

COVER SHEET

RESPONSIBLE AGENCIES:

Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Mid-Atlantic Fishery Management Council
Federal Building, 300 South New Street
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PROPOSED ACTIONS:

Adoption, approval, and implementation of Amendment 2 to the Monkfish Fishery Management Plan.

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TYPE OF STATEMENT:

DRAFT

FINAL

ABSTRACT:

The New England Fishery Management Council, the Mid-Atlantic Fishery Management Council and the NOAA Assistant Administrator for Fisheries propose to adopt, approve, and implement Amendment 2 to the Monkfish Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (the Act). The FSEIS presents the details of a management program designed to ensure compliance with the Act. It proposes measures to address a wide range of management issues, to resolve problems in the fishery that have arisen as a result of the implementation of the original FMP in 1999, and to minimize bycatch and adverse fishery impacts on essential fish habitat, to the extent practicable, while achieving optimum yield from the fishery during the stock rebuilding program.

DATE BY WHICH COMMENTS MUST BE RECEIVED: _____

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TABLE OF ACRONYMS

A	Adult life stage
A13	Amendment 13 to the Multispecies FMP
ALWTRP	Atlantic Large Whale Take Reduction Plan
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CA I	Closed Area I under the Multispecies FMP
CA II	Closed Area II under the Multispecies FMP
DAM	Dynamic Area Management
DAS	days-at-sea
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DSEIS	Draft Supplemental Environmental Impact Statement
E	Egg life stage
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FMP	fishery management plan
FW	Framework
FW 13	Framework 13 to the Scallop FMP
FY	fishing year
GB	Georges Bank
GOM	Gulf of Maine
GRT	gross registered tons/tonnage
HAPC	habitat area of particular concern
HCA	Habitat Closed Area
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	individual fishing quota
IWC	International Whaling Commission
J	Juvenile life stage
LOA	letter of authorization
MA	Mid-Atlantic
MAFMC	Mid-Atlantic Fishery Management Council
MMC	Monkfish Monitoring Committee
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	maximum sustainable yield
NAAA	Northwest Atlantic Analysis Area
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
NLCA	Nantucket Lightship Closed Area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	optimum yield
PBR	Potential Biological Removal
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SAFE	Stock Assessment and Fishery Evaluation
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
SIA	Social Impact Assessment
SMAST	U. Mass. Dartmouth School of Marine Science and Technology
SNE	southern New England
SNE/MA	southern New England-Mid-Atlantic
SSB	spawning stock biomass
TAC	total allowable catch
TED	turtle excluder device
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
YPR	yield per recruit

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1.0 INTRODUCTION

1.1 Executive Summary

This document presents the New England and Mid-Atlantic Fishery Management Councils' (Councils', NEFMC and MAFMC, respectively) goals and objectives for modifying the jointly managed Monkfish Fishery Management Plan (FMP), the proposed action and alternatives considered but not adopted to achieve those goals and objectives, and the analysis of expected impacts of each alternative. As discussed in Section 2.0, Background and History, the amendment is necessary to address a number of issues that arose out of the implementation of the original FMP, including displacement of some vessels from their established monkfish fisheries and permit qualification for vessels in the southern end of the range of the fishery; to address deficiencies in meeting Magnuson-Stevens Act requirements, particularly as identified in several court decisions pertaining to protection of essential fish habitat and reducing bycatch; and to reduce scientific uncertainty about the biology and population dynamics of monkfish and the optimal gear configurations for minimizing bycatch, protected species interactions and habitat effects. The amendment, along with its associated analyses, is also necessary to update the environmental impact statement for the FMP that was originally prepared in 1998.

To address those needs, the Councils adopted a set of specific Goals and Objectives for the amendment, as detailed in Section 3.0. In summary, those goals are:

- I.** Prevent overfishing or rebuild overfished stocks as necessary.
- II.** Address problems created by the implementation of the FMP.
- III.** Promote improved data collection and research on monkfish
- IV.** Comply with CEQ (Council on Environmental Quality) Guidelines to update Environmental Documents
- V.** Address deficiencies in meeting Magnuson Act requirements
- VI.** Address protected resources/fishery interactions, and
- VII.** Reduce FMP complexity where possible.

Starting with a public scoping process in December 2001, the Councils, and the Industry Advisory Panel and Monkfish Oversight Committee, developed through a series of public meetings, a range of alternatives designed to address the stated goals and objectives. During 2003 and early 2004 the Monkfish Committee and the Council staff completed the development of the alternatives and preparation of the Draft Supplemental Environmental Impact Statement (DSEIS).

The Councils published a Notice of Availability of the DSEIS on April 30, 2004 (69 *Federal Register* 23571) and held public hearings between June 15 and June 24, 2004 in six locations between North Carolina and Maine. Following the close of the public comment period on July 28, the Industry Advisory Panel and Monkfish Oversight Committee, as well as the NEFMC's Habitat Committee met to review public comment and recommend final measures. The NEFMC met in September, and the MAFMC in October to approve final measures to be submitted to the Secretary of Commerce for implementation by the May 1 start of the 2005 fishing year.

The proposed action comprises 14 measures that address the range of goals outlined in Section 3.0 and issues identified in the scoping and amendment development process. These measures, as well as the corresponding no-action alternatives, are summarized below in Table 1, and described in detail in Section 4.1. In addition to the proposed actions described in that table, the Councils are taking no action on four measures considered in the DSEIS (separation of DAS usage requirements, monkfish trawl minimum mesh size, NFMA experimental fishery, and changing the fishing year). The alternatives considered by the Councils in the DSEIS but not adopted are described in Section 4.2.2, along with a rationale for their disapproval. Appendix I contains a summary table of all the alternatives with their respective impacts and issues as presented in the DSEIS.

The proposed action is not likely to have significant impacts on the human environment, as discussed in Section 6.0, Environmental Consequences. The impacts of each measure, compared to the no-action alternative, are summarized below for biological impacts on monkfish and other managed species (Table 2) and protected species (Table 3), fishery impacts on habitat (Table 4), and socio-economic impacts (Table 5). In addition, the cumulative effect of the proposed action and all other past, present and reasonably foreseeable future actions on these environmental components is discussed in Section 6.6.

Of particular note in this amendment, is the proposal to close two offshore canyons to vessels fishing on a monkfish DAS. When the FMP was implemented in 1999, the offshore monkfish fishery that developed along the edge of the continental shelf was no longer profitable due to the restrictiveness of the trip limits and DAS usage requirements. A number of industry members who fished in that offshore fishery worked with the Councils to re-establish the fishery in a way that would be profitable for the participating vessels while being equitable with non-participating vessels and consistent with the rebuilding program. Since the offshore fishery takes place along the edge of the continental shelf where deep-sea corals exist, the Councils are proposing to close the deeper portions of two offshore canyons on the southern edge of Georges Bank where corals have been observed as a precautionary measure that minimizes the economic impact on the fishery as the offshore fishery becomes established, and as advances in deepwater fishing technology enable vessels to extend their activity into the canyon areas. The benthic life stages of six managed species that inhabit these two canyons utilize EFH that is adversely impacted by bottom trawls. While corals are not strictly part of the essential fish habitat (EFH) designation for any managed species in the region, protecting corals from the adverse effects of bottom trawls and gill nets may also indirectly benefit other managed species that occupy the closed areas, or species with EFH in adjacent areas.

Since a major part of the impetus to undertake this amendment is a court order pursuant to a lawsuit challenging the EFH provisions of the original FMP (*AOC v. Daley*, see Section 2.5.2.2), the Councils considered a range of alternatives to meet the goal and mandate to minimize, to the extent practicable, the effect of the fishery on EFH. The gear effects evaluation and adverse impacts determination (see Appendix II) has concluded that trawl gear (but not gillnets) used in the monkfish fishery, has an adverse impact on the EFH of some other species, however, gears used in the monkfish fishery and other fisheries have a low impact on monkfish EFH. In addition to the aforementioned canyon

area closures and a monkfish trawl roller restriction, the Councils are assessing the effect of other measures in this amendment, measures in the current FMP (the no action alternative), and actions taken in recent amendments to the Multispecies and Sea Scallop FMPs, Amendments 13 and 10, respectively, for their efficacy in minimizing the effect of the monkfish fishery on EFH of other species. Since the majority of vessels in the monkfish fishery are also involved in either the scallop or multispecies fisheries, the EFH protection measures in those amendments will directly effect how the monkfish fishery interacts with the EFH for those species.

Another major impetus for the amendment is the disqualification for a limited access permit under the original FMP for a number of monkfish vessels at the southernmost range of the fishery, off the North Carolina and Virginia coasts for reasons outlined in Section 4.1.5. To address this issue, the Councils are proposing to modify the limited access permit qualification criteria and to limit any newly qualifying vessels to fishing for monkfish to the area south of 38°20'N. Of the four action alternatives considered, the Councils propose one that is expected to qualify five vessels for a limited access permit, enabling them to fish for monkfish in the EEZ. The impact of this action on the resource or the fishery is not likely to be significant, especially considering the small number of affected vessels, the area restrictions placed on those newly qualifying vessels, the limited season of the fishery in that area, and the measures in place to protect sea turtles from entanglement. Admitting these vessels into the limited access program could have a modestly positive effect on the communities where those vessels operate as a result of the potential additional revenue and diversification that would result.

Two main issues identified in the scoping process remain unresolved by this amendment (see Section 8.1.4), the restrictiveness of current regulations to protect sea turtle interactions on gillnet vessels off the North Carolina/Virginia coast, and completion of the mandatory five-year review of the elements in the FMP pertaining to EFH requirements of the Magnuson-Stevens Act, such as EFH designation and consideration of Habitat Areas of Particular Concern (HAPCs). The Councils considered including in this amendment alternative approaches to the sea turtle protection measures implemented by NMFS under the authority of the Endangered Species Act, but the needed analysis was not completed in time to be used to develop appropriate management measures for this document. The Councils may take action in the future under the framework adjustment process. With regard to the EFH issues, the New England Council is initiating an omnibus amendment to all its FMPs (Amendment 3 to the Monkfish FMP) that will address those and other habitat issues.

Proposal	Details	No Action (Current Rules)
Incidental Catch – 50 lbs./day, 150 max.	Applies on all vessels not on a DAS and fishing with small mesh, and handgear, includes multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.	50 lbs. possession limit, regardless of trip length.
Incidental Catch – GC scallop dredge and surf clam dredge vessels	Applies incidental limit above.	No monkfish possession allowed.
Incidental Catch – Summer flounder vessels west of 72°30'W	Restores incidental limit of 5% total weight on board, adds 450 lbs. (tail wt.) cap	50 lbs. possession limit,; or 50 lbs./day, 150 max. under Amendment 2 revision above
Minimum Fish Size	11" tail, 17" whole, both areas	NFMA - No change SFMA - 14" tail, 21" whole
Closed Season	Eliminate April – June 20-day block out requirement on Category A and B vessels	Category A & B vessels: April – June, 20-day block out of the fishery; Category C & D (Multispecies): March – May, 20-day block (per MS FMP) Category C & D (Scallop): no requirement
Offshore SFMA Fishery Program	Enrollment program; Oct. – April; 1,600 lbs. (tail) per DAS; pro – rated DAS allocations; VMS; Category A & B gear requirement; (see text for area and other details)	Vessels subject to permit category trip limits
Modification of Permit Qualification – South of 38°N	Vessels qualify for limited access permit with landings south of 38°N, during 3/15 – 6/15, 1994-1998; 50,000 lbs. (tail) for Category A or C permit; 7,500 lbs. for Category B or D; may only fish for monkfish south of 38°20'N	Vessels do not qualify for limited access permit
Modify the Framework Adjustment Procedure	Framework adjustments can be done to implement transferable MF DAS; measures to minimize impact on protected species; or bycatch reduction devices	These actions would require plan amendment
NAFO Regulated Area Exemption Program	Vessels exempt from permit, mesh size, effort control and possession limit rules while fishing under High Seas Permit in NAFO Area; landings do not count against TAC	Vessels must comply with MF FMP regulations
EFH – SFMA Roller Gear Restriction	6" max. diameter trawl roller gear in SFMA on MF DAS	No restriction
EFH – Canyon Area closures	Vessels on a MF DAS prohibited from fishing in Oceanographer and Lydonia Canyons (see text for area description)	No restriction
Cooperative Research – DAS set aside	Vessels responding to cooperative research RFP may be allocated MF DAS; pool of 500 DAS deducted from total DAS allocation	No DAS allocated for cooperative research
Cooperative Research – DAS exemption	Vessels applying for MF cooperative research may obtain exemption from DAS usage requirements; available DAS limited to residual of DAS set-aside pool after RFP awards	Vessels may seek exemption from DAS for cooperative research; must complete Environmental Assessment
Clarification of Vessel Baseline	Vessel length, tonnage and horsepower baseline to be set at those of first federal permit; only on request of vessel owner during first year after implementation	Vessels may have dual baselines, if permit transferred to another vessel between issuance of first permit and MF limited access permit

Table 1 Summary of Amendment 2 proposed action and corresponding no-action alternatives

Proposal	Biological Impacts (compared to no action)	
	Monkfish	Other Managed Species
Incidental Catch – 50 lbs./day, 150 max.	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Incidental Catch – GC scallop and surf clam dredge vessels	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Minimum Fish Size	Could have a minor impact on yield-per-recruit if vessels target smaller monkfish in SFMA. No impact if measure simply converts discards to landings. Improved catch-at-age data.	No impact
Closed Season	No impact. Spawning area closure (no action) has no apparent biological benefit.	No impact
Offshore SFMA Fishery Program	May shift effort from inshore to offshore stock component with no overall increase in effort. May also result in some overall effort increase compared to no action if vessels participate who are not currently active in MF fishery (cannot predict the amount of participation by such vessels). Unsustainable effort increases can be mitigated by adjustment to trip limits and/or DAS allocations in subsequent years.	Could reduce impact on inshore and multispecies stocks by vessels shifting effort to offshore monkfish, where catch of other species is minimal. Category C and D multispecies vessels will use multispecies DAS while fishing in the offshore program (and, therefore, not have those DAS available to target multispecies).
Modification of Permit Qualification – South of 38°N	May shift effort from inshore (state waters) to offshore grounds with no overall effort increase. May also result in some effort increase compared to no action if vessels participate who are not currently active in MF fishery (<5 vessels expected). Overall potential effort limited by season/area. Effort increases can be mitigated by trip limits and/or DAS adjustment in subsequent years.	No impact likely, since any resulting effort shifts are limited seasonally and by area.
Modify the Framework Adjustment Procedure	No direct impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.	No direct impact since no action is being taken. If and when a action is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	No direct impact on domestic stocks. Could result in increase in effort on NAFO Area stocks, limited greatly by logistical considerations.	No impact
EFH – SFMA Roller Gear Restriction	No impact. Vessels targeting monkfish already use this gear, which is intended to prevent expansion of the fishery into complex bottom types, especially offshore canyon areas.	No direct impact but could be positive on species inhabiting complex habitats, particularly offshore canyons by limiting ability to trawl in those areas.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	Same as impact on monkfish.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Same as impact on monkfish.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Same as impact on monkfish.
Clarification of Vessel Baseline	No impact. This is an administrative change.	No impact. This is an administrative change.

Table 2 Summary of biological impacts of the proposed action.

Proposal	Protected Species Impacts (compared to no action)
Incidental Catch – 50 lbs./day, 150 max.	No impact – alternatives including no action will not affect protected species interactions
Incidental Catch – GC scallop dredge and surf clam dredge vessels	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact
Minimum Fish Size	No impact (including no action) – does not affect magnitude or distribution of effort
Closed Season	Could have a negative impact on protected species, but not clearly or significantly, since varying amounts of gear is still deployed during this period under no action.
Offshore SFMA Fishery Program	Would likely have a positive impact, or at least mitigate impacts on protected species since overall effort (DAS) is reduced under proposed action, and vessels must use VMS which will improve information regarding protected species interactions, to the extent they occur offshore.
Modification of Permit Qualification – South of 38°N	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures.
Modify the Framework Adjustment Procedure	No direct impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed. Indirectly proposed action could have a positive impact because it will allow for timely action to address protected species issues if, and when they arise.
NAFO Regulated Area Exemption Program	No significant impact expected due to small number of vessels capable of participating, and also that such an exemption already exists in the Multispecies FMP.
EFH – SFMA Roller Gear Restriction	No impact – sets a maximum diameter equivalent to size currently in use; prevents expansion of trawl effort into complex bottom areas and canyons at continental margin.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas and may have some positive (preventative) impact on offshore protected species.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could have a positive impact if research results in measures that reduce interactions with protected species.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could have a positive impact if research results in measures that reduce interactions with protected species.
Clarification of Vessel Baseline	No impact. This is an administrative change.

Table 3 Summary of impacts of the proposed action on protected species.

Proposal	Habitat Impacts (compared to no action)
Incidental Catch – 50 lbs./day, 150 max.	No impact
Incidental Catch – GC scallop dredge and surf clam dredge vessels	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact
Minimum Fish Size	No impact (including no action) – does not affect magnitude or distribution of effort
Closed Season	No impact – Short time of closure period under no action is not significantly different, in terms of habitat impacts than proposed elimination of closed season.
Offshore SFMA Fishery Program	No impact, or slightly negative. May affect deep water benthic habitats on the edge of the continental shelf by enabling vessels to return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels contribute to mitigate these potential effects.
Modification of Permit Qualification – South of 38°N	No, or minimal impact due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and that probable qualifiers are all vessels that fish exclusively with gillnets.
Modify the Framework Adjustment Procedure	No impact since this is administrative, and no immediate action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	No impact due to small number of vessels capable of participating, and also that such an exemption already exists in the Multispecies FMP.
EFH – SFMA Roller Gear Restriction	Positive but not a significant impact – sets a maximum roller gear diameter equivalent to size currently in use in the area; prevents expansion of trawl effort into complex bottom areas and canyons at continental margin.
EFH – Canyon Area closures	Positive but not a significant habitat impact since minimal monkfish fishing occurs in those areas (preventative measure).
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could have a positive impact if research results in measures that minimize habitat impacts.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could have a positive impact if research results in measures that minimize habitat impacts.
Clarification of Vessel Baseline	No impact. This is an administrative change.

Table 4 Summary of impacts of the proposed action on habitat.

Proposal	Socio-Economic Impacts (compared to no action)	
	Economic	Social
Incidental Catch – 50 lbs./day, 150 max.	Likely slightly positive due to increased allowable landings, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – GC scallop dredge and surf clam dredge vessels	Likely slightly positive due to increased allowable landings, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – Summer flounder vessels west of 72°30'W	Slightly positive. Average benefit to 114 vessels of \$825 annually, ranging from \$0 to about \$10,000.	Slightly positive due to reduced discards and improved profitability.
Minimum Fish Size	Likely slightly positive, including reduced enforcement costs, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Closed Season	Likely slightly positive, due to reduced regulatory burden/enforcement costs, but difficult to quantify with available data.	Slightly positive due to increased flexibility on Category A and B vessels.
Offshore SFMA Fishery Program	Likely positive due to higher profitability. Participation is voluntary, so presumably enrolled vessels anticipate positive economic effects.	Positive for larger vessels able to fish offshore due to higher profitability, and restores a pre-FMP fishery
Modification of Permit Qualification – South of 38°N	Likely positive for qualifying vessels, but unknown for rest of fleet.	Positive for the small number of affected vessels due to increased opportunity and value of vessel permit, and their communities.
Modify the Framework Adjustment Procedure	No impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.	No impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	Likely positive due to increased flexibility, but cannot be quantified.	Likely positive due to increased flexibility, but cannot be quantified.
EFH – SFMA Roller Gear Restriction	Could have short-term negative impact on vessels not already using this gear, although most already are. Could limit future expansion of the fishery into complex bottom areas. Cannot be quantified.	Slightly negative for vessels not already using this gear, otherwise neutral.
EFH – Canyon Area closures	No impact. Vessels targeting monkfish do not fish in these areas.	No impact likely. Vessels targeting monkfish do not fish in these areas.
Cooperative Research – DAS set aside	Would negatively impact those vessels that use their entire MF DAS allocation, but could be recouped, or even be positive if those vessels engaged in coop research under this program.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry “buy-in” to science supporting management.
Cooperative Research – DAS exemption	Would negatively impact those vessels that use their entire MF DAS allocation, but could be recouped, or even be positive if those vessels engaged in coop research under this program.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry “buy-in” to science supporting management.
Clarification of Vessel Baseline	No impact on vessel earnings, but could affect value of vessel permits.	Unknown social impact, or slightly positive since any adjustment is at vessel owner’s request only.

Table 5 Summary of economic and social impact of proposed action.

