Data from FY2002 logbooks on trips taken in the general vicinity of the proposed SAP (for purposes of analysis this was defined as anywhere within statistical area 561 or 562) bear this out as nearly 80% of the 221 identified trips were taken by vessels in excess of 70 feet LOA. There may also be some benefits that accrue to smaller vessels in the May through July period when weather conditions may allow them to fish offshore.

Total potential revenue will be limited by the GB cod and haddock TACs. However, realized revenue could be less than potential revenue particularly if the GB cod TAC is reached before the allowable catches of haddock can be taken. Since vessels fishing in the SAP will be required to use a haddock separator trawl and will be subject to a cod possession limit of 1,000 pounds the landings composition is likely to differ from that on past trips. Nevertheless, these trips provide some indication of the potential revenue per trip that may be derived from being able to access the SAP.

A total of 86 different vessels took at least one trip to either statistical area 561 or 562 in FY2002. Average revenue per trip was just over $32,000 although vessels 70’ or less earned about $10,000 less (Table 76). Average revenue per day was about $3,000 for vessels less than 50’ while vessels above 70’ earned a little more than $4,700. These averages are higher than average revenue on groundfish trips reported in the break-even analysis in the Amendment 13 FSEIS (see Table 232, p. I-695) suggesting that the proposed SAP would provide vessels with greater opportunity to remain solvent.

Length Class	Number of Vessels	Number of Trips	Days Absent	Revenue per Trip (dollars)	Revenue per day (dollars)
Less than 50'	3	8	59	22571	3060
50' to 70'	16	38	234	22633	3675
More than 70'	67	175	1274	34586	4751
Total	86	221	1567	32095	4527

Table 76 - Summary of trips taken in Statistical Areas 561 & 562 (FY2002 VTR)

Overall, the majority of the vessels that fished in Area 561 or 562 were from New Bedford (36), Point Judith (13), Gloucester (8), Portland (7) or Boston (6). Vessels from Boston had the highest average trip revenue ($43,000) while those from Point Judith earned about $17,000 less. Average trip revenue was nearly identical between Gloucester and Portland boats (about $32,000) and was slightly higher for vessels from New Bedford ($35,000).

7.2.4.5 Combined Trips to the Western U.S./Canada Area

The proposed action would relax current restrictions on where vessels may fish on the same trip, allowing vessels to fish both inside and outside of the Western U.S./Canada area. Without this change, vessels would continue to be limited to fishing either inside or outside the Western area on each trip. Fishermen have said that limiting trips to the Western U.S./Canada area creates an unacceptable risk of a "broker," a trip that does not catch enough fish to pay expenses. The extent to which the current prohibition affects overall economic opportunity is uncertain since VTR records suggest that fishing in multiple statistical areas is infrequent, yet observer data and fishermen's comments indicate that vessels do fish in multiple areas on the same trip. Nevertheless, the proposed action would alleviate a regulatory burden and should result in positive economic effects principally for vessels that fish on Georges Bank outside the Eastern U.S./Canada resource sharing area. Based on comments from fishermen, this change will help reduce the financial risk associated with fishing trips to the Western U.S/Canada area.

7.2.4.6 Combined Proposed Action Measures

The proposed action would provide individual vessel owners and their crew with increased fishing opportunities. 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). 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.

Each of the proposed measures would require 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 regular B pilot, Closed Area II Haddock SAP, and allowing combined trips in the Western U.S./Canada area would likely benefit the same groups of vessels. That is, vessels which are able to take advantage of the Closed Area II Haddock SAP will also be fishing in the Western U.S./Canada area and because they would also have an installed VMS unit they would be able to take advantage of the Category B (regular) DAS pilot program.

7.2.5 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.

7.2.5.1 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.

7.2.5.2 Category B (Regular) DAS Pilot Program

The pilot program would authorize the use of 1,000 Category B (regular) DAS in each of four consecutive quarters beginning with quarter 3 (November, 2004) of FY2004. These DAS are not assigned to individual permits. The charging of days is based on any portion of a calendar day being charged as one full day. The program will be suspended when either quarterly TACs or the quota on regular B DAS has been reached, which ever comes first. Category B (regular) DAS can be used to fish only stocks deemed to be healthy and not stocks of concern. DAS reductions were considered in Amendment 13 analysis to have the most profound potential impacts on communities resulting in changes in occupational opportunities, community infrastructure, daily living, and safety. Use of Category B (regular) DAS has the potential to alleviate some of the loss in capacity resulting from Amendment 13.

The most likely beneficiaries of Category B (regular) DAS are those that already possess VMS. Since the pilot program would not begin until November, 2004 some vessels may not have enough Category A DAS available in order to participate in this fishing year unless additional DAS can be acquired through a lease arrangement. Vessels in this situation may have greater opportunity to participate in the pilot program during the first two quarters of FY2005 since they would receive their new allocations of Category A DAS in May, 2005. VMS is currently required for many vessels that fish on much of Georges Bank. These vessels and the communities within which operators and crew reside would be immediately able to take advantage of the pilot program. By contrast vessels that fish in the Gulf of Maine particularly in the near- or in-shore portions of the Gulf are not currently likely to be required to have VMS. These Gulf of Maine vessels are less likely to have VMS due to the expense, and for smaller vessels, due to the lack of a sufficient power source while moored to meet the requirement to leave the VMS unit on at all times. While the opportunity to participate in the Category B (regular) DAS pilot program may be sufficient inducement to invest in a VMS unit, the limit on incidental TACs and the limited quota on Category B (regular) DAS increases the risk of such an investment. Under these circumstances vessels that fish in the Gulf of Maine may not choose to participate in the pilot program. Thus, on balance, the Category B (regular) DAS pilot program should have positive social impacts but these impacts may be more likely to be concentrated in the communities that support vessels fishing on Georges Bank.

One possible adverse social impact that could result from this measure relates to vessel safety. Under this proposal, Category B (regular) DAS are counted based on a calendar day – a vessel is charged a full twenty-four hours for every calendar day that is fished, regardless of the actual time spent underway. In the past, fishermen have raised the concern that similar provisions would encourage small, minimally manned vessels to fish a full twenty-four hours in order to maximize their fishing time. With small crews, there is a risk that this will result in accidents caused by fatigue. Fishermen questioned on this issue offered divergent views. Some said they did not believe this would be a problem, since the program essentially provides a way to use "free" DAS – DAS that could not otherwise be fished. Others, however, said that it would encourage risky behavior by small vessel operators seeking to maximize the time fished for each DAS charged. Two elements that may mitigate safety concerns is that this is a pilot program for one year and that all vessels are required to have a VMS to participate. Because of the cost, small vessel owners may be less likely to purchase a VMS for a one-year program.

7.2.5.3 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 Table 77). 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.

7.2.5.4 Closed Area II (CA II) Haddock SAP

Analysis of this management measure is based on the inclusion of vessels that had a conforming vessel monitoring system (VMS), a requirement for participation in this program (see Table 78). The analysis is limited to vessels that reported fishing in statistical areas 561 or 562 during fishing year 2002. The majority of vessels (65 out of 103 with VMS) reported Massachusetts as the port of landing. New Bedford has the greatest number of vessels (39) that both landed and homeported in New Bedford, while sixteen boats were from Boston. Gloucester showed 17 boats as landing in that city in 2002 of which 10 were also homeported in Gloucester. Boston, MA and Portland, ME boats that both landed and homeported in these respective ports.

Total people days absent (days absent per trip x no. of crew per trip) can be used as a measure of the location and intensity of human effort. Human effort can be viewed as the potential social benefit that may accrue. It is similarly distributed to that of the distribution of VMS with New Bedford, then Gloucester the top ranking ports for vessels that both land and homeport in those ports.

STATE	PORT	IN SECTOR	TRIPS	COD	HADDOCK	POLLOCK	REDFISH	W. HAKE	OTHER
MA	GLOUCESTER	13	250	84,586	121,494	139	20	24	16,815
	BOSTON	7	84	43,658	16,052	67	48	0	2,245
	CHATHAM	7	325	223,102	187,266	1,624	687	6,316	135,873
	BARNSTABLE	3	82	72,566	50,711	840	14	532	7,147
	OTHER	17	178	96,924	44,440	3,713	233	459	28,542
	MA Total	**47**	**919**	**520,836**	**419,963**	**6,383**	**1,002**	**7,331**	**190,622**
ME	OTHER	0	97	10,050	20,670	175	0	1,200	14,430
	ME Total	**0**	**97**	**10,050**	**20,670**	**175**	**0**	**1,200**	**14,430**
NH	OTHER	3	13	5,573	7,458	83	20	20	1,342
	NH Total	**3**	**13**	**5,573**	**7,458**	**83**	**20**	**20**	**1,342**
NY	OTHER	0	38	31,869	12	53	12	0	839
	NY Total	**0**	**38**	**31,869**	**12**	**53**	**12**	**0**	**839**
PA	OTHER	0	17	16,713	13,086	1,066	392	13,518	180,296
	PA Total	**0**	**17**	**16,713**	**13,086**	**1,066**	**392**	**13,518**	**180,296**
	GRAND TOTAL	50	1084	585,041	461,189	7,760	1,426	22,069	387,529

Table 77 - Closed Area I (CA I) Hook Gear Haddock SAP, analysis of social impacts for those declared into the sector. Based on VTR data for calendar year 2003.

Landed State	Landed Port	Home State	Home Port	VMS	Ave. Vessel Length	Average Days Absent per Trip	Average # Crew per Trip	Total People Days Absent	Groundfish Pounds	Total Port Ground-fish Pounds (%)	Ground-fish Value	Total Port Groun d- fish Value (%)	Other Species Pounds	Total Port Other Species Pounds (%)	Total Port Other Species Landings Value	Total Other Species Value (%)
MA	BOSTON	MA	BOSTON	8	83	8	4	396	336,508	14%	409,637	15%	101,027	8%	139,156	10%
	GLOUCESTER	MA	GLOUCESTER	10	80	6	5	866	670,665	8%	830,729	8%	116,373	5%	149,900	5%
			Other	0	76	5	4	61	38,808	0%	50,111	1%	3,460	0%	7,422	0%
		ME	Other	2	63	6	4	44	40,200	0%	50,370	1%	9,850	0%	10,740	0%
		RI	POINT JUDITH	5	79	7	5	170	195,008	2%	236,827	2%	11,238	0%	15,404	1%
			Total	**17**	**78**	**6**	**5**	**1,141**	**944,681**	**11%**	**1,168,037**	**12%**	**140,921**	**6%**	**183,466**	**6%**
	NANTUCKET	MA	Other	0	72	4	2	14	4,817	3%	6,131	3%	2,177	3%	4,566	5%
	NEW BEDFORD	MA	BOSTON	16	79	7	5	957	898,233	6%	1,105,855	6%	82,298	1%	120,208	1%
			Other	1	65	8	5	75	35,645	0%	44,603	0%	8,628	0%	17,380	0%
			NEW BEDFORD	39	77	8	5	2,422	1,567,934	10%	1,892,437	10%	216,809	3%	266,908	2%
		NC	Other	0	74	9	4	36	17,379	0%	18,539	0%	70	0%	97	0%
		NJ	Other	0	87	6	4	72	42,920	0%	50,445	0%	2,570	0%	720	0%
		NY	NEW YORK	4	83	8	4	209	132,965	1%	152,135	1%	6,476	0%	11,616	0%
			Other	3	77	9	4	198	209,640	1%	250,367	1%	6,496	0%	12,530	0%
		RI	Other	2	76	6	5	824	497,129	3%	613,293	3%	32,444	0%	55,485	0%
			Total	**65**	**77**	**7**	**4**	**4,793**	**3,401,845**	**22%**	**4,127,674**	**22%**	**355,791**	**5%**	**484,944**	**4%**
ME	PORTLAND	DE	Other	2	80	8	4	60	39,660	0%	51,311	1%	205	0%	255	0%
		MA	Other	1	71	8	4	32	19,000	0%	25,057	0%	1,000	0%	1,388	0%
		ME	PORTLAND	6	73	7	4	204	208,991	2%	247,503	3%	7,864	0%	10,836	0%
			Other	1	90	9	4	36	10,650	0%	12,920	0%	100	0%	139	0%
			Total	**10**	**76**	**8**	**4**	**332**	**278,301**	**3%**	**336,791**	**3%**	**9,169**	**0%**	**12,618**	0%
NH	PORTSMOUTH	NH	Other	0	50	4	4	42	18,041	3%	21,032	3%	4,695	2%	3,747	1%
RI	NEWPORT	RI	NEWPORT	3	75	7	5	181	120,335	7%	147,903	8%	5,614	0%	7,164	1%
	POINT JUDITH	RI	Other	0	62	6	4	44	27,350	1%	35,166	1%	2,080	0%	5,062	0%
			Total	**3**	**62**	**6**	**4**	**44**	**27,350**	**1%**	**35,166**	**1%**	**2,080**	**0%**	**5,062**	0%
			Total Vessels with VMS	103			**Total People Days**	13,253								

Table 78 - Closed Area II Haddock SAP, Analysis of Social Impacts for historical use of statistical areas 561 and 562. Data based on fishing year 2002 and limited to statistical areas 561 and 562. Total people days absent represents a measure of human effort.

7.2.5.5 Social Impacts of Combined Trips in the Western U.S./Canada Area

Vessels would be able to fish both inside the western U.S./Canada area and outside the western U.S./Canada on the same trip but not in the eastern U.S./Canada area. Vessels that are able to do so may find this provides increased flexibility and improves available options. VTR records for 2002 show that 236 individual vessels took at least one trip within the U.S./Canada area. As discussed in section 7.2.1.1, VTR records do not provide a reliable indication of the vessels that in the past have fished inside and outside this area on the same trip.

7.2.5.6 Social Impacts of Combined Proposed Action Measures

The proposed action 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.

7.2.6 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

Two fisheries managed by the NEFMC – monkfish and skates – may also be affected by this action.

A primary concern of participants in MAFMC fisheries is that as a result of the reduction in DAS adopted by Amendment 13, groundfish vessels will become more active participants in MAFMC-managed fisheries for which they hold permits. Since many of these fisheries are managed through quotas, an increased number of participants could lead to shorter openings and depressed prices as landings flood into the market. Amendment 13 included an analysis of the permits held by multispecies permit holders and described, in qualitative terms, the ability of groundfish vessels to shift into these other fisheries. Amendment 13 concluded that the ability to shift effort was primarily limited to trawl vessels. Amendment 13 also noted the ability to shift into other fisheries was not as great for those vessels that are heavily dependent on groundfish since many of these vessels do not hold additional limited access permits. These vessels are the ones most likely to be affected by Amendment 13's effort reductions. The ability to shift into other fisheries was greatest for those vessels that are only partially dependent on groundfish and that will have lower revenue losses as a result.

Since the proposed action provides opportunities for groundfish vessels to use Category B DAS to target healthy groundfish stocks, it will reduce the need for vessels to enter other fisheries in order to replace lost groundfish revenues. This will mitigate, to some extent, the possibility that Amendment 13 restrictions will force effort into other fisheries. Some of these opportunities may actually draw effort out of the other fisheries since there is a limited time opportunity to participate. For example, vessels may choose to fish in a Category B (regular) DAS pilot program at the beginning of a fishing quarter because of concerns that they will lose the opportunity if they wait since the number of DAS that can be used is limited. This could actually extend the fishing season for some MAFMC fisheries.

The proposed action will also impact the monkfish and skate fisheries since vessels will have a limited ability to use Category B (regular) DAS to target those species. Any impacts will be short-lived, since the pilot program will only be in place for one year. As discussed in section 7.2.1.2, this provision could increase effort on monkfish. The monkfish FMP includes provisions that adjust that FMP's effort controls based on fishing mortality rate proxies. As a result, it is possible that the proposed action could lead to reduced DAS or landing limits for the monkfish fishery. Section 8.1.3.3 concludes the proposed action is unlikely to have substantial effects on the skate fishery.

7.3 No Action

The No Action alternative represents the measures adopted by Amendment 13, as approved and as implemented by regulation on May 1, 2004. 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. For example, some fishermen have said that the regulations implementing Amendment 13 may have unintended consequences that were not foreseen when the amendment was prepared. It is not possible to evaluate whether these consequences will result in impacts that are outside of the scope of the impacts estimated in the amendment.

7.3.1 Biological Impacts

7.3.1.1 Impacts on Groundfish

If the proposed action is not adopted, the impacts on groundfish stocks should be the same as described in Amendment 13 (NEFMC 2003). 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 <u>if fished at the target fishing mortality rate</u>:

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 (Table 46). 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.

7.3.1.2 Impacts on Other Species/Bycatch

If the Council does not select any of the proposed measures contained in this framework action no additional impacts on the mortality of non-target species is expected. The multispecies fishery results in bycatch of both regulated groundfish and other species. Section 9.4.2.8 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.

7.3.2 Habitat Impacts

The habitat impacts of the No Action Alternative in this framework will not be any different than the implemented measures from Amendment 13. 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.

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 79 – Summary of the potential habitat benefits of non-habitat measures implemented in Amendment 13 that are applicable to the proposed measures in FW40A.

Habitat benefits identified above apply primarily to bottom trawls, not to fixed gear such as hooks and gill nets

7.3.3 Impacts on Endangered and Other Protected Species

Amendment 13 anticipated that groundfish measures implemented in that action would have negligible and possibly beneficial impacts on protected species. For instance, days-at-sea reductions and additional gear restrictions will significantly reduce effort in the groundfish fishery. Further, the Amendment 13 measures, added to actions implemented through the Interim Final Rule for the Northeast Multispecies Fishery, the existing rolling closures and Take Reduction Plans potentially contribute to an overall reduction in risk to protected species inhabiting the multispecies management unit. Despite that risk reduction, encounters between gear and protected species are still likely to occur, where gear and species overlap, particularly in marine mammal high use areas. The No Action alternative, therefore, will simply continue the potentially positive outcomes that could accrue as the result of Amendment 13 implementation.

7.3.4 Economic Impacts

Taking no action would leave all current fishery regulations in place. These regulations include all actions implemented on May 1, 2004 as well as any regulatory changes that have taken place since that time; the lifting of the haddock trip limit and approval of an additional VMS vendor, for example. Given the very short time period that has elapsed information on the realized impacts of Amendment 13 is not available. The anticipated or predicted impacts of the Amendment were described in the FSEIS to the Multispecies FMP.

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. 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.

7.3.5 Social Impacts

This alternative would leave present regulations in effect. These regulations were implemented on May 1, 2004 not leaving sufficient time between initial implementation and this action to determine actual impacts. Therefore, this discussion is based on a summarization of predicted impacts as describe in Amendment 13. 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. 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.

7.3.6 Impacts on Other Fisheries

As discussed in section 7.2.6, Amendment 13 effort reductions may result in a shift in fishing effort into several fisheries managed by the MAFMC. The No Action alternative would not mitigate this possible change in any way.

7.4 Alternative 1: Measures A.1, C.1, C.2, and D.1

This section analyzes the impacts if the following measures are adopted:

- Incidental catch hard TACs (Measure A.1)
- CAI hook gear haddock SAP (Measure C.1)
- CAII haddock SAP (Measure C.2)
- Relaxation of restrictions on areas that can be fished (Measure D.1)

This alternative is similar to the proposed action except for the following:

- The Category B (regular) DAS pilot program would not be adopted.
- There are options for the allocation of incidental catch TACs to the SAPs, rather than the specific allocations included in the proposed action.
- The details of the CAII haddock SAP are different than those in the proposed action

While the measures under consideration did not explicitly identify this combination as a package that may be adopted, it was identified as one of the likely combinations.

7.4.1 Biological Impacts

The biological impacts were analyzed using the same techniques as used for the proposed action (section 7.2). The following discussion does not repeat information on analytic techniques from that section. As was done in the analysis of the proposed action, 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. These impacts are included in the first two analyses.
- 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.

7.4.1.1 Impacts on Groundfish

As discussed in sections 3.1 and 7.2.1, Amendment 13 adopted mortality targets for groundfish stocks and a suite of management measures to meet those targets. The Amendment 13 measures were designed to achieve these targets on the mix of groundfish species. As a result, in some cases the measures are expected to reduce fishing mortality more than is necessary. This alternative allows for Category B DAS to be used in two additional SAPs. It allows a limited increase in the number of DAS that can be fished by groundfish vessels. Evaluation of the groundfish impacts of this alternative focuses on determining that the additional catches of the targeted healthy stocks and the incidental catch of other groundfish stocks will not exceed mortality goals. For the two SAPs proposed in this alternative, hard TACs are used to control the incidental catch of the primary incidental catch species and the target stock.

7.4.1.1.1 Target Stocks

This alternative includes two SAPs that are designed to target GB haddock. For both SAPs, 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 ceases.

Category B DAS Incidental Catch TACs

This measure limits the catch of stocks of concern taken while using Category B DAS. The proposed TACs are set at very low levels to reduce the risk to Amendment 13 mortality objectives. For some of the proposed Category B DAS programs, these TACs are so low that they may be caught and the program may be ended early, limiting the catch of the target stocks.

CAI Hook GearHaddock 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 5.4.1. The impacts of this measure on haddock are the same as those described for the proposed action in section 7.2.1.1.1. As noted in that section, an overall “hard” TAC of 1,000 mt limits the haddock catch of the participants in this SAP. The conclusion from comparing recent catches to the FY 2004 TAC 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 2004 TAC. Based on these comparisons, it is not likely that the proposed TAC for the CAI Hook Gear Haddock SAP would threaten mortality objectives of Amendment 13 (see Table 43).

This SAP proposes to implement fishing activity that was examined by an experimental fishery conducted during September through October 2003. The results of that experiment are detailed in section 7.2.1.1. 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 44)(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. For example, assuming the SAP fishery has a similar mean and variance of haddock catches, a twenty percent level of observer coverage should result in the mean haddock catch on all trips being within +/- ten percent of the mean of the sampled trips at the 90 percent confidence interval (see Figure 6).

CAII Haddock SAP

This alternative includes a SAP to target haddock in the eastern U.S./Canada area (statistical areas 561 and 562). Analysis of the impacts on the haddock resource in this section will focus on catches of haddock and haddock spawning activity. Some of the details of this measure differ from that in the proposed action:

- This measure was not limited to a two-year pilot program.
- This measure does not include a no-discard provision or the requirement to "flip" from a Category B DAS to a Category A DAS if the landing limit of cod is exceeded.
- The cod landing limit is different than in the proposed action.
- This measure considered options for the TAC that would limit the incidental catch of cod caught on a Category B DAS (the TAC adopted in the proposed action is within the range considered in this alternative).

Under the terms of the U.S./Canada Resource Sharing Understanding, a "hard" TAC limits catches of haddock in this area. When the TAC is caught, the only fishing that can take place is under a SAP for yellowtail flounder in CAII. The TAC is allocated to each country using an agreed upon formula that is applied to an annual assessment and an agreed mortality target. The U.S. allocation for 2004 is 5,100 mt – only 900 mt were landed from this area in 2002. All catches of haddock from this SAP are applied to this TAC, and if the TAC is caught, all fishing for haddock in the area is stopped. This hard TAC ensures catches of haddock under this SAP will not threaten the mortality targets of Amendment 13.

With respect to impacts on haddock, this measure will likely have the same impacts as the proposed action. These impacts are analyzed in section 7.2.1.1.1. That discussion estimates that 2,090 DAS would be needed to harvest the 5,100 mt (11.2 million pounds) TAC for based on observed catch rates in SA 561 and 562, adjusted for the use of the haddock separator trawl. Using a similar analysis, the higher catch rates in SA 562 would result in a catch rate of over 7,420 lbs./day, or 1,509 DAS needed to harvest the GB haddock TAC. This analysis does not differentiate between Category A or B DAS. Analysis of cod catches in this fishery, when compared to the incidental catch cod TAC, suggests that the constraint on this SAP will be the incidental catch of cod and not the catch of haddock.

It is theoretically possible that vessels could use Category B DAS under this SAP to catch the TAC in the U.S./Canada area, and then use Category A DAS to catch additional haddock outside the area. Such a transfer of effort, if large enough, could threaten haddock mortality targets. As shown in Table 43, however, there is a large gap between recent haddock catches and the TAC for FY 2004. Catches would have to more than double to exceed the target TAC for FY 2004. This is unlikely given the restrictions on fishing effort implemented by Amendment 13.

7.4.1.1.2 Incidental Catch Stocks

Category B DAS Incidental Catch TACs

While the main purpose of this action is to create opportunities to target healthy stocks, there may be some catch of groundfish stocks of concern. This alternative establishes hard TACs for the incidental catches (landings and discards) of groundfish stocks or concern that may be caught while using Category B DAS. 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 created in this alternative 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 the risk of exceeding Amendment 13 mortality objectives is not significant.
- 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 is 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 provides does not create much risk for these stocks.

The incidental TACs considered for this alternative are the same as those included in the proposed action (Table 50). The procedure used to estimate those TACs, and the evaluation of the impacts of those TACs, is described in section 7.2.1.1.2. There are no differences between this alternative and the proposed action for this measure.

The impacts of exceeding the target TAC by a small percentage were examined for those four stocks where the Amendment 13 measures are expected to just meet mortality objectives. These are the stocks where the incidental catch TAC is set at two percent of the total TAC. For GB cod, GOM cod, and CC/GOM yellowtail flounder, short-term projections were run to determine the impact on the target fishing mortality rate if the catch is equal to 102 percent of the target TACs estimated in Amendment 13. A projection could not be run for white hake because it is not assessed through an age-based method. The projections were not extended into the years beyond 2006 because of uncertainty over how the program may be pursued in the future. The increased catch results in a slight increase in the expected fishing mortality for all three stocks, and the spawning stock biomass trajectory is slightly depressed as a result (Table 51). The impacts are minor in the short-term, but if extended into the future they would be expected to reduce the probability of rebuilding in the defined time period. For stocks using an adaptive rebuilding approach (GB cod, GOM cod), the rebuilding mortality from 2009 through the end of the period would have to be reduced. Phased rebuilding stocks (white hake, CC/GOM yellowtail flounder) would need adjustments as well at some point in the rebuilding period. These adjustments could be made after the update assessment called for by Amendment 13 in 2005, or the baseline assessment called for in 2008.

The second step in analyzing the incidental catches of stocks of concern is to examine the specific measures proposed to determine if they will make it difficult to monitor and enforce the incidental catch TACs. This is done for the specific details of each measure.

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 5.4.1. For the

CAI hook gear SAP, there are only minor differences between this alternative and the proposed action. 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 threaten mortality objectives for GB cod.

This SAP proposes to implement fishing activity that was examined by an experimental fishery conducted during September through October, 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. The average catch was 112 lbs./trip for the entire experiment. The catch resulting from the experiment is shown in Table 44. The distribution of cod to haddock caught is shown in Figure 18. 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 the number of trips was not sufficient to draw valid conclusions). Table 55 and Table 56 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.

To summarize, the experimental fishery demonstrated that a longline fishery can 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 500 lbs./DAS. 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.

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. The experimental fishery measured the length of all cod caught. Most of the cod caught exceeded the minimum size limit for cod (see Figure 19). Based on these results, it is not likely the SAP will result in an excessive catch of juvenile cod.

Another 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 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 observer coverage of 20 percent of the DAS fished. Based on the experimental results and the TAC set for haddock (see the previous discussion, section 7.4.1.1.1), 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 20, 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.

This SAP includes a provision that would allow the Regional Administrator to expand the area for the SAP, or extend the season for the SAP. Before changes can be made, the Regional Administrator must consider the results of an experiment that had been proposed for a larger area and season. It is not possible to estimate the impacts on most incidental catch species until the results of the experiment are known. With respect to cod, however, changing the boundaries of the SAP will not result in a change in the incidental catch TAC. Cod removals will thus be controlled regardless of the area that is open to fishing. It is possible, however, that catch rates of other species may change (increase or decrease) from those observed in the original experiment.

Changing the season proposed for the SAP could extend the SAP into groundfish spawning seasons. Table 61 through Table 64 and Figure 22 through Figure 33 provide information on the time and location of groundfish spawning on Georges Bank. In general, the peak periods are December through June. The SAP proposal will not allow spawning in March and April to protect haddock spawning. The primary months for cod spawning, however, are January and February. NMFS spring trawl, Canadian spring trawl, and recent MARMAP surveys show that spawning cod or cod eggs and larvae are found in CAI during spring months. 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, expansion of this SAP into other months should carefully consider whether future experiments show that the cod caught during these months are in spawning condition.

CAII Haddock SAP

An experiment has not been conducted that estimates the incidental catch species that will be taken during the CAII haddock SAP. As a result, recent observer reports from the area were analyzed and combined with the results of several gear experiments to evaluate the impacts of this SAP on incidental catch species. These analyses are fully described for the proposed action in section 7.2.1.1 and only the results are repeated in this section. This measure differs from the proposed action in that it considered two different GB cod incidental catch TACs.

As discussed in section 7.2.1.1, recent observer reports were used to estimate cod catch rates for vessels participating in this SAP. These catch rates were adjusted to account for the use of the haddock separator trawl. By applying these catch rates to the GB cod incidental catch TACs that were considered in this measure, and estimate was developed of the number of days that could be fished in the SAP before the cod TAC is caught. If the catch rates estimated are applied to these TACs, the number of days fished before the cod TAC is reached ranges from 45 to 445 (see Table 80 below) in fishing year 2004. Given the analysis of haddock catch rates in a previous section, it is likely that participation in this SAP will be constrained by the incidental catch of cod rather than the haddock TAC.

This measure would adopt a cod possession/trip limit of 100 lbs./DAS. Based on the observed trips in this area in 2003, and the assumed performance of the haddock separator trawl based on experimental results in other areas, vessels may exceed the daily trip limit by 200 to 500 lbs. per day. The cod discard-to-kept ratio in this SAP may range from 2:1 to 5:1 if the 100 lb. limit is adopted. There is evidence, however, that as fishermen use the haddock separator trawl they can improve its ability to release cod. Canadian fishing vessel operators claim to achieve cod-to-haddock ratios of 40:1, which would result in cod catches of 134 lbs./day if the haddock catch is 5,360 lbs./day as estimated earlier. This report, however, is not entirely consistent with Canadian observer data provided to the Council that shows an average cod catch of nearly 50 lbs./hour of towing (Giroux, pers. comm. 2004). Even with an improvement in performance of the separator trawl, it is likely that this SAP will result in an increase in the cod discard-to-kept ratio compared to that observed in 2003 on Georges Bank (Table 60) for trips in this area.

CAII Haddock SAP	**Assumed Cod Catch Rates**	
2004 Cod TAC Options	**329 lbs./day**	**658 lbs./day**
12.6 mt	84	42
24.5 mt	164	82
54.5 mt	310	155
66.4 mt	445	222

Table 80 – Estimated fishing days before GB cod incidental catch TAC is caught using two different assumed catch rates

Observer reports also show that this SAP may catch large amounts of winter flounder (Table 57 and Table 58). While GB winter flounder is a stock of concern, analysis in Amendment 13 showed that considerable quantities of winter flounder may be caught in the CAII yellowtail flounder SAP. That analysis assumed that vessels would "top off" CAII yellowtail flounder SAP trips by targeting winter flounder and haddock in other parts of the eastern U.S./Canada area on the same trip. If this CAII haddock SAP were to result in yet further effort on winter flounder, it is possible that the combined catches could exceed the GB winter flounder target TAC and Amendment 13 mortality objectives. Vessels in this SAP that target haddock are likely to use a haddock separator trawl. Canadian researchers reported that less than 10 percent of winter flounder catches were caught in the lower cod end of vessels using a separator trawl (DFO 1992). While a recent experiment on Georges Bank did not catch significant amounts of winter flounder, that experiment documented that other flatfish were most often caught in the lower codend (Raymond and Manomet 2004). These results suggest that the requirement to use a haddock separator trawl will reduce winter flounder catches and will make it unlikely that this SAP will threaten GB winter flounder mortality objectives.

Because the likely constraint on the number of days fishing in this SAP will be the cod incidental catch, adequate monitoring of the cod catch (landings and discards) is crucial. The proposed measures include requirements for daily reporting of cod and haddock catches via VMS, helping NMFS to monitor progress to catching the respective TACs. In addition, there is a requirement for observer coverage of 20 percent of the days fished in this area. An experiment has not been conducted that would provide data to estimate the level of precision that will result from this observer coverage (as was done for the CAI hook gear SAP). In the absence of an experiment, observed trawl trips on all of Georges Bank in 2003 were examined. The discard-to-kept ratios for cod were broken down by quarter (Table 60). The results were used to calculate the level of precision that will result from different numbers of observed trips (Figure 21).