1.2 Document Organization

This document incorporates information required to meet the requirements of FMP amendments under the Magnuson-Stevens Act in a format that integrates the requirements of National Oceanic and Atmospheric Administration (NOAA, the parent agency to NMFS) guidelines for Supplemental Environmental Impact Statements (SEIS) to meet the mandates of the National Environmental Policy Act (NEPA). The document also contains sections explicit to a number of other applicable federal laws and executive orders. Thus, the document is divided into the following sections:

1. Cover sheet
2. Table of Contents
3. Introduction and Summary (Section 1.0)
4. Background, Purpose and Need (Section 2.0)
5. Goals and Objectives (Section 3.0)
6. Proposed Action and Alternatives (Section 4.0)
7. Affected Environment (Section 5.0)
8. Environmental Consequences (Section 6.0)
9. Magnuson-Stevens Act Consistency (Section 7.0)
10. Consistency with Other Applicable Law (Section 8.0)
11. Appendices

Information contained in the Affected Environment section of the SEIS also serves as the Council's annual Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 fishing year, ending April 30, 2003. (The 2003 SAFE report is being incorporated into a separate document supporting the annual adjustment for the 2005 fishing year). Appendix I contains a summary table of the alternatives that were under consideration in the DSEIS, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I has a second table that identifies the alternatives recommended by the Industry Advisory Panel and the Monkfish Committee and summarizes their respective comments following the DSEIS public comment period. Appendix II contains a summary of the Habitat Considerations – Gear Effects, incorporating information from the NMFS, NEFMC and MAFMC-sponsored Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast Region. Appendix III contains DSEIS public hearing summaries, written comments, summary of comments and the Councils' response.

2.0 BACKGROUND, PURPOSE AND NEED

2.1 History of the Fishery

Until relatively recently, monkfish (goosefish or angler) was an incidental catch in groundfish and sea scallop fisheries but had little or no commercial value. In the 1960's reported landings averaged less than a million pounds and revenues from monkfish were a few hundred thousand dollars a year. During the 1970's, however, a ten-fold increase in the price of tails led to a 17-fold increase in trips reporting landings, and in landings themselves, as gillnet and sea scallop fishermen joined trawlers in reporting landings. Further growth in the demand for tails by Europe and livers by Japan and other Asian countries (South Korea in particular) fueled growth of U.S. dockside markets into the 1990s.

In the early 1990's, fishermen and fish dealers expressed their concern about the fishery to the New England and Mid-Atlantic Fishery Management Councils. They cited the increasing proportion of small fish being targeted and, as the directed trawl fishery expanded into areas not previously fished by groundfish vessels, the growing frequency of gear conflicts between monkfish and other fisheries vessels, particularly the offshore lobster fishery.

2.2 FMP Development and Implementation

In response to those industry concerns, and scientific evidence that the stocks were under increasing pressure, such as declining survey indices and decreasing proportion of large fish in the commercial catch, the Councils jointly initiated efforts to develop an FMP with the publication in 1993 of a notice initiating the scoping process to gather public comment on issues and potential management strategies (58 *Federal Register* 7879, February 10, 1993). The Councils viewed the situation against a backdrop of rapidly rising prices for monkfish tails and livers, as well as the development of restrictive management programs in many of the region's fisheries that could potentially cause vessels to shift into the unrestricted and profitable monkfish fishery, further exacerbating the stock decline.

To discourage speculative entry into the fishery as they developed the FMP, which included a potential limited entry program, and to promote awareness of potential permit eligibility criteria, the Council published a control date on February 17, 1995 (60 *Federal Register* 10574, February 27, 1995). The Councils held public hearings that took place in 1997 and again in 1998 as the plan was being finalized. The Councils submitted the FMP to NMFS on September 17, 1998. NMFS published the proposed rule on February 16, 1999 and the final rule on October 7, with an effectiveness date for implementation of November 8, 1999. The FMP contains the following measures:

- multi-level limited access program
- two management areas (see Figure 1)
- target TACs
- effort limitations (DAS)
- trip limits

- bycatch allowances
- minimum fish sizes and minimum mesh size
- gear restrictions
- spawning season closures
- a framework adjustment process
- permitting and reporting requirements
- other measures for administration and enforcement.

In recognition of the fact that much of the growth of the monkfish fishery was attributable to multispecies and scallop vessels landing monkfish caught either incidentally or as directed effort during fishing trips that were under multispecies or scallop DAS, the Councils adopted a two-tiered permit program, in which qualifying vessels that also held a multispecies or scallop limited access permit would be required to use a DAS in those respective fisheries while on a monkfish DAS. The original FMP contained a four-year phase in of management measures to reduce fishing effort and rebuild the stocks within ten years or less. Year 1 of the plan began May 1, 1999 the scheduled start of the fishing year, even though the FMP was not implemented until six months into the fishing year. An analysis by NMFS in 2000, however, concluded that even if the Year 1 measures had been implemented on May 1, 1999, the quota for the SFMA would have been exceeded. Consequently, the Council made no adjustment to the default regulations for Year 2 or Year 3. These regulations allocated 40 DAS for directed fishing for monkfish and imposed a trip limit by permit category and gear type. For vessels fishing in the NFMA, other than scallop dredge vessels, the regulations imposed no trip limit during Years 2 and 3, regardless of whether a vessel is on a monkfish or multispecies-only DAS.

For Year 4, starting May 1, 2002, the FMP regulations included default measures that eliminated the directed fishery (zero DAS) and reduced bycatch trip limits, unless modified during the Year 3 review and adjustment process. The default measures were postponed by Framework 1/NMFS Emergency Rule in 2002, and removed from the FMP by Framework 2 in 2003, see discussion below.

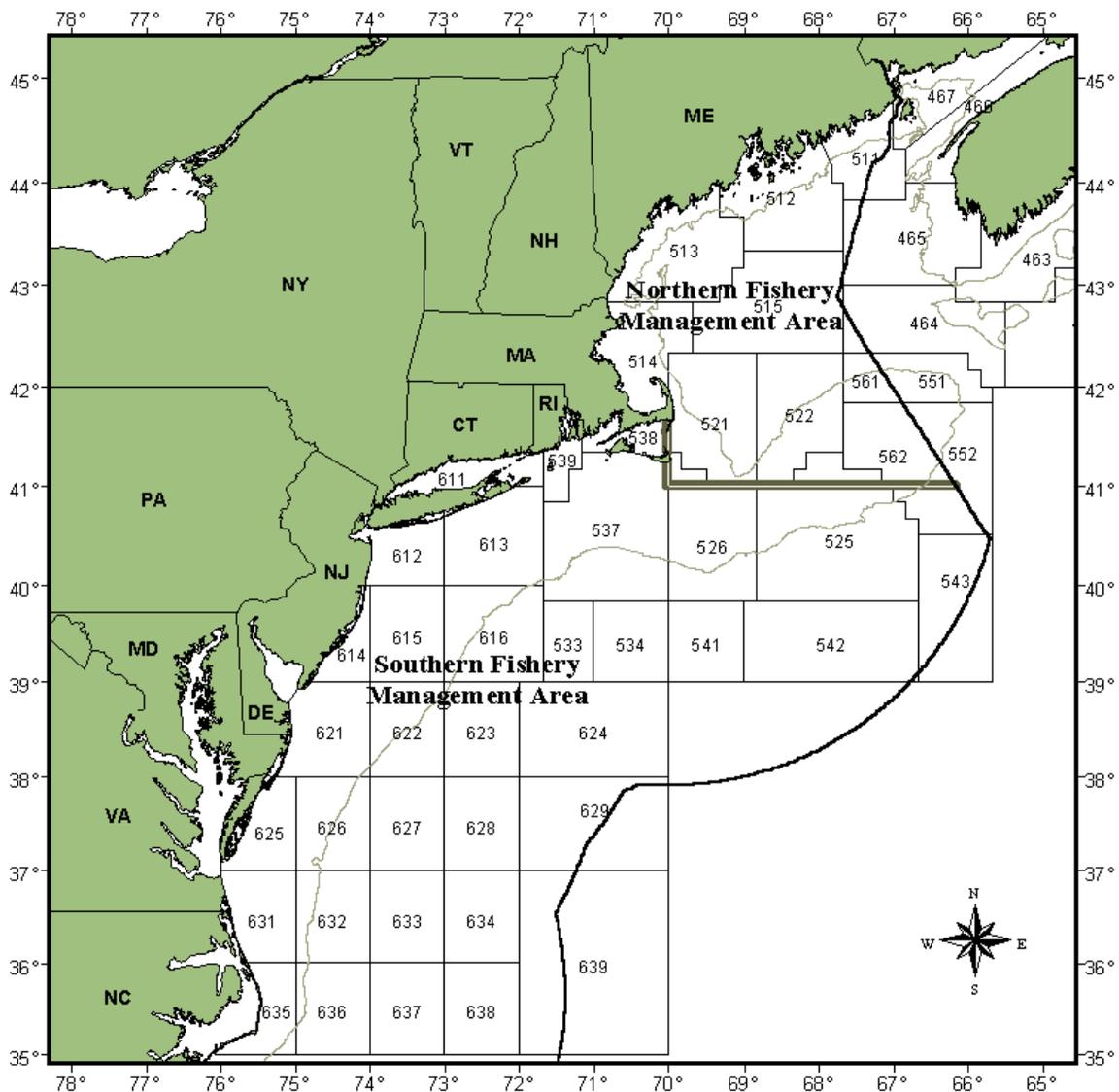


Figure 1 Monkfish fishery management areas map, showing 3-digit statistical areas.

2.3 Amendment 1

Amendment 1 was part of an omnibus amendment for multispecies, sea scallops, Atlantic salmon and monkfish FMPs submitted by the Council to comply with the Essential Fish Habitat (EFH) requirements of the Magnuson-Stevens Act (MSA). NMFS approved Amendment 1 on April 22, 1999.

2.4 Magnuson-Stevens Act Provisions on Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) required the National Marine Fisheries Service (NMFS) and regional Fishery Management Councils (Councils) to describe and identify essential fish habitat (EFH) within fishery management plans, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. EFH is defined in the Magnuson-Stevens Act as *“those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”*

As required by the Magnuson-Stevens Act, NMFS developed guidelines at 50 CFR part 600, Subpart J, to assist the Councils in the description and identification of EFH and in the consideration of actions to ensure the conservation and enhancement of EFH. Section 600.815(a)(9) recommends that Councils identify habitat areas of particular concern (HAPCs) within EFH to provide greater focus for conservation and enhancement efforts. HAPCs are subsets of EFH that are especially important ecologically, sensitive to human-induced environmental degradation, stressed by development activities, and/or rare. This EIS does not include the consideration of new descriptions and identifications of EFH and new HAPCs, as the Councils will take that action in the Council's upcoming Omnibus Habitat Amendment. The NEFMC published a Notice of Intent (69 *Federal Register* 8367, February 24, 2004) and expects to complete the amendment in 2005 (see Section 2.5.2.2 below). For the purposes of this Plan Amendment, the existing and approved EFH designations and HAPCs from the Amendment 1 to the Monkfish FMP of 1998 will continue. The EFH regulations include guidelines for identifying adverse impacts from both fishing and non-fishing activities and considering the practicability of actions for minimizing adverse effects on EFH from fishing.

2.5 Fishing Years 2 and 3

2.5.1 Stock Assessments

The Northeast Fisheries Science Center conducted two monkfish stock assessments during the initial years of FMP implementation. Another assessment is scheduled for the November, 2004.

2.5.1.1 SAW 31

The 31st Stock Assessment Workshop (SAW 31), July 2000, provided the Councils with an assessment of monkfish through calendar year 1999, prior to the implementation of the FMP. SAW 31 concluded that both stocks were overfished and that overfishing was occurring, and advised that fishing mortality should be reduced. SAW 31 could not reliably estimate fishing mortality, however, and did not provide projections of stock dynamics under various assumptions of fishing mortality. The SAW also recommended that both fishing mortality rate and biomass status determination criteria in the FMP be reevaluated for consistency with NMFS' National Standards Guidelines, and for attainability with respect to the control rules implied by the FMP.

2.5.1.2 SAW 34/Cooperative Survey

The 34th Stock Assessment Workshop (SAW 34), January 2002, provided the Councils with an updated monkfish assessment through calendar year 2000, and incorporated data collected during the Cooperative Goosefish Survey, February – May 2001 to estimate fishing mortality rates. SAW 34 concluded that both northern and southern stocks were overfished, and overfishing was occurring in 2000. Despite the additional data collected during the cooperative survey, SAW 34 did not provide a point estimate for either fishing mortality or biomass, nor did it provide projections of stock size under various assumptions of fishing mortality. SAW 34 provided a range of estimates of fishing mortality (F), however, and advised that fishing mortality rates need to be reduced 20-40 percent to reach proposed fishing mortality rate threshold (F_{max}, the rate of fishing that maximizes yield per recruit), and that discards should be reduced. The SAW

recommended that the proxy fishing mortality reference points in the FMP be changed to one based on yield-per-recruit analysis, such as Fmax.

2.5.2 Court Decisions directly or indirectly affecting this FMP

2.5.2.1 Trip limit differential lawsuit (*Hall v. Evans*)

In 2001, a Rhode Island Federal Magistrate Judge issued recommendations to the Federal District Court Judge on motions for summary judgment in a suit brought by several southern New England and New Jersey gillnetters challenging the differential trip limits in the FMP for vessels fishing under a monkfish DAS (*Hall v. Evans*, C.A. No. 99-549L). The Federal District Court Judge agreed with most of the conclusions and opinions of the Magistrate Judge and ruled that based on the justification provided in the FMP, the differential trip limit violated National Standards Two, Four and Five of the Magnuson-Stevens Act. The judge vacated the 300 pound-per-day gillnet trip limit and set a 1,500 pound trip limit “for all monk fishermen...until such time as the Secretary [of Commerce] establishes a fair and equitable gear differential or otherwise revises the catch limit”. The judge later clarified the order that the trip limits apply by permit category. The effect of this order was that the trip limit on non-trawl (i.e. gillnet) vessels was raised from 300 lbs./DAS to 1,000 or 1,500 lbs./DAS, depending on permit category, the trip limits in effect for FY2001. In general, this court order has resulted in trip limits for the SFMA that are equivalent across gear types.

2.5.2.2 EFH lawsuit (*AOC v. Daley*)

Pursuant to the Magnuson-Stevens Act and the EFH regulations, the Councils submitted FMP amendments and associated Environmental Assessments (EAs), as required under the National Environmental Policy Act (NEPA), to NMFS for Secretarial review. NMFS approved or partially approved all the EFH fishery management plan amendments in accordance with section 304(a) of the Magnuson-Stevens Act. Subsequently, a coalition of seven environmental groups and two fishermen’s associations filed a lawsuit challenging NMFS’ approval of certain EFH amendments prepared by the Gulf of Mexico, Caribbean, New England, North Pacific, and Pacific Fishery Management Councils (*American Oceans Campaign et. al. v. Daley et al.*, C.A. No. 99-982(GK)). The suit specifically contested the adequacy of the evaluations of fishing gear impacts on EFH in the fishery management plan amendments, and the analyses of environmental impacts in the EAs.

The U.S. District Court for the District of Columbia found that the agency’s decisions on the subject EFH amendments were in accordance with the Magnuson-Stevens Act, but found that the EAs for the Councils’ amendments were inadequate and in violation of NEPA. The court determined that the EAs prepared for the EFH provisions of the fishery management plans did not fully consider all relevant alternatives. The court specifically criticized several of the EAs for evaluating only two options for the EFH amendments: either approval of the amendment or status quo. Additionally, the decision noted that the descriptions and analyses of the environmental impacts of the proposed actions and alternatives were vague or not fully explained. The court ordered NMFS to complete a new and thorough NEPA analysis for each EFH amendment named in the suit. This Environmental Impact Statement (EIS) responds, in part, to the court’s directive to NMFS to complete new NEPA analyses for the Monkfish FMP. Although the plaintiffs’

complaint focused on whether NMFS had adequately evaluated the effects of fishing on EFH, NMFS decided to complete new EISs to evaluate all of the EFH components of the applicable fishery management plans. Accordingly, this EIS reevaluates the impacts of amending the Monkfish FMP to include the EFH provisions required by the Magnuson-Stevens Act.

2.5.2.3 Multispecies Framework 33 lawsuit (*CLF v. Evans*)

In December 2001, the Conservation Law Foundation and other organizations successfully filed suit against NMFS alleging that the rebuilding plans the NMFS implemented were not consistent with the Multispecies Amendment 9 overfishing definitions (*Conservation Law Foundation, et al. v. Evans, et al.*). Additionally, they charged that there had been a consistent failure in management plans to assess bycatch reporting and establish measures to minimize bycatch and bycatch mortality (when bycatch is unavoidable). After a long series of negotiations among various parties, the court adopted interim measures and instructed NMFS to submit a management plan to comply with the law. In response, the NEFMC has developed Multispecies Amendment 13 to address stock rebuilding issues, greatly reduce fishing effort and capacity in the multispecies fishery, and implement additional measures to specifically address habitat protection. Since most of the monkfish permit holders also hold multispecies limited access permits, the measures adopted through Amendment 13 will affect the monkfish fishery managed under this FMP.

2.6 Framework Adjustment 1/Emergency Interim Rule

The regulations implementing the FMP required the Councils to conduct a review of the status of the fishery during Year 3 of the rebuilding plan, FY2001, and make adjustments, as needed, to insure that rebuilding to stock biomass targets by 2009 remain on schedule. Based on the Year 3 review and the results of a new stock assessment (SAW 34, January 2002), the Councils determined that additional work was necessary to thoroughly evaluate stock status, biological reference points and the rebuilding program. To that end, submitted Framework 1, delaying for one year the default measures while the Councils prepared Amendment 2. In Framework 1, the Councils concluded that, based on the best available scientific information, fishing mortality rates had been reduced sufficiently to end overfishing under the fishing mortality threshold reference point recommended by the Stock Assessment Review Committee (SARC 34), and observed that stock biomass was stable (in the SFMA) or increasing (in the NFMA).

NMFS disapproved Framework 1 because it did not comply with the fishing mortality rate threshold specified in the original plan (which had been invalidated by SAW 31 and SAW 34), but implemented a revision to the overfishing definition based on the recommendations of SAW 34 through an emergency interim rule (*67 Federal Register* 35928, May 22, 2002). NMFS also implemented in the emergency rule the management measures recommended by the Councils in Framework 1. In so doing, NMFS concurred with the Councils' determination that the measures in Framework 1 would end overfishing in 2002, based on the revised fishing mortality threshold recommended by SARC 34. The measures in Framework 1/emergency rule also include a revision to the trip limit to account for a federal court decision in vacating the gear-based trip limit differential in the original plan. NMFS extended the emergency interim rule through April 30, 2003 (*67 FR* 67568, Nov. 6, 2002) to allow the Councils time to complete

Amendment 2. Upon expiration of the emergency interim rule, the default measures in the original FMP would take effect on May 1, 2003 unless the Councils implemented alternative rules, either through Amendment 2 or another framework adjustment.

2.7 Framework Adjustment 2

In June 2002, NMFS informed the Councils that even if they met the November 2002 submission target for Amendment 2, the agency could not guarantee that the measures would be implemented by the start of FY2003. As a result, and to forestall the default measures taking effect, the Councils agreed to put aside work on Amendment 2 and focus on Framework 2, to put in place management measures appropriate to the rebuilding plan and updated scientific information on stock status.

The Councils submitted Framework 2 in January 2003, and the rule became effective on May 1, the start of FY2003 (68 *Federal Register* 22325, April 28, 2003). The framework modified the overfishing definition reference points as recommended by SAW 34, and established an index- and landings-based method for setting annual harvest targets (TACs) to achieve optimum yield and biomass rebuilding goals. Framework 2 also eliminated the default measures established in the original FMP.

Framework 2 implemented a target TAC setting method that is based on the relationship between the 3-year running average of the NMFS fall trawl survey biomass index and annual biomass index targets that are based on 10 equal increments between the 1999 biomass index (at the start of the rebuilding program) and the biomass target reference point (B_{target}). According to this method, annual target TACs are set based on the ratio of the observed biomass index to the annual index target applied to the monkfish landings for the previous year. If the observed index is above the annual target, the TACs will be increased proportionally above the previous year's landings, to a maximum of 20 percent. If the observed index is below the annual target, the TACs is set by applying the ratio of observed/target indices to the previous year's landings. In all cases, the TACs will not be set at a level that exceeds the catch corresponding to $F=0.2$ ($F_{\text{threshold}}$).

Framework 2 also implemented a procedure for calculating trip limits and DAS allocations, once the annual target TACs are determined. In this procedure, the incidental catch of monkfish (on vessels not on a monkfish DAS) is subtracted from the target TAC. The remaining portion of the target TAC is distributed formulaically to the directed fishery based on observed effort and catch rates in the previous year. If the TAC is less than 8,000 metric tons, which would result in trip limits less than 550 lbs. and 450 lbs. (tail wt. per DAS, for Category A&C, and B&D, respectively), then trip limits are kept at that level, and DAS are reduced. This was the case in FY2004, when vessels were only allowed to use 28 DAS in the Southern Area.

2.8 Take Reduction Plans and Other Actions to Minimize Interactions with Protected Species

2.8.1 Harbor Porpoise TRP

NMFS published the rule implementing the Harbor Porpoise Take Reduction Plan (HPTRP) 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. Under the HPTRP, monkfish gillnets are required to comply with the requirements for large-mesh gillnets (defined as 7-18 inch mesh under the HPTRP). These include mandatory use of tie-downs and a net cap of 80 nets. The net cap is particularly relevant since the current FMP for monkfish has a net cap of 160 nets. Fishermen are required to comply with the most restrictive of all measures that apply to them. Therefore, monkfish gillnetters fishing in the Mid-Atlantic (as defined under the HPTRP) can only fish up to 80 nets (nets may be up to 300' long).

2.8.2 Atlantic Large Whale Take Reduction Plan (ALWTRP)

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. A DAM zone may be identified and a closure triggered within defined areas north of 40° N. latitude.

2.8.3 NMFS Rule to Conserve Sea Turtles

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

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

2.9 Other Regulatory Actions affecting the Fishery

The majority of vessels fishing for monkfish, either as an incidental catch or a directed fishery, are also involved in a number of other fisheries in the region where regulatory action may directly or indirectly affect their operations. This section briefly summarizes actions undertaken or under consideration in three of those fisheries, Northeast Multispecies Sea Scallops and Skates.

2.9.1 Multispecies FMP Amendment 13

The Council developed Amendment 13 to the Multispecies FMP to bring the FMP into conformance with all Magnuson-Stevens Act requirements, including ending overfishing and rebuilding all overfished groundfish stocks. Amendment 13 was partially approved by the Secretary of Commerce on March 18, 2004. A final rule implementing the amendment was published April 27, 2004 (69 *Federal Register* 22906) and become effective May 1, 2004. Amendment 13 adopted a suite of management measures to reduce fishing mortality on stocks that are either overfished, or where overfishing is occurring, and other management issues as summarized below:

- **Measures to achieve stock rebuilding**: measures designed to comply with Magnuson-Stevens Act requirements to rebuild overfished fisheries, and end overfishing where it is occurring. This includes management measures such as DAS reductions, gear restrictions, trip limits areas closures, TACs and other measures. It also includes measures that will affect the recreational fishery.
- **Measures to reduce capacity**: measures developed by the Council to control fishing capacity and potentially remove excess effort from the fishery.
- **Fishery program administration**: measures to address issues that are primarily administrative in nature, though some may have biological, social, or economic impacts. This section includes the DAS leasing alternatives.
- **Measures that minimize, to the extent practicable, adverse effects of fishing on habitat**
- **Other issues**: measures developed to alter restrictions on two exempted fisheries and one exempted gear.

For several groundfish 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. As a result, 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. Consequently, the NEFMC initiated Framework 40A to

the Multispecies FMP (see below). The primary purpose of FW 40A 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.

Since approximately half of the monkfish permit holders also hold multispecies limited access permits, the measures adopted in Amendment 13 and Framework 40A could have an impact on vessels engaged in the monkfish fishery, and on the monkfish resource (see Section 6.6.6.2).

2.9.2 Multispecies Framework 40A

The NEFMC developed Framework Adjustment 40A to the Multispecies FMP to address issues raised with the effort management, DAS, program implemented in Amendment 13. NMFS published a proposed rule for Framework 40A on September 14, 2004 (69 *Federal Register* 55389) with a comment period ending September 29.

One of the primary management measures used by Amendment 13 to control fishing mortality are DAS, which limit the time that vessels with limited access permits can fish for regulated groundfish. Amendment 13 categorized the DAS allocated to each permit as Category A, B (regular), B (reserve) or C DAS. Category A DAS can be used to target any regulated groundfish stocks, while Category B DAS are to be used only to target healthy groundfish stocks. Category C DAS cannot be used until some time in the future. The regulations implementing Amendment 13 only created one opportunity to use Category B DAS: a special access program designed to target Georges Bank yellowtail flounder in Closed Area II.

FW 40A creates additional opportunities to use Category B DAS, including Special Access Programs (SAPs), and a one-year Pilot Program for using B Regular DAS outside of the SAPs. This latter program is the one that potentially has an impact on the monkfish fishery because if the pilot program is successful, it will be a model for a future B Regular DAS management program. Under this program, multispecies vessels can target monkfish and healthy groundfish stocks, provided the quarterly TACs for the stocks of concern are not caught. Even though the total number of DAS on which multispecies vessels could target monkfish is less under this program, overall monkfish effort could increase under this program since vessels that did not direct on monkfish in past years could now choose to do so, since it is one of only a few stocks that would be available for targeting under a B DAS.

2.9.3 Atlantic Sea Scallop FMP Amendment 10 and Emergency Action

On November 11, 2003, the NEFMC submitted a final Amendment 10 document to the Atlantic Sea Scallop FMP (including a Final SEIS), and re-submitted a revised version on December 19. The proposed rule (69 *Federal Register* 8915, February 26, 2004) comment period ended on March 29, 2004. Since the fishing year under this FMP starts on March 1, measures adopted in Amendment 10 could not be in place at the start of the fishing year, so NMFS implemented regulations under the emergency action authority of the Magnuson-Stevens Act to protect against localized overfishing of the Hudson Canyon during the period before the Amendment 10 rules would be effective (69 *Federal*

Register 9970, March 3, 2004). NMFS published the Amendment 10 final rule on June 23, 2004 (69 *Federal Register* 35194).

Amendment 10 includes a comprehensive, long-term program to manage the sea scallop fishery through an area rotation management program to maximize scallop yield. The program includes a flexible boundary, adaptive area rotation system, beginning with a new closure off the Maryland coast. The rotation plan also continues the controlled access program for the Hudson Canyon Area and initiates mechanical rotation in parts of the Georges Bank closed areas, although access to the Georges Bank areas. This latter provision required approval of a groundfish framework adjustment to address groundfish bycatch concerns (see Scallop Framework 16/Multispecies Framework 39, below). Other features of the area rotation system include an expanded at-sea observer program and scallop-related research, both of which would be funded by scallop set-aside programs.

In addition to the rotational management program, Amendment 10 implemented an increase in twine top mesh from 8 to 10-inches and an increase in minimum dredge ring size from 3½ inches to 4-inches diameter. These changes will reduce bycatch and improve dredge efficiency while increasing the catch of larger sea scallops. It is expected that the larger ring will reduce bottom contact time per day and potentially reduce adverse effects on essential fish habitat. Amendment 10 also adopts a habitat closure, using portions of the groundfish closed areas, that would apply to vessels fishing with scallop gear until subsequent action is taken to replace or modify these areas. The Amendment also updated DAS allocations and allocated area-specific DAS and trip limits in controlled-access areas.

2.9.4 Scallop Framework 16/Multispecies Framework 39

The NEFMC developed Framework Adjustment 16/39, to the Scallop and Multispecies FMP, respectively, to address and implement scallop area management in parts of the groundfish closed areas. NMFS published a proposed rule for Framework 16/39 on August 26, 2004 (69 *Federal Register* 52470) and a final rule on November 2 (69 *FR* 63460).

Scallop biomass in portions of these areas has increased to high levels as a result of the closure to scallop fishing since 1994 to achieve groundfish mortality and rebuilding objectives. Although the Council wanted to allow controlled scallop fishing access starting with the 2004 fishing year, the specific issues associated with scallop fishing in the groundfish mortality closed areas were too complex and controversial to incorporate into Scallop FMP Amendment 10. Instead, Framework Adjustment 16/39 focuses on these issues, considering and analyzing the potential effects of alternatives to achieve the Scallop FMP goals with area rotation, without causing unacceptable impacts for groundfish habitat and bycatch.

Alternatives associated with Framework Adjustment 16 focus on allocations of fishing effort and scallop TACs, provisions to fund observers and research, enforcement provisions, and monitoring requirements. Alternatives associated with Framework Adjustment 39 focus on measures to minimize or control bycatch, including when and where scallop fishing may occur, as well as a limit on how much bycatch would be allowed. The joint framework also revises the EFH closures implemented in Amendment

10 (Scallops) to make them consistent with those implemented in Amendment 13 (Multispecies).

As noted in the Framework 16/39 submission document, scallop dredges often catch monkfish targeting sea scallops in many areas, and monkfish have been a significant part of the vessel's revenue at various times over the last 15 years. In fact, when scallop catches and revenue were low, many limited access scallop vessels have a history of targeting monkfish with scallop dredges. Because of this and the low survivability of monkfish after discarding, the Monkfish FMP allocates fairly generous trip limits for vessels on a scallop DAS, 300 lbs. tail-weight per DAS. In addition, some scallop vessels qualify for a limited access monkfish permit that allows them to catch and land more than this limit for 40 DAS to be counted against the limited access scallop DAS allocation.

Monkfish appear to be nearly as abundant within the access areas as they are elsewhere, based on the estimated bycatch in the 2000 access program. No targeting of monkfish was observed and targeting monkfish with a controlled access DAS is very unlikely due to the high catches of more-valuable scallops. With the proposed action and alternative rotation schedule, the daily catch rate is expected to vary between 175 to 332 lbs./day during 2004-2007. These are estimates of annual average catches per DAS, so conditions and catches will vary on individual trips made at various times of the year. Nonetheless, increases in discarding of monkfish are not expected because the catches are not substantially greater than the daily monkfish possession limit that applies on a limited access scallop DAS. Monkfish catches may decline overall, however, due to reductions in total fishing time that are anticipated under the access programs.

2.9.5 Skate FMP

On August 19, 2003, NMFS published regulations implementing the Skate FMP submitted by the NEFMC (68 *Federal Register* 46963). The purpose of the FMP is to implement permanent management measures for the northeast skate fisheries to prevent overfishing of skate resource. These regulations include the following measures: A possession limit for skate wings; a bait-only exemption to the wing possession limit restrictions; a procedure for the development, revision, and/or review of management measures on an annual, biennial, and inter-annual basis, including a framework adjustment process; open access permitting requirements for fishing vessels, operators, and dealers; new species-level reporting requirements for skate vessels and dealers; new discard reporting requirements for Federal vessels; and prohibitions on possessing smooth skates in the Gulf of Maine (GOM) Regulated Mesh Area (RMA), and thorny skates and barndoor skates throughout the management unit.

The Skate FMP identified and characterized a baseline of seven management measures in other fisheries that provide additional conservation benefits to skate species. If the Council initiates an action in another FMP that changes one of the seven 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 the Skate FMP requires a baseline review. Of the seven skate species managed under the Northeast Skate Complex FMP, only two species are in a formal rebuilding program: thorny and barndoor.

Monkfish DAS restrictions for monkfish only permit holders, Multispecies DAS restrictions and Scallop DAS restrictions are three of the seven baseline management measures identified in the Skate FMP that reduce impacts on skate mortality. Since the Councils considered in this amendment measures that would decouple Monkfish and Multispecies/ Scallop DAS, resulting in a potential increase in overall effort levels, the Skate PDT is required to evaluate the potential impacts of this change on the overall mortality of thorny and barndoor skate. All other measures proposed in Amendment 2 do not change any of the baseline measures identified in the Skate FMP, thus the skate baseline review is only triggered by the alternative to decouple Monkfish and Multispecies/Scallop DAS. Since the Councils rejected the proposal to decouple DAS usage requirements, the Skate Baseline Review appears under the section discussing impacts of non-preferred alternatives (Section 6.2.2.2).

2.10 Notice of Intent and Scoping

The Councils published a Notice of Intent to prepare an SEIS and formally initiate scoping on this amendment on December 10, 2001 (66 *FR* 63666). See Section 8.1.2 for information regarding the scoping process for this amendment, including scoping on the EFH components.

2.11 Summary of Current FMP Regulations

The following tables summarize the regulations in effect under the current FMP through Framework 2.

FMP Element	NFMA	SFMA
Target TAC	Calculated annually based on two factors: 1) three year running average fall survey biomass index compared to annual biomass rebuilding target 2) previous year landings If F is known, TAC is set to not exceed F threshold.	Same as NFMA
DAS	40	40, or lower if trip limit is calculated to be less than 550/450 lbs. tails/DAS on Cat. A, C & B,D, respectively. For FY2004, vessels will have 28 DAS to fish in the SFMA.
Liver landings	Maximum of 25% of wt. of tails or 10% of wt. of whole MF	Same as NFMA
Minimum fish size	11" tail, 17" whole	14" tail, 21" whole
Minimum mesh size on MF DAS	Trawl: 10" sq/12" dia. codend; Gillnet: 10"	Same as NFMA
Area Declaration	Must declare into NFMA for minimum of 30 days to fish under less restrictive measures (trip limits, minimum fish size); to be adjusted to 7 days by technical amendment	
Exempted Fishery	Must fish on a Multispecies or Scallop DAS or in an Exempted Fishery (gillnet only)	Must fish on a Multispecies or Scallop DAS or in an Exempted Fishery
Trip limits and Incidental Catch limits see table below.		

Table 6 Summary of current FMP regulations

Permit Category	DAS Program	Area	Gear ¹	Trip/Incidental Catch Limit ² (tail weight per DAS)
A, B, C, or D	Monkfish	NFMA	All Gear	No trip limit
A or C	Monkfish	SFMA	All Gear	550 lb (FY2004, adjusted annually)
B or D	Monkfish	SFMA	All Gear	450 lb (FY2004, adjusted annually)
C or D	Multispecies	NFMA	All Gear	No trip limit
C or D	Multispecies	SFMA	Trawl	300 lb
C or D	Multispecies	SFMA	Non-trawl	50 lb
C or D	Scallop	NFMA & SFMA	Dredge or net exemption	300 lb
E (incidental)	Multispecies	NFMA	All Gear	400 lb, or 50% of total weight of fish on board, whichever is less
E (incidental)	Multispecies	SFMA	All Gear	50 lb
E (incidental)	Scallop	NFMA & SFMA	Dredge	300 lb
A, B, C, D, or E	No DAS	NFMA & SFMA	Large Mesh ³	Up to 5% of total weight of fish on board per trip ⁴
A, B, C, D, or E	No DAS	NFMA & SFMA	Small Mesh ⁵ or Handgear	50 lb of tail weight per trip
C, D, or E vessels that are <30 feet with a multispecies limited access permit	No DAS	NFMA & SFMA	All Gear	50 lb of tail weight per trip

¹Dredge gear is prohibited unless fishing under a Scallop DAS

² Or the whole-weight equivalent (tail weight x 3.32)

³ Greater than or equal to the minimum NE multispecies mesh size for the Gulf of Maine, Georges Bank and Southern New England Regulated Mesh Areas, and minimum summer flounder mesh size for the Mid-Atlantic Regulated Mesh Area

⁴ Can land whole monkfish or monkfish tails, but the weight of all monkfish on board is converted to tail weight.

⁵ Less than the regulated mesh size as specified under footnote 3.

Table 7 Summary of current monkfish trip limits and incidental catch limits

2.12 Purpose and Need

The purpose of the amendment is to achieve the goals and objectives outlined in Section 3.2 below. The need for this action includes problems and issues that have arisen since, or as a result of the FMP implementation, as discussed below; court decisions and orders on elements of the plan as outlined in Section 2.5.2, particularly EFH (*AOC v. Daley*); actions taken in other fisheries that affect the monkfish fishery, as detailed in Section 2.9; and federal guidelines on the periodic updating of environmental documents and the content of fishery management plans, in particular the Council on Environmental Quality's "Forty Most Asked Questions Concerning CEQ's NEPA Regulations" (question 32).

This SEIS responds, in part, to the court's directive in the EFH lawsuit (*AOC v. Daley*) that NMFS complete new NEPA analyses for the Monkfish Fishery Management Plan. This amendment will minimize, to the extent practicable, the adverse effects of fishing on essential fish habitat to comply with section 303(a)(7) of the Magnuson-Stevens Act. More specifically, one purpose of the amendment is to identify and describe adverse effects of fishing on EFH and to minimize to the extent practicable these adverse effects. Although the plaintiffs' complaint focused on whether NMFS had adequately evaluated the effects of fishing on EFH, NMFS decided to complete new EIS's to evaluate all of the EFH components of the applicable fishery management plans. Accordingly, this SEIS reevaluates the impacts of amending the Monkfish FMP to include the EFH provisions required by the Magnuson-Stevens Act.

As noted, in addition to the issues raised in the lawsuits discussed above and in Section 2.5.2, the implementation of the FMP created several circumstances and situations which members of the public identified prior to and during the scoping process as problematic or unfair. In particular, the Councils received the following comments (summarized or paraphrased):

- During the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border, not south of that line where much of the affected fishery takes place.
- NMFS disapproved the "running clock" provision that would have enabled vessels to exceed their per-day trip limit and then run out the

commensurate DAS time while at the dock. This action, in combination with the requirement for Category C and D vessels to use a multispecies or scallop DAS when on a monkfish DAS, made offshore monkfish trawl trips unprofitable, especially in years when the trip limit was set relatively low. Members of the industry appealed to the Councils to restore the offshore fishery to a level of profitability within the requirements of the rebuilding program.

- Several individuals commented that the minimum fish size was contributing to discards, particularly on trips where vessels were using multispecies regulated mesh, rather than the larger mesh required on monkfish (but not multispecies) DAS
- Industry members requested the Council to implement the same exemptions for fishing outside the EEZ that already exist in the Multispecies FMP, so that vessels could investigate and promulgate a fishery in the NAFO Regulated Area.
- When the FMP was first implemented, numerous members of the affected public commented that the plan was extremely complicated and difficult to understand. Over the course of the next couple of years, however, the same individuals commented that the plan was more understandable than initially thought and that compliance at the vessel level was not so difficult once the operator learned the specific regulations that applied to his/her situation.

In April 2002, one conservation organization submitted comments on proposed Framework 1 expressing its concerns and issues with the Monkfish FMP. In responding to comments on the Emergency Interim rule, NMFS noted that those issues would be addressed in Amendment 2 which at that time was under development. In April 2003, as the Councils were finalizing the range of alternatives to be considered in the DSEIS, the organization re-submitted those comments and asked that they be addressed in Amendment 2. Those comments focused on three areas: improving data collection and research, especially in regards to bycatch; minimizing bycatch in the directed and incidental catch fisheries; and minimizing impacts of the monkfish fishery on designated EFH. The Councils note that these issues have been identified in the goals and objectives and form the basis for many of the alternatives considered.

2.13 Amendment 2 Public Comment Period and Hearings

NMFS published a Notice of Public Hearings and Request for Comments on May 28, 2004 (69 *Federal Register* 30624, May 28, 2004), announcing a 90-day comment period. The Councils held six public hearings, as follows:

DATE	LOCATION
June 15	Wading River, NY
June 16	Toms River, NJ
June 17	Manteo, NC
June 22	Fairhaven, MA
June 23	Peabody, MA
June 24	Portland, ME

Appendix III contains the hearing summaries and written comments, including a table summarizing the written comments received during the comment period, as well as late

comments. Appendix III also has a summary of the comments and the Councils' response.

3.0 GOALS AND OBJECTIVES

3.1 FMP Goals

The Councils adopted four management goals in the original FMP. These are:

1. To end and prevent overfishing; rebuilding and maintaining a healthy spawning stock.
2. To optimize yield and maximize economic benefits to the various fishing sectors.
3. To prevent increased fishing on immature fish.
4. To allow the traditional incidental catch of monkfish to occur.

These four goals were intended to ensure adequate spawning and the highest possible yields without radically altering the fisheries for other species, or causing extensive regulatory discards. In addition, they addressed the problem of the intensified fishing effort directed on small monkfish that occurred during the 1990's.

3.2 Goals for this Amendment

In addition to complying with the goals of the Magnuson Act, generally, and the Sustainable Fisheries Act (SFA) amendments, specifically, the goals of this amendment are:

- I.** Prevent overfishing or rebuild overfished stocks as necessary.
- II.** Address problems created by the implementation of the FMP.
Objectives:
 - 1) Reconsider the limited entry program for the monkfish fishery south of 38° N
 - 2) Address problems for deepwater fisheries resulting from the disapproval of the running clock in the original FMP
 - 3) Address the problem of multispecies or sea scallop permit holders having to use a multispecies or sea scallop day at sea (DAS) when using a monkfish DAS
 - 4) Establish appropriate exemptions for vessels fishing for monkfish outside of the EEZ (in the NAFO Regulated Area)
- III.** Promote improved data collection and research on monkfish
- IV.** Comply with CEQ (Council on Environmental Quality) Guidelines to update Environmental Documents
- V.** Address deficiencies in meeting Magnuson Act requirements
Objectives:
 - 1) Meet Magnuson Act requirements for Essential Fish Habitat
 - 2) Address known bycatch issues, specifically due to trip limits and minimum fish size
- VI.** Address protected resources/fishery interactions
Objective: specifically address the turtle/gillnet interaction
- VII.** Reduce FMP complexity where possible.

The following table identifies the alternatives associated with each of the goals and objectives outlined above, and includes reference to the decision document contained in Appendix I.

GOAL	OBJECTIVE	DECISION (Appendix I)
I. Prevent overfishing or rebuild overfished stocks as necessary	N/A	All decisions
II. Address problems created by the implementation of the FMP.	1) Reconsider the limited entry program for the monkfish fishery south of 38°N	Decision 9
	2) Address problems for deepwater fisheries resulting from the disapproval of the running clock in the original FMP	Decisions 1 and 8
	3) Address the problem of multispecies or sea scallop permit holders having to use a MS or scallop DAS when using a MF DAS	Decision 1, 8 and 14
	4) Establish the appropriate exemptions for vessels fishing for monkfish outside of the EEZ	Decision 10
III. Promote improved data collection and research on monkfish.	N/A	Decisions 1, 3, 6, 8, 12, and 14
IV. Comply with CEQ Guidelines to update environmental documents.	N/A	Decisions 1, 3, 4, and 6
V. Address deficiencies in meeting MAGNUSON-STEVENSON Act requirements.	1) Meet MAGNUSON-STEVENSON Act requirements for EFH	Decisions 11, 12 and 14
	2) Address bycatch issues, specifically due to trip limits and minimum fish size	Decisions 2, 3, 4, 6, 12, 14 and 17
VI. Address protected resources/fishery interactions.	Specifically address the turtle/gillnet interaction	Decisions 12 and 17
VII. Reduce FMP complexity where possible.	N/A	Decisions 6 and 13

Table 8 DSEIS alternatives and their relationship to specific goals and objectives, including reference to decision document in Appendix I.