In order to determine the number of trips in this area that may be sampled by the proposed observer coverage, the total number of days of coverage must be estimated. This estimate is contingent on whether the GB cod or GB haddock TACs prove to be the constraint on the number of days fished in the area, and whether the estimated catch rates are actually observed in the fishery. Because of the options for the GB cod incidental TAC and the differences in cod catch rates between the two statistical areas, at the extremes, the number of days fished in this SAP could be as low as 42 (Table 80) or as high as 2,090, leading to a wide range of observed days - from 8.4 to 418. These observed days are based on the days actually spent fishing in the area. Since it takes roughly one day of steaming time each way, the trip length in the area should be about five days based on the average trip length for all Georges Bank trips. This information can be used to estimate the sampling precision that will result for a given number of sampled trips.

The proposed season for this SAP is for May through February. Participation in the SAP will not be allowed during March and April in order to minimize interference with haddock spawning, but some fishing will be allowed during these months in the area to the west of CAII while under a Category A DAS. The primary difference between the No Action alternative and this SAP is that a small area at the northern end of CAII is open to fishing under the SAP conditions. There is a possibility that allowing the SAP to take place in this area during January and February will have a negative impact on groundfish spawning. The primary concern is over cod spawning. There are three main issues to consider:

(1) The time of spawning activity in the groundfish closed areas (in particular, the northern tip of CAII);
(2) The absence or presence of spawning activity in the groundfish closed areas (in particular, the northern tip of CAII); and
(3) Trawl impacts on groundfish spawning.

These questions are discussed in detail in section 7.2.1.1. Based on that analysis, CAI and CAII are important areas for groundfish spawning activity. The peak months for this activity are the period January through June, though the time of spawning varies for each species. There is direct evidence that trawl fishing disrupts the behavior of spawning cod. This is a concern for cod, since spawning biomass in 2002 was only 12 percent of the rebuilding target. The proposed SAP, however, only opens a small part of CAII to fishing during the peak groundfish spawning months. While in recent years the Canadian survey has caught some ripe and/or spawning cod in this area, there is more spawning activity to the east on the Northeast Peak. In addition, the SAP will require the use of a haddock separator trawl or a flounder net. In the corner of CAII that will be open to fishing, vessels are likely to use a haddock separator trawl to target haddock and most cod that encounter the net will be released through the lower cod end of the net.

Combined Trips to the Western U.S./Canada Area

This measures is identical to one included in the proposed action and analyzed in section 7.2.1.1. This measure would allow vessels to fish in the Western U.S./Canada area and outside the U.S./Canada areas on the same trip. Biological impacts of this change are difficult to estimate. Vessel operators have testified that with this restriction in place, they cannot afford to risk fishing in the western U.S./Canada area. If this behavior results, it may reduce fishing mortality on GB yellowtail flounder and may reduce mortality on GB winter flounder and GB haddock. At the same time, effort that would be used in this area may move inshore and result in increases in fishing mortality on stocks of concern such as GB cod, GOM cod, CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, plaice, and SNE/MA winter flounder. Removing the restriction may encourage vessels to target the healthy GB haddock and yellowtail flounder found in this area, and avoid targeting stocks of concern outside this area.

An additional concern is whether the proposed change will make it difficult to attribute catches of yellowtail flounder on combined trips to the appropriate stock area. As described in section 7.2.1.1, the measure includes reporting and recordkeeping requirements to facilitate tracking of yellowtail flounder catches, as well as reduced landing limits that will slow the catch of yellowtail flounder on combined trips. In addition, given the additional effort reductions adopted by Amendment 13, absent a tremendous increase in catch rates it will be difficult for U.S. vessels to catch the entire TAC. In essence, this provides a further safeguard as a form of buffer against misreporting of the catch by stock area. Finally, as analyzed in section 7.2.1.1, the catch of yellowtail flounder in the Western U.S./Canada area shows distinct differences by season and area, suggesting that fishermen on combined trips can choose to avoid large catches of yellowtail flounder in order to comply with the low landing limits adopted by this measure.

7.4.1.1.3 Summary of Impacts on Groundfish Species

This section summarizes the biological impacts of Alternative 1 on groundfish stocks, both those that are targeted and those that are caught incidentally. Overall, this alternative would not have significant impacts on any regulated groundfish species.

If this alternative were adopted, fishing mortality would be expected to increase on GB haddock as a result of the two SAPs. Fishing mortality might also increase on GB winter flounder as a result of the CAII haddock SAP, but this increase would probably be minimal because of the requirement to use the haddock separator trawl. Based on the analysis in Amendment 13 and this document, if this alternative were adopted. the fishing mortality for these two stocks would not be expected to exceed the thresholds established by Amendment 13.

Fishing mortality might also increase for GB cod caught by vessels participating in the two SAPs. The catch of GB cod would be constrained by a hard TAC. This TAC is established at a level so that, if caught, the risk of exceeding rebuilding targets would be low.

7.4.1.2 Impacts on Other Species/Bycatch

This alternative may have impacts on other species. The most probable impact is a result of catches of other species that results from groundfish fishing activity. 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 could 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. Impacts on other species were analyzed using the results of an experimental fishery was conducted in this area in October through December, 2003. That analysis is explained in section 7.2.1.2 and the details are not repeated here. For those species that accounted for more than one percent of the catch in the experiment, the expected catch if this measure would have been adopted is shown in Table 68. 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 are discussed in the skate baseline review (section 8.1.3). About eight percent of the total catch in the SAP will probably be discarded.

It is not possible to determine if these catches of other species represent 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).

CAII Haddock SAP

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips in SAs 561 and 562 were examined and interpreted in light of the results of several haddock separator trawl experiments in other areas. That analysis is detailed in section 7.2.1.2 and the details are not repeated here. The catch (kept and discarded) for the top eight species caught on observed trawl tows in 2003 is shown in Table 81. These eight species comprised forty-seven percent of the total catch on observed tows in both areas. While some of these species were retained, they accounted for ninety-six percent of the discards. Three skate species (little, winter, and not further specified) accounted for eighty-four percent of the discards on observed trips. Discards of these skates were highest in SA 562. Barndoor and thorny skates were also caught, but in smaller numbers. Total barndoor skate catches on these observed tows were 2,708 lbs,, and 2,973 lbs. of thorny skates were also caught and discarded.

Species	561		562		Grand Total
	Discarded	Kept	Discarded	Kept	
ANGLER	3,787	72,916	1,939	11,309	89,951
HAKE, SILVER	759	243	212	17,111	18,325
LOBSTER	6,581	25,037	3,995	15,038	50,651
SCALLOP, SEA	2,554	7,268	15,794	12,745	38,360
SEA RAVEN	5,027	0	7,412	0	12,439
SKATE, LITTLE	56,812	0	282,885	0	339,697
SKATE, WINTER(BIG)	66,581	46,318	330,624	56,742	500,264
SKATES	16,018	14,742	87,040	20,611	138,410
Grand Total	158,119	166,524	729,901	133,556	1,188,097
Total (all species)	199,361	626,003	797,243	914,722	2,537,329
Percent of Total	79%	27%	92%	15%	47%

Table 81 – Non-groundfish species caught on observed trawl tows in SAs 561 and 562, 2002 (lbs. round weight) (NMFS OBDBS)

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter large numbers of skates and other species. While the high-value species may be retained consistent with regulatory limits (monkfish, lobster, scallops, etc.), most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches of most of these species, including the skates. Because this net has been proven to be so effective, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

Summary of impacts on other species/bycatch

This alternative would increase groundfish fishing effort because it creates two additional opportunities to use Category B DAS. Bycatch would be expected to increase as a result. The species that will be caught in the largest amounts are various skate species and dogfish. The CAII haddock SAP will require the use of a gear that nearly eliminates the catches of skates and several other species, while an experiment demonstrated that bycatch in the CAI haddock SAP would only be a small percentage of the overall catch.

7.4.2 Habitat Impacts

From the perspective of analyzing the impacts of this alternative on EFH, this alternative is similar to the proposed action with the exception that it does not include the Category B (regular) DAS pilot program. The habitat impacts of the proposed action are described in section 7.2.2. The impacts on EFH of this alternative would be similar. Because this alternative does not include the Category B (regular) DAS pilot program, however, the possible increase in effort from this program (a maximum of 4,000 DAS used over two fishing years) could not occur. Therefore, the impacts on EFH would of this alternative would be slightly less than for the proposed action, and would be closer to the impacts estimated in Amendment 13.

7.4.3 Impacts on Endangered and Other Protected Species

The impacts under this alternative are similar to those discussed in the proposed action. Changes such as the elimination of the B DAS pilot program and changes to the SAPs largely affect groundfish conservation and do not impact protected species beyond those issues discussed in section 7.2.3 and assessed in the Amendment 13 Final Environmental Impact Statement.

7.4.4 Economic Impacts

Alternative 1 would implement a measure to assign incidental catch TACs to category B DAS fisheries and would also implement two SAPs and a provision allowing combined trips in the Western U.S./Canada area.

7.4.4.1 Category B Incidental Catch TACs

The economic impacts of this measure would be similar to that described for the proposed action (see section 7.2.4.1). That is, setting aside incidental catch TACs effectively limits the potential economic benefits that can be derived from any of the programs that are claimants to the TACs. Such benefits may be compromised by any derby effects that may arise as fishing vessels compete for the available TACs.

Although Alternative 1 does not specify how the incidental TACs would be allocated among the SAPs, once these decisions have been made set asides for any new SAPs or regular B fisheries would have to come from the fisheries established under this action. From an economic perspective, this means that establishment of any new programs would result in a reallocation of economic benefits away from vessels that will be enfranchised under this framework to vessels that may become enfranchised in a future action.

7.4.4.2 Closed Area I Hook Gear/Haddock SAP

The economic impact of this SAP was evaluated for the proposed action in section 7.2.4.3. This analysis was based on GB cod incidental catch TAC for non-sector participants shown as Option B in Table 9. That analysis provides an upper bound estimate of the potential economic benefits of approximately $2.5 million in gross revenues or profits of about $25,000 per vessel. Increasing the incidental catch TAC for non-sector participants to 24.5 mt under Option A would not change total potential revenue from the SAP since the haddock TAC would still be binding. However, the distribution of revenues between sector and non-sector vessels could change. Specifically, with a higher GB cod TAC participation from non-sector vessels could increase (i.e. more trips could occur) which would also mean that their share of the haddock TAC and overall share of potential revenue would also increase.

7.4.4.3 Closed Area II Haddock SAP

The economic impact of this SAP was described for the proposed action in section 7.2.4.4. This alternative would provide an economic opportunity to relatively larger vessels that may be able to operate offshore. VTR data indicate that this may be about 10% of the Northeast region groundfish fleet that operate from some of the larger New England ports. Potential average revenue for trips taken in the vicinity of the SAP may be greater than what may be obtained by fishing elsewhere.

7.4.4.4 Combined Trips to the Western/CA Area

This measure would relive a regulatory burden that prohibits vessels from fishing inside and outside of the Western U.S./Canada area on the same trip. As such, vessels would be afforded greater flexibility to optimize fishing decisions on a trip. The economic benefits of such a change cannot be quantified since reliable information is not available to determine how frequently vessels fish in multiple areas.

7.4.4.5 Combined Alternative 1 Measures

The aggregate available revenue from all the proposed measures would be limited by the manner in which the incidental TACs may be fished. If all of the incidental TACs are taken vessels could realize an increase in fishing revenues of at least $2.3 million at 2002 average prices for cod, yellowtail flounder, winter flounder, witch flounder, and white hake. Increased fishing revenues from other species – including targeted species such as haddock - would also result but are difficult to quantify because they may be limited by catch rates of the species of concern.

7.4.5 Social Impacts

The social impacts of this alternative differ from the proposed action primarily because it does not include a Category B (regular) DAS pilot program.

7.4.5.1 Social Impact of Alternative 1 Category B DAS Incidental Catch TACs

The social impacts of the Alternative 1 incidental catch TACs would be similar to that of the proposed action. As noted in section 7.2.5.1, the social impacts, while positive, are likely to be limited by incidental catch TACs that restrict the degree of benefit. Maximum social benefits will accrue to will be able to fish in one of the two proposed SAPs. Derby style fishing may occur as there are presently no guidelines for the allocation of DAS. Since the Alternative 1 TACs would be allocated to SAPs entirely within the Georges Bank area, beneficial social impacts will be greatest to communities that provide services to vessels that fish on Georges Bank and less so to communities that provide harbors to vessels that fish in the Gulf of Maine.

8.4.5.2 Social Impact of Alternative 1 Closed Area I (CA I) Hook Gear Haddock SAP

The social impacts of the Alternative 1 hook gear SAP would be similar to that discussed in section 7.2.5.3. The probable participant pool would be hook vessels that fish out of harbors in close geographic proximity to the closed area. Of the potential participants the majority had a Massachusetts homeport

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.

7.4.5.2 Social Impacts of Alternative 1 Closed Area II (CA II) Haddock SAP

This management measure would have similar social impacts to that described in section 7.2.5.4. Given the distance from shore and the specified gear requirements, social beneficiaries of this SAP would most likely to be larger vessels using trawl gear. Based on recent fishing year (2002) information these vessels would most likely be from larger ports in Massachusetts although larger vessels from Maine, Portland in particular may also benefit. Thus, the greatest portion of social benefit from the Alternative 1 closed area II haddock SAP would be felt in the largest New England ports of New Bedford, Boston, Gloucester, and Portland.

7.4.5.3 Social Impacts of Alternative 1 Combined Trips in the Western U.S./Canada Area

The Alternative I impacts of combined trips in the Western U.S./Canada would be no different from that described in section 7.2.5.5 for the proposed action. Like the proposed action, this measure would provide vessels with greater flexibility to plan fishing trips or to alter trip planning while at sea.

7.4.5.4 Social Impacts of Combined Alternative 1 Measures

Alternative 1 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. Since all of the Alternative 1 measures would affect vessels that fish on Georges Bank the majority of social impacts would be felt in communities where these vessels land their fish and the communities within which vessel owners, captains, and crew reside.

7.4.6 Impacts on Other Fisheries

As discussed in section 7.2.6, Amendment 13 effort reductions may shift fishing effort into other fisheries, including several managed by the MAFMC. AS discussed in Amendment 13, trawl vessels are the ones most likely to move into MAFMC fisheries as a result of Amendment 13. Alternative 1 provides some opportunities to mitigate those possible effort shifts because it includes the CAII Haddock SAP. Unlike the proposed action, this alternative does not include the Category B (regular) DAS Pilot Program and thus would not result in additional effort in the monkfish and skate fisheries.

7.5 Alternative 2: Measures A.1, B.1, C.1, C.2, and D.1

This alternative is similar to the proposed action. The differences are:

- The details of the Category B (regular) DAS pilot program differ from the proposed action. The pilot program would only be approved for six months at the end of FY 2004, the program would not include a no-discard provision, and the alternative considers a range of incidental catch TACs for GB cod.
- The details of the CAII haddock SAP differ from the proposed action. The landing limit for cod is 100 lbs./DAS, there is no requirement to flip to a Category A DAS when the limit is reached, and the SAP would be implemented permanently and not as a two-year pilot program. In addition, the alternative considers a range for the GB cod incidental catch TAC.

7.5.1 Biological Impacts

The biological impacts were analyzed using the same techniques as used for the proposed action (section 7.2). The following discussion does not repeat information on analytic techniques from that section. As was done in the analysis of the proposed action, 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. These impacts are included in the first two analyses.
- 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.

7.5.1.1 Impacts on Groundfish

7.5.1.1.1 Target Stocks

This alternative includes a Category B (regular) DAS pilot program to target healthy groundfish stocks and two SAPs that are designed to target GB haddock. Catch in the Category B (regular) DAS pilot program is constrained by a limit on the number of DAS and a hard TAC on the catch of stocks of concern. For both SAPs, 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 ceases.

Category B DAS Incidental Catch TACs

This measure limits the catch of stocks of concern taken while using Category B DAS. The proposed TACs are set at very low levels to reduce the risk to Amendment 13 mortality objectives. For some of the proposed Category B DAS programs, these TACs are so low that they may be caught and the program may be ended early, limiting the catch of the target stocks.

Category B (regular) DAS Pilot Program (Measure B.1)

This alternative includes a pilot program for the use of Category B (regular) DAS. The details for this program are specified in section 5.3.1. The biological impacts of this measure are discussed in relation to their likely effects on targeted groundfish stocks and incidental catch stocks.

Category B (regular) DAS are to be used to target the following healthy groundfish stocks:

- GOM haddock
- Pollock
- Redfish
- GOM winter flounder
- GB haddock
- GB yellowtail flounder
- GB winter flounder

The increase in effort resulting from the use of these days will increase mortality of these stocks above that estimated in Amendment 13. The fishing mortality expected to result from the Amendment 13 measures is compared to the target fishing mortality for these healthy stocks in Table 82. For all of the healthy stocks, the expected fishing mortality is roughly half the target fishing mortality. For these stocks, considerable additional catch can be supported without threatening Amendment 13 mortality targets.

Stock	Target Fishing Mortality	Expected Fishing Mortality
GB Haddock	0.26	0.14
GOM Haddock (Catch/Index)	0.23	0.07
GB Yellowtail Flounder	0.25	0.087
GOM Winter Flounder	0.43	0.08
GB Winter Flounder	0.32	0.17
Acadian Redfish	0.04	< 0.01
Pollock (Catch/Index)	5.88	2.27

Table 82 – Comparison of target and expected fishing mortality for healthy stocks

In broad terms, if all 2,000 DAS are used it represents an increase in effort of 5.7 percent over the midpoint estimate of 35,000 DAS used to evaluate the impacts of Amendment 13. A rough approximation is that this increase in effort will translate directly into a similar increase in mortality for this group of stocks, but the impacts for each stock depend on how this effort is distributed. Analysis of recent fishing activity, detailed in section 7.2.4.2, identified the opportunities for using Category B DAS shown in Table 83. Based on this table, it appears that Category B (regular) DAS use in this pilot program will occur in all areas and will not concentrate on any single stock. Assuming the additional effort is not likely to be concentrated on one stock, it seems unlikely that mortality rates will double with a six percent increase in effort.

	Otter Trawl	Gillnet
Gulf of Maine	skate/winter flounder winter flounder	monkfish
Georges Bank	yellowtail yellowtail/winter/monkfish/skates winter/monkfish/skates	monkfish skates monkfish/skates
Southern New England/Mid-Atlantic	skates fluke/winter/monkfish	monkfish skates monkfish/skates

Table 83 - Summary of Potential Regular B DAS Fisheries by Area and Gear

An additional concern is how this effort increase interacts with the SAPs that target GB haddock and GB yellowtail flounder that were approved in Amendment 13 or may be adopted by this action. These catches are compared to recent landings of these stocks in Table 84. Catches for 2003 were estimated based on preliminary landings statistics through October, 2002. The two SAPs for GB haddock are bound by a hard TAC on haddock, but may the binding constraint may prove to be the incidental catch of cod. If the entire haddock TACs are taken, these two SAPs could take 6,100 mt of GB haddock (1,000 mt in CAI, 5,100 mt in CAII). The CAII yellowtail flounder SAP is limited by the number of trips allowed. For GB yellowtail flounder, the CAII yellowtail flounder SAP is expected to land 4,350 mt of yellowtail flounder from 320 trips. Catch including discards may approach 5,000 mt. In addition, participants in this SAP may harvest 952 mt of GB winter flounder while fishing in the SAP area (NEFMC 2003).

The 2002 catch of GB haddock and GB yellowtail flounder was taken on DAS that could be used to target any stocks, analogous to the Category A DAS allocated in Amendment 13. While the analysis in Amendment 13 estimated that fishing mortality would decline for these stocks because of the additional effort reductions in the amendment, landings may not decline as much since stock increases should result in increase catch rates, partly offsetting the mortality reductions. This comparison shows that catches of GB haddock and GB yellowtail flounder taken using Category B (regular) DAS outside of SAPs must be carefully monitored to make certain that mortality targets are not exceeded. Most vessels will probably choose to target these stocks through the approved SAPs rather than on a Category B regular DAS since they SAPs provide access to closed areas and in some cases, credit for steaming time, but this will not be known for certain until the Category B DAS pilot program is evaluated.

	GB Haddock	GB Yellowtail Flounder
2002 U.S. Catch	7,617	3,000
2003 Estimated Catch	5,070	2,849
2004 U.S. TAC	14,955	6,000
CAI Haddock SAP	1,000	0
CAII Haddock SAP	5,100	0
CAII Yellowtail SAP	0	5,000

Table 84 – CY 2002 and estimated CY 2003 catch compared to catch authorized for three SAPs (mt)

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 5.4.1. The analysis of this measure is identical to the analysis for Alternative 2 (section 7.4.1.1). Based on these comparisons, it is not likely that the proposed haddock TAC for the CAI Hook Gear Haddock SAP will threaten mortality objectives of Amendment 13.

This SAP proposes to implement fishing activity that was examined by an experimental fishery conducted during September through October 2003. The results of that experiment are detailed in section 7.2.1.1. 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 44) (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. Assuming the SAP fishery has a similar mean and variance of haddock catches, the proposed level of observer coverage should result in the mean haddock catch on all trips being within +/- ten percent of the mean of the sampled trips at the 90 percent confidence interval (see Figure 6).

CAII Haddock SAP

This alternative includes a SAP to target haddock in the eastern U.S./Canada area (statistical areas 561 and 562). Analysis of the impacts on the haddock resource in this section will focus on catches of haddock and haddock spawning activity. Some of the details of this measure differ from that in the proposed action:

- This measure was not limited to a two-year pilot program.
- This measure does not include a no-discard provision or the requirement to "flip" from a Category B DAS to a Category A DAS if the landing limit of cod is exceeded.
- The cod landing limit is different than in the proposed action.
- This measure considered options for the TAC that would limit the incidental catch of cod caught on a Category B DAS (the TAC adopted in the proposed action is within the range considered or this alternative).

This measure is identical to the CAI Haddock SAP proposed in Alternative 1 and analyzed in section 7.4. The impacts of that measure on haddock are analyzed in section 7.4.1.1.1. As described in that section, the haddock hard TAC ensures catches of haddock under this SAP will not threaten the mortality targets of Amendment 13.

Using catch rates estimated from observer data and the results of haddock separator trawl experiments between 1,509 and 2,090 DAS would be needed to harvest the 5,100 mt (11.2 million pounds) TAC for this area. Analysis of cod catches in this fishery, when compared to the incidental catch cod TAC, suggest that the constraint on this SAP will be the incidental catch of cod and not the catch of haddock.

It is theoretically possible that vessels could use Category B DAS under this SAP to catch the TAC in the U.S./Canada area, and then use Category A DAS to catch additional haddock outside the area. Such a transfer of effort, if large enough, could threaten haddock mortality targets. As shown in Table 43, however, there is a large gap between recent haddock catches and the TAC for FY 2004. Catches would have to more than double to exceed the target TAC for FY 2004. This is unlikely given the restrictions on fishing effort implemented by Amendment 13.

Combined Trips to the Western U.S./Canada Area

This alternative would allow combined trips to the western U.S./Canada area, as described in section 5.5.1. This measure is identical to the proposed action, and the impacts on incidental catches of regulated groundfish are described in section 7.4.1.1.2. The impacts of this measure are uncertain, but it may encourage fishermen to target healthy stocks in this area rather than shift effort into inshore areas.

7.5.1.1.2 Incidental Catch Stocks

Category B DAS Incidental Catch TACs (Measure A.1)

Alternative 2 would adopt the incidental catch TACs described in section 5.2.1. These are the same TACs that would be adopted by Alternative 1 that are analyzed in section 7.4.1.1.2.The purpose of these TACs is to limit the catch of stocks of concern that is taken while using Category B DAS so that the mortality objectives of Amendment 13 are not jeopardized. As analyzed in section 7.4.1.1.2, the proposed TACs are set at a level that will not substantially increase the risk of exceeding the mortality targets of Amendment 13.

Category B (regular) DAS Pilot Program (Measure B.1)

This alternative includes a Category B DAS program that is similar to the proposed action. The major difference is that if Alternative 2 were selected, the Pilot Program would only last for six months rather than a full year. The total DAS that can be used in the program (2,000) are not restricted to a particular quarter in Alternative 2. There are also differences in the administration of the landing limit – Alternative 2 does not include the requirement that vessels retain all legal sized regulated groundfish while on a Category B (regular) DAS.

Vessels using Category B (regular) DAS to target healthy stocks may have some incidental catches of other groundfish stocks. Many of these stocks are defined as “stocks of concern” in Amendment 13. Catches (landings an discards) of stocks of concern that result from the use of Category B (regular) DAS are applied against the incidental catch TACs specified in section 5.2.1. As long as these catches can be adequately monitored, the impacts of this measure fall within the impacts described in the discussion of the incidental catch TACs (section 7.4.1). The proposed measure includes the following requirements to ensure the incidental catch TACs are adequately monitored:

- Vessel Monitoring Systems (VMS): All participants would be required to use an approved VMS system. This provides NMFS the ability to verify vessel location, and for the Coast Guard to verify vessels are fishing in appropriate locations.
- Catch Reporting: Vessels would be required to provide daily catch reports of stocks of concern (landings and estimated discards) via VMS. This enables NMFS to track daily progress towards achieving the incidental catch TACs, improving the service’s ability to estimate if and when the TACs will be taken. With this ability to forecast achieving the TAC, NMFS will be able to take action to adjust the program (stopping the use of Category B DAS in a stock area) in order to prevent the incidental catch TAC from being exceeded.
- DAS “flip” provision: The proposed measure includes the option for vessels to change to a Category A DAS if they exceed the daily trip/possession limit. This may reduce discards under the Category B DAS program, reducing the amount of uncertainty over actual catches.
- Increased observer coverage: The measure calls for a targeted observer coverage of 20 percent of the DAS used in the program, or 400 DAS if all of the allocated DAS are used. An experiment has not been conducted that provides information on the precision of catch estimates that will result from this coverage. Based on other analyses of the groundfish observer program, this coverage should result in a precision of approximately (+/-) twenty percent in the estimates of catch (see, for example, sections 7.4.1.2).

In addition to the incidental catch TACs, the proposed measure includes low trip/possession limits for stocks of concern. There are two possible responses for vessels fishing under these low limits: they may choose to fish selectively and avoid the stocks of concern, or they may fish in an indiscriminate manner and discard stocks of concern in order to retain healthy stocks. The choice between these behaviors will depend, in part, on whether opportunities exist to target healthy stocks and avoid stocks of concern. The analysis described in section 7.2.4.2 – based solely on past fishing practices where there was no incentive to avoid stocks of concern - concludes that there may be opportunities to fish selectively. Because selective fishing provides an opportunity to use Category B (regular) DAS, fishermen may actually identify more opportunities.

The analyses of this measure is described in section 7.2.1.1.2 and section 7.4.1.1.2. These two behavioral choices can be used to further refine the likelihood that the incidental catch TACs will be taken. A "perfect" Category B (regular) DAS would be one in which a fisherman's catch of a stock of concern was equal to the possession limit. In that case, the fisherman would have received the revenue from the maximum amount of fish allowed without causing any discards. While it is possible that catches of stocks of concern could be lower than the possession limit, at that point the fisherman is sacrificing revenue from these stocks. If all Category B DAS are "perfect" DAS, the maximum number of DAS would be used under this program. By grouping the stocks of concern by area, it is possible to develop an estimate of how the different incidental catch TACs may interact and to see if a closure for one stock will preclude catching the incidental catch TAC for other stocks.

Table 85 shows the results of this analysis. In FY 2004, the incidental catch TACs for CC/GOM yellowtail flounder, GB cod, and white hake are likely to be caught before 2,000 Category B DAS are used. If this occurs, the catch of other stocks of concern will also be lower since the stock areas will be closed to Category B DAS fishing. Using analytic techniques similar to those for the proposed action and Alternative 1, the worst-case scenario results are shown in Table 86.

While there are a number of limitations to this approach (see section 7.2.1.1.2 for a description), this approach is useful in outlining the impacts if restrictions in the Category B DAS program are completely ineffective in controlling the incidental catch of groundfish stocks of concern. It bears repeating that this is not presented as a likely scenario, but as a worst-case scenario. The worst impacts would occur on CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, SNE/MA winter flounder and GB cod. The total catch on Category B DAS for these stocks is four to ten times higher than the incidental catch TAC. For CC/GOM yellowtail flounder and SNE/MA yellowtail flounder, the catch is more than fifty percent of the total TAC. The least impacts are on witch flounder, where the total catch is about ten percent higher than the proposed incidental catch TAC and is only five percent of the total target TAC for 2004.

		TAC (mt)	Days to Catch TAC
	Daily Limit (lbs)	2004	2004
GOM cod	100	97	2,138
CC/GOM Yellowtail	25	18	1,587
Plaice	100	185	4,079
Witch Flounder	100	259	5,710
GB cod	100	79	1,742
White Hake	100	77	1,698
SNE/MA Yellowtail Flounder	25	35	3,086
SNE/MA Winter Flounder	100	143	3,153

Table 85 – Number of DAS before incidental catch TAC is caught, assuming daily catch equals possession limit (Note: GB cod TAC not reduced by amount allocated to CAI hook gear haddock SAP or CAII haddock SAP).

Stock	Daily Limit (lbs)	TAC (mt)	Days	Standardized CPUE (lbs./day absent)	Total Catch (mt)
GOM cod	100	97	1,587	537	349
CC/GOM Yellowtail	25	18	1,587	608	354
Plaice	100	185	1,587	211.9	249
Witch Flounder	100	259	1,587	144	284
GB cod	100	79	1,742	537	355
White Hake	100	77	1,742	41	NA
SNE/MA Yellowtail Flounder	25	35	2,000	608	458
SNE/MA Winter Flounder	100	143	2,000	1498	1,158

Table 86 – Estimated catch on Category B (regular) DAS, worst case scenario

Closed Area I Hook Gear Haddock SAP (Measure C.1)

This alternative would adopt the CAI Hook Gear Haddock SAP described in section 5.4.1. This is identical to the measure included in Alternative 1 that is analyzed in section 7.4.1.1.2. The conclusions of that analysis are that this measure is not likely to catch substantial amounts of cod and is not likely to generate substantial cod discards. Based on the results of an experimental fishery, this measure is not likely to result in substantial catches of other regulated groundfish. Any expansion of the area that would be authorized by the Regional Administrator in the future would be based on the results of additional experiments and thus would not be likely to result in excessive cod removals. Finally, expanding the season could result in catches of spawning groundfish.

Closed Area II Haddock SAP (Measure C.2)

This alternative would adopt the CAII Haddock SAP described in section 5.4.2. The impacts of that measure on the incidental catch of regulated groundfish are described in section 7.4.1.1.2. The conclusions of that analysis are that the constraining factor on this SAP is likely to be the GB cod incidental catch TAC. Using catch rates of cod that are estimated from observer reports, adjusted for expected impacts of the haddock separator trawl, and considering the different TACs this measure considered, the number of days fished before the cod TAC is caught ranges from 42 to 445 days. The proposed period for the SAP (May through February) could interfere with groundfish spawning – particularly cod spawning in January and February.

Combined Trips to the Western U.S./Canada Area (Measure D.1)

This alternative would allow combined trips to the western U.S./Canada area, as described in section 5.5.1. This measure is identical to the proposed action, and the impacts on incidental catches of regulated groundfish are described in section 7.4.1.1.2. The impacts of this measure are uncertain, but it may encourage fishermen to target healthy stocks in this area rather than shift effort into inshore areas. Specific reporting requirements are believed sufficient to adequately monitor the incidental catches of several stocks of concern.

7.5.1.1.3 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.

As a result of this action, fishing mortality is expected to increase on GB haddock primarily as a result of the two SAPs. 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 include GOM haddock, GOM winter flounder, pollock, GB haddock, GB winter flounder, and GB yellowtail flounder. While redfish is another stock that could be targeted, the minimum mesh regulations will make it difficult to target redfish and so mortality for that stock is not likely to increase. Based on the analysis in Amendment 13 and in this document, 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 this document, the risk of exceeding rebuilding targets will be small. For four stocks, the calendar year 2003 preliminary landings statistics suggest that there is little risk of exceeded the target TAC or mortality targets adopted by Amendment 13 as long as the incidental TACs are adequately monitored and in force. There are four other stocks (GB cod, GOM cod, white hake, CC/GOM yellowtail flounder) where the incidental catch TAC was set at a lower level to reduce the risk that the proposed programs will threaten rebuilding plans.

7.5.1.2 Impacts on Other Species/Bycatch

This alternative may have impacts on other species. The most probable impact is a result of catches of other species that results from groundfish fishing activity. 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 could 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.

Category B (regular) DAS Pilot Program

This alternative will allow Category B (regular) DAS to fill the requirement to use a groundfish DAS as required by other management plans. The primary fishery that this provision will affect is the monkfish fishery. Vessels that possess both a groundfish and monkfish limited access permit are required to use a groundfish DAS for every monkfish DAS. In addition, in the Monkfish Northern Fishery Management Area, monkfish limited access vessels are allowed to target monkfish without a trip limit while fishing on a groundfish DAS and using groundfish gear. A second non-groundfish species that could be targeted using Category B (regular) DAS are skates. The impacts of using these DAS to target skates is discussed in the skate baseline review (section 8.1.3).

Allowing vessels to use a Category B (regular) DAS to meet the monkfish requirement to use a groundfish DAS could increase effort on monkfish compared to the No Action alternative. Under the No Action alternative, vessels with a Category C or D monkfish permit must evaluate whether to use a limited number of Category A DAS to target monkfish. There are approximately 660 monkfish Category C or D permits, allocated over 8,100 Category B (regular) DAS in FY 2004. By allowing these vessels to use a Category B (regular) DAS additional effort could enter the fishery. The total DAS available (the total of Category A and Category B (regular) DAS) is less than what was available when this requirement was adopted by the monkfish FMP. The 660 permits have 32,600 Category A and B (regular) DAS in FY 2004, while they had 49,600 DAS allocated when the monkfish plan was adopted. Monkfish rebuilding has been taking place even with the higher level of DAS that were available prior to implementation of Amendment 13, A second way this provision may increase effort on monkfish is if it attracts more effort into the monkfish fishery by monkfish permit holders. Vessels that in the past fished primarily for groundfish, but that qualified for a monkfish permit, may choose to fish their Category A DAS on groundfish and use their Category B (regular) DAS to target monkfish monkfish. The monkfish resource in the Northern Fishery Management Area is almost completely rebuilt and any short-term increase in effort caused by this pilot program should not affect rebuilding. Additional effort may be more problematic in the Southern Fishery Management Area because the stock is not rebuilding as quickly.

This pilot program will affect other stocks that are caught on groundfish fishing trips. It is not possible to predict the exact impacts. In general, an increase in fishing effort would increase catches (and possibly discards) of other species. The program, however, may promote the use of gear that targets healthy groundfish stocks. For example, if vessels target haddock using the separator trawl, there will likely be little or no increase in the catches of skates compared to the No Action alternative. The observer coverage requirement will provide additional information on the catches of other species that results from the use of Category B DAS.

CAI Hook Gear Haddock SAP

The CAI hook gear haddock SAP allows longline vessels to target haddock in a defined area in CAI. Impacts on other species were analyzed using the results of an experimental fishery was conducted in this area in October through December, 2003. That analysis is explained in section 7.2.1.2 and the details are not repeated here. For those species that accounted for more than one percent of the catch in the experiment, the expected catch if this measure would have been adopted is shown in Table 68. 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 8.1.3). About eight percent of the total catch in the SAP will probably be discarded.

It is not possible to determine if these catches of other species represent 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).

CAII Haddock SAP

An experiment has not been conducted that will provide information on the catches by a haddock separator trawl in the area of the CAII haddock SAP. In order to evaluate the impacts of this SAP on other species, observed trawl trips in SAs 561 and 562 were examined and interpreted in light of the results of several haddock separator trawl experiments in other areas. That analysis is detailed in section 7.2.1.2 and the details are not repeated here. The catch (kept and discarded) for the top eight species caught on observed trawl tows in 2003 is shown in Table 81. These eight species comprised forty-seven percent of the total catch on observed tows in both areas. While some of these species were retained, they accounted for ninety-six percent of the discards. Three skate species (little, winter, and not further specified) accounted for eighty-four percent of the discards on observed trips. Discards of these skates were highest in SA 562. Barndoor and thorny skates were also caught, but in smaller numbers. Total barndoor skate catches on these observed tows were 2,708 lbs, and 2,973 lbs. of thorny skates were also caught and discarded.

To summarize, trawls observed in 2003 show that vessels fishing in this SAP will encounter large numbers of skates and other species. While the high-value species may be retained consistent with regulatory limits (monkfish, lobster, scallops, etc.), most of the skates will probably be discarded. The requirement to use a haddock separator trawl net in this fishery will nearly eliminate the catches of most of these species, including the skates. Because this net has been proven to be so effective, it is not likely that effort in this SAP will have a significant effect on discards. Indeed, if effort is drawn to this program, it may actually reduce discards of these species by increasing the use of the haddock separator trawl.

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. Fishing mortality may increase on monkfish and skates if vessels use the Category B (regular) DAS pilot program to target those species. There may also be increased mortality on other species, such as skates, that are caught while targeting groundfish. This action will promote the use of selective gear (e.g. the haddock separator trawl) on Category B DAS which actually reduces catches of skates, lobster, and scallops.

7.5.2 Habitat Impacts

From the perspective of analyzing the impacts of this alternative on EFH, this alternative is similar to the proposed action with the exception that the Category B (regular) DAS pilot program is limited to a maximum of 2,000 DAS used in one fishing year. The habitat impacts of the proposed action are described in section 7.2.2. The impacts on EFH of this alternative would be similar but slightly less than for the proposed action because of the reduced effort that can be used in the pilot program. The expected impacts of this alternative would be closer to the impacts estimated in Amendment 13.

7.5.3 Impacts on Endangered and Other Protected Species

The impacts under this alternative are similar to those discussed in the proposed action. Changes in the B DAS pilot program and a modification to the CA II haddock SAP largely affect groundfish conservation and do not impact protected species beyond those discussed in section 7.2.3 and assessed in the Amendment 13 Final Environmental Impact Statement.

7.5.4 Economic Impacts

Alternative 1 would implement a measure to assign incidental catch TACs to category B DAS fisheries and would also implement a pilot regular B DAS program, two SAPs and a provision allowing combined trips in the Western U.S./Canada area.

7.5.4.1 Category B Incidental Catch TACs

The economic impacts of this measure would be similar to that described for the proposed action (see section 7.2.4.1). That is, setting aside incidental catch TACs effectively limits the potential economic benefits that can be derived from any of the programs that are claimants to the TACs. Such benefits may be compromised by any derby effects that may arise as fishing vessels compete for the available TACs.

Although Alternative 2 does not specify how the incidental TACs would be allocated among the SAPs, once these decisions have been made set asides for any new SAPs or regular B fisheries would have to come from the fisheries established under this action. From an economic perspective, this means that establishment of any new programs would result in a reallocation of economic benefits away from vessels that will be enfranchised under this Framework to vessels that may become enfranchised in a future action.

7.5.4.2 Category B Regular DAS Pilot Program

Alternative 2 would implement a regular B DAS pilot program. This program would be limited to a total of 2,000 DAS that could be used during quarters 3 and 4 of FY2004. The program would be limited by quarterly incidental catch TACs for species of concern. The potential economic benefit from this program cannot be quantified directly since the economic gains would depend on the types of fisheries that are prosecuted and their associated catch rates of stocks of concern. Based on FY2001 VTR data average revenues for reported trips that would meet all of the prescribed possession limits for species of concern earned about $2,000 per day absent. Participation in the pilot program would be limited to vessels that have VMS. Given the fact that the program is a pilot vessels that do not currently have VMS may not choose to purchase and install a unit due to the uncertainty over how long the pilot program itself will last and whether or not it would be renewed.

7.5.4.3 Closed Area I Hook Gear/Haddock SAP

The economic impact of this SAP was evaluated for the proposed action in section 7.2.4.3. This analysis was based on GB cod incidental catch TAC for non-sector participants shown as Option B in Table 10. That analysis provides an upper bound estimate of the potential economic benefits of approximately $2.5 million in gross revenues or profits of about $25,000 per vessel. Increasing the incidental catch TAC for non-sector participants to 24.5 mt under Option A would not change total potential revenue from the SAP since the haddock TAC would still be binding. However, the distribution of revenues between sector and non-sector vessels could change. Specifically, with a higher GB cod TAC participation from non-sector vessels could increase (i.e. more trips could occur) which would also mean that their share of the haddock TAC and overall share of potential revenue would also increase.

7.5.4.4 Closed Area II Haddock SAP

The economic impact of this SAP was described for the proposed action in section 7.2.4.4. This alternative would provide an economic opportunity to relatively larger vessels that may be able to operate offshore. VTR data indicate that this may be about 10% of the Northeast region groundfish fleet that operate from some of the larger New England ports. Potential average revenue for trips taken in the vicinity of the SAP may be greater than what may be obtained by fishing elsewhere.

7.5.4.5 Combined Trips to the Western/CA Area

This measure would relive a regulatory burden that prohibits vessels from fishing inside and outside of the Western U.S./Canada area on the same trip. As such, vessels would be afforded greater flexibility to optimize fishing decisions on a trip. The economic benefits of such a change cannot be quantified since reliable information is not available to determine how frequently vessels fish in multiple areas.

7.5.4.6 Economic Benefits of Combined Alternative 2 Measures

The aggregate available revenue from all the proposed measures would be limited by the manner in which the incidental TACs may be fished. If all of the incidental TACs are taken vessels could realize an increase in fishing revenues of at least $2.3 million at 2002 average prices for cod, yellowtail flounder, winter flounder, witch flounder, and white hake. Increased fishing revenues from other species would also result but are difficult to quantify because they may be limited by catch rates of the species of concern.

The economic benefits of the Alternative would be limited to vessels that have VMS installed. Given uncertainty over the long-term viability of the Category B (regular) DAS pilot program this participation may be limited to current vessels with VMS which tend to be some of the larger vessels.

To the extent they occur, the potential economic benefits of Alternative 2 may be compromised by derby effects that could limit both potential revenues and potential vessels that may be able to participate in any given SAP or regular B DAS program.

7.5.5 Social Impacts

7.5.5.1 Social Impact of Alternative 2 Category B DAS Incidental Catch TACs

The social impacts of Alternative 2 assignment of incidental TACs would be similar to that described in section 7.2.5.1. These social impacts would be positive but would 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. To the extent that they occur, derby style fishing may compromise the potential social benefits. The rush to fish may also result in increased safety risks as the inclination to fish in poor weather is increased.

7.5.5.2 Social Impact of Alternative 2 Category B (Regular) DAS Pilot Program

The pilot program would authorize the use of 2,000 Category B (regular) DAS in each of two consecutive quarters beginning with quarter 3 (November, 2004) of FY2004. The program would be suspended if the either quarterly TACs or the quota on Category B (regular) DAS has been reached. DAS reductions were considered in Amendment 13 analysis to have the most profound potential impacts on communities resulting in changes in occupational opportunities, community infrastructure, daily living, and safety. Use of Category B (regular) DAS has the potential to alleviate some of these losses from Amendment 13.

The most likely beneficiaries of Category B (regular) DAS are those that already possess VMS. Since the pilot program would not begin until November, 2004 some vessels may not have enough Category A DAS available in order to participate in this fishing year unless additional DAS can be acquired through a lease arrangement. VMS is currently required for many vessels that fish on much of Georges Bank. These vessels and the communities within which operators and crew reside would be immediately able to take advantage of the pilot program. By contrast vessels that fish in the Gulf of Maine particularly in the near- or in-shore portions of the Gulf would not currently likely to be required to have VMS. These Gulf of Maine vessels are less likely to have VMS due to the expense, and for smaller vessels, due to the lack of a sufficient power source while moored to meet the requirement to leave the VMS unit on at all times. While the opportunity to participate in the Category B (regular) DAS pilot program may be sufficient inducement to invest in a VMS unit, the limit on incidental TACs and the limited quota on regular B DAS increases the risk of such an investment. Under these circumstances vessels that fish in the Gulf of Maine may not choose to participate in the pilot program. Thus, on balance, the Category B (regular) DAS pilot program should have positive social impacts but these impacts may be more likely to be concentrated in the communities that support vessels fishing on Georges Bank.

7.5.5.3 Social Impact of Alternative 2 Closed Area I (CA I) Hook Gear Haddock SAP

The social impacts of the Alternative 2 Closed Are I Hook Gear SAP would be similar to that of the proposed action impacts described in section 7.2.5.3. This management measure would be most likely to benefit vessels that join the hook sector; an estimated 50 vessels. Given that nearly all of these vessels list a Massachusetts home port the social benefits from the SAP would accrue to Massachusetts ports.

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.

7.5.5.4 Social Impacts of Alternative 2 Closed Area II (CA II) Haddock SAP

This management measure would have similar social impacts to that described in section 7.2.5.4. The distance from shore and the specified gear requirements suggest that the majority of beneficiaries of this SAP would be larger vessels using trawl gear. Assuming recent history provides some insight to likely beneficiaries, these vessels would most likely be from larger ports in Massachusetts although larger vessels from Portland, Maine may also benefit. Thus, the greatest portion of social benefit from the Alternative 2 Closed Area II Haddock SAP would be felt in the largest New England ports of New Bedford, Boston, Gloucester, and Portland.

7.5.5.5 Social Impacts of Alternative 2 Combined Trips in the Western U.S./Canada Area

The Alternative 2 impacts of combined trips in the Western U.S./Canada would be no different from that described in section 7.2.5.5 for the proposed action. Like the proposed action, this measure would provide vessels with greater flexibility to plan fishing trips or to alter trip planning while at sea.

7.5.5.6 Social Impacts of Combined Alternative 2 Measures

Alternative 2 would provide social benefits to individual vessel owners, their crew, and the communities within which they work that would not be available by taking no action. As noted previously, the VMS provision common to all of the Alternative 2 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 Category B (regular) DAS pilot program or either proposed SAP. This means that social impacts to communities that provide homes and services to vessels and crew that fish predominantly in the Gulf of Maine will not be as great.

7.5.6 Impacts on Other Fisheries

As discussed in section 7.2.6, Amendment 13 effort reductions may result in a shift in fishing effort into several fisheries managed by the MAFMC. Alternative 2 would mitigate this to some extent because, similar to the proposed action, it provides opportunities for vessels to use Category B DAS to target healthy groundfish stocks. There are some differences, however, in that the Category B (regular) DAS Pilot Program only lasts for six months, but the CAII Haddock SAP is no indefinite in this alternative. On balance, the impacts of this alternative on MAFMC fisheries would be beneficial and similar to the proposed action.

The Category B DAS (regular) Pilot Program could increase effort in the monkfish and skate fisheries, similar to the impacts of the proposed action as described in section 7.2.6. These impacts would occur for a shorter period, however, since in this alternative the program is only in effect for a six month period.

7.6 Comparison of Alternatives

7.6.1 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 7.2 through 7.5. 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. 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 87.

7.6.1.1 Biological Impacts

All of the 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), 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 using Category B DAS, so fishing effort is more likely to be consistent with the amendment. While the analyses concluded that all of the alternatives present little risk to Amendment 13 mortality objectives, there are minor difference between the alternatives. Alternative 2 adopts two SAPs that are specifically designed to increase catches (and thus mortality) for GB haddock. Because of the requirements of these SAPs, this alternative is expected to result in only small increases in mortality for other regulated groundfish stocks, including stocks of concern. The Proposed Action and Alternative 3 would have the most impact on mortality for regulated groundfish since these alternatives include a Category B (regular) DAS program that allows for the use of a maximum of 2,000 Category B (regular) DAS in a fishing year. The combination of two SAPs and the Category B (regular) DAS program allow for the largest increase in effort that is being considered, and is thus likely to have the most impacts on mortality of regulated groundfish and other species. Alternative 2 would have slightly less impacts than the proposed action since the Category B (regular) DAS Pilot Program takes place for only six months.

7.6.1.2 Habitat Impacts

As discussed in preceding sections, any adverse impacts on essential fish habitat attributable to this action are primarily the result of the relatively small increases in effort that will result from the two SAPs and the Category B (regular) DAS program. With this concept in hand, the alternatives can be readily compared. 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 2 adopts two SAPs, including one that uses gear that has been found to have few adverse impacts. This alternative would have the next fewest impacts on habitat. The Proposed Action and Alternative 2 include a Category B (regular) DAS program that allow for the use of a maximum of 2,000 Category B (regular) DAS in a fishing year.

7.6.1.3 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 some increase in fishing effort, the location of the two SAPs is such that there would be negligible impacts on these species. Indeed, while the Proposed Action and Alternative 2 allow for more fishing effort than the other two alternatives, the conclusion of the analyses in sections 7.2.3 and 7.5.3 is that these two alternatives will also have negligible impacts compared to Amendment 13.

7.6.1.4 Human Environment

The No Action alternative will result in the expected economic and social impacts described in Amendment 13. That document 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. The Proposed Action will likely differ the most from that analysis. The measures adopted in the Proposed Action provide the most opportunities for a wide spectrum of vessels and fishing communities to use Category B DAS to mitigate the adverse impacts of Amendment 13. This alternative would provide increased revenues that may help sustain the industry until groundfish stocks rebuild enough that landings and revenues increase as a result. Alternative 2 ranks slightly below the Proposed Action in this regard since the Category B (regular) DAS program lasts for only six months. Alternative 1 does not provide opportunities to as many vessels to use Category B DAS since the two SAPs are narrowly defined and are only available to vessels with certain capabilities (e.g. hook gear, or the ability to fish offshore).

The Proposed Action, Alternative 1, and Alternative 2 would all mitigate, to some extent, shifts of fishing effort into other fisheries that may be caused by Amendment 13 effort reductions. Because they include the Category B DAS (regular) Pilot Program, which will give more vessels the opportunity to use Category B DAS, the Proposed Action and Alternative 2 would do more to reduce effort displacement. These two alternatives, however, could result in increased effort in the monkfish and skate fisheries.

Type of Impacts	Alternative			
	Proposed Action	**No Action**	**Alternative 1**	**Alternative 2**
Biological				
Groundfish	Increase mortality on several groundfish stocks: haddock, pollock, etc. Safeguards to limit mortality increases.	No difference from A13 expected	Increase mortality on GB haddock; negligible impacts on GB cod	Increase mortality on several groundfish stocks
Other species	Possible mortality increase for monkfish, skates	No difference from A13 expected	Negligible impacts skates, monkfish	Possible mortality increase for monkfish, skates
Bycatch	Minor increase in bycatch associated with effort increases unless selective fishing practices developed	No difference from A13 expected	Negligible increases for incidental catches in two SAPs	Minor increase in bycatch associated with effort increases unless selective fishing practices developed
Habitat	Negligible impacts from small increase in effort	No difference from A13 expected	Negligible impacts from small increase in effort	Negligible impacts from small increase in effort
Endangered/ Protected Species	Negligible change from A13	No difference from A13 expected	Negligible change from A13	Negligible change from A13
Human Environment				
Economic	Largest increase in revenues from opportunities created to use Category B DAS	No difference from A13 expected – will not achieve OY on healthy stocks	Least increase in revenues from opportunities created to use Category B DAS	Increase in revenues from opportunities to use Category B DAS
Social	Greatest positive impacts on communities from opportunities created to use Category B DAS	No difference from A13 expected – negative impacts on communities	Positive impacts from opportunities created to use Category B DAS limited to small group of communities that can fish GB	Positive impacts on communities similar to proposed action, but for a shorter period

Table 87 – Comparison of impacts across alternatives

7.6.2 Rationale for Selecting the Proposed Action

This section describes the rationale for choosing the proposed action over the other alternatives. It is based on the description of the alternatives in sections 4.0 and 5.0and the comparison of impacts described in section 7.6.1.

The No Action alternative was not selected because it would not meet the need for this action as identified in section 3.2. Under the No Action alternative, the measures implemented by Amendment 13 would not be changed. Opportunities to harvest healthy groundfish stocks would be limited to the one SAP approved in Amendment 13 that facilitates targeting of GB yellowtail flounder. Healthy stocks of GB haddock, GOM haddock, pollock, redfish, and GOM winter flounder would be harvested at rates that are far below the rates which provide optimum yield. As a result, economic benefits that could realized from these stocks would foregone. In the short-term, this would have negative impacts on the fishing industry and communities. While the No Action alternative would pose the least risk to achieving the mortality targets of Amendment 13, it would pose the greatest risk to the fishing industry and communities. Selection of the No Action alternative would also continue to restrict the ability of vessels to fish inside and outside the western U.S./Canada area on the same trip, inhibiting the flexibility of fishing vessels to have profitable trips. This restriction could lead to increased fishing on unhealthy stocks of fish, threatening Amendment 13 mortality objectives.

Alternative 1 was not selected because while it does provide additional opportunities for some vessels to target healthy haddock stocks on Georges Bank, the opportunities to use Category B DAS are limited to a relatively small group of vessels and their communities. The two SAPs in this alternative are limited to those vessels that use hook gear and those vessels that are capable of fishing in offshore areas. As a result, while this alternative will increase landings and revenues, and will help achieve optimum yield from the GB haddock stock, the benefits to communities and the fishing industry are limited. This alternative also does not provide any opportunities to target other healthy stocks. Additionally, the cod landing limit of 100 lbs./DAS that was included in the CAII Haddock SAP would increase discards to unacceptable levels.

Alternative 2 and the Proposed Action would have similar impacts. Both of these alternatives provide the greatest opportunity to target healthy stocks by implementing a Category B (regular) DAS Pilot Program, two SAPs to target GB haddock, and by allowing fishermen to fish inside and outside the western U.S./Canada area on the same trip. The Category B (regular) DAS Pilot Program provides a limited opportunity for vessels to target other healthy stocks in addition to GB haddock. It also expands the number of vessels and communities that may be able to use Category B DAS beyond those which fish on Georges Bank. As a result, these two options would be expected to provide the most opportunities to harvest optimum yield. The increases in landings that should result will provide the most benefits to the fishing industry and fishing communities, mitigating the impacts of Amendment 13. While both of these alternatives will increase mortality on groundfish stocks and some other species, the increases are not expected to threaten the mortality objectives of any management plan. There are also only minor differences between these alternatives and the impacts of the other alternatives on habitat and protected species.

The choice of the proposed action over Alternative 2 is due to differences in the specific details of the measures between the two alternatives. In the proposed action, the Category B (regular) DAS Pilot Program will last for one year, while in Alternative 2 it would only last for six months. As a result, the economic and community benefits of the proposed action will be realized for a longer period. Extending the program for a full year will also provide data that can be used to evaluate whether a similar, future program should be allowed to take place year-round. In the proposed action, the CAII Haddock SAP includes additional safeguards to ensure that Amendment 13 mortality targets are not compromised. The proposed action establishes this SAP as a two-year pilot program, while Alternative 2 would have adopted this SAP as a permanent measure. In addition, the proposed action prohibits discard of legal-sized regulated groundfish and requires vessels to change their DAS to a Category A DAS if the catch limit of cod is exceeded. These measures will help reduce discards in this program. In contrast, under the CAII Haddock SAP in Alternative 2 the cod landing limit of 100 lbs./DAS would increase discards to unacceptable levels. From a biological standpoint, then, the Proposed Action includes additional safeguards that further reduce the risk that Amendment 13 mortality objectives could be compromised by the Category B DAS programs that will be implemented.

7.7 Cumulative Effects of the Proposed Action

The National Environmental Policy Act (NEPA) requires that cumulative effects of "past, present, and reasonably foreseeable future actions" (40 CFR § 1508.7) be evaluated along with the direct effects and indirect effects of each proposed alternative. Cumulative impacts result from the combined effect of the proposed action's impacts and the impacts of other past, present, and reasonably foreseeable future actions. These impacts can result from individually minor but collectively significant actions taking place over a period of time. The Council on Environmental Quality (CEQ) directs federal agencies to determine the significance of cumulative effects by comparing likely changes to the environmental baseline. On a more practical note, the CEQ (1997) states that the range of alternatives considered must include the "no-action alternative as a baseline against which to evaluate cumulative effects." Therefore, the analyses in this document, referenced in the following cumulative impacts discussion, compare the likely effects of the proposed actions to the effects of the no-action alternative.

CEQ Guidelines state that cumulative effects include the effects of all actions taken, no matter who (federal, non-federal or private) has taken the actions, but that the analysis should focus on those effects that are truly meaningful in terms of the specific resource, ecosystem and human community being affected. Thus, this section will contain a summary of relevant past, present and reasonably foreseeable future actions to which the proposed action may have a cumulative effect. Cumulative effects were recently analyzed in Amendment 13 (NEFMC 2003). That analysis has taken into account (both pre- and post-FMP) and present condition of the multispecies fishery. This document summarizes that analysis. In terms of past actions, it focuses on actions that have taken place since submission of Amendment 13 in December, 2003. In terms of future actions, the analysis examines the period between implementation of the framework (late 2004) and the planned benchmark assessment of the groundfish stocks scheduled for 2008. That assessment may lead to additional changes in groundfish management that are not possible to predict with any degree of certainty. The geographic scope of the analysis is the range of the groundfish fishery in the EEZ and adjacent fishing communities, from the U.S.-Canada border to, and including North Carolina.

The cumulative effects analysis focuses on five Valued Environmental Components (VECs):

1. Regulated groundfish stocks
2. non-groundfish species (incidental catch and bycatch)
3. endangered and other protected species
4. habitat, and
5. human environment, including the economics of the fishery and fishing communities

The discussion of the cumulative effects on those VECs will be based on the analysis of direct and indirect impacts contained in the Environmental Consequences section of this EA (section 7.0) as well as on the discussion in this section of actions outside of the FMP affecting the VECs.

7.7.1 Summary of Non-Fishing Effects

Non-fishing impacts were assessed in Amendment 13. For fish habitat, non-fishing effects were reviewed in the Essential Fish Habitat Amendment for Groundfish prepared by the NEFMC (Amendment 11 to the Groundfish FMP, NEFMC 1998). Table 88 below summarized the potential effects of numerous chemical, biological, and physical effects to riverine, inshore, and offshore fish habitats. In general, the closer to the coast, the greater the potential for impact. For the offshore area, with the exception of events such as oil spills and algae blooms, which can spread over large areas, moderate effects were generally localized to a well-defined and relatively small impact area such as oil/gas mining and dredged material disposal. Thus, only small portions of fish stocks would potentially use these sparsely located areas and would be adversely affected. For example, dredged material disposal sites, usually about 1 nm^2 in size, are managed by the U.S. Army Corps of Engineers and the U.S. EPA to minimize physical effect to the defined disposal area and allow no chemical effects at the site based on stringent sediment testing.

For fishery resources, there are several non-fishing threats that could have a direct and/or indirect impact on the groundfish stocks. Several of the items identified as non-fishing threats to fish habitat, identified in Table 88, 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, therefore, 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. This thermal discharge is believed to have a negative impact on reproduction capability and recruitment of affected fishery resources.

Although still speculative at this time, foreseeable future non-fishing threats to fishery resources could include global warming and the effects that this may have on water temperature. The impacts to the fish stocks are not certain and therefore could not be incorporated into this assessment. The possibility of windmill construction in marine waters for the purposes of harnessing alternative means of energy could also have an impact on fishery resources, especially as it relates to disruption of habitat. This project is the subject of a forthcoming EIS being prepared by the Army Corps of Engineers. The impacts of this project to the fisheries are yet to be determined. At present, the only wind farm that has been discussed would be established outside of the EEZ and is thus not included in the geographic scope of the cumulative effects analysis. Another possible impact could be caused by the construction of pipelines or offshore petroleum products terminals. In recent months, a company has expressed interest in constructing a liquefied natural gas terminal off Gloucester, MA. Impacts to fish stocks from such activity are uncertain.

THREATS	RIVERINE	INSHORE	OFFSHORE
Chemical			
oil	M	M	M
heavy metals	M	M	M
nutrients	H	H	L
pesticides	M	M	L
herbicides / fungicide	M	M	L
acid	H	M	
chlorine	M	M	
thermal	M	M	
metabolic & food wastes	M	M	
suspended particles	M	M	L
radioactive wastes	L	M	M
greenhouse gases	M	M	M
Biological			
nonindigenous / reared	M	M	M
nuisance / toxic algae	M	H	M
pathogens	M	M	M
Physical			
channel dredge	M	H	
dredge and fill	H	H	
marina / dock construction	M	H	
vessel activity	M	H	L
erosion control			
bulkheads	M	M	
seawalls		M	
jetties		M	
groins		M	
tidal restriction	M	H	
dam construction / operation	H	M	
water diversion			
water withdrawal	H	M	
irrigation	M	M	
deforestation	H	M	
mining			
gravel/mineral mining	M	M	M
oil/gas mining	L	M	M
peat mining	L		
debris	M	M	M
dredged material disposal	L	M	M
artificial reefs	L	M	M

Table 88 - Potential non-fishing threats to fish habitat in the New England region prioritized within regions (H = high; M = moderate; L = low)2

[1] From NEFMC (1998)

[2] Prioritization developed by compilation of *EFH Technical Team* survey

7.7.2 Summary of Fishing Gear Effects on EFH

The effects of mobile bottom-tending gear (trawls and dredges) on fish habitat have been recently reviewed by the National Research Council (NRC 2002). This study determined that repeated use of trawls/dredges reduce the bottom habitat complexity by the loss of erect and sessile epifauna, smoothing sedimentary bedforms and bottom roughness. This activity, when repeated over a long term also results in discernable changes in benthic communities, which involve a shift from larger bodied long-lived benthic organisms for smaller shorter-lived ones. This shift also can result in loss of benthic productivity and thus biomass available for fish predators. Thus, such changes in bottom structure and loss of productivity can reduce the value of the bottom habitat for demersal fish. These effects varied with sediment type with lower level of impact to sandy communities, where there is a high natural dynamic nature to these bedforms, to a high degree of impact to hardbottom areas such as bedrock, cobble and coarse gravel, where the substrate and attached epifauna are more stable. In the Northwest Atlantic, the more valued groundfish habitat is located in areas where there is a high percentage of gravel and cobble (NREFHSC 2002).

Use of trawls and dredges are common in inshore and offshore areas and somewhat less common in riverine areas. Section 9.3.1.2 of Amendment 13 discusses the numerous types of gear used in estuarine and offshore habitats. This section indicates that mobile bottom-tending gears are commonly used in most inshore and offshore habitats. In the Northeast, otter trawls are used to prosecute most M-S Act managed fisheries including Northeast Multispecies. Smaller trawls are used in inshore areas and lower estuaries, which are managed by states and not subject to the MSA. In addition, some states allow smaller dredges are used for harvesting oysters, bay scallops, sea urchins, quahogs, and mussels. Hydraulic dredging for softshell clams and bottom trawling for shrimp is also accomplished in certain nearshore and riverine habitats.

It is assumed for this analysis that the effects of gear are generally moderate to high in the riverine, inshore and offshore areas, depending upon the type of bottom and the frequency of fishing.

7.7.3 Endangered and Other Protected Species

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

Large whales may be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries. Ship strikes and fishing gear entanglement continue to be the most likely sources of injury or mortality for the right, humpback, fin and minke whales. Gear entanglement occurs in the vertical buoy lines of sink gillnet and pot/trap gear, the groundlines of pot/trap gear, and also in the net panels of gillnet gear. Sei, blue and sperm whales are also vulnerable, but fewer ship strikes or entanglements have been recorded. Mobile bottom trawls are less of a concern for the large whale species. Other marine mammals, such as harbor porpoise, dolphins and seals, are also vulnerable to entanglement in net gear (including seines, gillnets and drift nets).

Low frequency sonar may pose an additional threat, although the extent of its continued use by the U.S. military is unclear at this writing. A successful lawsuit brought by environmental groups limited the use of such sonar following a number of marine mammal deaths in the vicinity of naval exercises in several places around the world. Federal legislation being debated in Congress at this time could override the lawsuit settlement agreement and exempt the military from the "harassment" provisions of the MMPA, easing the restrictions on the limited deployment of low frequency sonar.

The potential impact of pollution is more likely problematic in nearshore areas closer to the source, such as agricultural and urban runoff and sewer outfalls. Nutrients can also promote toxic phytoplankton blooms, which have been known or suspected in killing whales and other marine mammals.

Turtles have been entangled in shrimp trawls, pound nets, bottom trawls and sink gillnets. Shrimp trawls are required to use turtle excluder devices. The diversity of the sea turtle life history also leaves them susceptible to many other human impacts, including impacts on land, in the benthic environment, and in the pelagic environment. Anthropogenic factors that impact the success of nesting and hatching include: beach erosion, beach armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, and an increased presence of native species (e.g., raccoons, armadillos, and opossums) which raid and feed on turtle eggs. Entanglement in debris or ingestion of marine debris are also seen as possible threats.

The factors discussed above, and other factors, potentially have had cumulative adverse effects on most protected species to varying degrees. Because of a lack of cause-effect data, little is known about the magnitude and scope of these factors and how they have contributed to the species' special listing. The direct and indirect effects of the alternatives in this action are discussed in section 7.0 and do not appreciably increase those discussed and analyzed previously.

Potential future actions whose effects would be cumulative to the proposed action include actions taken to protect marine mammals, and endangered and threatened species. Current measures in effect are discussed in section 6.4. These could be modified in the future under either a fishery management plan, marine mammal take reduction plan, or regulation promulgated under authority of the Endangered Species Act.

Specifically, known or anticipated future actions include: short-term closures to sink gillnets under the Atlantic Large Whale Take Reduction Plan Dynamic Area Management (DAM) system; changes to the Harbor Porpoise Take Reduction Plan; and measures adopted under the NMFS final rule implementing large-mesh gillnet closures off the North Carolina/Virginia coast to protect sea turtles. Since the specific nature of those potential changes are not known at this time, their effects cannot be determined at this time. Additionally, NOAA Fisheries is currently preparing an Environmental Impact Statement for the ALWTRP to solicit comments on the management measures and provisions in the plan and possible modifications to reduce interactions of right, humpback fin and minke whales with commercial fisheries. Table 360 in Amendment 13 summarizes the threats to protected species that may be affected by this action.