4.0 PROPOSED ACTION AND ALTERNATIVES

4.1 Proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission.

4.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries. The proposed alternatives would address current or potential monkfish bycatch issues on vessels engaged in other fisheries. As monkfish stocks rebuild, the potential for incidental catch increases, and the proposed alternatives would enable vessels to land such catch, rather than discarding it, while not appreciably affecting the allowable catch that is available to directed fisheries.

4.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

This is Alternative 2, Decision 2 in Appendix I. The incidental catch limit is currently 50 lbs. (tails) per trip on all vessels not on a DAS and fishing with small mesh (defined as mesh smaller than multispecies minimum mesh in the GB/GOM and SNE Regulated Mesh Areas, and fluke minimum mesh, specified in §648.94 (c) (3)(i), in the Mid-Atlantic regulated mesh area) and handgear. The same limit applies on multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.

Under the proposed action, vessels would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

Discussion/Rationale: This was the Councils' preferred alternative in the DSEIS, and the recommendation of the Monkfish Committee. While most of the industry advisors recommended taking no action out of concerns for the enforceability of this proposal (tracking the number of days of the trip), the Monkfish Committee recommended this alternative because they said it would reduce regulatory discards on multi-day whiting and squid trips in the SFMA. The Committee also noted that a 150 lbs. possession limit would not create an incentive to target monkfish on those trips. Regarding the enforcement concerns, the Committee believed that current electronic trip reporting systems (i.e., VMS) and future electronic vessel logbooks would make this measure more enforceable.

4.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

This is Alternative 2, Decision 3 in Appendix I. The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels. General Category scallop dredge vessels are an open access permit category in which vessels are restricted to a possession limit of 400 pounds of scallop meats. Clam dredge vessels are managed under an Individual Transferable Quota (ITQ) system, and harvest surf clams and ocean quahogs with a hydraulic dredge.

Discussion/Rationale: This was the Councils' preferred alternative in the DSEIS, and the recommendation of the Monkfish Committee. The industry advisors supported allowing these vessels to retain incidentally caught monkfish, but only up to a 50 lbs. possession limit. For the same reasons outlined under the incidental catch limit proposal in Section 4.1.1.1, and recognizing that the General Category Scallop fishery is a day fishery (being restricted to a possession limit of 400 lbs. of scallops), the Committee recommended including these vessels in the same incidental catch category as the small mesh fisheries. Furthermore, the Committee felt that uniform incidental catch limits, to the extent they are consistent with the fishery characteristics and FMP goals, was important for ease of compliance and enforcement.

4.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

This is Alternative 2, Decision 4 in Appendix I, although as recommended by the Industry Advisory Panel and the Monkfish Committee, the Councils are setting a maximum possession limit for vessels fishing in this category for the reasons discussed below. The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island. This action would restore the area specified in the original FMP where vessels fishing with the minimum mesh size required under the summer flounder (fluke) FMP are considered to be using "large mesh" for the purpose of determining the applicable monkfish incidental catch limit, but it would not change regulations implemented under the groundfish interim rule, other than the monkfish incidental catch limit in the area between 74°00'W and 72°30'W.

Discussion/rationale: Both the Advisory Panel and Monkfish Committee recommended this action, which was the Councils' preferred alternative in the DSEIS but without the maximum possession limit. Based on public comment and the Advisory Panel and Committee discussion, the Councils adopted the 450-lbs. possession limit. The Councils noted that the fluke fishery in that area has a higher incidental monkfish catch than the small-mesh fisheries in the area, and that this action would reduce regulatory discards. The Councils adopted the 450-lbs. possession limit because that is the trip limit that is allowed on directed (DAS) trips in some years, and it would not be equitable, nor reasonable to allow an incidental limit to be higher than the directed limit. The Councils also noted that, perhaps more importantly, the fluke fishery has evolved since this regulation was initially adopted (without the total monkfish possession limit), and that the

total landings of all species (primarily scup plus fluke) is now significantly higher than in the past. As a result, basing the incidental limit solely on a percentage of the total, creates the possibility of excessive, or even targeted monkfish catches, beyond what was anticipated when the original FMP was adopted.

4.1.2 Minimum fish size

This is Option 1, Alternative 2, Decision 6 in Appendix I. The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA).

Discussion/Rationale: The Councils considered four alternatives for minimum fish size, including the no action alternative. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch (regulatory discards). Furthermore, a uniform size is more enforceable than having two area-based sizes. Minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish, and increase yield per recruit (if successfully linked to gear requirements that have the appropriate size selectivity characteristics).

The Advisory Panel was evenly divided on supporting this action, or taking no action. The supporters of taking no action did not want the minimum size reduced in the southern area, preferring to increase mesh sizes. The Councils have indicated that their preference for a uniform minimum fish size is based primarily on improving enforcement and reducing regulatory discards. The action will also reduce FMP complexity, consistent with Amendment 2 Goal VII. Furthermore, the Councils' decision to not eliminate the minimum size, as recommended by the PDT, confirms the original basis for the minimum size rule, that is, to discourage targeting of small fish and increasing yield per recruit.

4.1.3 Closed season or time out of the fishery

This is Alternative 2, Decision 7 in Appendix I. The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies.

Discussion/Rationale: The PDT reviewed the current regulations requiring vessels to take 20-day blocks out of the fishery during the spring and agreed that there is no apparent biological benefit from a 20-day-out requirement. Under the current 20-day block out of a 90 day period, a vessel still has 70 calendar days during which it could use most or all of its 40 monkfish DAS. Scallop/monkfish vessels are not subject to this requirement. As long as other fishing can occur, the benefits to spawning will not be realized, even if they cannot be measured or predicted.

4.1.4 Offshore SFMA Fishery

This is Alternative 2, Decision 8 in Appendix I, with Area Option 1 and DAS/trip limit Option 2. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England. Currently, vessels fishing offshore are subject to the same DAS, trip limits and gear requirements that apply on the same permit category inshore. This program would establish a separate set of regulations for vessels

fishing in the offshore waters of the SFMA. Vessels may elect to enroll in the fishery on an annual basis and be subject to the following program elements. A vessel would not have to be enrolled in the program to fish in the area, in which case it would operate under the regular rules (trip limit, no VMS requirement, and DAS) applicable to that gear and permit.

Program elements:

Vessel Participation: A vessel must declare its intent to participate in the Offshore Monkfish Fishery Program when applying for its annual vessel permit, and NMFS will issue a Category F permit. Note that in the DSEIS this program was proposed as being administered through issuance of a Letter of Authorization, but in drafting proposed regulations, the staff determined that program administration would better administered by issuance of an annual permit to be consistent with programs in other fisheries that impact annual DAS allocations, such as the small dredge scallop fishery program and the large mesh multispecies program.

Area: (Offshore Area Option 1)- The area proposed is offshore of the loligo squid exemption line (approximately 50 fathoms) and north of 38°00'N, (Figure 2). Vessels would be subject to any gear-based closed area restrictions that might apply under this or other FMPs. Such restrictions could include areas closed to protect EFH as discussed in Section 4.1.8.

Season: October 1 –April 30

Trip limits/DAS - Directed fishery: (Offshore program DAS/trip limits Option 2): Under the proposed action, all vessels enrolled in the offshore fishery program would have a trip limit of 1,600 lbs./DAS (tail weight), and a variable DAS allocation that would be calculated at the time of enrollment in the program. The DAS allocation would be calculated as the product of applying a trip limit ratio (the standard permit category trip limit applicable to non-participating vessels in the SFMA divided by 1,600 lbs) times the DAS available to vessels fishing in the SFMA. Unless otherwise set by the annual adjustment procedure, the DAS allocated to each vessel is 40 (less any portion set aside for cooperative research under the proposal in Section 4.1.9), but in some years (such as 2004) the DAS allocation could be less, depending on the progress of the rebuilding program.

Incidental catch limits (not on DAS): The same incidental monkfish catch limit applies to the vessel as other similar vessels when not on a DAS (gear-, area-, and permit category-based limits). Enrolled vessels fishing on a multispecies DAS in the NFMA would be limited to the monkfish incidental limits applicable to Category E vessels. (Non-enrolled Category C and D vessels on a Multispecies DAS in the NFMA do not have a monkfish trip limit).

Gear: Vessels would be required to use the same gear as Category A and B vessels (monkfish only permits) when fishing on a monkfish DAS, including minimum mesh size applicable on monkfish-only DAS and the roller gear restriction (trawl vessels) proposed in Section 4.1.8, even though Category C and D vessels with multispecies limited access permits would be using a multispecies DAS in conjunction with their monkfish DAS as required under the regulations at §648.9992 (b)(2).

Vessel monitoring system (VMS): Vessels would be required to have a VMS in operation during the entire season (Oct. 1 – Apr. 30). Vessels that are otherwise not required to have a VMS in operation during the entire fishing year, would able to shut

down the VMS between May 1 and Sept. 30 in any year in which they enroll in the offshore fishery.

Discussion/Rationale: This proposal addresses the problem created by implementation of the FMP without the “running clock”. The Councils’ original FMP proposal, disapproved by NMFS, would have allowed vessels to run their DAS clock upon returning to port to account for any trip limit overages. Without the running clock, offshore vessel owners have stated they can no longer profitably fish for monkfish under the restrictive trip limits while also consuming a multispecies DAS. The running clock would have allowed vessels to exceed the per-day trip limit and remain at the dock with the DAS clock running to account for the overage. While the proposed action would establish an enrollment program for vessels wanting to fish in a designated offshore area under a higher trip limit, with other restrictions, other vessels could fish for monkfish in the area under the regular rules applicable to the vessel’s permit category and gear. This would preserve maximum flexibility for the fleet, since some vessels may want to fish for monkfish both inside and outside the area, and not have to install a VMS.

The Councils selected the Area Option 1 because it provides access to the offshore monkfish resource on the southern flank of Georges Bank and uses an established management boundary line. The Councils selected DAS/Trip Limit Option 2, based on public comment that vessels would prefer a consistent trip limit from year to year, and also, if any increase in allocation is made, that it be made to DAS rather than increased trip limits.

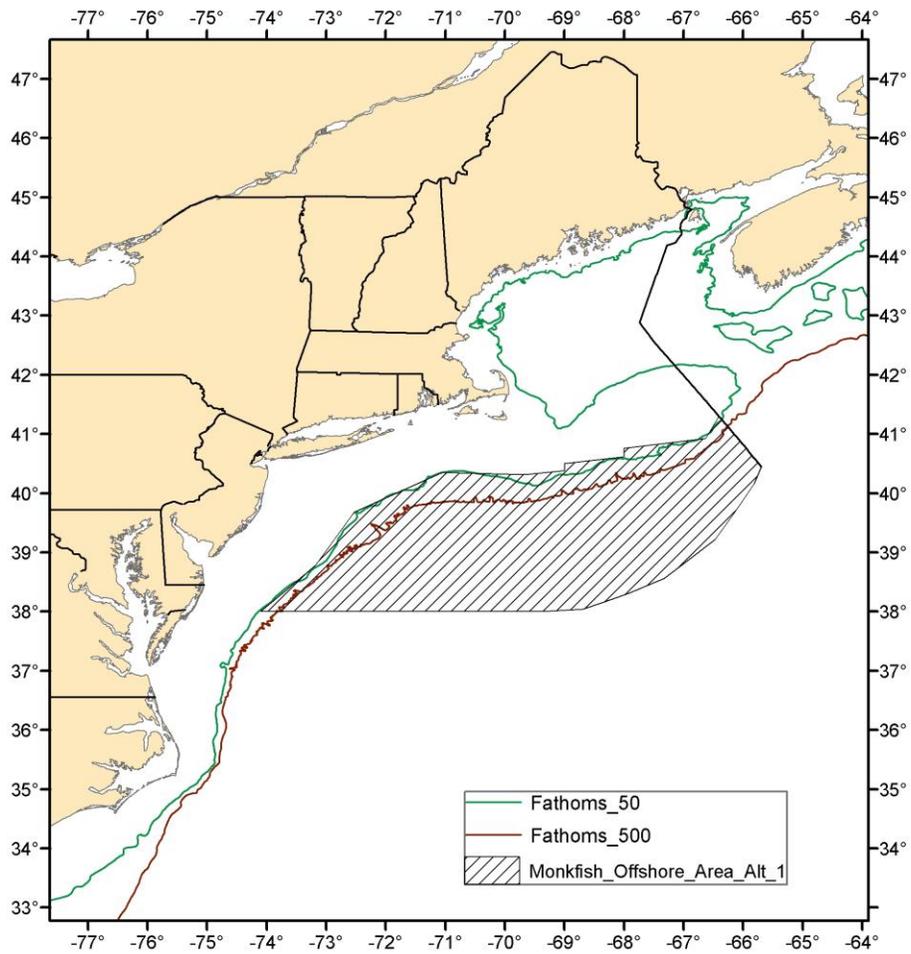


Figure 2 Offshore Area Alternative 1 – based on Illex Exemption Area but terminating at 38°N.

4.1.5 Modification of permit qualification for south of 38°N

This is Alternative 3, Decision 9 in Appendix I. The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described below. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

To qualify for a special limited access permit under this action, a vessel would have to have landed 50,000 lbs. (tail wt.) for a Category A or C permit, or 7,500 lbs. (tail wt.) for a Category B or D permit, in the area south of 38°N, during the March 15 – June 15 period over the four years prior to June 15, 1998. These are the same landings weight qualification criteria as in the original FMP, although the period during which the landings are counted is changed, and the area restriction is applied. The original FMP qualification period was four full years prior to February 27, 1995.

Discussion/Rationale: During the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border. With the proposed action, the Councils are addressing the concerns of those vessels with a special limited access permit that is based on the characteristics of that southernmost fishery, while not opening up the entire monkfish fishery to new participants.

During the development of alternatives for this proposal, NMFS implemented sea turtle protection measures that closed the primary fishing areas to large-mesh gillnet gear during times when monkfish are present (Section 2.8.3). In response, the Councils proposed to extend the area accessible to vessels qualifying for a monkfish permit under this action from 38°00'N to 38°20'N. This change provides an opportunity for qualifying vessels to target monkfish during the peak season outside the area where sea turtle protection closures are in effect.

4.1.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure.

4.1.6.1 Implement transferable MF-only DAS

This is part of Decision 1c in Appendix I, and is identified as Alternative 1, Option 2b. Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action. Initially, the Councils proposed that this action would only be considered if the Councils adopt Alternative 1, Decision 1, to separate DAS usage requirements on Category C and D permit vessels. Even though the Councils are not proposing such action in this amendment, they decided to include the ability to transfer monkfish DAS in the list of actions that could be taken under the framework adjustment procedure. This would provide greater flexibility to implement such a program in the future, should the Councils decide to consider it. This action would not implement a DAS transfer provision as part of the rule implementing this amendment.

Under this approach, the list of measures that can be adopted under the framework process would be amended to include a program allowing the transfer of monkfish DAS, through leasing or sale between vessels, but would include the stipulation that any such program implemented via the framework adjustment process would have to go through proposed and final rulemaking procedures to maximize the opportunity for public comment.

Discussion/Rationale: The Councils are considering allowing the transfer of monkfish DAS as a way to mitigate the potential cumulative impact of restrictions being considered in scallop and multispecies fisheries that will affect monkfish vessels, and to mitigate the impact of any future monkfish DAS restrictions should they become necessary. The Councils recognize that DAS transfer programs are complicated, still evolving in other FMPs, and potentially highly controversial. For these reasons, the Councils have indicated that even if a DAS transfer program is considered in a future framework adjustment, the proposals would have to go through proposed and final rulemaking, in addition to the appropriate NEPA analysis.

4.1.6.2 Implement measures to minimize fishery impact on protected species

This is part of Decision 17 in Appendix I. The Councils propose to include in the FMP list of actions that can be taken under the framework adjustment process measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises. The list of measures would include gear-specific seasonal/area closures or gear modification.

Discussion/Rationale: This action will enable the Councils to take timely action to implement measures to address protected species issues that are consistent, to the extent possible, with the other management objectives of the FMP and other applicable laws. The Councils originally considered a second strategy, that is to include in this amendment specific measures to address the immediate problem of sea turtle catches in the large

mesh gillnet fishery south of 38°N. The development of specific measures, however, depended on the completion of analysis sea-surface temperature data and other analyses that were not done in time to be included in this amendment. Therefore, no specific measures are proposed for Amendment 2 at this time, other than the proposal outlined above.

4.1.6.3 Implement requirements to use bycatch reduction devices

This is part of Decision 17 in Appendix I. The Councils propose to add “bycatch reduction devices” to the list of measures that can be implemented under the framework adjustment process in the FMP.

Discussion/Rationale: This proposal increases the Councils’ flexibility to consider measures to reduce bycatch in a timely manner. The Councils anticipate that such gear-based alternatives may arise out of the cooperative research programs, supported by this amendment, and should be able to be implemented with a minimum of procedural delay.

4.1.7 NAFO Regulated Area exemption program

This is Alternative 1, Decision 10 in Appendix I. Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions, specified in §§648.4, 648.91, 648.92 and §648.94, respectively, while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided:

- (a) The vessel operator has a letter of authorization issued by the Regional Administrator on board the vessel;
- (b) For the duration of the trip, the vessel fishes, except for transiting purposes, exclusively in the NAFO Regulatory Area and does not harvest fish in, or possess fish harvested in, or from, the EEZ;
- (c) When transiting the EEZ, all gear is properly stowed in accordance with one of the applicable methods specified in §648.23(b); and
- (d) The vessel operator complies with the High Seas Fishing Compliance permit and all NAFO conservation and enforcement measures while fishing in the NAFO Regulatory Area.

Discussion/Rationale: The proposed action would enable vessels to fish in the NAFO Regulated Area without being subject to the FMP regulations designed to manage the domestic monkfish fishery. The proposed action parallels a similar provision in the Multispecies FMP.

4.1.8 Measures to minimize fishery impact on EFH

The two gear types used in the directed monkfish fishery are bottom trawls and bottom gillnets. Gillnets are not considered to have more than minimal adverse impacts on EFH for any species in the region (See Appendix II), but could damage or remove corals from hard substrates in deepwater canyon habitats (Section 5.4.1.7). Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found

with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epi-benthic fauna that provide relief and shelter, and are known to be particularly vulnerable to damage or loss by bottom trawls and bottom gillnets (Section 5.1.6 and Section 5.4.1.7). Therefore, the only gear used in the fishery that could have more than a minimal adverse impact on EFH for any species in the region is the bottom trawl. Furthermore, monkfish EFH has been determined not to be adversely impacted in a manner that is more than minimal or more than temporary in nature (See Appendix II). Therefore, the only direct adverse impacts of fishing that need to be minimized in this Amendment are the effects of bottom trawls on the EFH of benthic life stages of 23 other species that have been determined to be more than minimally vulnerable to bottom trawling (see Table 99 in Section 6.3.1.5.3). Damage or loss of deep-sea corals caused by either gear used in this fishery would constitute an indirect adverse impact to EFH in the offshore canyons.

The Councils propose two habitat specific measures to be implemented in this Amendment to address the Magnuson-Stevens Act requirement to minimize, to the extent practicable, the adverse impact of fishing on EFH: EFH Alternative #4, option 3, and EFH Alternative 5AB, option 2. There were several other non-habitat measures considered during the development of Amendment 2 that had beneficial impacts in EFH (EFH Alternative #2); however, none of those measures were selected for the proposed action.

The Councils recognize that there are additional habitat benefits to EFH from measures that were recently approved in Amendment 13 to the Multispecies FMP, as well as Amendment 10 to the Scallop FMP. During the development of this Amendment, these habitat benefits were considered EFH Alternative #3. Since the time alternatives were first developed for Amendment 2, both Amendment 13 and Amendment 10 have been implemented. These habitat benefits were considered separately because during the development of Amendment 2, the Councils were uncertain about when, and if these two Amendments would be approved. Since both Amendment 13 and Amendment 10 are now approved, these EFH benefits are now more appropriately considered part of the No Action alternative (EFH Alternative #1 in this document). Therefore, for NEPA purposes the EFH benefits of these two alternatives are described separately, but the Councils understand that these benefits are actually part of the No Action alternative, since no affirmative action needs to be taken in order to implement these measures. EFH Alternative #3 and the habitat benefits associated with that alternative have been integrated into EFH Alternative #1 (No Action alternative) discussion in Section 4.2.2.9.1, rather than within this Proposed action section.

4.1.8.1 Southern Area trawl disc restriction

This is Option 3, Alternative 4, Decision 11 in Appendix I. The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

Discussion/Rationale: This trawl gear proposal, and another not adopted, were developed during a cooperative workshop held by the Monkfish PDT involving trawl industry members and gear technology experts. Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern

areas, although during migration periods monkfish are caught in sandy and more complex bottom types. In the southern area the bottom characteristics are more consistent over large areas, while in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud. Under these conditions, southern area vessels can target monkfish successfully with smaller roller gear, and such a restriction would effectively ensure that such vessels do not fish in areas of more complex bottom characteristics, particularly in the offshore canyons.