7.7.4 Summary of Past, Present and Future Actions Affecting the Multispecies Fishery

7.7.4.1 Past and Present Actions

Past management actions through 2003, and their impacts on the VECs, were summarized in section 5.7.6.1 of Amendment 13. That summary is repeated below. The groundfish fishery of New England in the 19th Century was originally prosecuted on sailing vessels using such low impact techniques such as handlines, jigging and later longlines. When steam-powered vessels came into prominence in the early 1890s, mobile gear such as trawls were found to be very efficient harvesters of groundfish. By 1930, otter trawls became the dominant gear. As a result of more efficient gear, faster and larger vessels and better preservation, haddock landings, for example, grew from 20,000 mt/year in 1900 to over 100,000 mt/yr in 1920 (Collette & Klein-MacPhee, 2002). Fishing effort expanded in the 1950s due to the influx of foreign vessels after World War II, and in the late 1970s/early 1980s, when the domestic fishery expanded in the wake of the Magnuson Act of 1976. There are currently several gear types employed in the multispecies fishery. As reported in the Amendment 13 Affected Environment section, the major gear types used now are bottom trawl, bottom longline, hook and line, and sink gillnet gear.

Although management measures for groundfish were first enacted in 1977 under the original Groundfish Fishery Management Plan, the dramatic increase in larger vessels, bigger gear and electronic aids such as fishfinders and navigation equipment, contributed to a greater efficiency and intensity of fishing, which, in turn, resulted in a precipitous drop in landings during the 1980s to an all-time low in the early 1990s. Table 89, below, describes the major regulatory actions taken to manage the New England groundfish fishery since the original Magnuson Act was enacted and their effect on groundfish resources, community, and EFH. The first several years of groundfish management included annual and quarterly catch quotas for cod, haddock and yellowtail flounder, quota allocations by vessel class, and trip limits. The quota and trip limits imposed during the inception of the Groundfish FMP led to frequent fishery closures of one or more segments of the fishing fleet, interrupting the normal activities of the industry. Consequently, this form of management frequently imposed both economic inefficiencies and hardships on the industry, which led to a breakdown in support of these measures. This in turn, led to widespread misreporting and non-reporting by the industry as a way to circumvent the regulations. Starting in the early 1980's a new management program was implemented through the 1982 Interim Fishery Management Plan. This plan, and the next several groundfish actions (through Amendment 4 in 1991) managed the groundfish fishery (now expanded to include 13 species) primarily through seasonal closures and minimum mesh and fish size restrictions. However, these measures proved not enough since the condition of the resources, especially cod, haddock and yellowtail flounder continued to decline to record low levels.

To end overfishing and address the severe decline in the groundfish resources and the influx of more and larger vessels, the Council began developed of Amendment 5 to the FMP. This action, which became effective in 1994, implemented a moratorium on permits as well as an effort-control program that proposed to reduce a vessel's days-at-sea (DAS) by 50% over a 5-7 year period. Amendment 5, thus, was the first action to restrict both access and effort in the multispecies fishery. The FSEIS for Amendment 5 determined that this action may have significant effects on a substantial number of small entities, specifically those vessels less than 45', which, at the time, consisted of 36% of the qualified vessels. Although the FSEIS demonstrated that Amendment 5 provided economic and social benefits to the fishery in the long-term, vessels were expected to incur significant short-term loses in revenue.

Despite implementation of Amendment 5, however, stocks continued to decline rapidly and a "Special Advisory" was issued by the Northeast Fisheries Science Center in 1994 stating that Amendment 5 was "too little, too late" to address the critical status of many of the groundfish stocks. In response, the Council requested that NMFS implement an emergency action to close, on a year-round basis, three large areas to all vessels capable of catching groundfish (Closed Area I, Closed Area II, and the Nantucket Lightship Closed Area), while it developed Amendment 7 to the FMP. NMFS implemented the emergency action to close these three areas in December of 1994. These closure areas have been thought to have a major beneficial effect on groundfish stocks, as they afforded protection over large areas and for extended amounts of time. Indirect benefits to other species accrued from these closures as well, such as protection of sea scallops. Although there were large benefits attributed to these closures, it is important to note that they may have had a negative effect on other groundfish stocks as vessels moved elsewhere to fish. Framework 9, implemented in 1995, extended the emergency action permanently and also implemented a prohibition on all small mesh fisheries in the GOM, GB and SNE Regulated Mesh Areas, unless it was determined that the fishery had less than 5% bycatch of regulated species. Through elimination of small mesh fisheries where groundfish bycatch exceeded 5%, discard of groundfish was largely reduced by vessels fishing in non-groundfish fisheries. Amendment 7, implemented in 1996, accelerated the Amendment 5 DAS effort-reduction schedule and expanded the 5% bycatch rule to include a prohibition on all non-DAS fisheries, further reducing bycatch of regulated species. Amendment 7 also implemented recreational fishing restrictions and framework adjustment criteria that would allow management measures to be implemented under a more accelerated mechanism than through an amendment. These actions, in combination, have reduced fishing effort significantly and have provided large areas of year-round protection, especially on Georges Bank, for several species of groundfish. In response, the status of several groundfish stocks have improved over the past several years and landings have increased as a result. Similar to Amendment 5, the FSEIS for Amendment 7 specified that this action was expected to have a significant impact on a substantial number of small entities in the short-term, with higher, long-term benefits accruing to the industry and to the Nation. Overall revenues were projected to be reduced by 10-25% in the first 3 years, with differential effects on gear groups, with trawlers projected to be more disadvantaged than others are.

Following Amendment 7, there have been several framework adjustments implementing further restrictions and, in some cases, extensive restrictions in the groundfish fishery. Due to concerns primarily regarding the status of GOM cod, Frameworks 20, 25, 26, 27, 31 and 33 implemented additional management measures to further protect this stock. These measures included new GOM seasonal and year-round closures, gillnet effort-reduction measures (including limits on the number of allowable nets), and adjustments of the GOM cod trip limit. Additionally, measures in these actions also increased the haddock daily trip limit and increased the minimum square mesh size throughout the GOM/GB/SNE Regulated Mesh Areas. Because the main focus of these actions was to protect GOM cod, the socio-economic impact was primarily felt within communities located in the states of Maine, New Hampshire and Massachusetts, due to the proximity of these communities to the GOM fishing areas.

In response to a Federal Court decision in the case of *Conservation Law Foundation, et al. V. Evans, et al.*, NMFS, in August 2002, implemented management measures consistent with a Settlement Agreement through an interim final rule. Measures contained in the interim rule included a freeze of DAS at the highest annual level used during fishing years 1996-2000 and a 20% cut from that level; increased gear restrictions for certain gear types, including gillnets, hook-gear, and trawl nets; modifications and additions to the closure areas; limits on yellowtail flounder catch; and more restrictive recreational fishing measures. Biological impacts of the "Settlement Agreement" management measures that were first implemented on August 1, 2002, vary by species. Based on a quantitative analysis only, the July 2002 EA estimated the resultant decrease in fishing mortality to range from 1% for GB winter flounder and 16% for GOM cod. It has been recently projected in the June 2003 EA, completed for an Emergency Action to extend the August 2002 interim rule measures, that, based upon the number of DAS used in 2002, continuation of the Settlement Agreement for the duration of the 2003 fishing year would result in a 25-35% reduction in fishing effort.

Measures implementing the Settlement Agreement have further protected several groundfish species, most notably GOM cod, and increased the likelihood of timely stock rebuilding. A particularly important aspect of these rules is the control of latent DAS. The DAS freeze has significantly limited the extent to which latent DAS can be activated and, therefore, has limited the extent to which the increases in fishing mortality from the use of such DAS could undermine efforts to control fishing mortality. The DAS allocations for the 2002 fishing year were 45.7% less than the DAS allocations for the 2001 fishing year (including carryover days). Preliminary estimates made in June 2003 calculated a 37% decline in DAS use during the 2002 fishing year (compared with the 2001 fishing year). While the combination of measures implemented since the adoption of Amendment 5 have improved stock status (increasing biomass and reducing fishing mortality) for many stocks, as discussed in section 9.2.1.1, the improvement has not been achieved for all stocks.

Overall, the DAS restrictions resulting from the Settlement Agreement impacted most, those vessels that rely on groundfish for a majority of their income. For vessels with high dependence on groundfish income, the adverse income effects of the Settlement Agreement were nearly twice that of vessels that rely on groundfish for less than half of their annual fishing income. Estimated revenue losses were greatest for vessels bordering the GOM (Gloucester, Portland, Portsmouth, Chatham/Harwich). DAS reductions were largest for the home port states of New Jersey, New York, Maine, and Massachusetts (in descending order). Charter/party vessels experienced a decrease in the number of trips booked, however the majority of the economic impacts were borne by approximately 20-25 charter/party operators whose primary business is in offering groundfish trips.

Bottom trawl, longline gear and hook-gear are classified as Category III fisheries under the Marine Mammal Protection Act and are, therefore, determined to have a remote likelihood of, or no known, incidental mortalities and serious injuries of marine mammals. Gillnet gear has been categorized as a Category I fishery; a fishery that has been determined to have frequent incidental mortality or serious injury of marine mammals. Many of the groundfish actions discussed above have had an overall beneficial impact on protected resources. For instance, the DAS reductions have significantly reduced effort in this fishery. Extensive area closures to protect groundfish stocks, including harbor porpoise closure areas specific to gillnet vessels, and reductions in fishing gear, such as reductions in allowable gillnet gear, have all contributed to benefiting protected resources.

Development of other recent management actions, such as for whiting and monkfish, have also benefited groundfish stocks as they have likely reduced groundfish discards (e.g., through the development and implementation of a whiting grate fishery, and coupling of multispecies and monkfish DAS). Also, it should be noted that a vessel buyout program, starting in 1996, has contributed to reducing the socio-economic impacts on small entities associated with the groundfish actions.

Amendment 13, implemented on May 1, 2004, adopted major changes to groundfish management The expected impacts of that action are described in detail in the amendment document. A short summary of the expected impacts includes:

- Regulated groundfish: ending overfishing for all groundfish stocks, and rebuilding overfished stocks by 2014 for most stocks (2018 for CC/GOM yellowtail flounder, 2026 for GB cod, and 2047 for redfish). Reduced discards due to adoption of increased mesh size.

- Other stocks: reduced bycatch of skates, dogfish, monkfish as a result of effort reductions.

- Endangered and other protected species: negligible or possibly beneficial impacts on endangered and other protected species as a result of effort reductions.

- Habitat: benefit habitat through adoption of areas closed to mobile gear to protect habitat, benefits of other measures (effort reductions)

- Human environment: short-term reductions in revenue will have negative impacts on fishing communities, but over the period of the rebuilding program revenues will increase. Considerable uncertainty over whether current fishery participants will benefit from rebuilding.

One possible impact that is not discussed in Amendment 13 is the impact of the CAII yellowtail flounder SAP on the CAII Haddock SAP that is part of the proposed action for FW 40A. FW 40 A adopts an incidental catch TAC for GB cod, and allocates part of that TAC to the CAII haddock SAP. The CAII yellowtail flounder SAP catches small amounts of cod, but was not specifically allocated a GB cod incidental catch TAC because that measure was not part of Amendment 13. The cod catch in the yellowtail flounder SAP, however, will count against the eastern GB cod TAC established by the U.S./Canada Resource Sharing Understanding. It is possible that the cod catch for the CAII Yellowtail Flounder SAP may limit opportunities for the CAII Haddock SAP that will not be implemented until FW 40A is adopted.

Other recent management actions that may affect groundfish include the adoption of Scallop Amendment 10 and Scallop Framework Adjustment 16/Multispecies Framework Adjustment 39. Scallop Amendment 10 has been approved by the NMFS but the implementing regulations have not yet taken effect. Framework 16/39 has been submitted by the Council, but has not yet been approved by NMFS. Scallop Amendment 10 implements a rotational management system for the scallop fishery. In summary, Amendment 10 creates a system for opening and closing areas to scallop fishing in order to maximize scallop yield. Framework 16/39, if adopted, will define the requirements for extending scallop fishery area management into the groundfish mortality closed areas.

These two actions may impact groundfish resources. Scallop dredges have historically caught groundfish. In fact, in some years scallop fishermen have used dredges to target yellowtail flounder. For this reason, scallop dredges were prohibited from the groundfish mortality closed areas in 1994. In recent years, improvements in dredge design have greatly reduced the incidental catch of groundfish by scallop dredges, changes in regulations have reduced the incentive for scallop dredge vessels to target groundfish, and several programs have allowed scallop dredge fishing in groundfish closed areas subject to strict limits on yellowtail flounder catches. Framework 16/39 adopts an approach similar to that used in earlier access programs. Caps would be set on the amount of yellowtail flounder that can be caught inside groundfish mortality closed areas (ten percent of the GB yellowtail and SNE/MA yellowtail flounder target TACs), and the retention of cod is restricted to small amounts. Unlike the incidental catch TACs in FW 40A that are allocated to specific Category B DAS programs, the caps in FW 16/39 do not represent specific allocations for groundfish to the scallop fishery. For example, while the FW 16/39 cap for SNE/MA yellowtail flounder caught by scallop dredges in the groundfish closed areas was set at ten percent of the target TAC, it did not reduce the SNE/MA yellowtail flounder target TAC for groundfish. While the caps in FW 16/39 were designed to limit any increase in catches of yellowtail flounder to levels that would not threaten Amendment 13 mortality targets, they were not developed in concert with the incidental catch TACs in FW 40A.

From the standpoint of cumulative effects on regulated groundfish, this is not likely to be an issue for either SNE/MA yellowtail flounder or GB yellowtail flounder. There is only a limited opportunity to use Category B (regular) DAS in the SNE/MA yellowtail flounder stock area, and no SAPs that will allow the use of Category B DAS in this area. For GB yellowtail flounder, all catches will be counted towards the hard TAC adopted by the U.S./Canada Resource Sharing Understanding. Actions imposed when this TAC is reached will reduce the possibility that mortality goals will be threatened. Analysis in FW 16/39 suggests that yellowtail flounder catches may actually decrease further as a result of the access program.

FW 16/39 also limits scallop dredge vessels fishing in groundfish closed areas to 100 lbs. (45.4 kg.) of cod per trip for personal use. Based on the number of trips expected in CAI and CAII, this could amount to a substantial amount of GB cod. Analysis of observed scallop trips into the closed areas, however, reveals that scallop dredge vessels catch little cod. Expansions of the observed data, taking into account changes in scallop and cod abundance, resulted in estimates that the total cod catch resulting from the access programs would be one metric ton, less than 0.03 percent of the FY 2004 target TAC for this stock, an insignificant amount (Tables 103 through 106, FW 16/39).

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1977	Original FMP	Cod, haddock and yellowtail annual and quarterly catch quotas Quota allocations by vessel class Trip or weekly catch limits	Moderate	Negligible	Moderate - High
1982	Interim Plan	George Bank Closed Areas (seasonal) Minimum mesh size requirements when fishing for cod, haddock or yellowtail flounder in GB and portions of the GOM (5.5") Minimum fish size requirements Permit requirements	Moderate-High	Low	Moderate-High
1986	Multispecies Plan	Inclusion of pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder, and white hake Additional minimum fish size restrictions Extensions of GB spawning areas closures to protect haddock (seasonal) A SNE closure to protect yellowtail (seasonal)	Moderate	Moderate	Moderate
1987-1991	Amendments 1-4	Closure of the Southern New England/Mid-Atlantic Yellowtail Area during March-May Extension of GB RMA Minimum mesh size requirements in SNE Exclusion of scallop dredge vessels from SNE closure Minimum fish size changes Gear restrictions in the Northern Shrimp fishery Inclusion of silver hake, red hake, and ocean pout	Moderate-High	Moderate	Moderate-High
1994 (01/03/94)	Emergency Action	Implementation of a 500-lb haddock trip limit Expansion of CAII in area and time (from 4 month to 6 months) Prohibition on scallop dredge vessels from possessing haddock during January-June Prohibition on pair-trawling for multispecies	Moderate	Low	Moderate

Table 89 - History of Management Actions and Associated Impacts

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1994	Amendment 5	Implementation of '94 Emergency Action year-round Moratorium on new entrants to the multispecies fishery An effort reduction program for most vessels whereby historical DAS would be reduced by 50% over a 5-7 year period SNE and MidAtl Regulated Mesh Area (RMA) (5.5") Increase mesh in GOM/GB RMA (6.0") Minimum fish sizes Suspension of CAI (except for gillnet vessels) Finfish excluder requirement for shrimp vessels Mandatory reporting and observer requirements Framework adjustment provisions	High	High	High
1994	Amendment 6	Implementation of March1994 Emergency Action measures on a permanent basis	Moderate	Moderate	Moderate
1994	Emergency Action	Year-round closure of redefined CAI, the Nantucket Lightship Closed Area and CAII - to protect cod, haddock and yellowtail flounder Prohibition on scallop vessels from fishing in the closed areas A small mesh prohibition - disallowance on any fishery utilizing mesh smaller than the minimum mesh size requirements, with the exception of fisheries that have been determined to have a catch of less than 5 % by weight of regulated species Prohibition on retaining regulated species w/ sm mesh Increase in SNE mesh size (6.0") Winter flounder exemption in state waters	High	High	High
1995	Framework 9	Implementation of December 1994 Emergency Action measures on a permanent basis	High	High	High

Table 89 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1996	Amendment 7	Acceleration of Amendment 5 DAS reduction schedule Elimination of exemptions to effort control program Implementation of seasonal GOM closures Implementation of a 1,000 lb haddock trip limit Expansion of the 5% bycatch rule, where vessels fishing in the GOM/GB/SNE RMAs are allowed to fish only in an exempted fishery, under a mults or scallop DAS ,or under the Small Vessel permit category Establishment of an annual target TAC for cod, haddock and yellowtail stocks, and expansion of framework provisions to set annual TACs Restrictions on party/charter and recreational vessels	High	High	High
1997 (05/01/97)	Framework 20	Implementation of GOM cod daily trip limit (1,000 lb) Seasonal increase in haddock daily trip limit (1,000 lb) Gillnet effort-reduction measures, including net limits	Moderate	Moderate	Moderate
1998 (04/09/98)	Framework 24	Adjustment to GOM cod trip limit – vessels must remain in port & run clock to account for cod overage Implementation of DAS carry-over provision Implementation of NAFO exemption	Low	Low	Moderate
1998 (05/01/98)	Framework 25	Implementation of GOM Inshore Closure Areas Implementation of year-round Western GOM Closure Area Addition of a seasonal offshore GOM closure area (Cashes Ledge Closure Area) Reduction in the GOM cod daily trip limit (700 lb)	High	High	High
1999 (01/19/99)	Framework 26	Expansion of April GOM Inshore Closure Area Addition of seasonal inshore GOM and Georges Bank area closures	Low	Low	Moderate
1998	Amendment 11	Designated EFH for Multispecies Required Federal agencies to consult with NMFS on actions that may adversely effect EFH. NMFS provides recommendations to avoid or minimize impacts to EFH	Low	High	Low

Table 89 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
1999 (05/01/99)	Framework 27	Elimination of the Northeast Closure Area Establishment of seasonal inshore GOM Rolling Closure Areas of greater size and duration than Inshore Closure Areas (from 1 month 2 months) Reconfiguration of the seasonal Cashes Ledge Closure Area and expansion in time (from 1 to 4 months) Exemption for scallop dredge vessels to fish within the GOM Rolling Closure Areas and Cashes Limitation on roller and rockhopper trawl gear to a maximum diameter of 12" within a GOM inshore area Decrease in the GOM cod daily trip limit (200 lb), w/ mechanism to reduce further if necessary (reduced to 30 lb on 5/28/99) Increase in the haddock daily trip limit (2,000 lb) Increase in GOM/GB/SNE square mesh size (6.5”)	Moderate-High	Moderate	Moderate-High
1999 (07/29/99)	Interim Rule	GOM cod daily trip limit revision (100 lb/500 lb max) DAS running clock revised-cod overage limit to 1 day	Moderate	Low	Moderate
1999 (11/15/99)	Amendment 9	Prohibition on the use of Brush-Sweep Trawl gear Inclusion of halibut into the FMP Possession and size limit on halibut - 1 fish (36”)	Moderate	High	Moderate
2000 (01/05/00)	Framework 31	Increase in GOM cod daily limit (400 lb/4,000 lb max) Additional February inshore GOM closure Extension of ’99 Interim rule running clock measure	Moderate	Low-Moderate	Moderate
2000 (05/01/00)	Framework 33	Addition of a Georges Bank Seasonal Closure Addition of 2 1-month conditional GOM closure areas Increase in haddock daily trip limit (3,000 lb)	Moderate	Negligible	Moderate

Table 89 - History of Management Actions and Associated Impacts (cont.)

DATE	ACTION	FEATURES THAT AFFECT RESOURCES, HABITAT AND COMMUNITIES	RESOURCE BENEFITS	HABITAT BENEFITS	COMMUNITY IMPACTS
2002 (05/01/02)	Interim Action (Settlement Agreement)	Restriction on vessels using more than 25% of their DAS allocation during May-July 2002 Modification of DAS clock – all vessel trips 3-15 hours counted as 15 hours during May-July 2002 Year-round closure of Cashes Ledge Area Closure Expansion of Rolling Closure Area III and IV Prohibition on front-loading the DAS clock Increase in GOM trawl (codend) & gillnet mesh (6.5”) Limitations on Day gillnets Restrictions on party/charter and recreational vessels	High	Moderate-High	High
2002 (08/01/02)	Interim Action (Settlement Agreement cont’d)	May 2002 interim measures continued Establishment of “used DAS baseline” and reduction of 20% from this baseline Freeze on Handgear permits & trip limit reduction Elimination of GOM January & February seasonal closure areas Increase in SNE trawl (codend) mesh (7.0/6.5” sq/diamond) Increase in GB gillnet mesh (6.5”) Further limitations of both Day & Trip gillnets Increase in SNE gillnet mesh (6.5”) Longline gear restrictions - prohibition on de-hookers (crucifiers) w/ < 6” spacing between fairlead rollers, hook size restrictions, and limit on number of hooks Increase in commercial cod fish size (22”) Possession limits and restrictions on yellowtail catch Increase in GOM daily cod trip limit (500/4000 lb max)	High	Moderate	High
2004 (05/01/2004)	Amendment 13	Formal rebuilding programs for overfished stocks Categorization of DAS based on permit history during FY 1996 through FY 2001 Reduced DAS that can target any stock by 40 percent Changes to gear requirements Increased GOM cod landing limit, decreased GB cod landing limit Adopted U.S./Canada Resource Sharing Understanding Adopted process for implementing voluntary sectors Special Access Programs (SAPs) DAS leasing and transfer provisions Areas closed for habitat protection	High	Moderate	High

Table 361 - History of Management Actions and Associated Habitat Benefits

7.7.4.2 Future Actions

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

- Multispecies FW 40B: This action will further modify the measures adopted by Amendment 13. In addition to proposed changes to the DAS leasing and transfer programs, this action will consider additional Category B DAS programs to target healthy stocks and providing access for shrimp trawls to the WGOM closed area. While the specific proposals have not been developed, possible impacts include:
  - Regulated groundfish: increased mortality on healthy stocks but no threat to Amendment 13 mortality targets if appropriately designed programs are adopted.
  - Other species: Possible increases in bycatch as a result of increased effort resulting from additional Category B DAS programs.
  - Habitat: Scope of adverse impacts on essential fish habitat will depend on specific of programs that are adopted.
  - Endangered and other Protected Species: Little change given scope of effort reductions in Amendment 13.
  - Human Environment: Increased revenues from Category B DAS programs will benefit fishery and fishing communities.
- Monkfish Amendment 2: This amendment may change the monkfish DAS program. At present, some vessels use a groundfish DAS to target monkfish, and in some circumstances monkfish vessels with limited access Category C or D permits must use a groundfish DAS for each monkfish DAS that is used. One of the changes under consideration would decouple the use of groundfish and monkfish DAS. According to analysis in the draft Monkfish Amendment 2, this could result in a small increase in groundfish DAS targeting groundfish should this provision be adopted. Changes in trawl mesh could benefit regulated groundfish, as it may reduce interactions with regulated groundfish by vessels targeting monkfish.
- Legal action resulting from Amendment 13: As of June 1, 2004, at least five legal actions were filed objecting to elements of Amendment 13. The legal briefs addressed a wide range of issues in relation to the amendment. It is not possible to predict with any certainty how these court cases will be resolved or what their impact will be on groundfish management.
- Future multispecies actions: An updated assessment for all groundfish stocks is planned for 2005. The Council may adjust management measures based on these assessments. It is not possible at this stage to predict how management measures will change as a result of this assessment.

In addition to federal fishery management actions, there are other reasonably foreseeable future actions by other state, local, or federal agencies. These actions were identified in discussed in Amendment 13. While that discussion is not repeated here, the actions are identified in the table that summarizes the cumulative effects (see Table 90).

7.7.5 Cumulative Effects of the Proposed Action

The following table summarizes the cumulative effects of past, present, and reasonably foreseeable future actions on the VECs identified in section 7.6.2.

7.7.5.1 Cumulative Effects on Groundfish Stocks

The cumulative effect on groundfish stocks of this action and other past, present, and reasonably foreseeable actions is positive. In general, the prior multispecies actions of Amendment 5 and Amendment 7 initiated rebuilding the multispecies stocks. While the pace of rebuilding did not meet the requirements of the 1996 amendment to the M-S Act, these two actions and subsequent frameworks reversed a decades long decline in groundfish stock status. Amendment 13 will increase the pace of rebuilding so that it complies with the M-S Act. The proposed action may result in an increase in fishing mortality for some groundfish stocks, but the programs in this action are designed so that they will not have a substantial impact on groundfish stocks because they will not threaten the mortality objectives of Amendment 13. With respect to future actions (such as a follow-on framework adjustment that is being considered, Framework 40B) that may adopt additional programs that provide opportunities to use Category B DAS, the proposed action implements an incidental TAC measure that will prevent any future programs from threatening mortality objectives. As long as the Amendment 13 mortality objectives are met, groundfish stock status should improve as stocks are expected to continue to increase. Indeed, Amendment 13 includes provisions for periodic review of rebuilding progress that will, if necessary, provide the information necessary to ensure rebuilding programs remain on track.

7.7.5.2 Cumulative Effects on Other Stocks

The cumulative effect on other stocks of this action and other past, present, and reasonably foreseeable actions is positive. The overall reduction in groundfish fishing effort begun in Amendment 5, accelerated in Amendment 7, and further controlled by Amendment 13 benefit other stocks by reducing the number of interactions vessels fishing for groundfish and other stocks other stocks. Additional elements of these amendment contribute as well: increases in mesh size have reduced the catch of all stocks of small fish, limits on the amount of gear that can be set reduces discards, requirements for specific gears adopted through the amendment and other framework actions have reduced bycatch. While the proposed action may result in a small increase in mortality for some stocks (i.e. monkfish, skates), this increase is not likely to have a substantial impact on these species. Total effort in the groundfish fishery will remain well below the levels observed in FY 2000 and FY 2001., the use of selective gear will further reduce interactions with other species, and two of the programs are pilot programs that will only be in effect for a short period.

7.7.5.3 Cumulative Effects on Endangered and Other Protected Species

As was stated earlier in this document, the Council does not anticipate the measures proposed in Framework Adjustment 40A will adversely impact threatened, endangered or protected species beyond those analyzed and discussed on Amendment 13. Under optimal conditions (little overlap of fishery operations and the distribution of protected species), the measures could provide benefits to protected species inhabiting the management unit because of anticipated reductions in fishing effort. Most likely, however, the measures will have negligible impacts or those that cannot be quantified. This conclusion coupled with the discussion of impacts above leads the Council to believe that substantial cumulative effects will not occur as the result of implementation of the management measures proposed in this action.

7.7.5.4 Cumulative Effects on Habitat

The cumulative effects of this measure on habitat are expected to be minimal. Amendment 13 adopted a suite of measures that minimized, to the extent practicable, the adverse effects of fishing on EFH. These measures included areas restricted to all mobile bottom-tending gear and benefits that accrue from the effort reductions and other provisions of the amendment. While the proposed action will allow a small increase in fishing effort, the increase relative to the effort reductions in Amendment 13 is small and represents roughly six percent of the effort that may be used under Amendment 13. In addition, the proposed action continues to honor the areas identified as needing protection from mobile gear.

7.7.5.5 Cumulative Effects on Communities

Past management actions have had negative effects on communities. Management actions taken prior to Amendment 5 failed to reverse increases in fishing mortality and declines in groundfish stock size. As a result, landings and revenues began a slow decline until the mid-1990's. These economic losses translated into reductions in the number of fishing vessels and fishermen, caused consternation in fishing communities, and led to a regulatory response that exacerbated many of these problems. Beginning with Amendment 5 and Amendment 7, and expected to continue with Amendment 13, reductions in fishing effort required to meet mortality objectives further reduces the size of the groundfish fleet and the positive benefits of the fishery on communities. Some communities lost access to the resource entirely as vessels left the fishery or stock size contracted. As stock size began to increase as a result of Amendments 5 and 7, landings and revenues also began a slow rebound.

Because fishing mortality still exceeded legal requirements, Amendment 13 imposed further restrictions on the industry. In the short term, these are expected to slow reverse recent increases in landings and revenues that have benefited communities. The measures have also limited the opportunities for many fishermen to participate in the groundfish fishery through DAS reductions – indeed, over 300 permit holders do not have any Category A DAS needed to fish for any stock of groundfish. Over the longer term, however, the pace of stock rebuilding is expected to increase under Amendment 13 and landings and revenues will increase as well. These increases will benefit fishing communities.

The proposed action will provide some short-term mitigation of the negative effects on communities of Amendment 13. Because the proposed action allows for a limited increase in fishing effort by creating opportunities to use Category B DAS to target healthy groundfish stocks, groundfish landings and revenues will be higher than they would be without this action. The economic returns are expected to provide some benefits to vessels that can target healthy stocks. While this will not be a widespread benefit because of the location of those stocks and the restriction on the programs, it will provide a measure of relief. These benefits are not expected to be substantial compared to the negative short-term impacts of Amendment 13, or the significant benefits that will accrue in the future as a result of stock rebuilding.

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 (see Table 88)					
• Inshore	Chemical/biological – negative Physical – positive, short-term; possibly negative long-term	Negative, moderate	Negative, moderate	Unknown – possibly negative	Negative, moderate-high
• Offshore		Negative, low	Negative, low	Unknown	Negative, low
Past Actions	Short-term negative, high Long-term positive, low	Positive, moderate-high	Positive, moderate - high	Positive-low	Positive, low
Reasonably Foreseeable Future Actions					
• Amendment 13	Short-term negative, high Long-term, positive, low	Positive, high	Positive, low	Positive, low	Positive, moderate
• Framework 16/39	Short-term positive Long-term positive	None	Positive, moderate	None	None
• Monkfish Amendment 2	Unknown	Unknown	Positive, low	Unknown	Unknown
• Amendment 13 legal action	Short-term – negative Long-term - unknown	Unknown	Unknown	Unknown	Unknown
Local					
• Preserve industry waterfront access	Positive	None	None	None	None
• Promotion of tourism, waterfront development	Negative (fishing community)	Positive	Positive	Cetaceans Negative-low	Unknown
State					
• Coastal facility permitting decisions	Unknown	Unknown	Unknown	Unknown	Unknown
• Fishing industry support	Positive	None	None	Negative-low	None
• University support for fishing industry research	Positive	Positive	Positive	Unknown	Positive
Federal					
• Regulatory decisions for other fisheries	Unknown	Unknown	Unknown	Unknown	Unknown
• Direct industry support	Positive	Unknown	Unknown	Unknown	Unknown
• Offshore permitting decisions	Unknown	Unknown	Unknown	Unknown	Unknown
Framework 40A					
• Incidental Catch TACs	None	Positive, low	None	None	None
• Category B (regular) DAS Pilot Program	Positive, low	Negligible	Negative, low		
• CAI Hook Gear Haddock SAP	Positive, low to moderate	Negligible	Negligible		
• CAII Haddock SAP	Positive, low to moderate	Negligible			
• Combined trips to the Western U.S./Canada Area	Positive, low	None	Unknown	None	None

Table 90 – Summary of cumulative effects

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8.0 APPLICABLE LAW

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 Consistency with National Standards

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

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

The proposed action will facilitate catching optimum yield from the Northeast Multispecies fishery by creating additional opportunities to target healthy groundfish stocks. Amendment 13 to the Northeast Multispecies FMP adopted formal rebuilding plans and measures to end overfishing on this complex. Because of the multispecies nature of this fishery, the measures necessary to rebuild overfished stocks also reduce fishing mortality on healthy stocks. The primary tool used to reduce fishing mortality was a reduction in fishing effort through controls on the number of DAS that can be fished by limited access vessels. These effort reductions were designed to end overfishing and to rebuild overfished stocks consistent with legal requirements. Because DAS controls are not a selective management tool, fishing mortality is also expected to be reduced on stocks where it is not necessary. This could prevent harvesting the optimum yield from those stocks while rebuilding programs are being followed for the overfished stocks.