4.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deep-sea canyon habitats. This is EFH Alternative 5AB Option 2, Decision 11 in Appendix I. The closures would take effect when this amendment is implemented, scheduled for May 1, 2005.

Alternative	AREA (nm2)
5 AB	116

Table 9 – Area in square nautical miles of the proposed coral habitat protection areas

	Latitude		Longitude	
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38

Table 10 - Coordinates of Habitat Alternative 5AB

Discussion/Rationale:

Since the Councils considered and approved measures to re-establish an offshore directed monkfish trawl fishery in the southern fishery management area, the Councils are proposing closing two deep-sea canyon habitat areas to minimize the potential impacts of that fishery. Within these canyon habitats, a variety of species have been found which are known to provide structured habitat and shelter for some species of demersal fish and invertebrates, including deep-sea corals.

The directed monkfish fishery is conducted with bottom trawls and bottom gillnets, primarily in coastal and offshore waters of the Gulf of Maine, on the northern edge of Georges Bank, and in coastal and continental shelf waters of southern New England, including offshore waters on the edge of the continental shelf, near the heads of several deepwater canyons. Deep-sea corals are known to exist in some of the submarine canyons in the area that is identified for increased offshore fishing. EFH for some federally-managed species extends beyond the edge of the continental shelf and includes portions of some of the canyons. Therefore, the possible expansion of the directed offshore monkfish fishery – either spatially into new areas or in terms of increased fishing intensity in existing areas – increases the probability of adverse impacts to EFH, canyon habitats, and, thus, deep-sea corals. Alternative 5 is intended as a precautionary measure to prevent any potential direct or indirect impacts of an expanded offshore monkfish fishery on EFH and offshore canyon habitats.

The EFH Final Rule states that FMPs must minimize the adverse effects of fishing on EFH, to the extent practicable (600.815(a)(2)(ii)). Adverse effects are defined to mean “any impact that reduces the quality and/or quantity of EFH” and 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 site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions” (600.810(a)). The scope of the regulations is rather broad and provides a basis for closed area management alternatives that address the potential indirect habitat or ecosystem impacts of fishing on EFH, as well as the direct impacts on EFH, in offshore canyon habitats. Impacts to offshore canyon habitats, which include deep-water coral species, has a direct adverse impacts on EFH that is more than minimal and less than temporary in nature; therefore, the Councils are considered alternatives to minimize those impacts.

Protection of deep-sea corals is a relatively new concept in this region and the Councils asserted that there are several statutory and regulatory authorities that support the Councils’ initiative to protect deep-sea coral habitats, whether or not corals have been specifically identified as EFH for managed species. These authorities include the EFH Final Rule, discretionary provisions of the Magnuson-Steven Act, as well as bycatch provisions of the Magnuson-Stevens Act. National Standard 9 of the Magnuson-Stevens Act requires that management plans minimize bycatch to the extent practicable. NOAA fisheries consider bycatch to include finfish, shellfish, invertebrate species, and all other forms of marine animal and plant life. In the Response to Comments on the National Standard One Guidelines, the specifics of what constitutes as bycatch was examined. Based on the Response to Comment #4, NOAA Fisheries interprets bycatch to include a wide variety of marine species, with or without commercial value. Therefore, there may be regulatory justification to consider alternatives to reduce the impacts of the offshore monkfish fishery on deep-sea coral habitats.

Following the NMFS guidance entitled *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002), a step-by-step evaluation of habitat impact evaluation was conducted by the Councils.

First, a description of the gears used in this fishery and an evaluation of the spatial distribution of their use in the Northeast region was conducted. Next, the results of scientific studies of the habitat impacts of these gears on different habitat types were summarized and an evaluation was made of the species and life stages of federally-managed species in the region with EFH that was determined to be vulnerable to the effects of different types of fishing gear. This information is presented in Appendix II to this FSEIS.

Twenty-three (23) federally-managed species have been observed or collected in surveys within the Alternative 5AB proposed closure areas, and many of them have EFH defined as hard substrates in depths greater than 200 meters. Furthermore, the EFH designations for juvenile and/or adult life stages of six of these species overlap with the two areas proposed for closure under this alternative, including pollock, redfish, whiting (silver hake), clearnose skate and tilefish. EFH for all six of these species has been determined to be moderately or highly vulnerable to the effects of bottom trawls and minimally vulnerable to bottom gill nets. Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epibenthic species that provide relief and shelter, and are known to be particularly vulnerable to damage or loss by bottom trawled and bottom gillnets (Section 5.1.6 and Section 5.4.1.7).

The proposed habitat closures would prevent an expansion of the offshore monkfish fishery into the deeper (>200 meters) portions of Lydonia and Oceanographer canyons, on the southern edge of Georges Bank. By avoiding any direct adverse impacts of bottom trawls and gill nets used in this fishery on EFH for six species of fish and any indirect adverse impacts on hard bottom substrates and species of emergent epifauna, including corals, that grow on those substrates within the boundaries of these two closures, adverse impacts of an expanded offshore fishery would be minimized. Since the fishery is not operating in these two areas at present, there would be no negative economic impact of this alternative. No other fisheries that operate within the closures would be affected by this action. Thus, it is practicable.

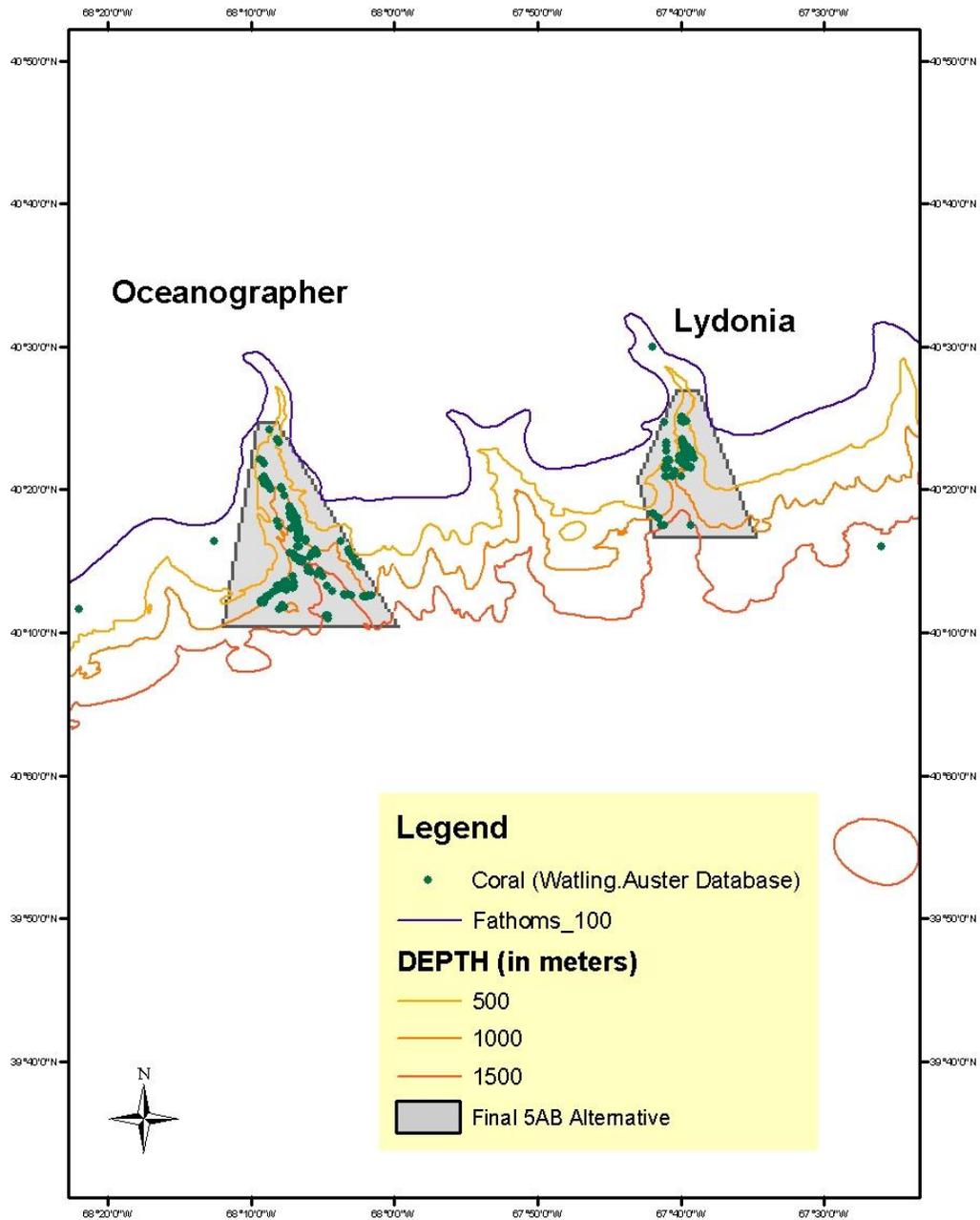


Figure 3 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon)

Note that location of known soft coral is mapped as well (Watling and Auster).

4.1.9 Cooperative research programs funding

This is Decision 12 in Appendix I. The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application or respond to a NMFS Request for Proposals.

The research that could be conducted under either of these programs includes, but is not limited to: research to minimize bycatch and interactions with sea turtles and other protected species; research to minimize impacts of the fishery on EFH or other sensitive habitats; research or experimental fisheries for the purposes of establishing a trawl exempted fishery under the multispecies FMP in the NFMA; research on the biology or population structure and dynamics of monkfish; cooperative surveys; and gear efficiency.

Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below.

4.1.9.1 Research DAS set-aside

This is Alternative 1 in Decision 12. A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. The Councils would identify research priorities and NMFS would issue a Request for Proposals (RFP) for monkfish research/surveys to be conducted under the DAS set-aside. NMFS Regional Office would conduct a technical review of the proposals and forward the approved proposals to NMFS HQ for further review and awarding of DAS from the set-aside pool. Vessels would, in effect, increase their monkfish DAS allocation by the number of DAS awarded from the set-aside pool, and would conduct the research or survey work while on a monkfish DAS.

Under this option, the DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. With over 700 limited access permits, a substantial and adequate pool of DAS could be set aside by each vessel contributing only a fraction of a DAS.

4.1.9.2 DAS Exemption

This is Alternative 2 in Decision 12. Under this proposal, DAS set aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. In other words, the total number of DAS allocated under the set-aside program, and this exemption program would not exceed 500 DAS in any year.

In order to qualify for an exemption under this program, a vessel and/or principal investigator would submit a proposal to NMFS via the Experimental Fishery Permit process. The proposal would include, among other elements, a statement of the number of exempted DAS needed to complete the research/survey. If the number of exempted DAS exceeds the quantity analyzed and recommended in this amendment, an applicant would have to prepare an Environmental Assessment for the excess DAS exemptions requested,

primarily to determine the impact of any additional fishing effort that could result, in excess of the amount allocated to vessels. Under this program, applicants would not have to submit proposals under the RFP and grants processes, as they would under the previous set-aside program.

Discussion/Rationale: The Councils recognize that scientific information in the areas of monkfish biology, fishery impacts on EFH, bycatch and others is inadequate to effectively manage the fishery. The Councils also recognize that cooperative research programs, where industry and scientific/technical partners jointly investigate particular problems or scientific questions, are the most cost-effective and successful programs, and receive the broadest acceptance. The alternatives proposed above would reduce the costs to vessels, by allowing them to retain monkfish caught during experimental cruises, while not expending the vessels' DAS allocations. By including the exemption or set-aside alternatives in the FMP, the Councils will also streamline the experimental fishery process by obviating the need for individual researchers to apply for such exemptions and conduct the required impact analysis on a case-by-case basis.

The Councils have had a number of successful cooperative research programs, in both monkfish and in other fisheries, in recent years, and are seeking ways to continue and expand these efforts. Most notable in this fishery is the second triennial cooperative survey conducted in the spring of 2004. By providing DAS to vessels, so they can land and sell monkfish caught during experimental fisheries, the Councils are greatly expanding the incentive to participate in a broad range of research and survey activities. The 500 DAS that are identified, if all used, would result in a minimal (less than 1 DAS) reduction in the regular DAS allocation available to vessels, but would provide a substantial pool of DAS to conduct research. Including this program within the FMP, rather than requiring vessels to seek exemptions on an *ad hoc* basis, greatly streamlines the process of starting experimental fisheries work, since an environmental assessment (EA) would not have to be conducted for each project seeking an exemption from monkfish DAS, although an EA may be required if exemptions to other regulations are sought. Allowing vessels to land and sell the monkfish reduces the cost of research, either borne by participating vessels or funding agencies.

4.1.10 Clarification of vessel baseline history

This is Alternative 2, Decision 13 in Appendix I. The Councils are considering a proposal that would eliminate the dual vessel-upgrading baseline that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit. Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented). This proposal would set a single vessel permit baseline at the length, tonnage and horsepower specifications of the first limited access permit applied to the vessel, regardless of whether those specifications are larger or smaller than any subsequent baseline properties. NMFS will only consider making changes under this program if contacted in writing by the vessel owner, and only if such request is made on or before April 30, 2006, or within one year of the effectiveness of this amendment.

Discussion/Rationale: The Councils received early comment about the situation where vessels that were downsized after receiving their initial federal permit had two upgrading baselines. This reduced the value of the vessel in any potential sale, since either the smaller baseline took precedence or monkfish permit had to be relinquished. The Councils recognized that the permit characteristics reflected the vessel at the time the monkfish permit was issued, 1999, and not necessarily the characteristics of the vessel during the permit qualification period (1991-1995).

During the public comment period, however, the Councils also learned that some vessels have a reverse situation due to changes in the method of measuring a vessel's tonnage during the period between the issuance of the permits. In response, they included the stipulation that the change only be done at the request of the vessel owner. The one-year opportunity period is intended to minimize the administrative burden of the permit adjustment program.

4.1.11 No action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13). The rationale for not adopting those measures, and taking no action is discussed under the referenced sections where the non-adopted measures are discussed.

4.1.11.1 DAS usage Alternative 2 (no action) –Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously

This is Decision 1 in Appendix I. Under this no action alternative, vessels in Permit Category C or D (those with both monkfish and either sea scallop or multispecies limited access permits) would continue to be required to use a multispecies and/or sea scallop DAS when on a monkfish DAS. Under this alternative, if a vessel's multispecies DAS are reduced below the number of monkfish DAS allocated (currently 40), the vessel could use those excess DAS (the difference between the monkfish and multispecies DAS) as monkfish-only DAS. In that circumstance, the vessel would fish under the restrictions that apply to Category A or B vessels (gear, area, etc.) when fishing under monkfish (only) DAS.

4.1.11.2 Minimum mesh size Alternative 1 (no action)

This was the preferred alternative in the DSEIS. Under the current system, mobile gear vessels on a monkfish DAS (Category A and B) or on a scallop/monkfish DAS (Category C and D) are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches (stretched measurement). Category C and D vessels on a monkfish/multispecies DAS can use the mesh size specified in the multispecies FMP. Under the terms of the proposed Offshore Fishery Program (see Section 4.1.4), vessels enrolled in the program would be required to use the gear required on Category A and B vessels, even if they are a Category C or D permit with a multispecies limited access permit.

4.1.11.3 NFMA experimental fishery Alternative 1 (no action)

Currently, there is no monkfish trawl exempted fishery in the NFMA, although, a monkfish gillnet exempted fishery already exists. The purpose of the proposed experimental fishery would be to determine whether, and under what conditions a trawl exempted fishery could be established in the Gulf of Maine. If monkfish DAS are separated from multispecies DAS usage requirements, trawl vessels in the NFMA would not be able to target monkfish unless they also used a multispecies DAS, or they propose an experimental fishery through one of the procedures outlined in the alternatives in Section 4.1.9. Since the Councils are not proposing to separate DAS usage requirements, the need for a trawl exempted fishery is minimized, and, further, vessels are already conducting such experimental fisheries under the current program.

4.1.11.4 Fishing year – Alternative 1 (no action)

This was the preferred alternative in the DSEIS. The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP. The fishing year under the Sea Scallop FMP runs from March 1 through February, thus, vessels with monkfish Category C and D permits that also have limited access scallop permits operate under two different fishing years.

4.2 Non-preferred and rejected alternatives

This section is divided into two parts: alternatives that were considered by the Monkfish Committee, but were rejected by the Committee for further analysis prior to preparation of the DSEIS (Section 4.2.1); and alternatives that were analyzed in the DSEIS, presented to the public, but not adopted by the Councils as proposed action items (Section 4.2.2).

4.2.1 Alternatives rejected prior to the DSEIS

The Monkfish Committee considered the following alternatives during the development of this amendment, but did not recommend them to the Councils for consideration and further analysis for the reasons discussed.

4.2.1.1 Single-stock management

In response to scientific inquiry at stock assessment workshops, the Committee considered a single stock approach to monkfish management. The most recent SARC (SARC 34) commented that, while some scientific information suggests there is a single stock throughout the northeast, other information supports the current two-stock approach, and the evidence overall is inconclusive. The SARC noted that the choice of management units is independent of the number of assessment units, but that if it is managed as a single unit (thereby reducing the complexity of the FMP) there is the potential to overfish one stock, if in fact multiple stocks are contained in the management unit. In recognition of this advice, and of the significantly different characteristics of the monkfish fisheries between the two areas, the Committee recommended taking no action on this proposal and retaining the current two-stock assessment and management approach.

4.2.1.2 Individual vessel quotas

The process described in Section 4.2.2.1.1.4 for allocating individual shares of a pool of DAS for the directed fishery could also be applied to allocations of individual vessel

quotas. The process of calculating shares would be done as in the Individual DAS alternative, except that baseline shares would be based on pounds landed on directed trips during the baseline period applied to the total landings by contributing (directed) trips. Expected total catch under incidental catch limits would be calculated and deducted from the TAC to determine the total catch available for the individual vessel quotas. As with the individual DAS alternative, quota shares could be leased or sold, with a cap placed on the total share any single vessel could hold in a given year. For enforcement purposes under this option, on trips where vessels would be fishing under their individual quota, the vessel would still be required to call in and identify the trip as a directed trip. The call-in would facilitate quota monitoring and minimum mesh size regulation enforcement. On trips where the vessel does not call in, the incidental catch limits would apply. The Committee's recommendation to not consider this alternative in Amendment 2 is based on members' concerns that developing an IVQ proposal would risk delaying the amendment due to the proposal's complexity, controversy and resource requirements (to fully develop the alternatives).

4.2.1.3 Measures to protect sea turtle/gillnet interactions

The Councils originally considered including in this amendment specific measures to address Goal VI, and specifically the immediate problem of sea turtle catches in the large mesh gillnet fishery south of 38°N. NMFS Protected Resources Division, which has been working with the Plan Development Team toward development of alternative measures, informed the Monkfish Committee that there are no known gear modifications that would be expected to minimize the number or severity of sea turtle interactions with monkfish gillnet gear, and that the analysis of sea surface temperature data (which is essential to developing time/area based measures) is not ready for application to management measures. The Councils are addressing this interaction in this amendment by including actions to address interactions with protected species in the list of actions that can be taken under the framework adjustment process (Section 4.1.6). With this in place, when the temperature data analysis is completed and alternative time/area closure alternatives are developed, or when gear-based alternatives become available, the Councils can consider the alternatives in a streamlined process rather than the more time-consuming amendment process. The Councils note here that the experimental fishery incentives outlined in Section 4.1.9 will help promote research into minimizing fishery interactions with protected species.

4.2.1.4 Modification of permit qualification for south of 38°N

The Committee considered the following options, but following September, 2002 scoping hearings and further analysis it is recommending they not be considered in the amendment. All of these alternatives would have allowed substantially more vessels into the limited access program than the alternatives being considered. (Alternative numbers in this section refer to the alternative number in the original list under consideration by the Committee, and not the alternative numbers in the DSEIS.)

Alternative 3: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP during the four year period prior to June 15, 1998.

Alternative 4: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP during the four year period prior to June 15, 1997.

Alternative 7: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP between March 15 - June 15 during the four year period prior to June 15, 1998.

Alternative 8: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP between March 15 - June 15 during the four year period prior to prior to June 15, 1997.

4.2.1.5 DAS Counting

The Councils considered three options that would have modified how the first day, or partial days are counted under the monkfish-only DAS system. If monkfish DAS are not separated from multispecies or scallop DAS on Category C and D vessels, then it would be impracticable to count the first day of a trip differently across plans where the DAS are used simultaneously.

4.2.1.5.1 Alternative 1, Option 3a - One landing per calendar day

This option would continue to use the current method of counting actual time between call-in and call-out, but would limit each vessel to only one landing at the per-day trip limit for each calendar day.

4.2.1.5.2 Alternative 1, Option 3b - Count partial days as a 24-hour DAS

This option would count DAS in whole day increments. A vessel on a trip less than 24 hours would have 24 hours deducted from its DAS allocation, and a vessel on a trip longer than one day would have 24 hours deducted from its allocation for the final day of the trip even if the only a partial day was used.

4.2.1.5.3 Alternative 1, Option 3c - Count first day as 24-hour DAS

This option would count the first day of a trip as 24 hours against the vessel allocation, even if the trip were less than one day. On trips over 24 hours, the time counted against the allocation would be actual time between call-in and call-out. In other words, any partial day used at the end of a multi-day trip would be counted as actual time used.