The proposed action includes measures that are designed to allow increased harvests of healthy stocks. These measures include the provision for two special access programs to target the healthy GB haddock stock, as well as the provision for additional fishing time in the form of a different category of DAS in order to target healthy stocks. These programs are designed to increase the harvest of healthy stocks so that optimum yield can be harvested. At the same time, the proposed action includes measures that will prevent these programs from causing overfishing or threatening the rebuilding programs adopted by Amendment 13. The primary tool is a hard TAC on the incidental catches of stocks of concern – regulated groundfish stocks that require a reduction in fishing mortality. One program (the Category B (regular) DAS pilot program) also limits the number of DAS that can be used in the program as an additional measure to prevent it form raising fishing mortality on unhealthy stocks.

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

The proposed action is based on the most recent estimates of stock status available. These estimates are in the form of unpublished information provided by the Northeast Fisheries Science Center. Stock size and fishing mortality in calendar year 2002 was estimated based on landings information for that period. In addition, the amendment used information from the most recent stock assessments: either the updated assessments in November 2002 for the groundfish complex as a whole, or assessments published during 2003 for five stocks (witch flounder, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, SNE/MA winter flounder, and GOM winter flounder). Estimates of fishing mortality and stock biomass are not yet available for calendar year 2003. Preliminary commercial landings statistics for calendar year 2003 were used to characterize likely stock status in the absence of new projections or assessments. With respect to bycatch information, the action uses bycatch information from observer reports and fishery experiments to estimate the bycatch that will result from the proposed measures.

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

The proposed action manages each individual groundfish stock as a unit throughout its range. In general, management measures specifically designed for one stock are applied to the entire range of the stock. There are exceptions, such as when a Special Access Program (SAP) is designed for a specific area or gear type. These exceptions are necessary to provide increased opportunities to harvest healthy stocks and achieve optimum yield. In addition, the groundfish complex as a whole is managed in close coordination. Many of the management measures are applied to all groundfish stocks. They are designed and evaluated for their impact on the fishery as a whole.

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

The proposed management measures do not discriminate between residents of different states. They are applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. For example, the SAPs designed to target GB haddock may not be available to fishermen who do not use a specific gear or do not have the capability to fish in offshore areas. Some of these impacts may be localized, as often communities may have developed small boat fisheries to target nearshore stocks that are not appropriate targets for increased fishing effort because of current stock status. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.

The proposed action does include some measures designed to mitigate these distributive impacts. The special access programs are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts. In addition, the use of Category B (regular) DAS may create similar opportunities in the future, though many of the details of this program have yet to be defined.

The proposed action creates opportunities to use Category B DAS, either through one of two SAPs or through the Category B (regular) DAS pilot program. Amendment 13 allocated fishing privileges based on a permit's fishing history during the period fishing years 1996 through 2001. Active groundfish fishermen during this period receive a higher percentage of their DAS that can be used when the amendment is implemented, and a higher percentage of Category B DAS. In the extreme, a vessel that did not actively fish for groundfish during this period will not be able to fish at all in any of these Category B DAS programs.

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

The Amendment 13 management program relies primarily on restrictions in time fishing – days-at-ea (DAS) – to control fishing mortality. The proposed action creates opportunities to use additional DAS (Category B DAS). While measures are included that tend to reduce economic efficiency of vessels, they are generally required for sound management reasons. For example, restrictions on the type of trawl net that can be used in an SAP may reduce catches, but benefit the resource and the industry by selecting stocks that can support additional fishing effort.

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

The measures allow for the use of different gear, vessel size, and fishing practices. While the SAPs that are proposed include restrictions included with to type of gear, area fished, seasons fished, and landing limits for some species, there are no restrictions preventing the use of a specific gear in an open area, and few restrictions on the deployment of that gear. The proposed action includes programs designed to encourage innovation in fishing practices in order to target healthy stocks. The Category B (regular) DAS pilot program encourages development of selective fishing practices with few limits. This program is also authorized for four consecutive quarters, providing opportunities for fishermen in different areas and different sized vessels to take advantage of the program.

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

The proposed management measures do not duplicate other fishery regulations. They provide opportunities to target healthy regulated groundfish stocks that were conceived, but not explicitly developed by, Amendment 13. While the proposed measures do duplicate reporting requirements for vessels that choose to participate in the SAPs or the Category B (regular) DAS pilot program, this duplication is necessary to monitor catches in a timely manner so that TACs are not exceeded.

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

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

Nevertheless, effort has been made in recent years to better identify the nature of fishing dependency on communities where people fish. Hall-Arbor et al., (2001) developed a series of regional dependency indices and port profiles for New England. Profiles for the Mid-Atlantic (McCay and Cieri 2000) are in the process of being updated. The Hall-Arbor et al, (2001) report evaluated regional dependence in New England using several measurement metrics including: the percentage of related occupations within a region; the percentage of fishing to total employed, and an index of alternative occupations. While the indices represent sub-regions within New England[1], rather than communities, they do provide a context within which port level dependence on fishing can be understood. Table 91 shows the potential level of involvement in Closed Areas I and II sorted by the alternative occupation ratio summary and accompanied by other related employment indices. The indices themselves, though using different measurement metrics, show remarkable symmetry. This table shows that the most highly dependent regions, downeast and Upper Midcoast Maine, will not benefit from the Closed Area I and II measures however Chatham and Gloucester will likely benefit from CA I and New Bedford and Gloucester will benefit from CA II.

				Level of Involvement	
SUB-REGIONS	**% Related Occupations**	**% of Total Employed**	**Alternative Occupation Ratio Summary**	**CA I Table**	**CA II Table**
Downeast Maine	45	3.6	255.54		
Upper Midcoast Maine	36	2	171.05		
Cape and Islands/ Chatham	27	0.79	104.43	Medium	
Lower Midcoast Maine /Portland	23	0.46	51.32		Low
New Bedford/South Shore	27	0.4	38.95		High
Southern Maine	23	0.39	36.94		
Rhode Island	24	0.31	30.86		Low
Gloucester/North Shore	20	0.21	24.91	High	Medium
New Hampshire Coast	8	0.09	9.46		
Boston Area	7	0.05	6.39	Low	Low
	2	0.01	2.61		

Table 91 - Level of Involvement in Closed Areas I and II and Comparative Fishing Dependence Indices for the Eleven Sub-regions of New England (adapted from Hall-Arbor et. Al., 2001)

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 4.1). These limits promote the use of selective fishing practices, since vessels can only fish for target stocks as long as the incidental catch TACs have not been met. In order to monitor fishing practices and make sure that unreported discards do not result in the TACs being exceeded, all of the Category B DAS programs proposed will have sufficient observer coverage to accurately monitor catches. The gear requirements for the CAII haddock SAP pilot program reduce bycatch of unwanted

[1]Similar indices for the Mid-Atlantic have not yet been developed

species and reduce the catch rates of unhealthy regulated groundfish stocks (such as GB cod, plaice, white hake, etc.). Since some of these stocks have low trip limits, these gear requirements will reduce the bycatch of those species. 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. The Category B (regular) DAS pilot program prohibits discards of legal sized regulated groundfish while fishing on a Category B (regular) DAS. The program also includes a provision that allows a vessel operator to change from a Category B (regular) DAS to a Category A DAS if low catch limits are exceeded. Both of these elements are intended to reduce discards/bycatch.

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

The proposed action continues to rely on DAS as a primary management tool, and provides opportunities for vessels to use additional DAS. DAS provide flexibility to fishing vessel operators to fish when they deem it safe to do so. This action also includes some provisions (hard TACs, limits on Category B (regular) DAS use by quarter) that may foster development of a derby fishery. If a derby fishery develops, vessel operators may take increasing risks in order to participate before the fishery closes. Some provision of the action may make participation in these programs undesirable and may mitigate development of a derby fishery.

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;

Optimum yield from this fishery is harvested entirely by U.S. vessels. There is no opportunity and there are no provisions for foreign fishing in this management plan.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

A detailed description of the fishery is included in the Affected Human Environment section of Amendment 13. A brief update of the fishery is included in the Affected Human Environment section of this document, section 6.0.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

Maximum sustainable yield is described in Amendment 13, section 3.1.5 with a short explanation of the source of this estimate. Optimum yield continues to be defined as in Amendment 9. The condition of the fishery is included in section 6.5, 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 7.0.

(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 sections 4.2, 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.2, and 4.4.

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

The proposed action 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 7.2 described the impacts of the proposed action on the multispecies fishery. Impacts of the alternatives on other fisheries are described in sections 7.2.6, 7.3.6, 7.4.6, and 7.5.6.

(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 Category B (regular) DAS pilot program, the CAI hook gear haddock SAP, and the CAII haddock SAP. It also adopts additional daily electronic reporting requirements of catch (kept and discarded) for the programs implemented by this 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 7.2.1.3.

(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 6.5.

(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. For the Category B (regular) DAS pilot program, these opportunities are not allocated to specific sectors of the industry but are available to any fishing vessel that can target healthy groundfish stocks. Two SAPs are proposed which allocate the ability to target GB haddock to specific gear types. In one instance, 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. The CAII haddock SAP is limited to trawl vessels by this action since a specific gear has been identified that can selectively target haddock. The Regional Administrator can expand this program to other gear if it can demonstrate the ability to avoid cod catches.

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

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

(A) Identify and description of EFH

EFH for the management unit of the Northeast Multispecies FMP has been identified and described in Amendment 10. The Council plans to update these EFH designations through an omnibus amendment that will be initiated in early 2004 and will become Amendment 14 to the Northeast Multispecies FMP.

(B) Fishing activities that adversely affect EFH

(i) Evaluation of potential adverse effects

The EFH Final Rule (50 CFR Part 600) provides guidance to the Regional Fishery Management Councils for identifying fishing activities that adversely impact essential fish habitat (EFH). In addition to the EFH Final Rule, guidance provided by the Habitat Conservation Division (HCD) headquarters office in the form of a memo dated October 2002. This evaluation should primarily include the impacts of activities associated with the fishery that is the subject of the management action, as well as other federally-managed and state-managed fishing activities. Based on the guidance provided by the EFH Final Rule and the HCD office, this determination focuses on the effects of fishing activities in the New England multi-species fishery on groundfish EFH. It also includes information on the effects of other federally-managed fishing activities on groundfish EFH, and identifies gears used in state-managed fisheries that could affect groundfish EFH. Most of the information needed to complete this determination is provided in more detail in previous sub-sections of section 9.3.1 of Amendment 13.

Section 9.3.1.2 of Amendment 13 describes commercial fishing gears used in the Northeast region of the U.S. and the geographic distribution and use of the principal bottom-tending gears in three broadly-defined habitat types. It also evaluates the effects of bottom trawls and dredges on benthic marine habitats in the region. The information in this section serves as the basis for evaluating which gear types, if any, are most likely to have an adverse impact on essential fish habitat for federally-managed species in the NE region.

Section 9.3.1.3 of Amendment 13 evaluates the vulnerability of all 37 federally-managed species to gear types found to have potential adverse impacts on EFH. Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. Results are summarized by species and life stage.

Section 9.3.1.8 of Amendment 13 summarizes the results and findings of this section, identifying the potential adverse impacts of the three principal mobile, bottom-tending gears on three principal bottom types in the region. These results serve as the basis for analyzing proposed alternatives to minimize the adverse impacts of these gears on EFH.

(ii) Minimizing adverse effects

The EFH Final Rule stipulates "each FMP must minimize to the extent practicable the adverse effects of fishing on EFH that is designated under other federal FMPs". Federally-managed species that could be affected by the New England groundfish fishery are listed in section 9.3.1.7 of Amendment 13.

In order to minimize and mitigate the adverse effects of the fishery on EFH the Council implemented effort reductions, gear restrictions and habitat closed areas for bottom tending mobile gear. The Council has determined that the combination of these measures minimizes, to the extent practicable, the adverse effects of fishing on EFH. This includes the adverse effects of the groundfish fishery on all federally-designated EFH as well as the adverse effects of other federally-managed fisheries on groundfish EFH.

The proposed action in Framework 40A will implement the following measures:

1.Adopt Total Allowable Catch (TAC) limits for stocks of concern (unhealthy stocks) that can be caught while using Category B DAS;

2. Implement a pilot program for the use of Category B (regular) DAS;

3. Implement a Special Access Program to target GB haddock using hook gear in Closed Area I (CAI);

4. Implement a Special Access Program to target GB haddock in and near CA II; and

5.Allow vessels to fish in both the Western US/CA area and other areas on the same trip.

Section 7.2.2 demonstrates that the overall habitat impacts of all the measures combined in this action have negative impacts relative to the baseline habitat protections established under Amendment 13. However, because the types of bottom where the additional DAS will be applied is difficult to ascertain, and the fishery must respect the 2,811 square nautical miles of habitat closed areas, the additional DAS in the pilot program will occur in areas that are already open to bottom tending mobile gears and increase in DAS will not exceed 6% of the Amendment 13 baseline DAS, the potential adverse impacts will be less than minimal and are temporary in nature. Therefore, measures to minimize adverse effects on EFH are not necessary.

(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

7.6.2 of this document addresses the requirement of this component.

(F) Identification of conservation and enhancement actions.

Section 9.3.2 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(G) List the major prey species and discussion the location of the prey species' habitat

Section 9.3.3 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(H) Identification of habitat areas of particular concern

Section 9.3.5 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(I) Recommendations for research and information needs

Section 9.3.4 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

(J) Review and revision of EFH components of FMPs.

Section 9.3.6 of Amendment 13 addresses the requirement of this component. This section will be thoroughly updated in the upcoming omnibus habitat amendment (to be Amendment 14 to the NE Multispecies FMP).

8.1.2 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.

8.1.2.1 Description of Action

The proposed action is described in section 4.0. In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. The primary purpose of this action is to adopt programs that will provide additional opportunities to target healthy stocks in order to achieve optimum yield. These programs will also mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

The proposed action is a suite of management measures that will:

- Adopt Total Allowable Catch (TAC) limits for stocks of concern (unhealthy stocks) that can be caught while using Category B DAS;
- Implement a pilot program for the use of Category B (regular) DAS;
- Implement a Special Access Program to target GB haddock using hook gear in Closed Area I (CAI);
- Implement a Special Access Program to target GB haddock in and near CA II;
- Allow vessels to fish in both the Western U.S./Canada area and other areas on the same trip.

In general, the activity described by this proposed action, fishing for twelve groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout) occurs off the New England and Mid-Atlantic coasts within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

8.1.2.2 Assessing the Potential Adverse Impacts

Although otter trawls, used predominantly in the multispecies fishery, have been shown to be associated with adverse impacts to some types of bottom habitat (NEFMC 2003), this action does not propose to increase current levels of fishing activity in the U.S. EEZ more than 10% above the current days-at-sea allocation.

Implement a pilot program for the use of Category B (regular) DAS: It is estimated that approximately 2000 DAS will be allocated back to the fishery by the Category B (regular) DAS pilot program (proposed action) in FY 2004 (and again in FY2005) or a 4.65% increase from current levels at 43,000 DAS and that otter trawls will be used to fish a large portion of these DAS (with gillnets used for some as well).

Implement a Special Access Program to target GB haddock using hook gear in Closed Area I (CAI): Between 300 and 1000 DAS will be allocated to a special access program to target GB haddock using hook gear in Closed Area I. Hook gear has been determined not to adversely affect EFH in the northeastern U.S. (see Amendment 13 gear effects evaluation).

Implement a Special Access Program to target GB haddock in and near CA II: Between approximately 400 and 2090 DAS will be used to target GB haddock in and near Closed Area II. The range of the DAS is wide due to the hard TAC for incidentally caught cod. The biological impacts section of the proposed action suggests that it is unlikely that the higher end of the range of DAS will be used to target haddock as it will be limited by the catch of cod. At the lower end of the range a 0.93% increase in DAS will be used and at upper end a 4.86% increase will be realized.

Adopting Total Allowable Catch (TAC) limits for stocks of concern (unhealthy stocks) that can be caught while using Category B DAS and allowing vessels to fish in both the Western U.S./Canada area and other areas on the same trip will have negligible impacts to essential fish habitat.

Section 7.2.2 provides a complete assessment of the potential habitat impacts of the proposed measures. As described above, the actions proposed in this 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 that is addressed by this actions, the adverse effects on the EFH of any managed species by this action will not be more than minimal and temporary in nature relative to the baseline conditions established under Amendment 13.

8.1.2.3 Minimizing or Mitigating Adverse Impacts

Section 7.2.2 demonstrates that the overall habitat impacts of all the measures combined in this action have negative impacts relative to the baseline habitat protections established under Amendment 13. However, because the types of bottom where the additional DAS will be applied is difficult to ascertain, the fishery must respect the 2811 square nautical miles of habitat closed areas, the additional DAS in the pilot program will occur in areas that are already open to bottom tending mobile gears and increase in DAS will not exceed 10% of the Amendment 13 baseline DAS, the potential adverse impacts will be less than minimal and are temporary in nature. Therefore, measures to minimize adverse effects on EFH are not necessary.

8.1.2.4 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.

8.1.3 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. There are other measures being implemented in this framework such as incidental catch limits, regulations for B-day usage for a Category B (regular) DAS pilot program, and measures related to the U.S./Canada resource sharing understanding, but the impact of these measure on skate mortality is either non-existent or uncertain, and none of these measures fall within the list of seven categories of management measures that trigger a skate baseline review. In general, this section will evaluate whether the two distinct proposed SAPs 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. Therefore, this baseline review will assess only one of the seven categories of management measures: a change in the groundfish mortality closed areas.

8.1.3.1 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 92 shows the Autumn survey indices for the two species of skate that are in a formal rebuilding program. Updated values for 2002 and 2003 have been added to the bottom of the table, as well as a new three-year average (2001-2003) for each species. According to the respective three-year average updated through 2003,barndoor biomass has increased, while thorny biomass has declined slightly. Figure 38 and Figure 39 show the spatial distributions of barndoor and thorny skates based on NMFS Autumn trawl survey data (1963 – 2003). In general, barndoor skate is distributed on Georges Bank and southern New England, while thorny skate is found primarily in deeper waters throughout the Gulf of Maine, and secondarily, along the southern edge of Georges Bank.

This baseline assessment focuses on the Autumn survey for several reasons. First, the Autumn survey was determined to be the most appropriate survey to use for overall biomass estimates for these two species. Second, the spatial distributions of the two surveys are relatively consistent for barndoor and thorny skates, thus analyzing both is redundant.

	BARNDOOR	THORNY
YEAR	**AUTUMN SURVEY (kg/tow)**	**AUTUMN SURVEY (kg/tow)**
1992	0.002	0.96
1993	0.14	1.66
1994	0.04	1.51
1995	0.11	0.78
1996	0.04	0.81
1997	0.11	0.85
1998	0.09	0.65
1999	0.30	0.48
2000	0.29	0.83
2001	0.54	0.33
1999-2001 Three-year average	**0.38**	**0.55**
Values above this line are from the Skate FMP. Values below are new updates.		
2002	.78	.44
2003	.55	.74
2001-2003 Three-year average	**0.62** *(+ 0.24 since FMP)* *(0.19 below threshold)*	**0.50** *(- 0.05 since FMP)* *(1.7 below threshold)*
SAW 30 Biomass Threshold	0.81	2.20
CURRENT STATUS	**OVERFISHED**	**OVERFISHED**

Table 92 – NEFSC Autumn survey indices and updated status of Barndoor and Thorny skates

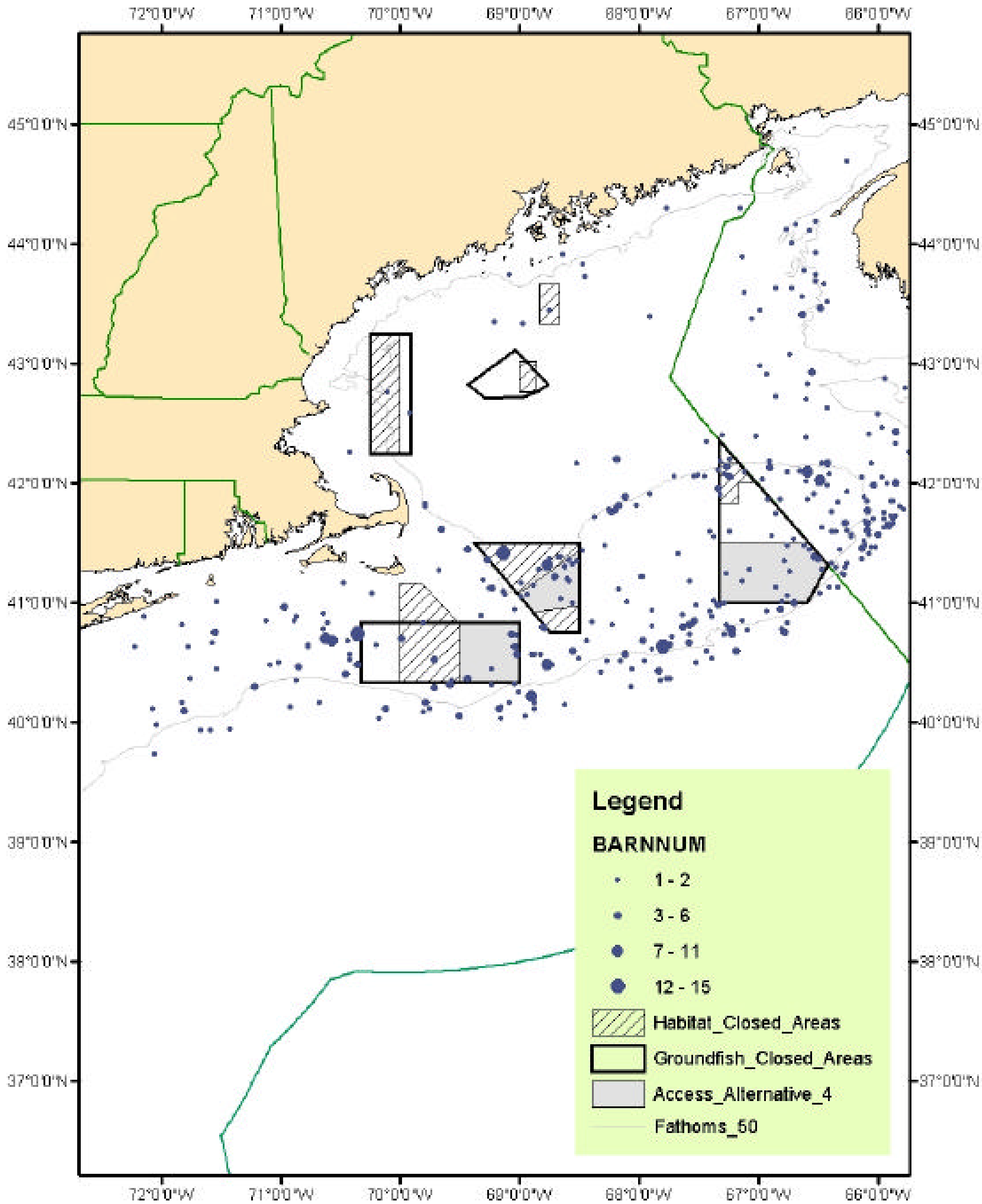

Figure 38– Distribution of Barndoor skate from NMFS Autumn trawl survey data (1963 – 2003).

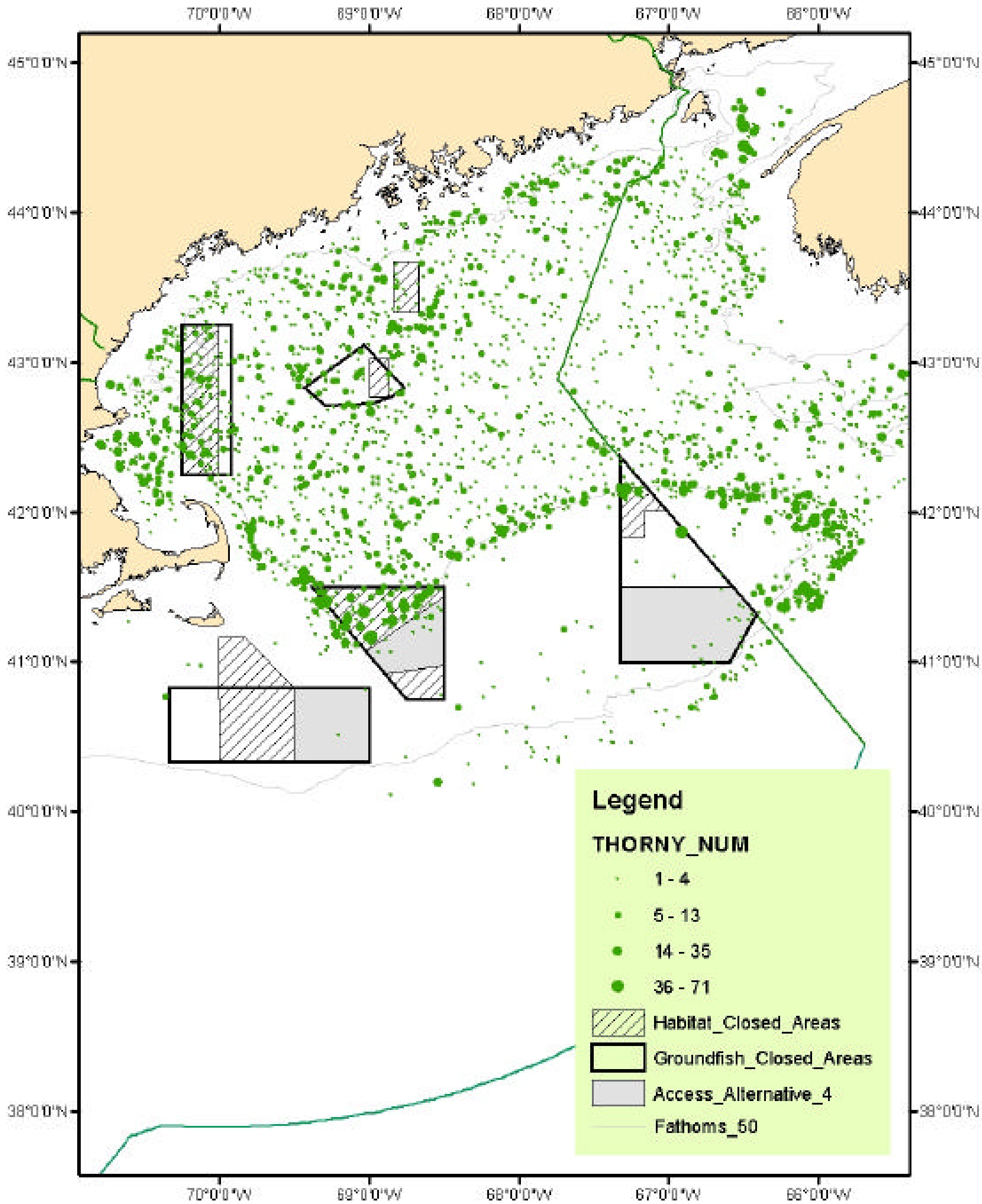

Figure 39 - Distribution of Thorny skate from NMFS Autumn trawl survey data (1963 –2003).

Number of skates in the *entire survey area*

Table 93 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 skates.

		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 93 – 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

Table 94 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).

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

8.1.3.2 Summary of potential impacts on skate mortality from the two proposed special access programs

Figure 40 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.

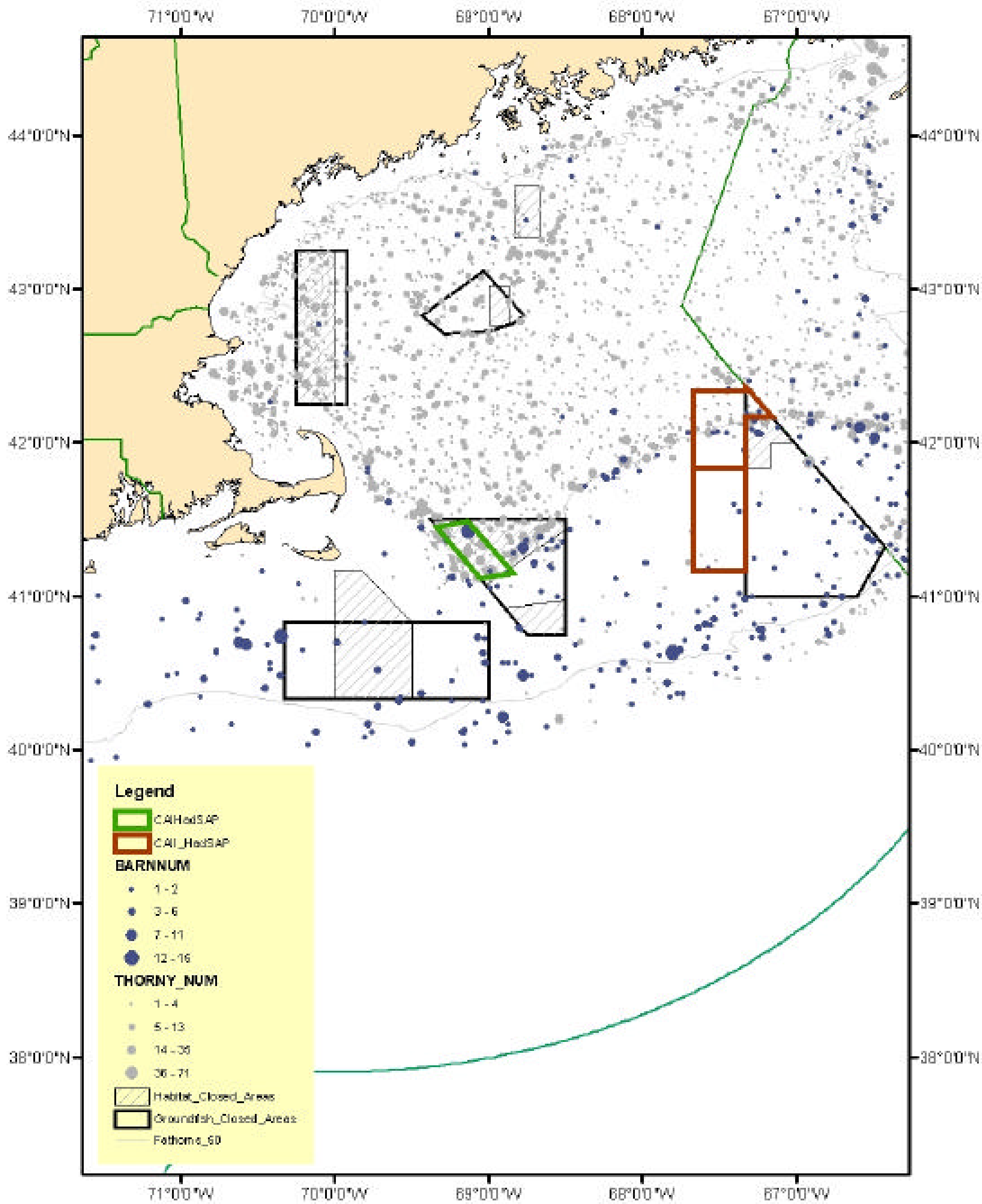

Figure 40 – Distribution of both thorny and barndoor skate based on the NMFS Autumn Survey (1963-2003) as well as the boundaries of the two proposed Special Access Programs.

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

This SAP proposes to allow 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. 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 44 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 95 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.

		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 95 - 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).

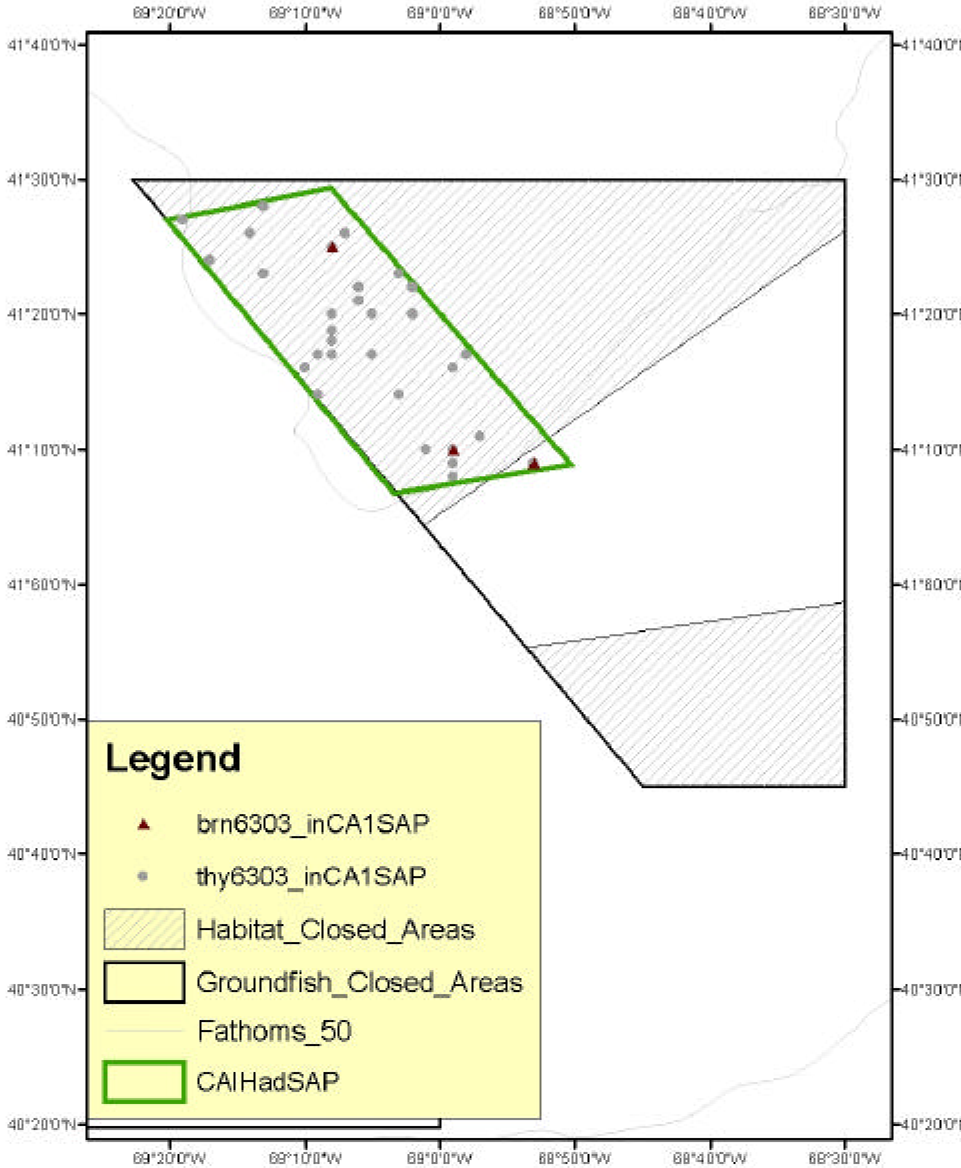

Figure 41 - Locations of where thorny skate (circles) and barndoor skate (triangles) were caught within the proposed Closed Area I SAP on the NMFS trawl survey from 1963-2003.

Potential impacts on skate mortality from the Closed Area II Haddock SAP

Access will be granted to Closed Area II to facilitate taking of the U.S. share of haddock as allocated under the U.S./Canada Resource Sharing Understanding. Currently the only gears approved for this area are a haddock separator trawl or a flounder net. It is most likely that vessels will use a haddock separator trawl when targeting haddock, and this net has been shown to minimize the catch of skates (DFO, 1992 and Raymond and Manomet, 2004). It is important to point out that the majority of this access area is outside the groundfish mortality closed area. Thus the additional impact on skate mortality as compared to the baseline review should be limited to the small triangular shaped area north of the Cod HAPC within Closed Area II. The entire SAP is about 1,100 square nautical miles, while the area inside the existing groundfish closed areas is only about 45 square nautical miles (four percent of the total SAP area). It is difficult to determine the level of effort that will be used in this area because it is greatly constrained by the "hard" TAC of cod catch. It is projected that anywhere from 40 to 500 DAS may be used in this SAP depending on how effective the net is at excluding cod. It cannot be determined whether the DAS used in this SAP will be distributed evenly throughout the area, or if effort will be concentrated in certain portions of the SAP. Therefore, there is no way to predict if more effort will be concentrated in the small area within Closed Area II (the area of concern in terms of the skate baseline review), or in the larger portion of the special access program to the west of Closed Area II (See Figure 42 for the location of the small triangular area within Closed Area II, and the larger portion of the SAP outside of Closed Area II).

An experiment with a haddock separator trawl has not been conducted in this area to estimate the incidental catch species that could be impacted by this SAP. Instead the Groundfish PDT has evaluated recent observer reports from trawl vessels that fished in the area (statistical areas 561 and 562) in 2002 and 2003. According to the data, large quantities of skates were caught, particularly little and winter skates (See Table 57 and Table 58). However, since these values are based on vessels using regular trawls, not vessels using a haddock separator trawl, which is required for this SAP (or a flounder net), the actual level of skate bycatch will most likely be significantly less than these estimates. Preliminary analysis shows that essentially all skates are eliminated as bycatch when a vessel uses a haddock separator trawl. An experiment conducted by the Canadian Department of Fisheries and Oceans in 1992 noted an almost complete absence of skate species in the top end of a separator trawl net, thus it can be assumed that the actual level of skate bycatch will be lower than the estimates based on regular trawls.

Table 96 summarizes the number and weight of both thorny and barndoor skate found within the boundaries of the proposed SAP in and around Closed Area II from all survey years combined (1963-2003). Very few barndoor skates have been recorded on the survey from areas within this proposed haddock SAP. Only 11 barndoor skates have been recorded in that area for the entire 41-year time series as compared to 727 for the entire survey area (1.5%). Similarly, only 76 thorny skates have been recorded in this area out of a total 10,586 thorny skates caught in the entire survey area (0.7%). Therefore, neither barndoor nor thorny seem to be heavily distributed within the boundaries of the proposed haddock access area in and around Closed Area II. Furthermore, only a very small percentage of this access area is within the groundfish mortality closed areas, thus the potential impacts on skate mortality as compared to the skate baseline is limited to the small triangular shaped area in the northernmost tip of Closed Area II.

		Autumn Survey (1963-2003) *14,188 records*
BARNDOOR	Total Number of barndoor caught	11
	Total weight of barndoor caught	35.6
	Number of tows in the proposed access area that caught barndoor	8
	Average number of barndoor skates caught per year	0.27
THORNY	Number of thorny skates	76
	Total weight of thorny caught	196.4
	Number of tows in the proposed access area that caught thorny	27
	Average number of thorny skates caught per year	1.9

Table 96 - Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the proposed Closed Area II Haddock SAP (1963 through 2003).

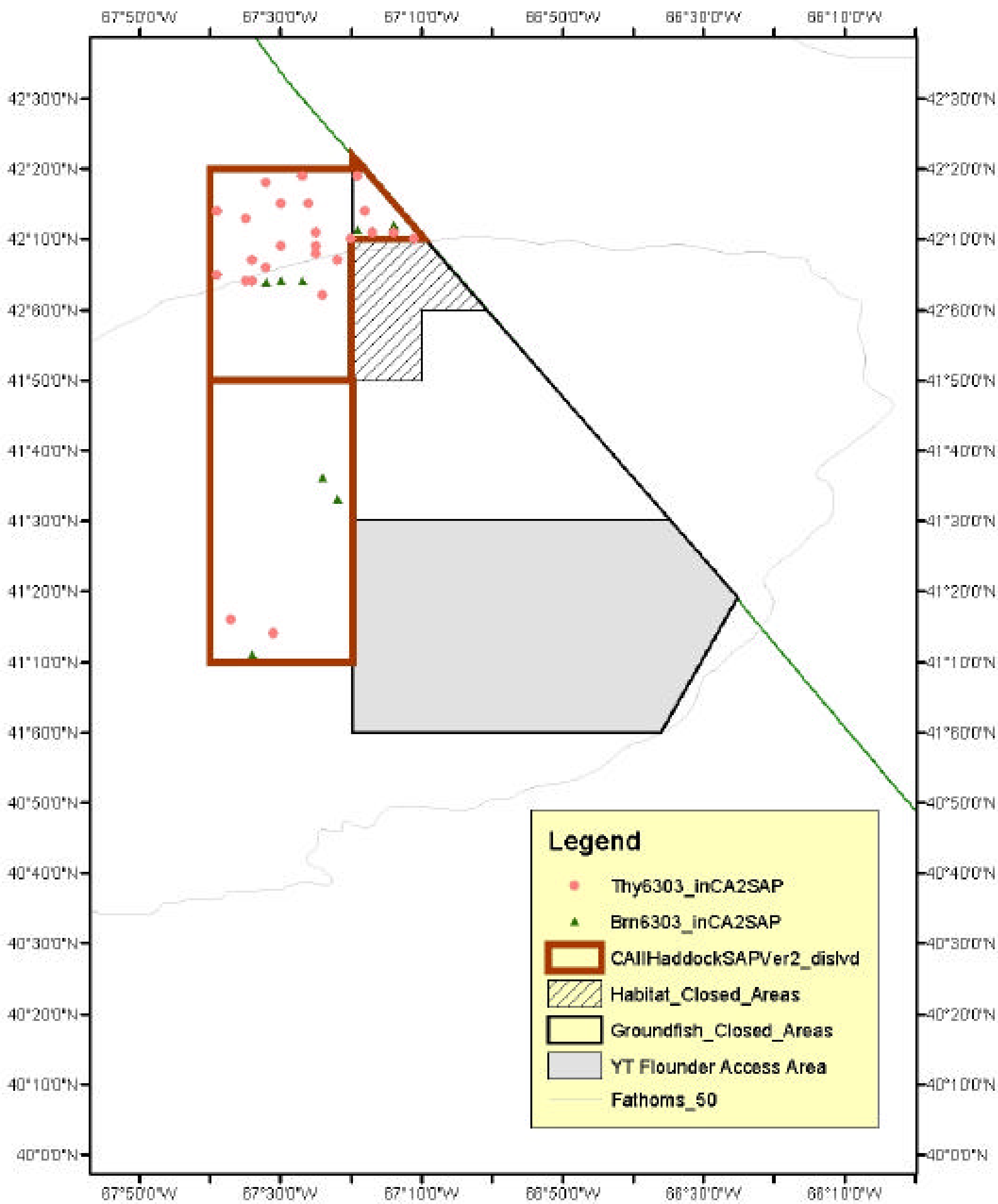

Figure 42 – Locations of where thorny skate (circles) and barndoor skate (triangles) were caught in the proposed Closed Area II SAP on the NMFS trawl survey from 1963-2003.

8.1.3.3 Conclusions

The proposed special access programs will modify 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 both proposed SAPs is expected to be minimal. While these 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 the Closed Area II SAP is projecting about 40 to 500 additional DAS, and the 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.

The access area in and around Closed Area II is not expected to have significant impacts on skate mortality, because the distribution of thorny and barndoor skates in this area is low. Keep in mind that the skate baseline review is only required in terms of access to the current mortality closed areas, thus the relevant impacts of this SAP on skate mortality are limited to the small area within Closed Area II, compared with that of the entire SAP. Furthermore, vessels will be required to use gear that has been shown to effectively reduce skate bycatch levels (DFO, 1992).

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 44 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.

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 the SAPs proposed 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.

8.2 National Environmental Policy Act (NEPA)

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

8.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

- The need for this action is described in section 3.1;
- The alternatives that were considered are described in sections 4.0 (proposed action) and 5.0 (alternatives to the proposed action);
- The environmental impacts of the proposed action are described in section 7.0;
- The agencies and persons consulted on this action are listed in section 8.2.4.

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

- An Executive Summary can be found in section 1.0.
- A table of contents can be found in section 2.1.
- Background and purpose are described in section 3.0.
- A summary of the document can be found in section 1.0.
- A brief description of the affected environment is in section 6.0.
- Cumulative impacts of the proposed action are described in section 7.6.2.
- A determination of significance is in section 8.2.2.
- A list of preparers is in section 8.2.3.
- The index is in section 9.3.

8.2.2 Finding of No Significant Impacts

National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides nine criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below:

1. Can the final action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action?

No, the proposed action is not reasonably expected to jeopardize the sustainability of any target species that may be affected by the action. The primary purpose of this action is to create opportunities to target healthy groundfish stocks. The identification of healthy groundfish stocks is based on analyses in Amendment 13, That document estimated that for several groundfish stocks, as a result of management measures adopted by the amendment, fishing mortality would be well below the mortality expected to provide maximum sustainable yield. This action is designed to increase yields from those target stocks without exceeding fishing mortality thresholds. Measures are included (hard TACs on the catch of target species in SAPs, limits on DAS use in the Category B DAS pilot program) that will prevent this action from jeopardizing the sustainability of these stocks (see sections 4.2 and 4.3). In addition, two of the programs are designed as pilot programs and will automatically expire at a future date unless extended by another action. This expiration further reduces the possibility that sustainability will be jeopardized.

Other regulated groundfish stocks that may be caught incidental to these programs are protected through hard TACs on their catch by vessels fishing in these programs (see section 4.1). These incidental catch TACs are set at very low levels to virtually eliminate the possibility that this action will jeopardize the sustainability of these stocks.

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 an/or EFH as designed under the M-S Act. The proposed action will allow an increase in fishing effort since it creates opportunities for fishing vessel operators to use Category B DAS. These opportunities are limited in scope and in area. The conclusion of the EFH assessment in section 8.1.2 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 complicates the use of DAS in that it also controls the various programs through hard TACs on the catch of target and incidental catch regulated groundfish, and in one instance through a limit on the number of DAS that can be used in a certain time period. 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.

The proposed programs, however, include elements that will help reduce the development of a derby fishery. The Category B (regular) DAS Pilot Program spaces the DAS and incidental catch limits out over four consecutive periods, providing more opportunities for vessels that may be limited by weather or other restrictions to participate in the program. In addition, some elements of this program may serve to discourage participation – the requirement for vessels to purchase use a VMS, the requirement for advance notice prior to a trip, the limited target species that are available in some areas, etc. The CAI Hook Gear Haddock SAP will be prosecuted by vessels in the GB hook sector as well as vessels not in the sector. Vessels in the sector will have less incentive to develop a derby since their cod catches will be applied against the sector's cod TAC and not the incidental catch cod TAC. Vessels not in the sector may be deterred by the VMS requirement and the lower cod trip limit. The CAII Haddock SAP takes place offshore and is effectively limited to vessels that can safely fish in this area in most weather conditions.

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 6.4 for a listing). The impacts of the action on these species are described in section 7.2.3. Overall effort reductions are occurring as the result of reduced effort and other fishing restrictions on groundfish stocks, possibly reducing risks to protected species on the positive end of the spectrum. Most likely, the proposed measures will have a negligible impact because they do not appreciably affect effort beyond Amendment 13 levels in times and places where protected species occur. 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.

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 7.6.2. While this action will result in increased mortality on regulated groundfish stocks targeted in the Category B DAS programs, the resulting mortality is not expected to exceed mortality thresholds and as a result the cumulative effects are not expected to have a substantial effect. For other regulated groundfish stocks, the cumulative effects of this action will not be substantial primarily because incidental catch TACs will limit the impacts of this program. This action is not expected to have substantial effects on any other non-target species.

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

Due to the limited programs being adopted, and the short time period that two of the programs will be in place, this action is not expected to jeopardize the sustainability of an 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. While the proposed action will result in a small increase in fishing effort, this increase is not expected to have substantial impacts on habitat and thus will not affect benthic productivity.

8. Are significant social or economic impacts interrelated with significant natural or physical environmental effects?

There are no significant social or economic impacts, so interrelations with significant natural or physical environmental effects are moot.

9. To what degree are the effects on the quality of the human environment expected to be highly controversial?

The effects on the quality of the human environment are not expected to be controversial. The primary impact on the human environment of this action is that it will increase fishing opportunities to target healthy groundfish stocks. 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

8.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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8.2.4 Agencies Consulted

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

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

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

8.2.5 Opportunity for Public Comment

The proposed action was developed during the period November 2003 through May 2004 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Council Meeting	Holiday Inn, Peabody, MA	11/4 – 11/6/03

Groundfish Oversight	Holiday Inn, Mansfield, MA	1/14/2004
Council Meeting	Hotel Viking, Newport, RI	1/27 & 1/28/04
Groundfish Advisory Panel	Holiday Inn, Portsmouth, NH	2/25/2004
Groundfish Oversight	Holiday Inn by the Bay, Portland, ME	3/2/2004
Council Meeting	Tavern on the Harbor, Gloucester, MA	3/24/04
Groundfish PDT	Holiday Inn, Mansfield, MA	4/7/2004
Groundfish Advisory Panel	Holiday Inn, Peabody, MA	4/14/2004
Groundfish Oversight	Holiday Inn, Peabody, MA	4/22/2004
Council Meeting	Providence Biltmore, Providence, RI	5/12/04

8.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 13 Final Supplemental Environmental Impact Statement. NMFS has already concurred on that action.

The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 13. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 40A.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see section 7.0 of this document.

8.4 Marine Mammal Protection Act

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

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see section 7.0 of this document.

8.5 Coastal Zone Management Act

The Council has determined that the final proposed alternatives comply with the rules and regulations of the Coastal Zone Management Act. This document has been sent to coastal states from Maine to North Carolina for review of compliance with individual state's CZMA management regulations.

8.6 Administrative Procedure Act

This action was developed in compliance with the requirements of the Administrative Procedures Act, and these requirements will continue to be followed when the proposed regulation is published.

8.7 Data Quality Act

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that “provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies.” OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to complete these actions.

8.7.1.1 Utility of Information Product

Explain how the information product meets the standards for ***utility****:*

Is the information helpful, beneficial or serviceable to the intended user?

The proposed action and the proposed rule implementing that action include a description of Framework Adjustment 40A, including the purpose and need, measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included. This action implements the Northeast Multispecies FMP conservation and management goals consistent with the M-S Act and other applicable laws.

Is the data or information product an improvement over previously available information? Is it more current or detailed? Is it more useful or accessible to the public? Has it been improved based on comments from or interactions with customers?

This proposed action was developed as a result of a multi-stage process that involved review of the source document (Framework 40A to the FMP) by affected members of the public (through the Regional Fishery Management Council (Council) public review process). The latest information available from the Fisheries Statistics Office was used to update landings and quota figures from the proposed rule to the final rule.

What media are used in the dissemination of the information? Printed publications? CD-ROM? Internet? Is the product made available in a standard data format? Does it use consistent attribute naming and unit conventions to ensure that the information is accessible to a broad range of users with a variety of operating systems and data needs?

The Federal Register notice that announces the final rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements. The Framework 40A document is also available on the Council’s web site in standard PDF format. Copies are available on CD-ROM from the Council office.

8.7.1.2 Integrity of Information Product

Explain how the information product meets the standards for ***integrity:***

All electronic information disseminated by NOAA adheres to the standards set out in Appendix III, "Security of Automated Information Resources," OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

If information is confidential, it is safeguarded pursuant to the Privacy Act and Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business and financial information).

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

8.7.1.3 Objectivity of Information Product

Indicate which of the following categories of information products apply for this product:

Original Data
Synthesized Products
Interpreted Products
Hydrometeorological, Hazardous Chemical Spill, and Space Weather Warnings, Forecasts, and Advisories
Experimental Products
Natural Resource Plans
Corporate and General Information

This information product is a Natural Resource Plan.

Describe how this information product meets the applicable objectivity standards. (See the DQA Documentation and Pre-Dissemination Review Guidelines for assistance and attach the appropriate completed documentation to this form.)

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NMFS 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.

What published standard(s) governs the creation of the Natural Resource Plan? Does the Plan adhere to the published standards? (See the NOAA Sec. 515 Information Quality Guidelines, Section II(F) for links to the published standards for the Plans disseminated by NOAA.)

In preparing the Amendment and Final Supplemental Environmental Impact Statement document, the Council(s) must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 12612 (Federalism), 12630 (Property Rights), 12866 (Regulatory Planning), and 13158 (Marine Protected Areas). NOAA Fisheries has determined that the final rule to implement Amendment 10 to the FMP is consistent with the National Standards of the Magnuson-Stevens Act and all other applicable laws.

Was the Plan developed using the best information available? Please explain.

This proposed action and its implementing regulations have been found to be in compliance with all the applicable National Standards of the M-S Act, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures implemented under this rule were selected based upon the best scientific information available.

This information includes NOAA Fisheries dealer weighout (weight of fish landings) data from 1998 to 2002, which was used to characterize the economic impacts of the management proposals. These data, as well as the NOAA Fisheries Observer program database (1994 – 2003) and the Vessel Effort Monitoring System (VMS) program database (1998 – 2000), were used to characterize historic landings and effort.

Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the scallop fishery. A fuller description of the data used and the process the Council followed in analyzing the current status of the fishery and the potential future impacts is presented in Section 8.0.

Have clear distinctions been drawn between policy choices and the supporting science upon which they are based? Have all supporting materials, information, data and analyses used within the Plan been properly referenced to ensure transparency?

The policy choices (i.e., management measures) implemented by this rule are supported by the available scientific information. The management measures contained in the rule and developed in Framework 40A to the FMP are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing, while maintaining sustainable levels of fishing effort for to ensure a minimal impact on fishing communities and the environment.

The supporting materials and analyses used to develop the measures in the final rule are contained the framework document and the accompanying environmental assessment.

Describe the review process of the Plan by technically qualified individuals to ensure that the Plan is valid, complete, unbiased, objective and relevant. For example, internal review by staff who were not involved in the development of the Plan to formal, independent, external peer review. The level of review should be commensurate with the importance of the Plan and the constraints imposed by legally enforceable deadlines.

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

8.8 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA.

The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

8.9 Executive Order 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.

8.10 Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995 requires that agencies obtain OMB approval before requesting most types of information from the public. “Information collections” include forms, interviews, record-keeping requirements, and a wide variety of other things. Framework 40A imposes additional information collection requirements on the public that include:

- Advance notice of participation in programs to facilitate observer coverage.
- Additional reporting of catches on a daily basis through electronic means.
- Notice of participation in specific fishing programs at the start of a trip.

Estimates the burden (time and cost) of preparing, submitting, and administration of new data collection requirements for the proposed action as described in section 4.0 can be found in Appendix II. These estimates may be revised based on changes to the proposed action that may result during its review and approval by NMFS. A formal burden-hour analysis of these new reporting requirements in Framework 40A will be available with the proposed rule.

8.11 Regulatory Impact Review

8.11.1 Executive Order 12866

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

- Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

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

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

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

Of these four criteria, the discussion to follow focuses only on the expected magnitude of the economic impacts of the Proposed Action.

The proposed action would implement a pilot program for using Category B regular DAS, two SAPs and would provide regulatory relief to vessels fishing in the Western U.S./Canada resource sharing area. Each of these programs would be limited by incidental catch TACs that would assure that the biological impacts of the proposed action would not compromise the rebuilding plan.

The proposed action would provide economic opportunities to vessels that would not be available if no action is taken. Both SAPs would provide fishing opportunities to vessels using hook gear (the Closed Area I Hook Gear Haddock SAP) and to vessels that use trawl gear (the Closed Area II Haddock SAP Pilot Program). In each case, vessels would be provided access to haddock stocks that would not be available under the No Action alternative. Similarly, implementation of a Category B (regular) DAS pilot program would provide opportunities to vessels to use Category B (regular) DAS to direct on healthier stocks. Although the use of Category B (regular) DAS was proposed as part of Amendment 13 to the Northeast Multispecies FMP, there was considerable uncertainty as to how and whether such a program would work. The pilot program would provide the opportunity to determine the most appropriate means for future implementation of Category B (regular) DAS. Last, the proposed action would provide vessels fishing in the Western U.S./Canada resource sharing area with greater flexibility by permitting vessel to fish inside and outside (except in the Eastern portion of the area) of the area on the same trip. Although each of these programs would require vessels to have VMS installed participation would be voluntary so any vessel that does not wish to do so would still be able to continue fishing on its allocation of Category A DAS outside of these programs.

The aggregate economic impact of the proposed action will be limited by the ability of fishermen to make the incidental catch TACs last as long as possible. The value of the incidental TACs is estimated to be $2.3 million based on calendar year average prices for cod, yellowtail flounder, witch flounder, winter flounder, American plaice, and white hake. The revenue from any other species landed on these trips would provide even greater value but the aggregate impact would not rise to the $100 million threshold for a significant action. Therefore, the proposed action will not constitute a significant action for purposes of E.O. 12866.

8.11.2 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 Small Business Administration (SBA) size standards for small fishing entities ($3.5 million) all permitted and participating vessels in the groundfish fishery are considered to be small as gross sales by any one entity do not exceed this threshold. The proposed action would implement five separate measures each of which would apply to any vessel (a total of about 1,400) that holds a limited access groundfish permit. Note that about 400 of these permit holders were not allocated any Category A or Category B DAS under Amendment 13 regulations. As a result, they would not be eligible to participate in any of the programs that would be implemented under the proposed action unless they were to enter into a DAS lease agreement with another vessel.

As a practical matter, each of the measures would probably affect a limited number of current and potential participating vessels. For this reason, the discussion below identifies the conditions under which vessels may participate, the potential number of affected entities, and an assessment of the possible economic impacts. Note that the number of affected entities is difficult to assess since participation in any one of the proposed action measures would be voluntary. This means that no small entity would be made to bear any added regulatory or economic burden unless it was convinced that it would be financially beneficial to do so.

8.11.2.1 Incidental Catch TACs

The proposed action would implement incidental catch TACs for stocks of concern. These TACs would further be allocated to the regular B DAS pilot and the two proposed SAPs. While the setting of these TACs imposes no specific regulatory burden on small entities they have an indirect effect in that they place a limit on the potential benefit that may derived from any one of the initiatives contained in the proposed action. Small entity benefits will be maximized provided incidental catches of stocks of concern remain low but will be compromised if catch rates turn out to be higher than expected.

8.11.2.2 Category B (regular) B DAS Pilot Program

The proposed action would implement a pilot program to establish whether and how Category B (regular) DAS may be used to target healthier stocks with little or no bycatch of stocks of concern. A total of 4,000 DAS allocated equally across four quarters beginning in November, 2004 would be set aside for the pilot program. Incidental catch TACs would similarly be distributed evenly across all four quarters. Participating vessels would be required to use VMS and to report their catches of stocks of concern through the VMS unit on a daily basis. As of May 1, there were 118 vessels that were reporting position information to the NMFS through VMS. An unknown number of vessels have already purchased VMS units but are not currently required to report position information. The number of additional vessels that may install VMS to take advantage of any one or more proposed action measures is not known. However, due to uncertainty over the longer-term viability of the pilot DAS program few vessels may take a financial risk on a program that may not become permanent. Thus, the actual number of potentially affected entities is at least 118 but is indeterminate on the upper end.

The economic impact of the Category B (regular) DAS pilot program will depend on the types of fisheries defined by where, when and how vessels decide to fish and the resulting catch rates of stocks of concern. Examination of recorded trips taken in fishing year 2001 indicate that there are opportunities to fish in several different stock areas with low catches of stocks of concern (see Appendix A). On average, daily revenues from these fisheries were about $2,000 but ranged from a low of $688 to a high of nearly $3,000 per day (see section 7.2.4.2, Table 73). These estimates suggest the potential value of being able to use Category B (regular) DAS but realized gains may be very different if vessels pursue fisheries that had not been identified in Appendix A. Even if these averages are representative of realized gains, the full benefit from the pilot program may not be brought to fruition if the quarterly incidental catch TACs become binding before the quarterly allocation of DAS can be used. The proposed action does not include any mechanism for allocating available DAS among small entities so there will be no assurance that any given vessel would be able to participate.

In addition to the provisions noted above, small participating entities will also be required to retain all legal sized fish and if catch exceeds the daily limit for a stock of concern the trip must be flipped to a Category A DAS. Also, vessels will be required to provide the observer program with 72 hours advance notice prior to taking a trip. Requiring vessels to "flip" the trip from a Category B (regular) DAS to a Category A DAS has two possible effects. First, trip income may be affected because the intended category B DAS trip may have been less profitable than if a category A DAS trip were taken in the first place. Second, flipping to a Category A DAS uses up a DAS that may be needed to be kept in reserve for the next Category B (regular) B DAS trip, since a vessel must have enough Category A DAS available to enable the vessel to flip from a Category B (regular) DAS to a Category A DAS. This means that a vessel with 5 Category A DAS and 20 Category B (regular) DAS would be limited to a maximum duration for a Category B regular trip of 5 DAS. In this circumstance, the vessel would be able to take four separate Category B regular DAS trips of 5 DAS each and still have the 5 Category A DAS available provided that none of the Category B regular DAS trips had to be flipped. If the same vessel were forced to flip the first five-day trip then the vessel would not only be out of Category A DAS (unless more could be obtained through a lease agreement), but would also be unable to use of the remaining Category B (regular) B DAS.

Providing the observer program with 72 hours advance notice may have some effect on trip planning. However, the proposed action requires a level of observer coverage appropriate to monitor the program and to demonstrate its efficacy. Providing advance notice provides the observer program with an opportunity to place an observer on the vessel. Once an observer is placed on the vessel the vessel may leave at that time. If an observer cannot be placed on the vessel within the 72-hour notice period then the vessel would be provided with a waiver and would still be able to fish without the observer. Thus, while the advance notice requirement may be inconvenient on some occasions it is a necessary component to monitoring the pilot program and does not preclude anyone from being able to take a trip.

8.11.2.3 Closed Area I Hook Gear Haddock SAP

The proposed action would provide an opportunity for vessels using hook gear to access haddock inside Closed Area I. The SAP would be available both to vessels that have joined the hook gear sector as well as non-sector participants. The economic effects of this SAP were detailed in section 7.2.4.3. That analysis identified 50 likely hook sector vessels and an additional 10 non-sector vessels that had a history of using hook gear and would have sufficient range to fish within the SAP. Thus, a total of 60 small entities were identified as being likely participants in the SAP.

Given the TACs for haddock of 1,000 mt that would apply to all SAP participants and the 12.6 mt incidental catch limit of GB cod for non-sector participants the total potential revenue from the SAP was estimated to be $2.5 million. Of this value, just under $0.9 million would go to income payments to crew and hired captains and $0.1 million would go to trip costs leaving $1.5 million (about $25,000 per vessel) to the vessel owner.

Participation in the hook gear SAP will require VMS. Since the operating rules for the hook sector participants require VMS, this provision of the proposed action will not place any added burden on sector vessels. However, non-sector participants would be required to install a VMS unit before entering the SAP. At present, none of the potential non-sector participants identified in section 7.2.4.3 were known to have an operating VMS unit. The estimated average return to participating vessels would be sufficient to cover the cost (ranging between $1,500 and $3,500 depending on vendor) of having a VMS unit installed.

8.11.2.4 Closed Area I Haddock SAP Pilot Program

The proposed action would implement an access program to allow vessels an economic opportunity to access GB haddock. Participating vessels would be required to use gear capable of reducing bycatch of GB cod. At this time the only approved gear for use in the SAP is a haddock separator trawl as defined in 50 CFR 648.85(a)(3)(iii)(A) and (B). The potential number of affected small entities that may participate in the SAP is not known with certainty. Analysis provide in section 7.2.4.4 showed that there were 86 vessels that had taken one or more trips in the vicinity of the SAP (i.e. statistical areas 561 and 562) during fishing year 2002. Since vessels will be credited with steaming time to and from the SAP there may be a greater incentive for more vessels to try to participate in the SAP. However, the distance from shore combined with the requirement to use a haddock separator trawl and the requirement to have VMS will likely limit the number of potential participants to larger vessels in terms of overall length.

The potential revenue that may be garnered from the SAP is not known since the catch rates of groundfish and other species using a separator trawl are not known. However, average revenue per trip by vessels using trawl gear in the vicinity of the SAP averaged $32,000, about $4,500 per day absent. Thus, the potential revenue from fishing in the SAP may be higher than the average revenue from other groundfish fishing opportunities particularly since transit time to and from the area will not be counted against a vessel's DAS allocation. These opportunities may be limited by the overall Eastern U.S./Canada resource sharing understanding TAC on GB cod since the SAP will be closed once this TAC has been met.

8.11.2.5 Combined Trips in the Western U.S./Canada Resource Sharing Area

The proposed action would provide regulatory relief to vessels that may want to fish both inside and outside the Western U.S./Canada resource sharing area on the same trip. Current regulations require that vessels fish exclusively inside or outside the Western area on a given trip. The proposed action would remove this prohibition and would afford greater flexibility to small fishing entities to make trip planning decisions. According to VTR reports there were a total of 236 different vessels that took at least one trip within the Western U.S./Canada area during fishing year 2002. VTR records indicate that fishing in more than one statistical area is not common practice yet observer data indicate that fishing in multiple statistical areas is quite common. For this reason, available data do not provide a reliable indication as to how many of these vessels, or any others that may participate in the future, may benefit from the proposed change. Nevertheless, the proposed action would have a beneficial, albeit indeterminate, economic impact on small fishing entities.

8.11.2.6 Alternatives to the Proposed Action

Alternatives to the proposed action are described in Section 5.0. The No Action alternative would provide no relief to small entities affected by the Amendment 13 measures implemented on May 1, 2004. All of the remaining measures described in Section 5.0 are included in the proposed action but there are differences between some of these measures that had been developed for consideration at the May NEFMC meeting and the measures developed for the proposed action. These differences are described in the following.