4.2.1.5.4 Alternative 1, Option 3d - No action alternative

Under the current method of counting DAS, vessels other than gillnet vessels are charged actual time between call-in and call-out against their DAS allocation. Vessels can land a per-day trip limit of monkfish for any partial days of a trip. Gillnet vessels are charged a minimum of fifteen hours for trips over three hours, but actual time used for trips less than three hours. A gillnet vessel can land a per-day trip limit for either a trip less than three hours or a trip that charges 15 hours against the DAS allocation. This is the Committee's recommendation for a preferred alternative.

4.2.1.6 EFH Alternative 6 (Tilefish HAPC Closure)

This option proposed closing the Tilefish HAPC to monkfish fishing since tilefish has been defined as a species with EFH vulnerable to bottom tending gear according to the Gear Effects Workshop (2001), and later approved by the NEFMC (Appendix II). According to the spatial locations of the directed monkfish otter trawls trips from 1999 and 2001, a significant portion of them are within the tilefish HAPC. Since this area has been defined as important EFH for tilefish, this option would have prevented monkfish fishing in this area.

There are several pieces of information that may or may not conclude that bottom-tending mobile gear has an adverse impact to tilefish EFH more than minimal and temporary in nature. The Gear Effects workshop (citation) indicated that tilefish EFH, particularly the pueblo village structures, is vulnerable to bottom-trawling. A MAFMC funded report (Able and Muzeni) concludes, based upon a limited review of video tapes of submersible dives, that there is no evidence that otter trawls adversely impact tilefish burrows through sedimentation. Lastly, the NEFMCs gear effects evaluation ranks tilefish EFH as vulnerable to otter trawling based upon the potential adverse impacts to habitat components other than structure such as impacts to food sources, impacts to reproduction, and impacts to non-burrow structures.

EFH Alternative 6 -Option 1: Closed to trawl gear only (on a monkfish DAS)

EFH Alternative 6 -Option 2: Closed to all gears on a monkfish DAS (trawl and gillnets)

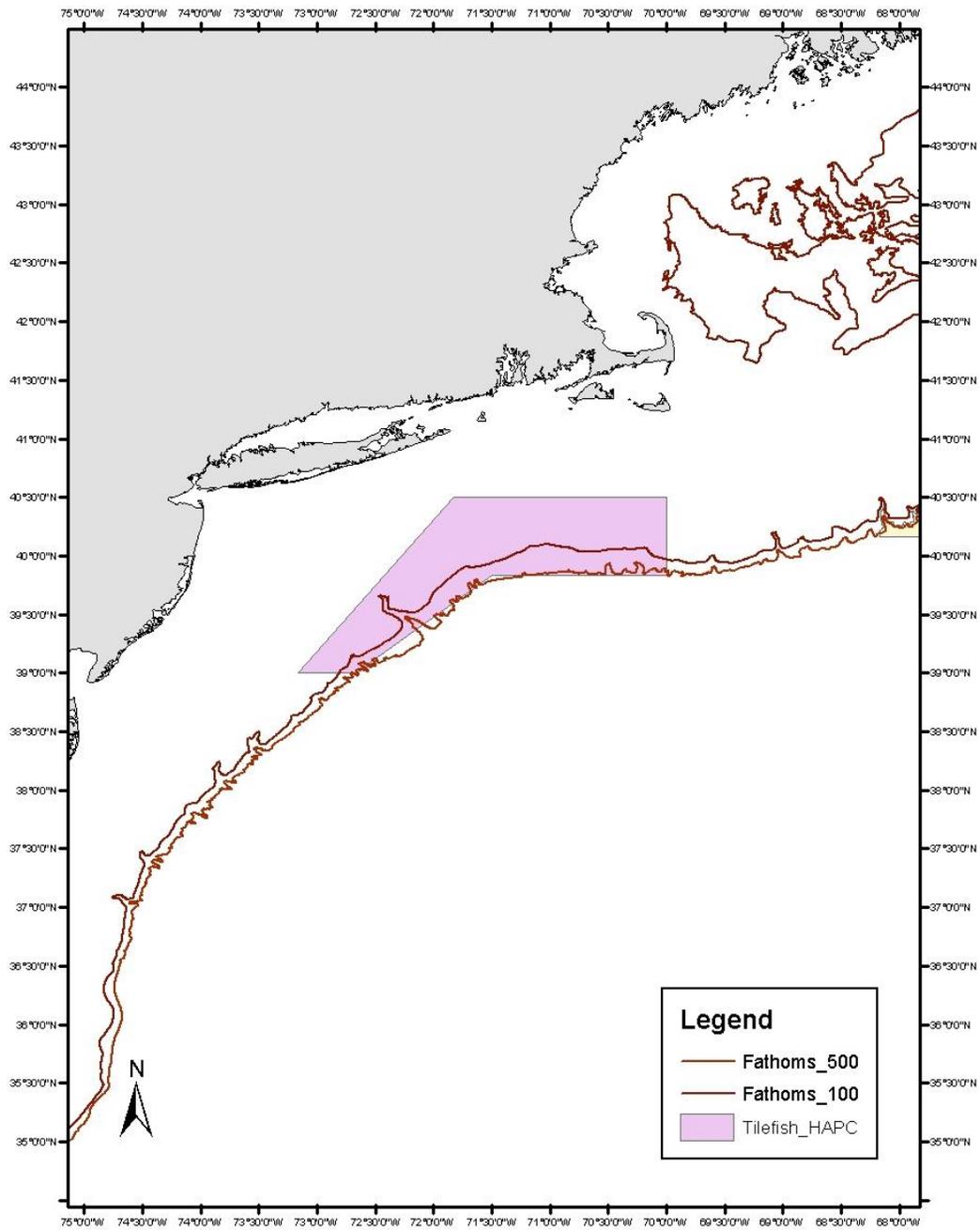


Figure 4 – EFH Alternative 6 – Closure of tilefish HAPC to directed monkfish fishing.

4.2.2 Non-preferred alternatives

This section describes the alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. The discussion under each alternative provides the rationale for the Councils' not adopting these alternatives.

4.2.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, all monkfish limited access permit holders would be allocated 40 monkfish DAS. Options were also provided under Alternative 1 that would allocate individual DAS based on past performance in the monkfish fishery. In addition, DAS could be reduced, under the management program implemented in Framework 2, if the SFMA TAC is set below 8,000 mt. In that case, the trip limits would remain fixed at 550 lbs. and 450 lbs. (tails/DAS) for Category A and C, and B and D, respectively. For example, for FY2004 vessels will only have 28 DAS to fish in the SFMA, but can fish 40 DAS in the NFMA (that is, a vessel can fish 28 DAS in the SFMA and the remaining 12 in the NFMA).

4.2.2.1.1 DAS usage Alternative 1 – De-couple monkfish DAS from scallop and multispecies DAS

This is Decision 1 in Appendix I, and was the Councils' preferred alternative in the DSEIS. Under this alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b).

The following items summarize some of the elements of the de-coupled DAS alternatives that the Councils considered in the DSEIS:

- 1) Under either Alternative 1a or 1b, a vessel that is enrolled in a separated DAS program has the option to fish on a combined DAS on a trip-by-trip basis. When calling in to start the trip, a vessel that is enrolled in a separated DAS program would indicate if it is using a monkfish only DAS or a combined (monkfish/multispecies or scallop) DAS.
- 2) All Category C and D vessels would be allocated monkfish DAS. Options are presented below for Individual or Fleet Monkfish DAS allocations (Decision 1b, Appendix I).
- 3) As under the current program, vessels would be required to declare into the NFMA to fish under the less restrictive trip limits and different minimum fish size (if applicable, Section 4.1.2).
- 4) Vessels that enroll in the offshore fishery program (if adopted, see Section 4.1.4) would have separate MF only DAS allocations and not be able to participate in this "choice" program since enrollment in the offshore program is on an annual basis.

- 5) An experimental fishery would have to be established for trawl vessels fishing on a monkfish (but not a multispecies) DAS in the NFMA (see Section 4.2.2.12) with the purpose of establishing a trawl exempted fishery (in accordance with the multispecies FMP regulations) in the NFMA.
- 6) Scallop and multispecies limited access vessels, when fishing under monkfish only DAS would fish under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS (see Section 4.2.2.3).

Discussion/rationale: This discussion incorporates both the Councils' rationale for initially considering this alternative as a preferred alternative and for their ultimate rejection of it as a proposed action following public comment. Following the discussion of Councils' rationale for rejecting this alternative, there is a complete description of the alternatives that the Councils were considering to further define the de-couple DAS management program. Since they rejected the overall alternative, no further discussion is provided beyond the description of alternatives.

Rationale for the preferred alternative: The Councils believed that these alternatives would meet the goals of addressing problems created by implementation of the FMP, and addressing deficiencies in meeting Magnuson-Stevens Act requirements (particularly bycatch and EFH requirements, as well as achieving optimum yield). Having separated DAS will enable the Councils to address monkfish management issues such as bycatch and EFH impacts directly through gear requirements on monkfish DAS, rather than defaulting to the multispecies and scallop regulations on Category C and D vessels (the majority of monkfish limited access permits) when vessels are on a combined DAS (as under the current system). Having a fishery that is directly controlled by regulations specific to the monkfish fishery will also allow managers to exercise more control over monkfish effort in achieving optimum yield, since that effort will no longer be indirectly, and sometimes unintentionally controlled by the regulations implemented to manage effort in multispecies or scallop fisheries.

If vessels have the option of using monkfish only DAS, the opportunity cost of fishing for monkfish would be reduced on many vessels, especially those fishing in the SFMA, since they would not have to use a multispecies or scallop DAS, and could target monkfish and groundfish separately. Vessels fishing in the SFMA, can specifically direct on either monkfish or multispecies without significant catches of the other, making separate DAS more practicable. Fishermen from the NFMA, however, have commented that monkfish is a component of their multispecies catch, and it would be difficult for them to fish for monkfish separately without causing discards. Furthermore, for many vessels in the NFMA, the no action alternative provides more opportunity to fish for monkfish with no trip limit than either of the proposed alternatives because their multispecies DAS allocations exceed their monkfish DAS. For NFMA trawl vessels, until, and only if a monkfish exempted trawl fishery can be established, those vessels could not use their monkfish only DAS in the NFMA, and may elect to shift to the SFMA to use their monkfish only DAS, potentially slowing the southern stock rebuilding.

Rationale for Councils' rejection of this alternative: The Councils heard nearly unanimous opposition to separating DAS in public comment, and from the Advisory Panel and Monkfish Committee. The public, advisors and Committee members were extremely concerned about the potential increase in fishing effort that would result if vessels were not required to use either a multispecies or scallop DAS when targeting monkfish. This increase in effort could have a negative impact on the monkfish rebuilding program, as well as on other the rebuilding of other species, particularly groundfish stocks, as a result of multispecies DAS being freed up. Active monkfish vessel owners were concerned that as a result of the increased overall effort, their trip limits and DAS allocations would have to be reduced to accommodate the new effort within the confines of the rebuilding program. Furthermore, many commenters were concerned with the evolution of the multispecies effort management system, allowing vessels to target monkfish while on a multispecies "B" day (see Section 2.9.2), and the potential effect that change would have on overall monkfish effort. The Councils, in consideration of these comments, rejected this alternative, and decided to take no action on separation of DAS usage requirements.

The Councils also considered the impact of this alternative on skates and EFH in rejecting it for further action. Since the action would potentially increase overall effort levels, the Skate FMP requires that the Skate PDT prepare a baseline review, which was presented to the Councils prior to their making a final decision (Section 6.2.2.2). The analysis of impacts of decoupling DAS on EFH is contained in Section 6.3.2.1.

The following subsections describe the alternative elements of the de-coupled DAS program that the Councils were considering.

4.2.2.1.1.1 De-coupled DAS Alternative 1a (SFMA only)

This is part of Decision 1a in Appendix I. Under this alternative, a Category C or D vessel would declare annually (when renewing its permit) that it intends to retain the option to fish under monkfish only DAS in the SFMA only. The vessel may declare on a trip-by-trip basis to fish on a combined (multispecies or scallop) DAS or a monkfish only DAS, but may only fish on a monkfish DAS (combined or not) in the SFMA (see Table 11). If a vessel that has declared into the SFMA intends to fish in the NFMA (for example, under multispecies or scallop DAS), then it would fish under the applicable incidental catch limits. In other words, while a Category C or D vessel may fish in the NFMA with no monkfish trip limit while on a multispecies DAS, a vessel that has declared into the SFMA for separation of DAS would only be able to fish under the regulations applicable to Category E vessels in the NFMA, and could not obtain an NFMA exemption authorization letter. A vessel that has not declared into the SFMA would fish under the regulations that apply under Alternative 2 (the no action alternative).

4.2.2.1.1.2 De-coupled DAS Alternative 1b (Annual declaration) (preferred alternative in the DSEIS)

This is part of Decision 1a in Appendix I. Under this alternative, any Category C or D vessel would declare annually its intent to retain the option to fish under a monkfish only DAS. This alternative differs from Alternative 1a in that vessels would not be restricted to fishing on a monkfish DAS (combined or not) in the SFMA. A vessel that declares into

the program would have the ability to call-in a monkfish-only DAS or a combined DAS when starting the trip, and could fish in either area, subject to any area-specific rules and restrictions that apply (see Table 11). A vessel that has not declared into the de-coupled DAS program would fish under the regulations that apply under Alternative 2 (the no action alternative).

The following table (Table 11) summarizes the regulations and options applicable to vessels that have declared into the de-coupled DAS programs under either Alternative 1a or 1b. A vessel that has not declared into the program would fish under the regulations applicable under Alternative 2.

NFMA (Alt. 1b only)	DAS	GEAR	MF Trip Limit (tail wt.)	MS Trip Limits
MF only (For trawls, requires exempted or experimental fishery)	Fleet or Individual (2 Options)	Large Mesh or MF trawl	None	Zero
MS only (any day not using a MF DAS)	MS Regs.	MS Regs.	Lesser of: 400 lbs./50% wt. FOB	MS Regs.
Combined (MS or scallop not using dredge)	Lesser of MF Fleet or Individual DAS or MS DAS (if MS DAS are less than MF DAS, remaining MF DAS must be MF only)	MS Regs. or Large Mesh or MF trawl (3 Options)	None	MS. Regs.

SFMA	DAS	Gear	MF Trip Limit (tail wt.)	MS Trip Limits
MF only	Fleet or Individual (2 Options)	Large Mesh or MF trawl	(2003) 1,250/1,000 lbs. – set annually	Zero
MS only	MS Regs.	MS Regs.	Trawls: Lesser of: 300 lbs./25% wt. FOB Non-trawl: 50 lbs. or 50 lbs. per day/150 or 500 lbs. max.	MS Regs.
Combined (MS or scallop not using dredge)	Lesser of MF Fleet or Individual DAS or MS DAS (if MS DAS are less than MF DAS, remaining MF DAS must be MF only)	MS Regs. or Large Mesh or MF trawl (3 Options)	(2003) 1,250/1,000 lbs. – set annually	MS Regs.

Table 11 Summary of regulations applicable to vessels declared into de-coupled DAS programs under Alternative 1a (SFMA only) or 1b (either area).

Table shows applicable rules on vessels trip declaration to fish on a monkfish, multispecies or combined DAS. Vessels that do not declare into a de-coupled DAS program, under either 1a or 1b, would fish under the current rules (no action alternative).

The Councils considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform (“fleet”) allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery. The NEFMC did not identify a preferred alternative, while the MAFMC identified Option 1a (Fleet DAS) as preferred.

4.2.2.1.1.3 Alternative 1, Option 1a – Fleet DAS allocations

This is part of Decision 1b in Appendix I. This option would assign DAS uniformly within permit categories to all vessels with limited access monkfish permits. This is essentially the current program, but applied to monkfish-only DAS. Initially, all vessels would be allocated 40 monkfish only DAS. As noted, the MAFMC identified this as the preferred alternative, while the NEFMC did not select either option.

The Councils considered two options for allocating Fleet DAS and associated trip limits, as follows:

Option 1a(1) - Variable trip limits/uniform DAS: Uniform DAS allocations across permit categories, and differential trip limits between management areas and between Categories A/C and B/D to reflect higher initial qualification criteria. This is the current system of distributing the TAC (no action alternative).

Option 1a(2) - Uniform trip limits/variable DAS by permit category: Uniform trip limits across all permit categories within each management area, with Category A and C DAS allocations greater than Category B and D DAS to reflect the higher initial qualification criteria. NOTE: Option 1a(2) is not practicable at this time because the variable Fleet DAS allocations cannot be calculated with available data and is, therefore not analyzed further in this SEIS.

4.2.2.1.1.4 Alternative 1, Option 1b – Individual DAS allocations

This is part of Decision 1b in Appendix I. This option would distribute, based on past participation in the monkfish fishery, individual shares of a total pool of DAS for the directed fishery according to the method described below. This option assumes that the directed monkfish fishery is the residual claimant to an annual target TAC (i.e. after accounting for expected catch in non-directed fisheries). As with Option 1a, on vessels fishing in the NFMA, where there is currently no trip limit on limited access (monkfish vessels) fishing on a multispecies DAS, incidental catch limits are based on analysis of monkfish catch on vessels fishing on multispecies DAS. For the SFMA, it will apply the current incidental catch limits, or any changes to incidental catch limits proposed in this amendment. The total expected catch on trips not on a monkfish DAS under the incidental catch limits is subtracted from the TAC to determine the total portion of the TAC that would be available to the directed fishery in each area, and subsequently the DAS and trip limits that would apply on monkfish-only DAS.

The process of distributing individual DAS would go through the following steps:

Step1. Establish individual vessel baseline share of DAS (percentage of the total pool of available DAS) based on level of participation in the monkfish fishery. Qualifying days are based on cumulative effort (days absent or DAS) over the qualifying period when monkfish was 40, 50, or 60 percent or more of total weight of fish on board (where

“weight” refers to live weight equivalent). The qualification period for determining baseline DAS shares is 1997-2001, including both pre- and post-FMP effort.

Qualification options:

Qualification Option 1: days are counted when monkfish was **40 percent** or more of the total weight of fish on board. Total number of days in the pool = **25,000**.

Qualification Option 2: days are counted when monkfish was **50 percent** or more of the total weight of fish on board. Total number of days in the pool = **20,000**.

Qualification Option 3: days are counted when monkfish was **60 percent** or more of the total weight of fish on board. Total number of days in the pool = **17,000**.

The purpose of establishing qualification criteria is for calculating individual vessel shares of the total pool of DAS. Each vessel’s share would be calculated by dividing that vessel’s number of days at or above qualification criterion by the total number of days in the pool. The lower the qualification threshold (for including days in the total pool), the more days would be included in the denominator, and, therefore, would distribute the pool of available DAS across more vessels. If all of a vessel’s qualifying days qualify at the highest level, for example, that vessel would have a lower share at the lower qualification threshold since the same number of qualifying days would be divided by a larger pool. On the other hand, some vessels would see their shares increase because of the lower qualification and the larger number of days they contribute to the numerator. The shares equate to a percentage of a total pool of DAS available for the directed fishery, calculated in Step 2.

Step 2. The total DAS available depends on the target TAC in any given year after subtracting out the expected catch of monkfish not on a DAS, that is, fishing under incidental catch limits. The pool of available DAS is calculated by dividing the directed fishery component of the TAC by the average catch per DAS on directed monkfish trips. For the purpose of this analysis, the SFMA incidental catch is based on the total monkfish catch on vessels not on a monkfish DAS. In the NFMA, however, where there is no trip limit on a Category C or D vessel fishing on a multispecies DAS, the same criterion cannot be applied. In this case, the incidental catch portion of the TAC was calculated by adding the catch on all trips below the Category E trip limit, that is, the lesser of 50 percent of total weight of fish on board, or 400 lbs./DAS. Using the FY2003 TACs as an example, the pool of DAS would be calculated as follows:

	2003 TAC (1,000 lbs)	Incidental Catch (1,000 lbs)	Directed Fishery TAC (1,000 lbs)	Average catch/DAS (lbs.)	DAS pool
NFMA	39,039	3,500	35,539	2,000	17,769
SFMA	22,511	6,500	16,011	1,400	11,436

Table 12 Calculation of Individual DAS pool using FY2003 TACs.

The total DAS pool to be allocated to individual DAS vessels would be 17,769+11,436=29,025.

Step 3. Allocation per vessel is then determined as the product of the baseline share and total allowable DAS. NMFS will inform vessel permit holders of their individual shares prior to public hearings.

The PDT conducted a preliminary analysis (because the final distribution would be based on the outcome of appeals) using Qualification Option 1 (counting days where monkfish comprised 40 percent of the total weight of fish on board during the 1997-2001 qualification period). The analysis shows that a total of 40 vessels would account for a 20 percent share of the total pool of DAS share. A total of 96 vessels would account for a 40 percent share (note both vessel count and share are cumulative, that is the 96 vessels includes the 40 vessels in the first statement). A total of 129 vessels would have a 50 percent share, and 196 vessels would account for 66.7 percent of the total pool. Since there were a total of 726 vessels included in the analysis (that is, they had qualifying days), and 581 vessels would account for 100 percent of the total pool, 145 vessels would get no share at all.