8.11.2.6.1 Non-Selected Category B (regular) DAS Pilot Program

This alternative to the proposed action would have implemented the Category B (regular) B DAS pilot program for only the third and fourth quarter of FY2004 for a total of 2,000 DAS. Compared to the proposed action, this alternative would likely have provided an opportunity to fewer vessels since the duration would have applied only to the last two quarters of the fishing year, a time period over which potential participants may be weather limited.

Given the time frame that will be required to evaluate the pilot program and develop a more long term approach to managing Category B (regular), extending the pilot to four quarters as was done in the proposed action means that there will likely be less down-time between the effective time period for the pilot program and implementation of subsequent actions.

Compared to the provisions for the proposed action Category B (regular) B DAS pilot program the non-selected alternative does not contain the advance notice requirement to the observer program nor does it contain the "flipping" requirement. While dropping these two provisions may be less burdensome to small entities both provisions are important to assuring that the purpose and need for the proposed action will be met. Given the fact that the number of available observers is limited the advance notification requirement makes it possible to assure that the monitoring objectives for the pilot program can be met. Since the purpose for the Category B (regular) DAS pilot program is to identify fishing opportunities where bycatch of stocks of concern is low, a trip that exceeds the intended catch limits would not be considered a successful Category B (regular) B DAS fishery. A trip that gets flipped effectively preserves the opportunity to "try again" while assuring that the overall conservation objectives of Amendment 13 are met.

8.11.2.6.2 Non-Selected Closed Area I Hook Gear Haddock SAP

This alternative would not require advance notice to the observer program but in all other respects contains the same provisions as the proposed action. As noted above, not requiring advance notice would be less burdensome to small entities, but fails to account for the practical realities of scheduling observers to match the required monitoring objectives of the program.

8.11.2.6.3 Non-Selected Closed Area II Haddock SAP Pilot Program

This non-selected alternative contains the same provisions as that of the proposed action with the following exceptions; the season would be May-Feb; the trip limit for GB cod would be 100 pounds per DAS up to a maximum of 1,000 pounds per trip, and vessels would not be required to flip from a Category B DAS to a Category A DAS if the cod trip limit were exceeded. The longer season would provide for greater economic opportunities to access the SAP but the months of January and February are important for GB cod spawning so including these months would not meet the conservation objectives of the FMP. The trip limit would mean that the maximum 1,000 pounds could only be retained trips of at least 10 DAS. The proposed action would make it possible to retain up to 1,000 pounds of GB cod on trips of any duration and may, therefore, provide for greater opportunity to retain cod particularly in the case where catch rates may exceed 100 pounds per day. In addition to the economic benefits provided to small entities, this change may help reduce cod bycatch as defined by the M-S Act.

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9.0 REFERENCES

9.1 Glossary

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

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

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

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

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

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

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

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship S=1-A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define B_{MSY} and F_{MSY} reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1^+, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, $B_{threshold}$ is often defined as either 1/2B_{MSY} or 1/4 B_{MSY}. $B_{threshold}$ is also known as $B_{minimum}$.

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (B_{MSY} or proxy) as a management objective. The biomass threshold ($B_{threshold}$ or B_{min}) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

Discards: animals returned to sea after being caught; see Bycatch (n.)

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterised by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exempt fisheries: Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses F_{MSY} or F_{MSY} proxy for $F_{threshold}$. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Lethrinids: Fish of the genus *Lethrinus,* commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A_{50} is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^+ mean biomass; mean biomass summed across ages 3 and over is 3^+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L_{25} is the length where

25% of the fish encountered are retained by the mesh. L_{50} is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Minimum spawning stock threshold: the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

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.

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9.3 Index

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APPENDIX A

Methods to Analyze the Category B (regular) DAS Pilot Program

Framework 40A proposes a pilot program where a limited number of regular B DAS would be used (a maximum of 2000) subject to prescribed trip limits and a hard TAC on the incidental catches of stocks of concern. Heretofore, PDT advice has been that the ability to evaluate how and in what manner regular B DAS fisheries might develop is difficult to predict. Nothing in the following should be construed as changing this position since adjustments to fishing practices cannot be predicted. However, based on the specific conditions proposed for Framework 40A makes it possible to at least identify trips that meet all of the proposed trip limits and evaluate the extent to which such reported trips form identifiable fisheries that may be likely candidates for use of regular B DAS.

To develop an initial data set, VTR records from FY2001 were queried to identify trips that met the following criteria:

- Limited access permit holder
- At least one pound of regulated groundfish was kept
- Reported landings per day absent was less than or equal to the following 25 pounds per DA of each CCGOM yellowtail flounder and SNE/MA yellowtail flounder and less than or equal to 100 pounds per DA each of SNE/MA winter flounder, GOM cod, GB cod, American plaice, witch flounder, and white hake (note that days absent from the VTR was rounded up to the nearest whole day consistent with the proposed measure)
- Gear used was limited to otter trawl, sink gillnet, bottom longline, or hook and line
- Reported mesh size for otter trawl and gillnet gears was at least 6-inches (the minimum mesh required for FY2001)

Based on this initial query a total of 4,102 trips were identified. Landed pounds for the following species were identified: all 10 regulated groundfish plus monkfish, bluefish, butterfish, cusk, summer flounder, scup, black sea bass, dogfish, skates, silver hake, red hake, wolfish, lobster, scallops, squids, and all other species combined. The data were subdivided into gears (hook i.e. hand line, bottom longline, sink gillnet, and otter trawl) and generic stock areas defined as follows; GOM = statistical areas (510, 511, 512, 513, 514, 515) GB = statistical areas (520, 521, 522, 525, 526, 561, 562, 541, 542, 543) and SNE/MA was defined as statistical areas (533, 534, 537, 538, 539 and all area 600 and above).

The combined pounds of all stocks of concern as a percent of total weight of all fish on board are plotted for each gear/stock area combination in Figure 53 through Figure 63. Among these gear/stock combinations there are notable differences both in terms of the total number of "qualifying" trips and the distribution of the contribution of stocks of concern to total landings. For example, only 88 qualifying trips were reported by vessels using hook gear in the GOM (Figure 43). Of these trips, the majority were trips where stocks of concern comprised most of the landings even though landings per DA were still under all required trip limits. The same may be said of hook gear on GB (Figure 44) as well as bottom longline gear in the GOM, GB and in SNE/MA (Figure 45 through Figure 47 respectively). The relatively high proportion of stocks of concern, principally GB and GOM cod, in these four gear/area combinations raise issues concerning the desirability of allowing the use of regular B DAS on trips that are directing on stocks of concern since these trips may represent the lower end of the landings distribution (i.e busted or poor trips) of a directed cod fishery. Even though the possibility would exist to "flip" the regular B to an A DAS, doing so has been suggested as being a regular B DAS "failure." Flipping DAS in the context of the limited pilot proposal for this Framework may also prove to be problematic in terms of monitoring the cap on DAS use and the incidental catch TACs.

Unlike the gear/area combinations noted above, the remaining combinations (Figure 48 – Figure 52) indicate that over the range of trips represented in the data there were a substantial number of occasions where stocks of concern were clearly incidental to the trip. To further explore the composition of these trips, the data were trimmed by deleting any record where the combined landed weight of all stocks of concern was less than or equal to 20% of total weight of fish on board; yielding a total of 2,195 trip records.

Potential regular B DAS fisheries were identified by initially plotting each trip, sorted by the percent of cod on board, using a 100 percent area chart in EXCEL. Sorted in this manner trips of similar composition appear as bands of colors which facilitates identification of potential "fisheries." After an initial inspection of the chart species that were landed on very few trips or that individually comprised a very low proportion of landings were aggregated into an "other" category. Finally, to facilitate presentation and visual inspection of the chart, data were resorted to improve the ability to identify similarities across trips.

Gulf of Maine Trawl - Based on FY2001 data there were a total of 321 trips that took place inside the Gulf of Maine where landings of stocks of concern were 20% or less of total landed weight. These trips clustered into four clusters of similar landings composition; skates/winter flounder, monkfish/plaice/winter flounder, winter flounder, and mixed trawl (Figure 53). Of these four clusters the skate/winter flounder and winter flounder clusters seem to be the most likely candidates or provide the most likely opportunity to use a regular B DAS in the GOM with low interactions with stocks of concern. The monkfish/winter flounder/plaice cluster also seems to be relatively distinct but only represents about 12 trips.

Since the proposed pilot program would be in effect only during the third and fourth quarters of FY2004 the GOM trawl data were further trimmed to include only trips that took place from November through April. Even though this trimming removed nearly two-thirds of reported trips the clustering of data still indicates that the skate/winter flounder and winter flounder clusters noted above persist (Figure 54).

Georges Bank Trawl – The Georges Bank trawl data does not separate into as distinct a set of clusters compared to the GOM trawl data although a substantial number of trips are comprised almost entirely of yellowtail flounder with small amounts of winter flounder, skates and monkfish (Figure 55). This approximate mix of species persists with declining proportions of yellowtail flounder for at least half of the 215 GB trawl trips with 20% of less incidental landings of species of concern. As the proportion of yellowtail falls below 50% the species composition is dominated by a combination of winter flounder, skates, and monkfish. The data also indicates that some vessels were able to fish almost exclusively on haddock with some incidental landings of cod although the number of such occasions was small. Note that the general composition of landings in quarter 3 and 4 (Figure 56) is quite similar to that for the entire fishing year except that the relative importance of winter flounder figures is less prominent.

Southern New England/Mid-Atlantic Trawl – There were almost 800 trips using trawl gear in the SNE/MA area by limited access multispecies permit holders that used at least six-inch mesh (Figure 57). These trips clustered into three components; 1) a skate fishery with incidental landings of summer flounder, winter flounder and windowpane flounder, 2) a summer flounder fishery with incidental landings of winter flounder, windowpane flounder, and monkfish, and 3) a mixed trawl fishery with varying proportions of many different species. These findings indicate that there may be opportunities to use regular B DAS in the SNE/MA area in a skate fishery and in a mixed flatfish fishery where summer flounder was the primary target. These general findings also hold for quarter 2 and 3 although the number of trips taken in FY2001 from November through April was less than one-third of total trips throughout the entire fishing year (Figure 58).

Gulf of Maine Gillnet – The dominant gillnet fishery in the Gulf of Maine with minimal incidental landings of stocks of concern is the directed monkfish fishery (Figure 59). For all but 76 of the 558 reported trips monkfish was at least 50% of total trip weight. Many of the these trips did report incidental amounts of cod but the largest reported landing was less than 600 pounds with the majority of records being less than 100 pounds. In addition to the monkfish fishery there were a small number of trips that landed almost exclusively pollock, dogfish, or haddock or these species were landed in varying combinations. As was the case for other gear/area combinations the majority (almost 75%) of qualifying GOM gillnet trips were taken before quarters 3 and 4. However, as was also the case previously, the clusters of "fisheries" in quarters 3 and 4 are similar to that of the entire fishing year (Figure 60).

Georges Bank Gillnet – In FY2001 the dominant fishery using gillnet gear on Georges Bank with low incidence of stocks of concern was a monkfish/skate fishery where some trips were clearly directed monkfish or directed skate trips while others were combined monkfish/skate trips (Figure 61). This species composition was also evident in quarters 3 and 4 of FY2001 although there were about one-third as many trips (Figure 62).

Southern New England/Mid-Atlantic Gillnet – The composition of landings by vessels using gillnet gear in the SNE/MA statistical areas was nearly identical to that of vessels using gillnet gear on Georges Bank. The dominant species mix was monkfish/skates with a small number of trips where summer flounder comprised the majority of landings (Figure 63). As was the case above, the composition of trips in this area was no different during quarters 3 and 4 (Figure 64) as compared to the entire fishing year.

Summary

Based on the data from fishing year 2001 there do appear to be fisheries that were prosecuted in that year that would have required using a groundfish DAS yet had low incidence of stocks of concern. These fisheries (summarized in Table 97) may be likely fisheries where a regular B DAS may be used with a low probability of flipping to an A DAS.

	Otter Trawl	Gillnet
Gulf of Maine	skate/winter flounder winter flounder	monkfish
Georges Bank	yellowtail yellowtail/winter/monkfish/skates winter/monkfish/skates	monkfish skates monkfish/skates
Southern New England/Mid-Atlantic	skates skates/fluke fluke/monkfish	monkfish skates monkfish/skates

Table 97 - Summary of Potential Regular B DAS Fisheries by Area and Gear

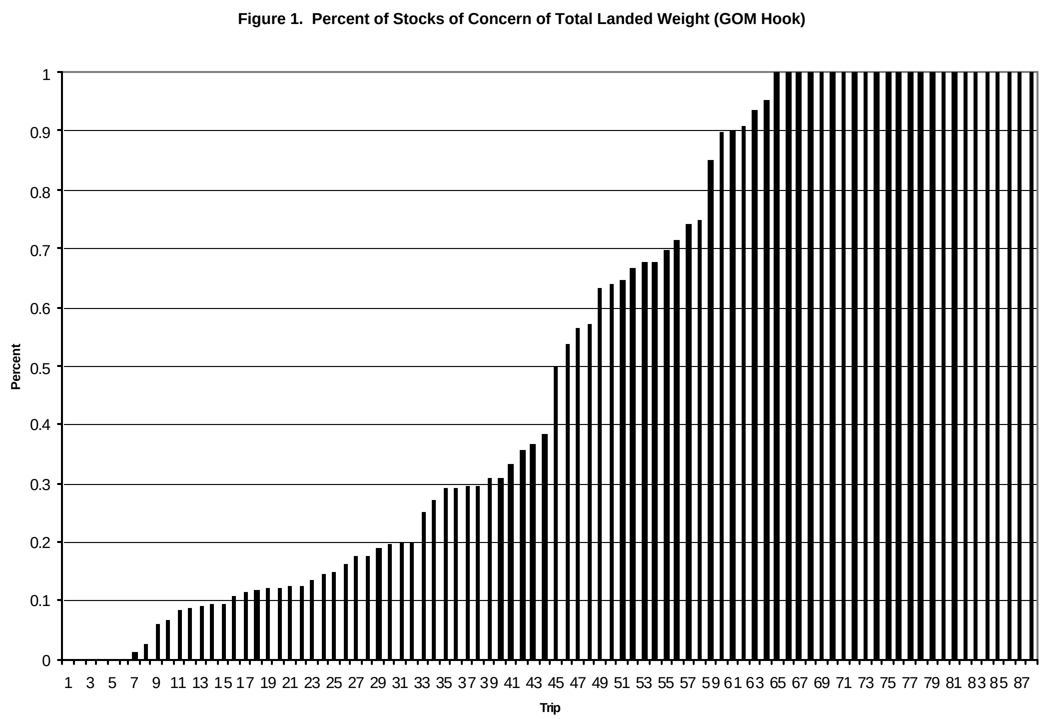

Figure 43– GOM hook: percent of total landed weight of stocks of concern

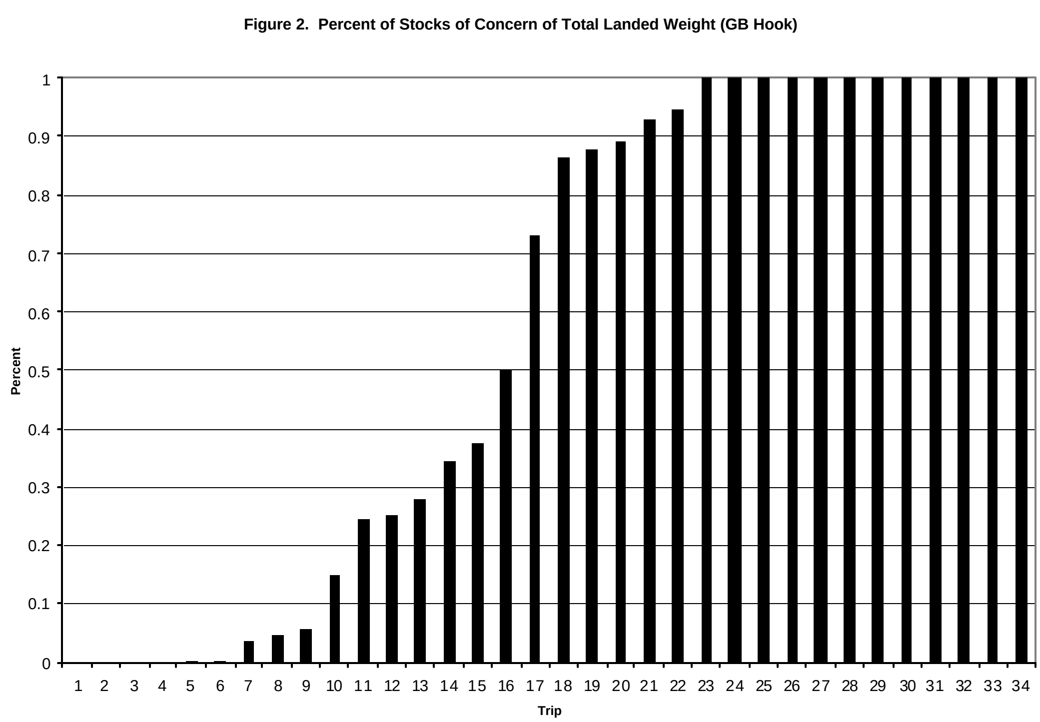

Figure 44 – GB hook: percent of total landed weight of stocks of concern

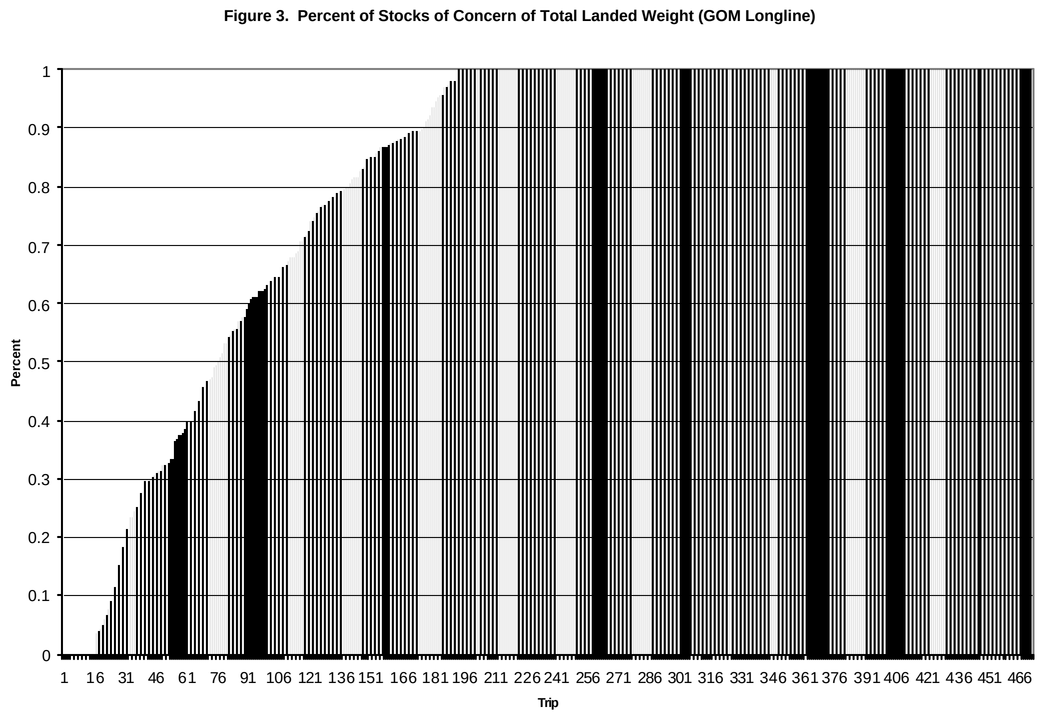

Figure 45 – GOM longline: percent of total landed weight of stock of concern

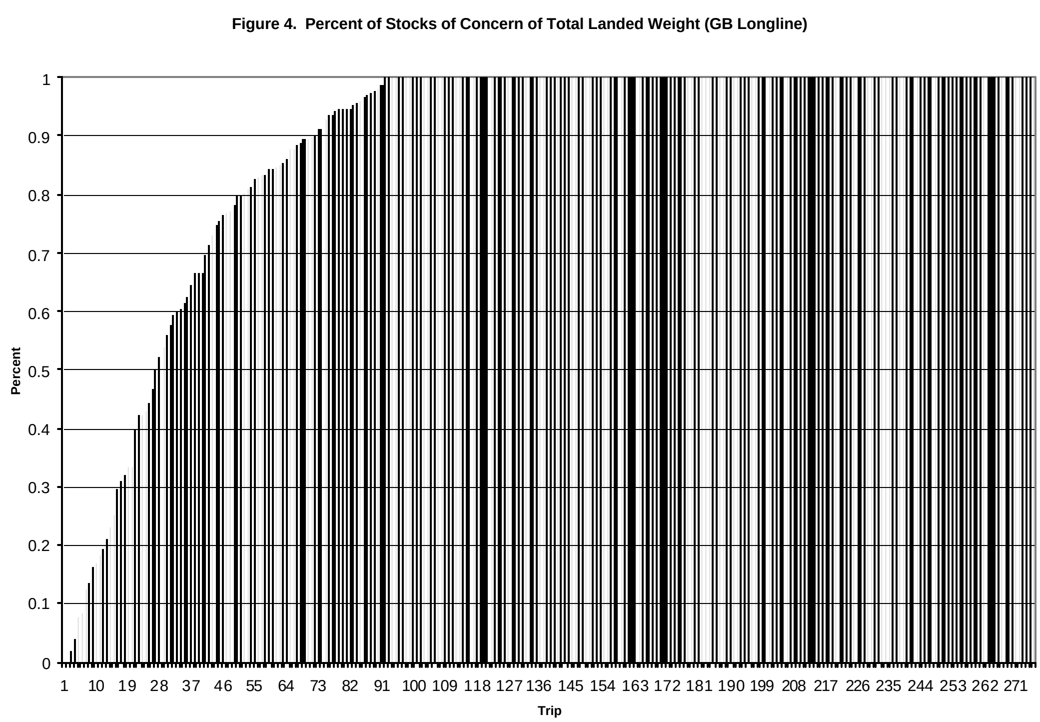

Figure 46 – GB longline: percent of total landed weight of stocks of concern

Figure 5. Percent of Stocks of Concern of Total Landed Weight (SNE/MA Longline)

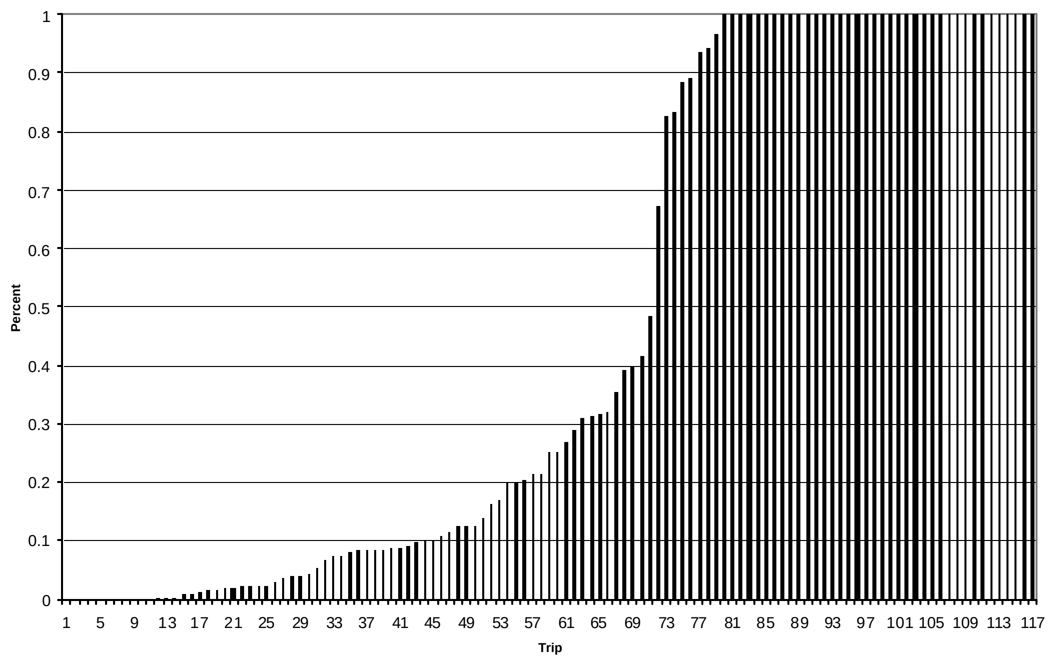

Figure 47 – SNE/MA longline: percent of total landed weight of stocks of concern

Figure 6. Percent of Stocks of Concern of Total Landed Weight (GOM Trawl)