To illustrate these percentages so that they can be additive: 40 vessels accounted for the first 20 percent (average share of 0.5 percent); 56 vessels accounted for the next 20 percent (average share of 0.36 percent); 33 vessels accounted for the next 10 percent (average share of 0.3%); 67 vessels accounted for the next 16.7 percent (average share of 0.25 percent); and 385 vessels accounted for the last 33.3 percent (average share of 0.09 percent). As noted, this leaves 145 vessels that would receive no share.

Note that if a different qualification criterion were used, such as counting only days where monkfish was 50 percent of the total weight of fish on board, the total pool of days would be smaller and fewer vessels would qualify for shares. The distribution of shares, however, would still be skewed because a relatively small number of vessels account for the majority of monkfish landings (many vessels land relatively small proportions of the total, while a few vessels land comparatively large proportions).

Step 4. Vessels would be provided an opportunity to appeal individual share allocations and would fish under the fleet allocation (40 DAS) during the first year pending resolution of appeals.

4.2.2.1.1.5 Alternative 1, Option 2a - Implement transferable MF-only DAS under the Amendment 2 rule

This is part of Decision 1c in Appendix I. If DAS are separated, under Alternative 1, whether allocated as fleet or individual MF only DAS, a vessel owner could transfer its monkfish-only DAS to another permitted vessel. This option would implement, as a component of the separated monkfish DAS provision of this amendment (if adopted), a procedure to enable vessels to transfer, their monkfish DAS allocations, including conditions, restrictions and other parameters as outlined in the DSEIS for Amendment 13 to the Multispecies FMP, with appropriate monkfish-specific considerations. Of the following three alternatives, no action, DAS leasing and DAS sale, the Councils did not identify a preferred alternative, but indicated their preference that DAS transfer not be implemented as part of the Amendment 2 rule but that it be considered in the future under the framework adjustment process.

4.2.2.1.1.5.1 Transferable DAS Option 1 (no action)

This is part of Decision 1d in Appendix I. Current regulations do not provide for separation of the DAS from the vessel permit, and, therefore, do not allow for leasing or sale of monkfish DAS.

4.2.2.1.1.5.2 Transferable DAS Option 2 (leasing)

This is part of Decision 1d in Appendix I. This alternative, and its various options described in this section is adapted from the DAS leasing alternative under consideration in the Multispecies FMP Amendment 13.

The following elements would form the basis for a leasing program that would not necessarily be affected by measures that may affect limits on DAS exchanges to assure conservation equivalency, as described below.

Common Elements

Term of Lease: DAS would be leased for only one fishing year.

Multiple vessel transactions: Vessels may lease DAS from more than one other vessel (conversely vessels may lease DAS to more than one vessel) subject to conservation equivalency provisions.

Lease units: DAS may be leased on a unit basis where a unit is defined as being 1 DAS or 24 hour increment.

Conservation tax: Leases would not be subject to a “conservation tax.”

Renewal of Lease: Vessels may renew leased DAS on an annual (fishing year) basis.

Required Use: Leased DAS must be used in the same fishing year they are acquired.

Prohibition on Carry-Over: Leased DAS may not be used as part of any carry-over.

Limit on Leasing by Category: DAS available for leasing shall be limited to only Category A DAS; DAS that may be immediately available for use. (Note: this element is contained in the Multispecies Amendment 13 leasing proposal, but is not applicable in the monkfish fishery since DAS are not categorized.)

Registration of Leases: Lease agreements must be registered with the NERO. Administrative process based on two possible approaches 1) internal administration by NERO or 2) external administration by approved “brokers” (for example, permit brokers could be sanctioned by NERO to document exchanges and provide data to NERO for monitoring and enforcement purposes) to be developed.

Permit History: the lease agreement must clearly state which permit retains the history of the leased DAS

Conservation Equivalency (CE) Alternatives

CE Option 1: Leasing Within Size Categories

A lessor may not lease DAS to any vessel with a main engine horsepower rating that is more than 20% that of the lessee and may not lease DAS to any vessel that is more than 10% of the lessee's vessel's LOA, GRT, and NT.

Sub-Leasing DAS

There are two options for sub-leasing of DAS:

Sub-leasing Option A: DAS cannot be sub-leased

Sub-leasing Option B: DAS can be sub-leased

CE Option 2: Calibrated DAS

Creating a standardized measure to calibrate effective effort (hereafter referred to as a *calibration factor*) across vessel sizes would provide broader opportunities to match buyers and sellers of leased DAS. Calibration of DAS across vessel platforms needs to take into account the potential difference in capacity output of each vessel to assure that DAS trades are capacity neutral. Such capacity output measures were developed as part of the latent multispecies permit buyout and provide a basis for developing a calibration factor for leasing DAS. For the latent permit buyout, capacity estimates for inactive vessels were based on the average capacity output per DAS for active vessels for six different vessel horsepower clusters. These average values may then be used to develop a schedule of calibration factors to determine the number of potential DAS that may be exchanged (note that this approach is identical to what was developed for Amendment 7 to the Scallop FMP).

Sub-leasing DAS

There are two options for sub-leasing of DAS:

Sub-leasing Option A: DAS cannot be sub-leased

Sub-leasing Option B: DAS can be sub-leased

CE Option 2A: With this option, DAS leases would be subject to the calibration factors in Table 13. Since the calibration factors in Table 13 and Table 14 were not developed specifically to accommodate a leasing program they should be regarded as preliminary and may be adjusted upon further review by the PDT. The number of horsepower classes may also need to be adjusted.

These calibration factors provide for both upward and downward adjustments to DAS based on the buying and selling vessel's horsepower class. A selling vessel in any given class would be able to lease DAS to a buying vessel in the same class at a 1:1 rate. A selling vessel in any given class would be able to lease DAS to any vessel in a lower class at a higher rate but would be able to lease DAS to any vessel in a higher class at a lower rate. For example, if a vessel in the 251-324 horsepower class had 10 DAS available to lease, that vessel could lease exactly 10 DAS to another vessel in the same class. If the same vessel were to lease to a vessel in the 176-250 horsepower class then the buying

vessel would receive 11.4 DAS. From a DAS accounting perspective, the selling vessel would have its DAS reduced by 10 DAS while the buying vessel would have its DAS allocation increased by 11.4 DAS.

		Selling Vessel Horsepower Class					
		0-175	176-250	251-324	325-400	401-650	651+
Buying Vessel Horsepower Class	0-175	1.00	1.25	1.42	1.72	2.05	2.76
	176-250	0.80	1.00	1.14	1.37	1.63	2.20
	251-324	0.70	0.88	1.00	1.21	1.44	1.93
	325-400	0.58	0.73	0.83	1.00	1.19	1.60
	401-650	0.49	0.61	0.70	0.84	1.00	1.35
	651+	0.36	0.45	0.52	0.62	0.74	1.00

Table 13– Option 2A for calibration of DAS between vessels

CE Option 2B: Allowing upward adjustments places a significant burden on the precision of the estimated capacity output by horsepower class that is used to calculate the calibration factors. A more precautionary approach would be set all DAS calibration factors for DAS leases from a larger vessel to a smaller vessel equal to one. The calibration factors that would be associated with this option are shown in Table 14. Under this option any vessel within one horsepower class that was leasing DAS from a vessel in a higher class would lease DAS at a 1:1 rate. Vessels leasing DAS from any vessel in a lower horsepower class would lease DAS at less than a 1:1 rate. For example, a vessel in the 176-250 horsepower class would lease DAS at a 1:1 rate from any vessel in the same or higher horsepower class. However, if this vessel were to lease DAS from a vessel in the 0-175 horsepower class then the DAS would be leased at a 0.8:1 rate. For an exchange of 10 DAS in this case the selling vessel’s DAS allocation would be reduced by 10 DAS and the buying vessel’s allocation would be increased by only 8 DAS.

		Selling Vessel Horsepower Class					
		0-175	176-250	251-324	325-400	401-650	651+
Buying Vessel Horsepower Class	0-175	1.00	1.00	1.00	1.00	1.00	1.00
	176-250	0.80	1.00	1.00	1.00	1.00	1.00
	251-324	0.70	0.88	1.00	1.00	1.00	1.00
	325-400	0.58	0.73	0.83	1.00	1.00	1.00
	401-650	0.49	0.61	0.70	0.84	1.00	1.00
	651+	0.36	0.45	0.52	0.62	0.74	1.00

Table 14– Option 2B for calibration of DAS between vessels

Limitations on Number of DAS Leased

Limitations Option 1: A vessel would be allowed to lease from other vessels not more than 50 percent of its Amendment 2 allocation (not including carry-over DAS).

Limitations Option 2: A vessel would be allowed to lease from other vessels not more than its Amendment 2 allocation (not including carry-over DAS).

Limitations Option 3: A vessel would not be allowed to lease from other vessels more days than 365 minus its Amendment 2 allocation (including any carry-over DAS). In other words, the total number of leased and allocated DAS could not exceed 365, including any carry-over.

Permit History Provisions

To clarify the implications of leasing DAS on permit history, the following policies will be followed:

- The history of DAS use remains with the permit that "owns" the DAS (that is, the lessee retains the DAS history of any DAS leased to another vessel—even after the DAS are leased).
- Any landings associated with leased DAS remain with the permit that lands the fish.
- If a vessel does not use all the DAS that are allocated to it and that it leases, the DAS will be considered used in the following order (one alternative will be selected by the Council:

Permit History Option A: Leased DAS are considered used first

Permit History Option B: Leased DAS are considered used last

Expiration of a Leasing Program

There are two options for the duration of the proposed leasing program

Expiration Option 1: Any adopted DAS leasing program will continue indefinitely unless changed by a future Council action.

Expiration Option 2A: Any adopted DAS leasing program will automatically expire after a **two to five** year period unless extended by a future Council action. The length of the period will be determined after considering public comment on this Amendment. If an expiration date is adopted, there is no guarantee that a DAS leasing program will be renewed.

Expiration Option 2B: Any adopted DAS leasing program will automatically expire after a **one-year** period unless extended by a future Council action.

Confirmation of Permit History

Any permit in the permit history category cannot lease DAS to an active permit.

4.2.2.1.1.5.3 Transferable DAS Alternative 3 (sale of DAS)

This is part of Decision 1d in Appendix I. This alternative would allow monkfish permit holders to sell monkfish DAS to other monkfish limited access vessels based on the program developed for Multispecies Amendment 13 and taking into account any monkfish-specific considerations.

Measures

All transfers of DAS are limited to monkfish limited access vessels. The LOA or gross registered tonnage of the purchasing vessel may not be more than 10% greater and its

horsepower may not be more than 20% greater than the baseline of the selling vessel. The selling vessel is required to retire from all state and federal commercial fisheries. Consistent with the DAS leasing program, a history permit cannot transfer its DAS to another vessel.

Option 1: Adopt the transfer provisions without a flat rate reduction in DAS transferred from smaller to larger vessels.

Option 2: Adopt the transfer provision with the condition that DAS transferred from smaller to larger vessels are subject to a substantial flat rate reduction based on the following formula: In a transaction between selling Vessel A (smaller) to buying Vessel B (larger), DAS available to Vessel B after transfer = 30% of Vessel A's active DAS + 5% of Vessel A's inactive DAS.

Restrictions

Category 3 vessels (that is, those with any landings of monkfish during the time period used to define active DAS) and Category 2 vessels (that is, those with any landings of any species during the time period used to define active DAS) may transfer DAS with some reduction in fishing privileges for the recipient, as described below:

Option 1: Transferred active DAS will be reduced by 40% and inactive DAS will be reduced by 90%.

Option 2: No reduction in the number of active or inactive DAS transferred.

For the purpose of this alternative, **active DAS** are determined based on the definition of "effective effort" chosen in Amendment 13. If an alternative which defines active DAS is *not* chosen for Amendment 13, active DAS will be defined according to one of the following two options:

Option 1: Active DAS are the maximum days used (not to exceed current DAS allocations) as determined by the call-in system or days absent computed from the VTR on trips where monkfish were landed, from fishing years 1994 to 1999.

Option 2: Active DAS are days on which more than 10% of landings by weight (as reported in the VTR) was composed of monkfish (tail weights converted to whole weights) from fishing years 1994 to 1999.

In this document the terms *active DAS* and *effective effort* are used interchangeably.

Reactivation of DAS – (DAS Use by Permit Buyer)

All DAS acquired by a vessel under this alternative may not be used immediately following the transaction. Instead, they will be made available to the permit recipient according to the following reactivation schedule:

Option 1: **Phase-In of DAS**

20% of the DAS acquired (after a conservation tax is applied) could be reactivated each year. In other words, a vessel would be allowed to use only 20% of the DAS it bought in the first year, 40% the next year, 60% the next, and so forth.

The Council may increase the rate at which the DAS could be activated each year through a framework adjustment.

Option 2: **Immediate Use of DAS**
DAS may be used in their entirety at any time following the transaction.

4.2.2.2 Trip/possession limits for incidental catch

The Councils considered alternatives for modifying the allowable retention of monkfish incidental catch by vessels in various fisheries.

4.2.2.2.1 Alternatives to the 50 lbs./trip incidental catch limit

This is Decision 2 in Appendix I. The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted one (Alternative 2). In addition, the Councils propose to apply this limit to surf clam dredge and General Category scallop dredge vessels, rejecting the no action alternative. In a separate alternative, for the purpose of applying the monkfish incidental catch limit on “large-mesh trips”, as described in Section 4.1.1.3, the Councils recommend returning to the boundary between the Mid-Atlantic and Southern New England Regulated Mesh Areas to its location prior to groundfish interim rule (this change would only apply to the monkfish incidental catch limit and not other regulations that apply in each area). The following describes the non-preferred alternatives, and the rationale for rejection.

4.2.2.2.1.1 Incidental catch Alternative 1 – 50 lbs. (tails) per trip (no action alternative)

The incidental catch limit is 50 lbs. (tails) per trip on all vessels not on a DAS and fishing with small mesh (defined as mesh smaller than multispecies minimum mesh in the GB/GOM and SNE Regulated Mesh Areas, and fluke minimum mesh, specified in §648.94 (c) (3)(i), in the Mid-Atlantic regulated mesh area) and handgear. The same limit applies on multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used. The incidental catch limit is up to 5 percent of the total weight of fish on board on vessels using large mesh (that is, fluke mesh in the Mid-Atlantic Regulated Mesh Area and multispecies mesh elsewhere) when not on a DAS.

4.2.2.2.1.2 Incidental catch Alternative 3 – 50 lbs. (tails) per day/500 lbs. maximum

Vessels would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 500 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

4.2.2.2.2 General Category scallop dredge and clam dredge incidental limit – Alternative 1 (no action)

This is Decision 3 in Appendix I. Currently, general category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. General Category scallop dredge vessels are an open access permit category in which vessels are restricted to a possession limit of 400 pounds of scallop meats. Clam dredge vessels are managed under an Individual Transferable Quota (ITQ) system, and harvest surf clams and ocean quahogs with a hydraulic dredge. The Councils are proposing including these two vessel groups under the small mesh incidental limit (50 lbs./day up to 150 lbs. maximum).

4.2.2.2.3 Incidental catch limit on summer flounder vessels west of 72°30'W (no action)

This is Alternative 1, Decision 4 in Appendix I. The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to the amounts that were allowed prior to the 2002 interim rule implementing changes to the Multispecies FMP.

The Monkfish FMP specifies that “large mesh” (for the purpose of determining the applicable monkfish incidental catch limit) in the Mid-Atlantic Regulated Mesh Area is that which is specified under the Summer Flounder FMP, or 5.5-inch diamond/6-inch square. The Multispecies interim rule shifted the large-mesh multispecies line (SNE/MA Regulated Mesh Areas boundary) from 72°30'W to 74°00'W. Consequently, the area east of 74°00'W is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30'W and east of 74°00'W went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1. The Councils rejected the 500 lbs. maximum alternative (Alternative 3, Decision 2) because of a lack of evidence that affected vessels actually have a monkfish bycatch problem that would not be adequately addressed by the selected alternative (150 lbs. maximum), and to minimize the incentive to target monkfish with small mesh.

4.2.2.3 Minimum trawl mesh size on directed MF DAS

This is Decision 5 in Appendix I. The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, including the no action alternative that they adopted. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

4.2.2.3.1 Minimum trawl mesh size Alternative 2

Under this option, trawl vessels on a monkfish DAS would be required to use 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net. This would apply on Category A and B vessels, and on Category C and D vessels with a scallop limited access vessel, fishing on a combined scallop/monkfish DAS. If DAS were de-coupled, the Councils were considering one of two options for Category C and D vessels fishing under the optional combined multispecies/monkfish DAS.

4.2.2.3.1.1 Mesh Alternative 2 Option 1

Alternative 2 mesh size would apply on monkfish only DAS, but not on combined monkfish/multispecies DAS.

4.2.2.3.1.2 Mesh Alternative 2 Option 2

Alternative 2 mesh sizes would apply on combined multispecies/monkfish DAS.

4.2.2.3.2 Minimum trawl mesh size Alternative 3

This option is similar to the previous option, except that the applicable mesh in the body of the trawl net would be the minimum mesh that applies on multispecies vessels. The mesh that applies in the codend would be 12-inch square mesh, or its nearest metric equivalent. This would apply on Category A and B vessels, and on Category C and D vessels with a scallop limited access vessel, fishing on a combined scallop/monkfish DAS. As with Alternative 2, if DAS were de-coupled, the Councils were considering one of two options for Category C and D vessels fishing under the optional combined multispecies/monkfish DAS.

4.2.2.3.2.1 Mesh Alternative 3 Option 1

Alternative 3 mesh size would apply on monkfish only DAS, but not on combined monkfish/multispecies DAS.

4.2.2.3.2.2 Mesh Alternative 3 Option 2

Alternative 3 mesh sizes would apply on combined multispecies/monkfish DAS.

Discussion/Rationale: The Councils considered increasing the minimum mesh size requirement on monkfish trawl vessels primarily to minimize the bycatch of small monkfish and of other species. However, minimizing or eliminating the ability of a large-mesh monkfish net to catch other species, particularly regulated multispecies, reduces the incentive to fish in areas where they otherwise might have a component catch of other species, with commensurate benefits to the EFH of those other species. Increased mesh sizes also have the effect of shifting the exploitation pattern to larger fish, increasing the yield-per-recruit (average weight of fish in the catch). Gillnet vessels fishing with 10-inch minimum mesh do not appear to have the same bycatch problems as trawl vessels, and,

furthermore, many gillnet vessels actually use meshes larger than the minimum size, according to anecdotal reports.

While the Councils considered increasing the trawl minimum mesh size to address both bycatch of small monkfish and of other species, the preferred alternative in the DSEIS was no action. The basis for this preference is that data is not yet available to quantify the benefits, and, in the case of regulated species, bycatch issues are addressed by the exempted fishery program requirements (that is, regulated multispecies must bycatch must not exceed 5 percent of the total catch for a fishery to qualify as a multispecies exempted fishery). Most of the industry advisors (that is, who fish with gillnets) and the Monkfish Committee recommended Alternative 3.

Under the current rules, which the Councils are not proposing to change, mobile gear vessels on a monkfish DAS (Category A and B) or on a scallop/monkfish DAS (Category C and D) are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches (stretched measurement). Category C and D vessels on a monkfish/multispecies DAS can use the mesh size specified in the multispecies FMP. Under the terms of the proposed Offshore Fishery Program (see Section 4.1.4), vessels enrolled in the program would be required to use the gear required on Category A and B vessels, even if they are a Category C or D permit with a multispecies limited access permit. In discussing the final action on this alternative, one Council member noted that, even though no scientific studies have document the selectivity of 12-inch square mesh on groundfish, his experience has been that there is virtually no groundfish bycatch with the 10-inch square mesh. This observation was supported by a member of the advisory panel who is currently involved in a cooperative research project examining the selectivity of 10-inch mesh. Furthermore, while 12-inch mesh may catch fewer sub-legal sized monkfish than 10-inch square mesh, it also likely reduces the catch of legal sized monkfish, creating inefficiencies and an incentive to strategize ways to minimize those losses. The Councils also noted that with the proposed reduction in minimum fish size in the southern area (from 14 inches to 11 inches, tail length), the number of sublegal sized monkfish caught will decline.

4.2.2.4 Minimum fish size

This is Decision 6 in Appendix I. The Councils considered four alternatives for minimum fish size, including the no action alternative. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS.

4.2.2.4.1 Minimum fish size Alternative 1 (no action)

The current regulations apply different minimum sizes in the NFMA and SFMA, as follows:

NFMA: 11 inches (tail) or 17 inches (whole)

SFMA: 14 inches (tail) or 21 inches (whole)

4.2.2.4.2 Minimum fish size Alternative 2 (uniform size in both areas – 10 inches)

The Councils considered two minimum fish size options that would apply in both areas, and propose a uniform 11-inch tail size. This alternative, (Option 2, Alternative 2, Decision 6 in Appendix I) would have reduced the minimum size to 10 inches (tail), 15 inches (whole) in both areas.

4.2.2.4.3 Minimum fish size Alternative 3 (no minimum size)

Under this alternative, the minimum size would be eliminated.

4.2.2.4.4 Minimum fish size Alternative 4 (different size on monkfish-only DAS)

The Councils were considering this alternative if they adopted the DAS option that separates monkfish DAS from multispecies and scallop DAS usage requirements (under Decision 1 in Appendix I), and it would apply on monkfish-only DAS. Under this option, vessels fishing on a monkfish-only DAS, using large mesh as described Section 4.2.2.3, would have a uniform (in both areas) minimum size of 14 inches (tail), 21 inches (whole). This is the status quo minimum size in the SFMA and an increase from 11 inches (tail) in the NFMA.