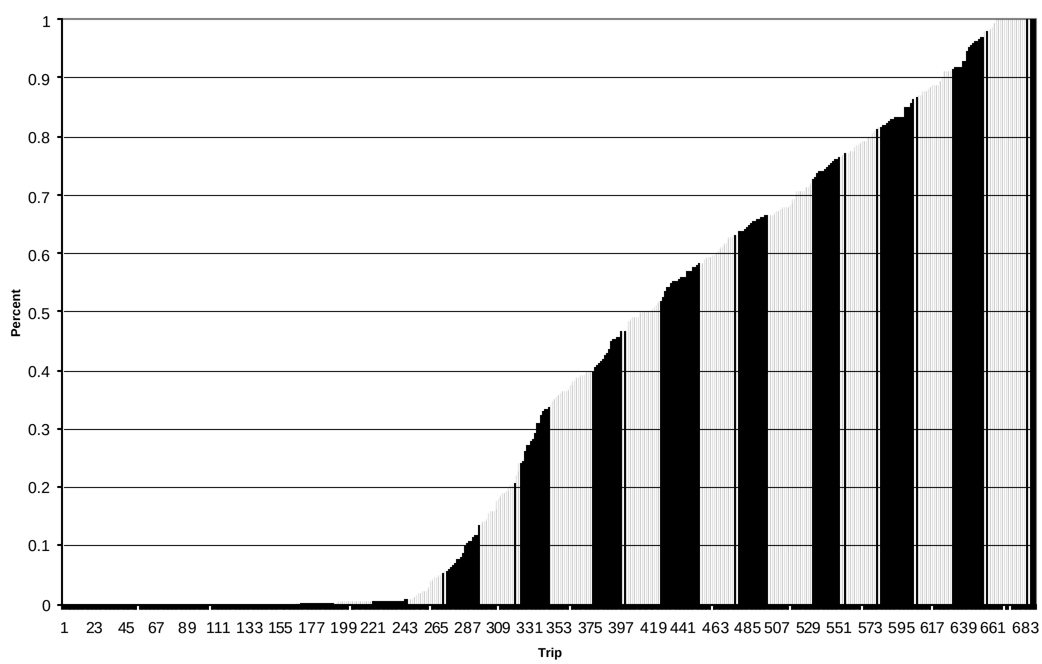

Figure 48 – GOM trawl: percent of total landed weight of stocks of concern

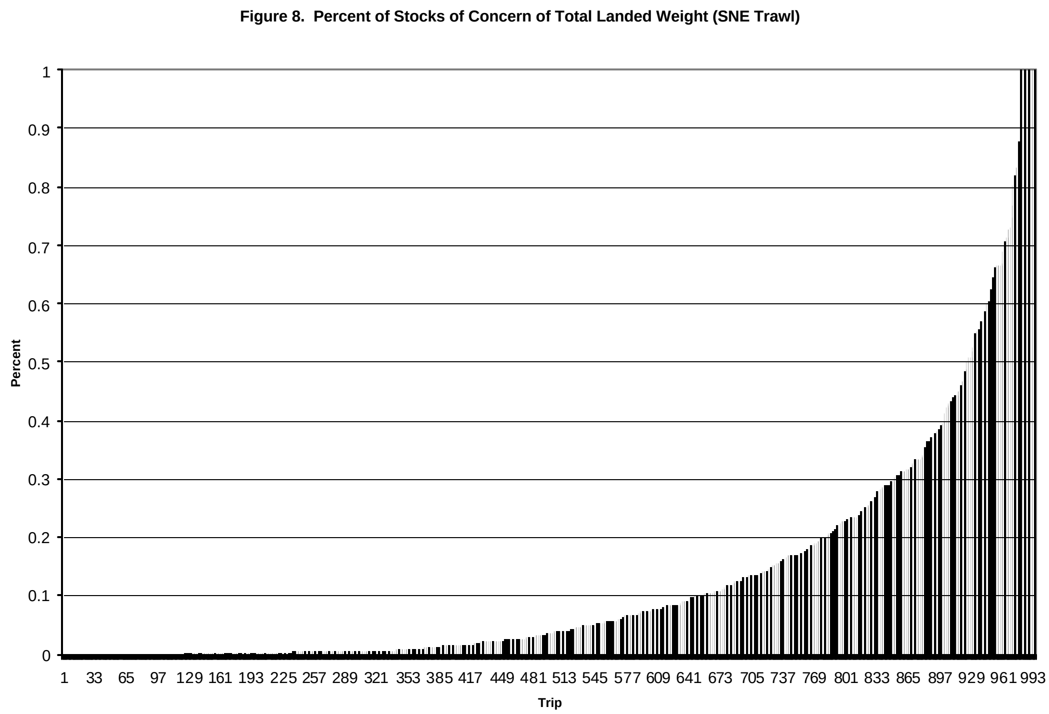

Figure 49 – SNE trawl: percent of total landed weight of stocks of concern

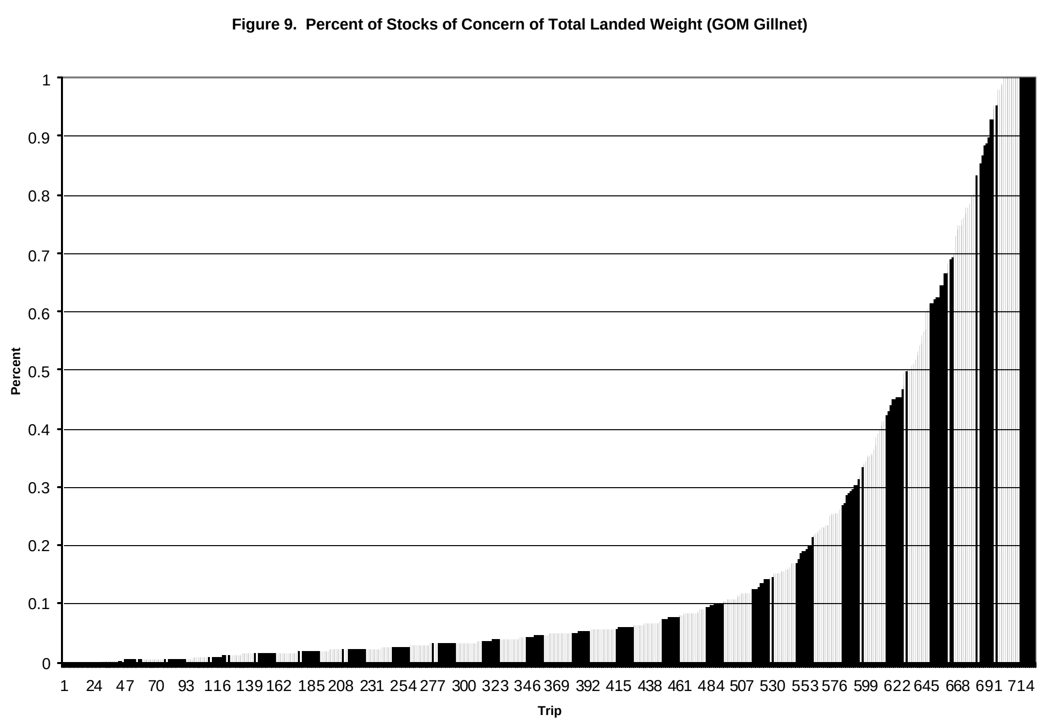

Figure 50 – GOM gillnet: percent of total landed weight of stocks of concern

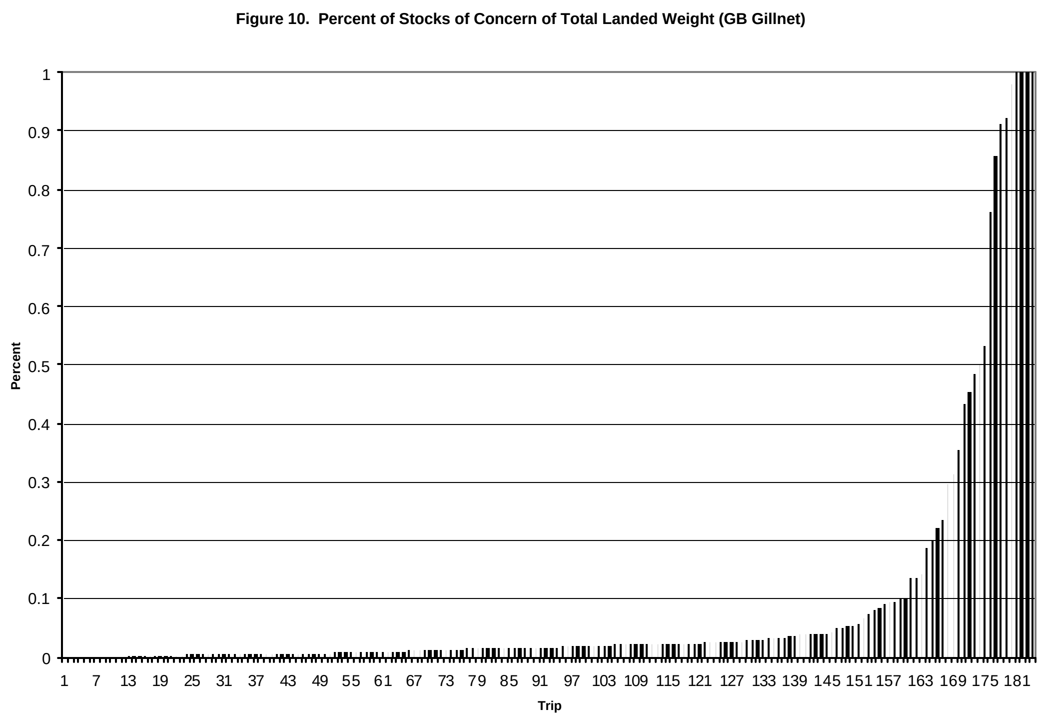

Figure 51 – GB gillnet: percent of total landed weight of stocks of concern

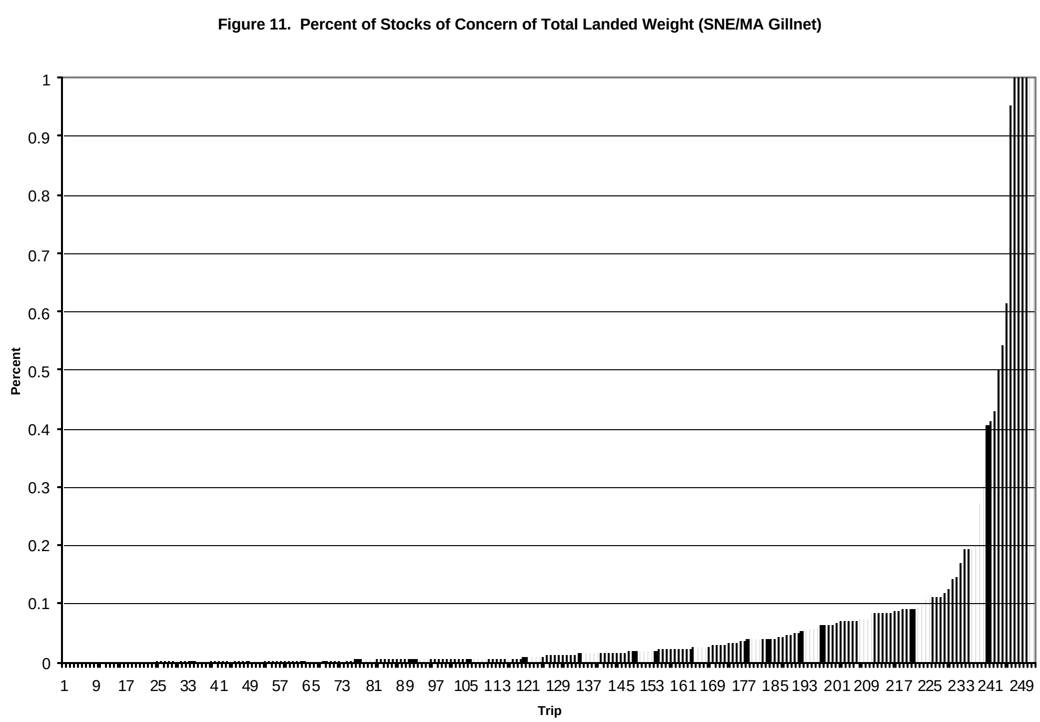

Figure 52 – SNE/MA gillnet: percent of total landed weight of stocks of concern

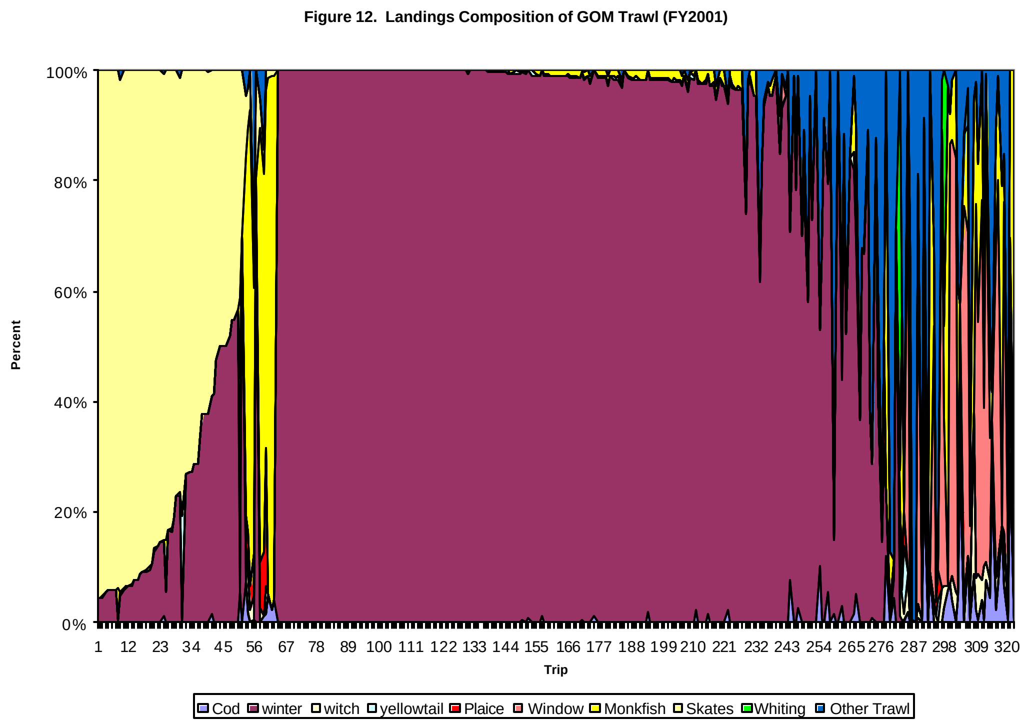

Figure 53 – GOM trawl landings composition (FY 2001)

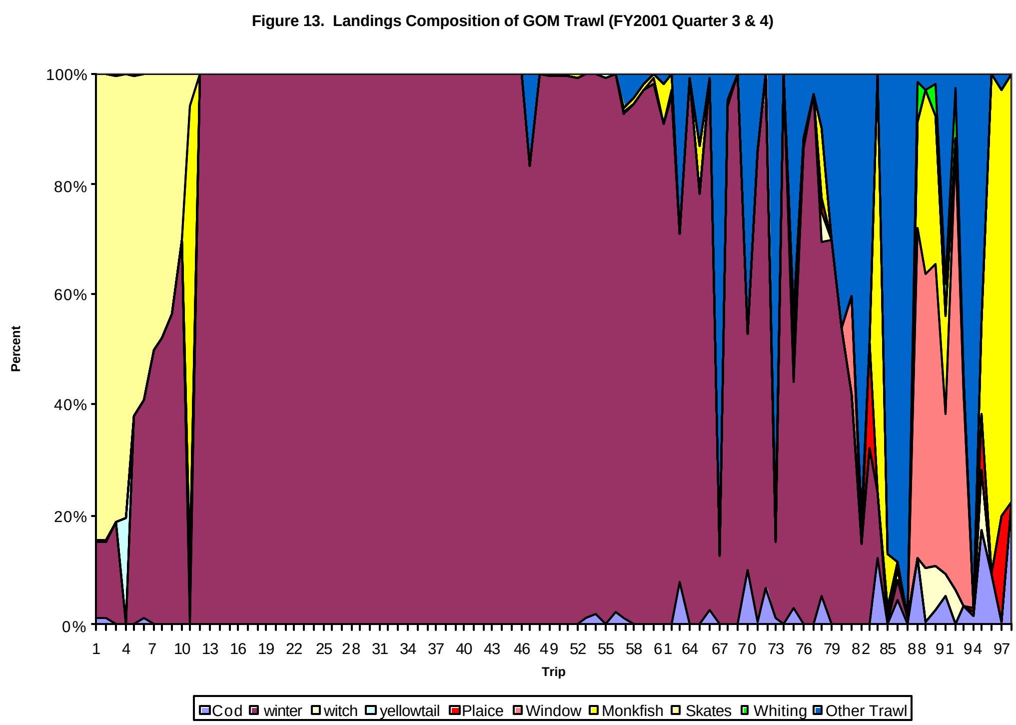

Figure 54 – GOM trawl landings composition, quarters 3 and 4 (FY 2001)

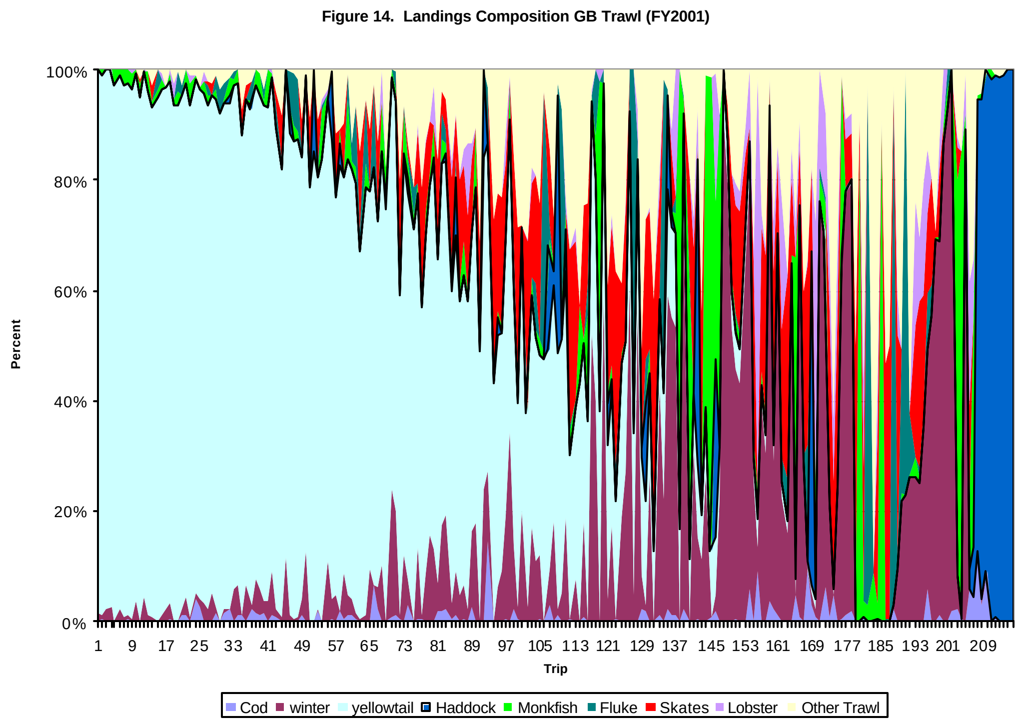

Figure 55 – GB trawl landings composition (FY 2001)

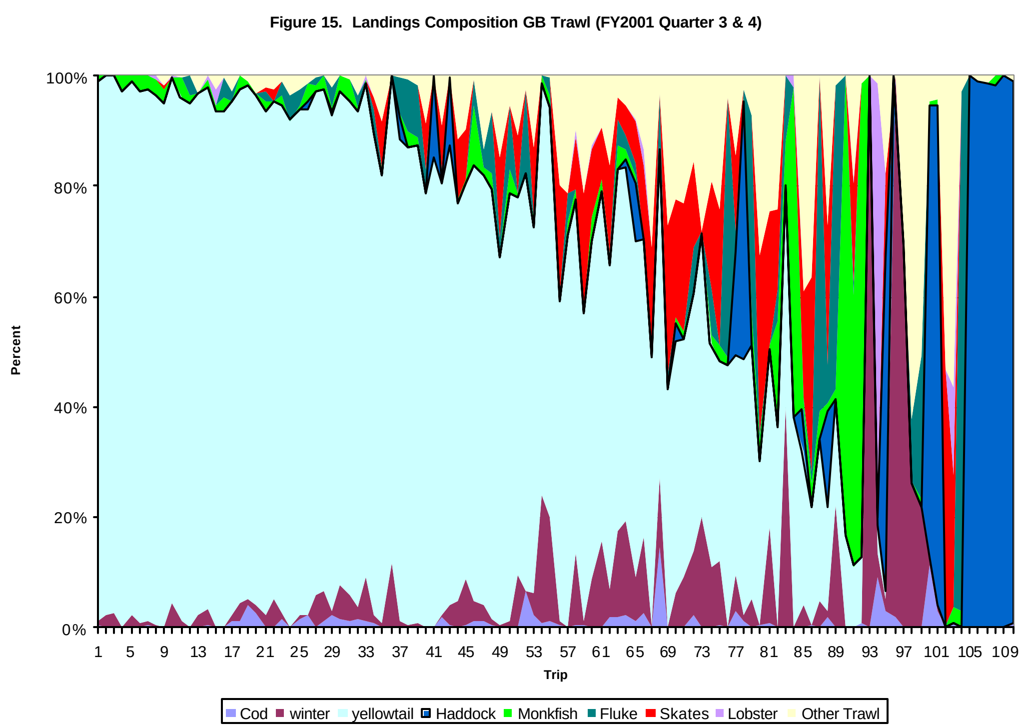

Figure 56 – GB trawl landings composition, quarters 3 and 4 (FY 2001)

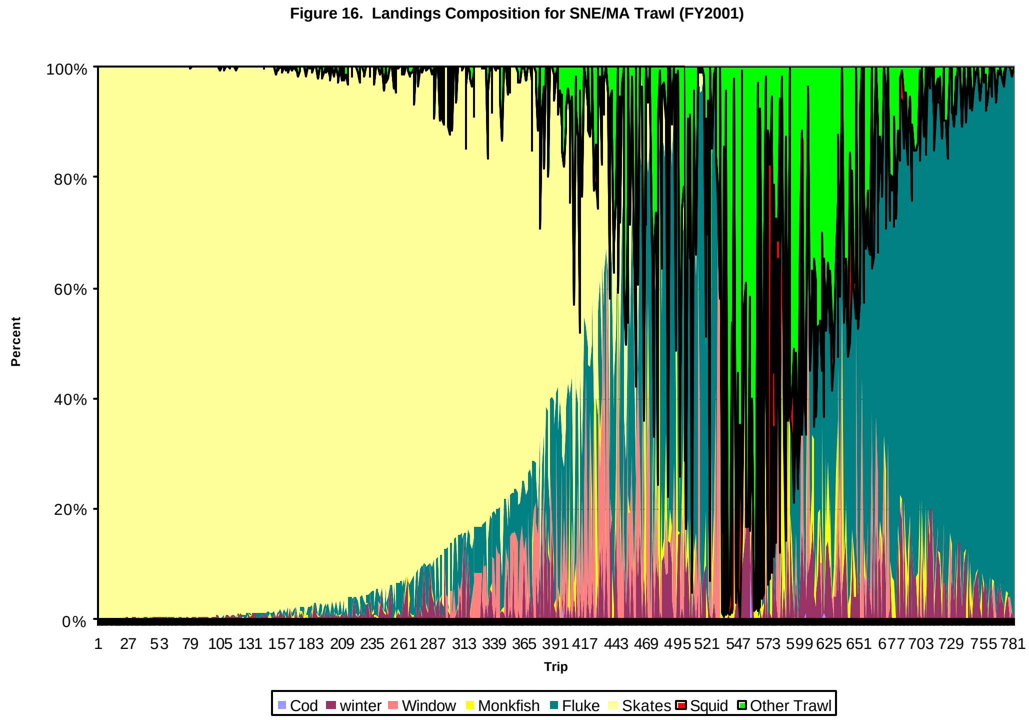

Figure 57 – SNE/MA trawl landings composition (FY 2001)

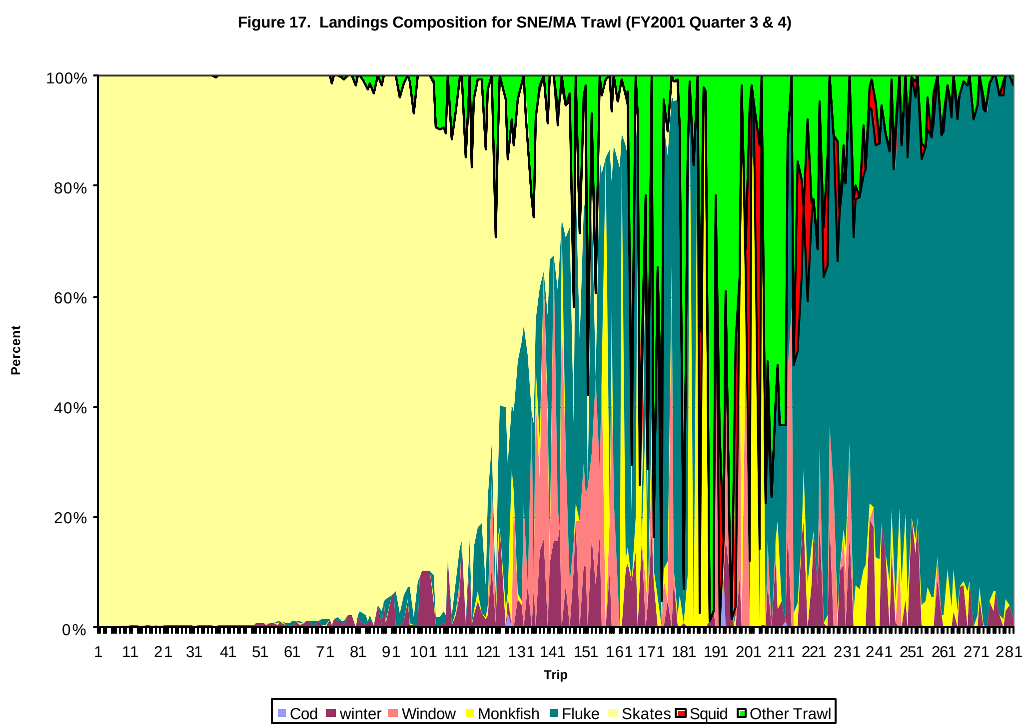

Figure 58 – SNE/MA trawl landings composition, quarters 3 and 4 (FY 2001)

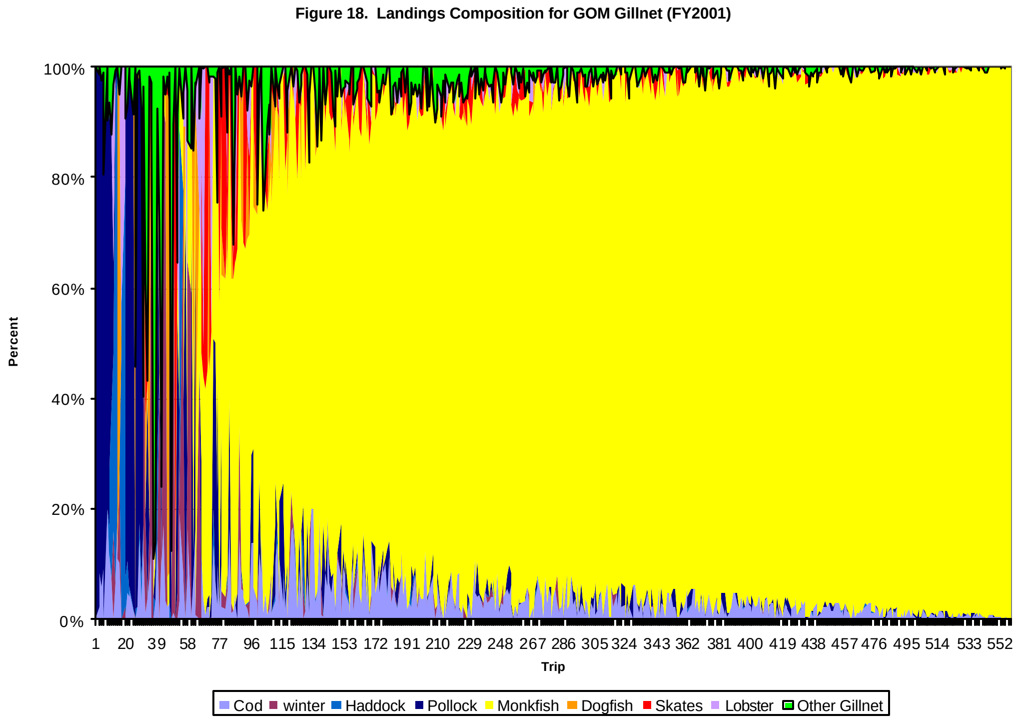

Figure 59 – GOM gillnet landings composition (FY 2001)

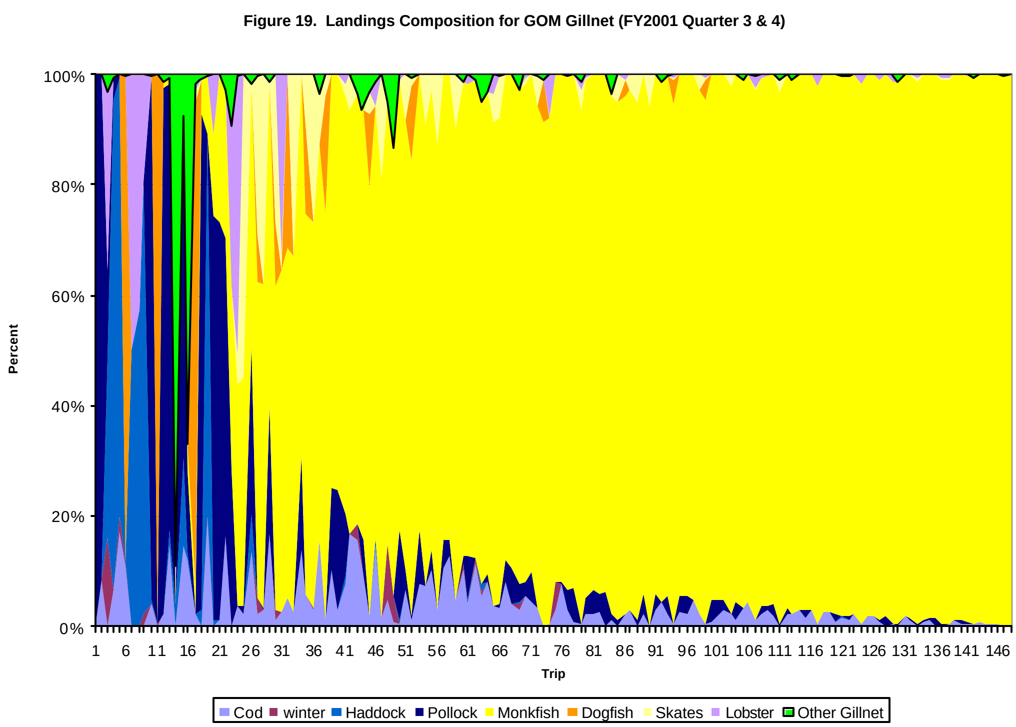

Figure 60 – GOM gillnet landings composition, quarters 3 and 4 (FY 2001)

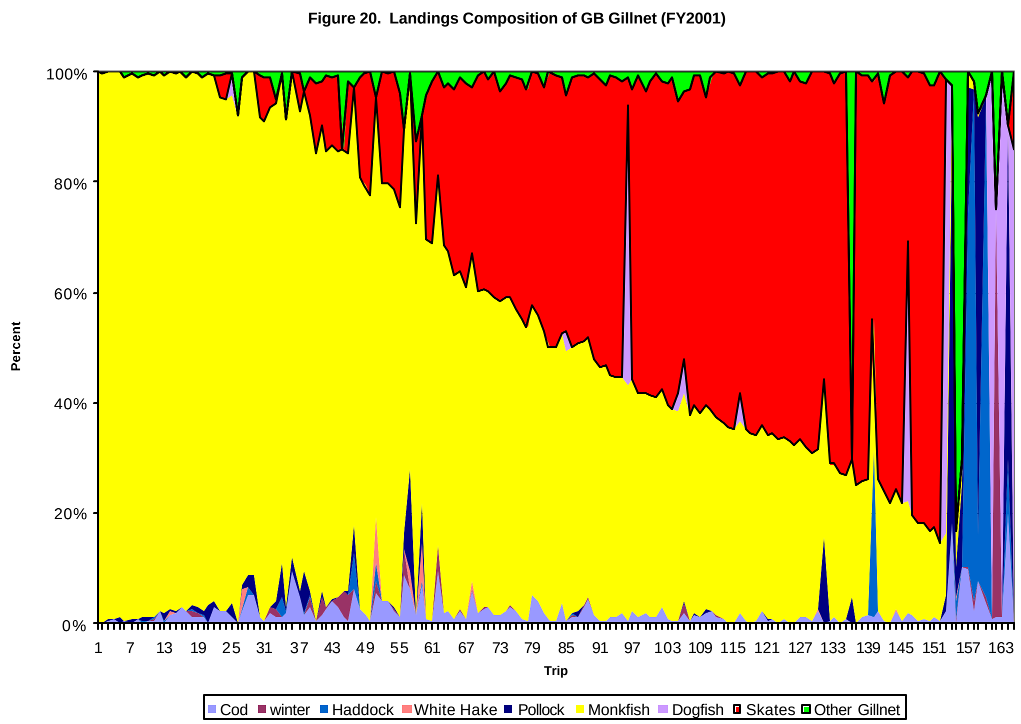

Figure 61 – GB gillnet landings composition (FY 2001)

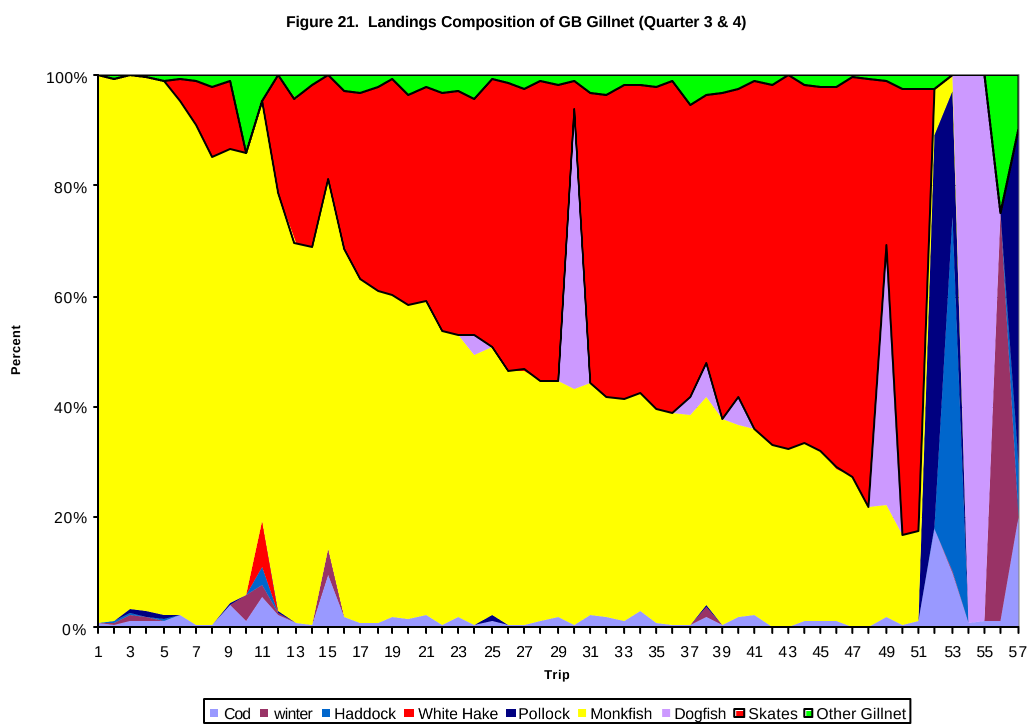

Figure 62 - GB gillnet landings composition, quarters 3 and 4 (FY 2001)

Figure 22. Landings Composition for SNEMA Gillnet (FY2001)

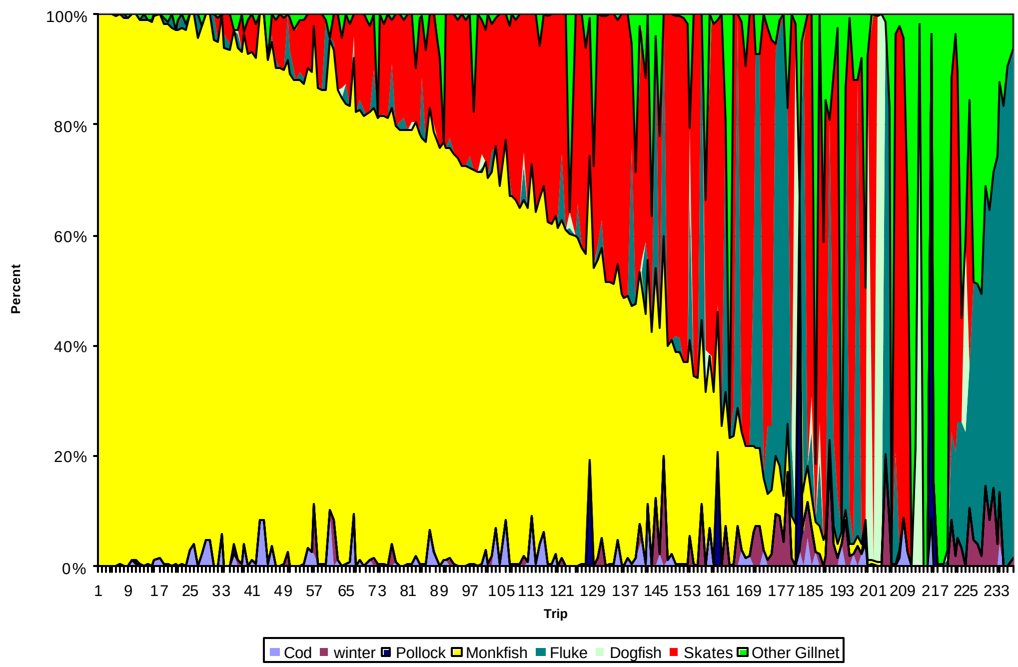

Figure 63 – SNE/MA gillnet landings composition (FY 2001)

Figure 23. Landings Composition for SNEMA Gillnet (FY2001 Quarter 3 & 4)

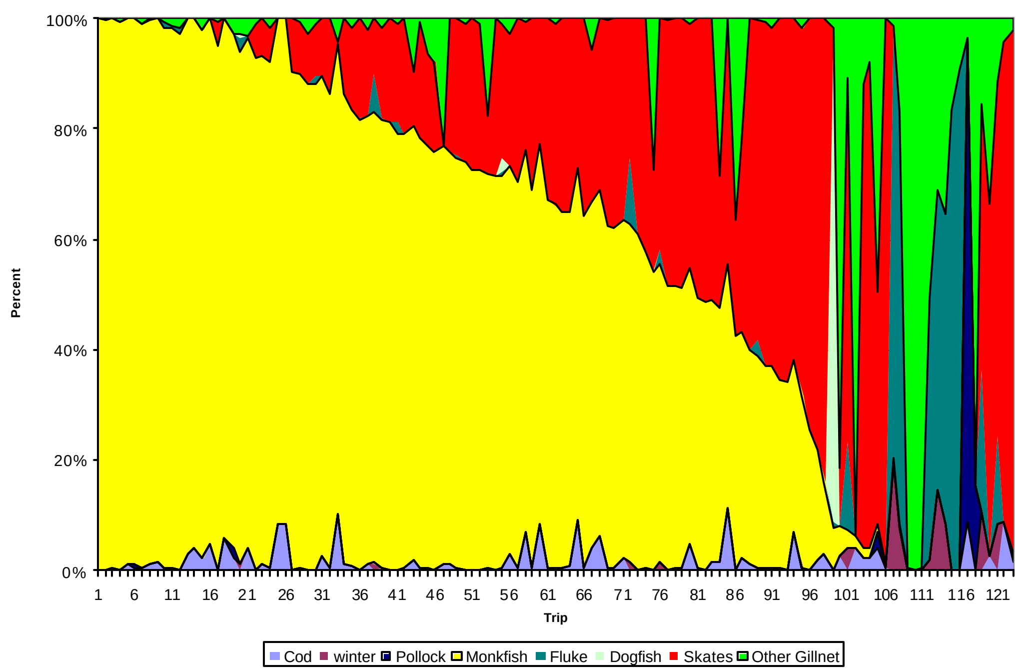

Figure 64 – SNE/MA trawl landings composition, quarters 3 and 4 (FY 2001)

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