Discussion/Rationale: The Councils considered reducing or eliminating the monkfish minimum size limit to reduce regulatory discards and improve monkfish commercial catch-at-age data. Minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish, and increase yield per recruit (if successfully linked to gear requirements that have the appropriate size selectivity characteristics). On the other hand, a minimum size rule increases discards (because gear selectivity is not precise, or “knife-edged”), and results in incomplete commercial catch-at-age data because the landings data do not include the portion of the catch that is discarded. The Monkfish PDT agreed that, in general, there are more negative aspects to having a monkfish minimum size rule than not. Furthermore, the PDT noted that a significant portion of monkfish is caught incidentally in fisheries using gear that is not as size-selective as that required of the directed fishery, which diminishes the benefits of a minimum fish size in the directed fishery. As long as small-mesh and even 6-inch mesh fisheries catch monkfish, then a minimum size regulation will cause discarding of sub-legal sized monkfish. The PDT recognized, however, that in the absence of minimum size limits, other measures are needed to prevent targeting of small monkfish. The PDT suggested that gear strategies and/or other measures (targeted area closures) may be better approaches to delaying age at first capture (increasing yield per recruit) but their effectiveness depends on widespread support of fishermen and the willingness of fishermen to use gear solutions as intended.

The Councils have indicated that their preference for a uniform minimum fish size is based primarily on improving enforcement, and it will result in some reduction in discards, since the minimum size is being reduced in the southern area. Furthermore, the retaining a minimum size reaffirms the original basis for the minimum size rule, that is, to discourage targeting of small fish and increasing yield per recruit. The Advisory Panel was split between recommending no action and adopting a uniform 11-inch minimum size (the Councils’ proposed action). Those supporting no action did not want to see a lower minimum size in the southern area than what is currently in place. The advisors

generally opposed eliminating the minimum size because they did not want to create any incentive to target small monkfish, and this was also reflected by Council member comments.

4.2.2.5 Closed season or time out of the fishery

This is Decision 7 in Appendix I. The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) and propose Alternative 2, eliminating the closed season requirement.

4.2.2.5.1 Closed season Alternative 1 (no action)

Multispecies vessels (Monkfish Category C and D) are currently required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.

4.2.2.5.2 Closed season Alternative 3

Under this alternative, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations.

4.2.2.5.3 Closed season requirement under separated DAS

If DAS were separated, all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (20-day block) or Alternative 3 (2 20-day blocks).

Discussion/Rationale: The PDT reviewed the current regulations requiring vessels to take 20-day blocks out of the fishery during the spring and agreed that there is no apparent biological benefit from a 20-day-out requirement. Under the current 20-day block out of a 90 day period, a vessel still has 70 calendar days during which it could use most or all of its 40 monkfish DAS. Scallop/monkfish vessels are not subject to this requirement. As long as other fishing can occur, the benefits to spawning will not be realized, even if they cannot be measured or predicted. The PDT recommended that if the Councils want to retain a time-out requirement to protect a spring monkfish migration or spawning activity, the amount of required time out should be increased significantly, and it should be applied at the same time for all monkfish vessels. (Currently the start and end dates are different for monkfish-only and multispecies-monkfish vessels.) The Councils rejected the extended spawning closure alternative because its efficacy cannot be demonstrated, and because vessels fishing under the incidental limits would still be landing monkfish during this period.

4.2.2.6 Offshore SFMA Fishery

This is Decision 8 in Appendix I. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected

options for the area covered under this program, and for the applicable trip limits and associated DAS that are discussed in this section.

4.2.2.6.1 Offshore SFMA Fishery Alternative 1 (no action)

Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas.

4.2.2.6.2 Offshore SFMA Fishery Alternative 2 (preferred alternative in the DSEIS)

As noted, under alternative the Councils considered, but rejected two options related to the area covered, and to the applicable trip limits and DAS.

Offshore Area Option 2: north of 38°00' and offshore of the loligo squid exemption line to its intersection with the northern boundary of the Monkfish/Skate trawl exemption area, 40°10'N, then eastward along the trawl exemption boundary, (Figure 5)

Offshore program DAS/trip limits Option 1: at the time of enrollment in the program, a vessel would select one of three choices, in addition to the standard trip limit/DAS applicable to all vessels. The choices are based on a ratio of 1:2, 1:3, or 1:4. Ratio is standard to program trip limit, so, for example, if the standard trip limit is 1,000 lbs./DAS, a 1:2 choice would allow the vessel to land up to 2,000 lbs./DAS on up to 1/2 the standard DAS allocation.

Discussion/Rationale: The proposed action addresses the problem created by implementation of the FMP without the “running clock”. The Councils’ original FMP proposal, disapproved by NMFS, would have allowed vessels to run their DAS clock upon returning to port to account for any trip limit overages. Without the running clock, offshore vessel owners have stated they can no longer profitably fish for monkfish under the restrictive trip limits while also consuming a multispecies DAS. The running clock would have allowed vessels to exceed the per-day trip limit and remain at the dock with the DAS clock running to account for the overage.

The Councils rejected Area Option 2 because of public comment supporting the proposed option that uses the squid exemption line as the northern boundary. Option 2 would eliminate much of the monkfish fishery on the southern flank of Georges Bank (Figure 5). The Councils rejected Trip limit/DAS Option 1, with the variable DAS allocation based on each vessel’s selected trip limit ratio, because the proposal was overly complicated, and because public comment supported a 1,600 lb. trip limit with the potential for increased DAS (depending on the trip limits allocated to the regular fishery).

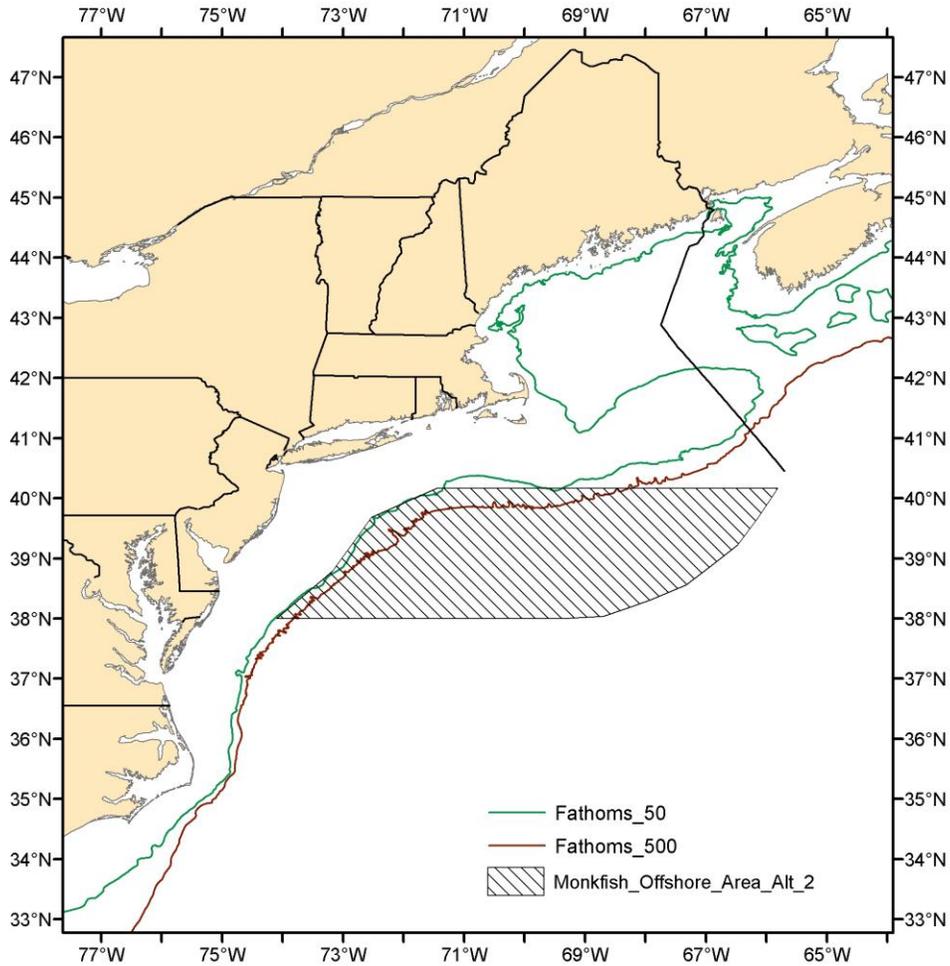


Figure 5 Offshore Area Alternative 2 –

Alternative 2, considered but rejected, would follow the Illex Exemption Area boundary from 38°N to the northern boundary of the Southern New England Monkfish Trawl Exemption Area (at 40°10'N), and then due east to the intersection with the EEZ boundary.

4.2.2.7 Modification of permit qualification for south of 38°N

This is Decision 9 in Appendix I. The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

Vessels that qualify for a permit under one of these alternatives would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38° N, pending any change to the sea turtle protection closures that would provide fishing opportunity in that area. If the current sea turtle protection measures are not modified prior to the effectiveness of any revised permit qualification alternative under consideration in this section, then the northern boundary of the area accessible to vessels qualifying under this action would be set at 38°20'N when the Councils submit the final amendment document.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
Alternative 3	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 15 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

Discussion/Rationale: As noted in the discussion of the proposed action in Section 4.1.5, during the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border. The Councils tacitly rejected the no action and other alternatives by virtue of having adopted one of the

action alternatives, based on a review of the analysis and public comment supporting Alternative 3.

4.2.2.8 NAFO Regulated Area exemption program – no action

This is Alternative 2, Decision 10 in Appendix I. Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.9 Measures to minimize fishery impact on EFH

This is Decision 11 in Appendix I.

4.2.2.9.1 EFH Alternative 1 (No Action, which now includes EFH Alternative 3)

This option is the baseline EFH alternative, that is, the measures that would be in effect if the Councils take no action on measures proposed in this Amendment. Both Amendment 10 and Amendment 13 have been approved since the Councils completed development and analysis of this no-action alternative in the DEIS; therefore, this alternative includes measures implemented by Amendment 13 and Amendment 10 (EFH Alternative #3).

Table 16 evaluates the habitat impacts of the No Action alternative in this Amendment for each type of management measure. Overall, if no action is taken in this Amendment, the impacts on EFH will be neutral, relative to the status quo. Figure 6 displays the year-round closed areas, both habitat and mortality closures, that are in effect under the No Action alternative.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Authorized fishery programs	Monkfish	<ol style="list-style-type: none"> Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N. 	<ol style="list-style-type: none"> This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect. 	0
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. 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 EFH. Rare kelp beds are found in that area.	+
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	+
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
EFFORT REDUCTION MEASURES				
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Monkfish	Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously	This alternative relies on the scallop and multispecies management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	+
Trip limits for incidental catch	Monkfish	<ol style="list-style-type: none"> 1. 50 lbs. (tails) per trip. 2. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. 3. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00' went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip 	<ol style="list-style-type: none"> 1. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries. 2. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries. 3. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery. 	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	<p>Mix of adaptive and phased effort reduction strategies.</p> <p>A days (60% of effective effort)</p> <p>B days (40% of effective effort)</p> <p>C days (FY01 allocation).</p> <p>Provides opportunity to fish on stocks that do not need rebuilding.</p>	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this provision cannot be sold.	+
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: NFMA: 11 inches (tail) or 17 inches (whole) SFMA: 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent.	+
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	0
OTHER MEASURES				
Exemption program for vessels fishing outside of	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
the EEZ (in the NAFO Regulated Area)		the monkfish are caught outside of the EEZ.		
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	Uncertain
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	+
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	+

Table 16 - Description of Status Quo measures that impact EFH that would be in effect under the EFH No Action Alternative (#1)

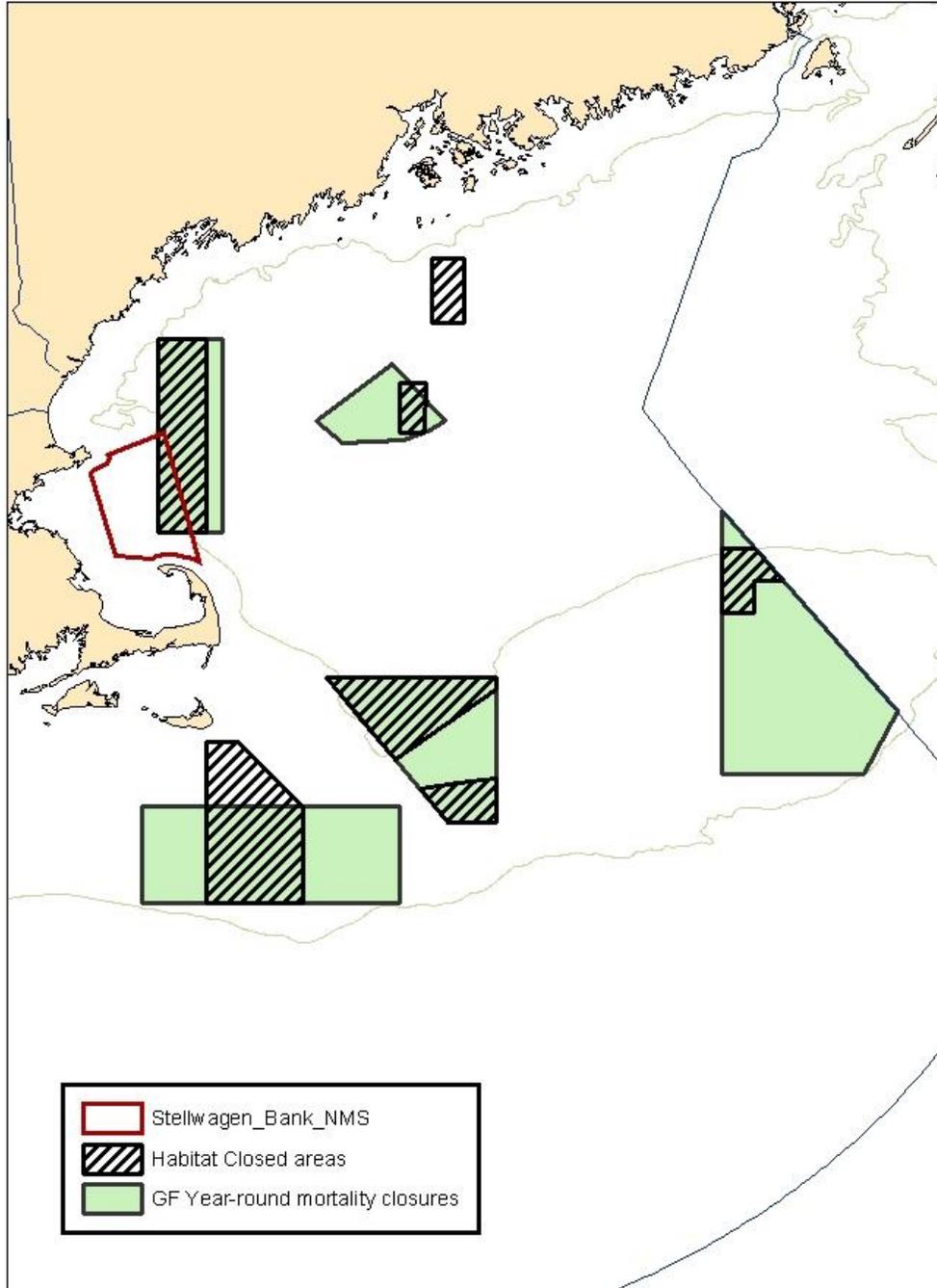


Figure 6 – Habitat closed areas implemented under the Multispecies and Scallop plans (dashed lines) overlapped with the year-round groundfish mortality closed areas.

4.2.2.9.2 EFH Alternative 2 (Benefits of other measures considered in Amendment 2)

This alternative was designed to identify the non-habitat specific measures selected in Amendment 2 that would have potential benefits to EFH, in addition to the measures already defined as part of the No action. Of all the non-habitat specific measures under consideration in this Amendment, only a handful of measures were expected to have beneficial impacts on EFH if selected (Table 17). Once the Councils selected final measures for this Amendment, none of the non-habitat specific measures with habitat benefits were part of the proposed action. Therefore, this alternative is not considered part of the proposed action to minimize the impacts of this fishery on EFH, since none of these measures are being recommended under this Amendment. There are numerous other non-habitat specific measures under the Monkfish plan that have potential benefits to habitat, and they are described in Section 4.2.2.9.1.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	Without the associated trawl gear requirement, separated DAS would allow for increased overall effort with no habitat benefit. However, if the proposed trawl gear configuration is adopted as part of the separated DAS alternative, separating DAS may actually reduce impacts to vulnerable EFH for several reasons.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	<ul style="list-style-type: none"> Expected to improve bottom habitat conditions by reducing bycatch and mortality of benthic organisms. May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 17 Potential habitat benefits of non-habitat Amendment 2 management alternatives

* Note: none of these measures under consideration were selected as part of the proposed action.

4.2.2.9.3 EFH Alternative 4 (Monkfish trawl configuration)

The Councils considered an alternative trawl configurations specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated.

4.2.2.9.3.1 Option 2 (Preferred Alternative in DSEIS)

The Councils considered requiring specific trawl gear when a vessel is on a monkfish DAS (not a combined DAS), if DAS were decoupled. The Councils considered adopting individual elements from the following options, and sought public comment on the specific components. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other Groundfish species (see rationale below).

1. Max disc diameter on sweep

Option A: 12-inches in the northern and southern management areas

Option B: 6-inches in the southern management area only

Option C: 16-inches in northern area only, configured so discs can roll (with only one wire or chain)

2. Maximum ratio of headrope length to footrope length of 1:1.1 to eliminate overhang

3. No ground cable, or maximum distance between doors and wings cannot be greater than ½ the length of the vessel

4. Upper and lower legs (cables that attach the net wings to the doors) must be of equal length

5. Minimum mesh size

Option A: (no action) 10" square or 12" diamond. (codend only), Multispecies mesh in the body of the net

Option B: 10" square or 12" diamond. (entire net)

Option C: 12" square (codend), 12" diamond (body and wings)

Option D: 12" square (codend only), Multispecies mesh in the body

6. Two-seam net construction requirement

Discussion/Rationale: These trawl gear proposals were developed during a cooperative workshop held by the Monkfish PDT involving trawl industry members and gear technology experts. Initial discussion in the workshop focused on the relationship between monkfish behavior and the configuration of trawls. Observations of monkfish behavior in the vicinity of a trawl show that herding is not a factor, minimizing the need for the gear to create a dust cloud, but increasing the importance of the wings of the net, which are often extended on monkfish trawls. Further, monkfish do not attempt to escape upwards, as do roundfish, allowing for a lower headrope than is needed on a groundfish trawl.

Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more uniform over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not

necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

Furthermore, since most vessels are required to use a multispecies DAS while fishing for monkfish, they currently fish in areas where they can target both groundfish and monkfish. But industry members suggested that, under de-coupled monkfish DAS, a directed, monkfish-only trawl fishery could occur if vessels fished solely on muddy bottoms. If retention of groundfish were prohibited, vessels would have no incentive to fish on the more complex bottom types where those species would be caught in combination with monkfish.

Through this discussion, participants agreed that the best strategy would be to develop a net that is efficient at catching monkfish (taking into account fish behavior and bottom types) while inefficient or incapable of fishing in more complex bottom areas where many groundfish species are found. Increased efficiency would reduce the time gear would be in contact with the bottom for a given trip limit. By removing the incentive and ability to fish in hard bottom, the strategy would effectively eliminate the impact of the monkfish trawl fishery on essential fish habitat for many groundfish species that depend on those areas during most life history stages.

The Councils recognized that, while some fishermen may have worked with individual components of the proposed configuration, the complete net configuration has not been tested under commercial conditions. To that end, the Councils sought public comment on which individual components could be adopted under this amendment, and which need further testing before being required on directed monkfish trawls. Public comment, and the industry advisors, suggested that this net needs further testing before it is required on commercial vessels. Furthermore, since the Councils are not separating DAS usage requirements, one of the stated conditions of this alternative was not met.

4.2.2.9.4 EFH Alternative 5 (deep-sea canyon habitats)

The Councils considered two options to minimize the impacts of the directed monkfish fishery on deep-sea canyon habitats (Alternative 5AB and Alternative 5C). Alternative 5AB is part of the proposed action, and Alternative 5C was rejected.

4.2.2.9.4.1 EFH Alternative 5C (up to 12 large, steep-walled canyon closures) (Preferred alternative in DSEIS)

This option proposed to close waters above up to 12 large canyons, based on the premise that many deep-sea corals need hard substrate and are predominately found on hard substrate within canyons, not on the slope. Although research has not been conducted in every large canyon in the region, the canyons with hard substrate and steep walls are likely to have corals, since other canyons with similar characteristics do (Figure 7 and Table 18). The Council chose Alternative 5AB to reduce the potential impacts of the fishery on deep-sea canyons with *known* coral habitats. The primary justification for selecting Alternative 5AB over Alternative 5C is that there is considerable research from the two canyon areas in Alternative 5AB, but not all twelve. Until more data is available on other canyons in the region, the Councils support closing the waters above the two canyons to protect the deep-sea ecosystems in those areas. The Councils considered closing the areas to trawl gear only (Option 1) or all gears (Option 2) on a monkfish DAS.

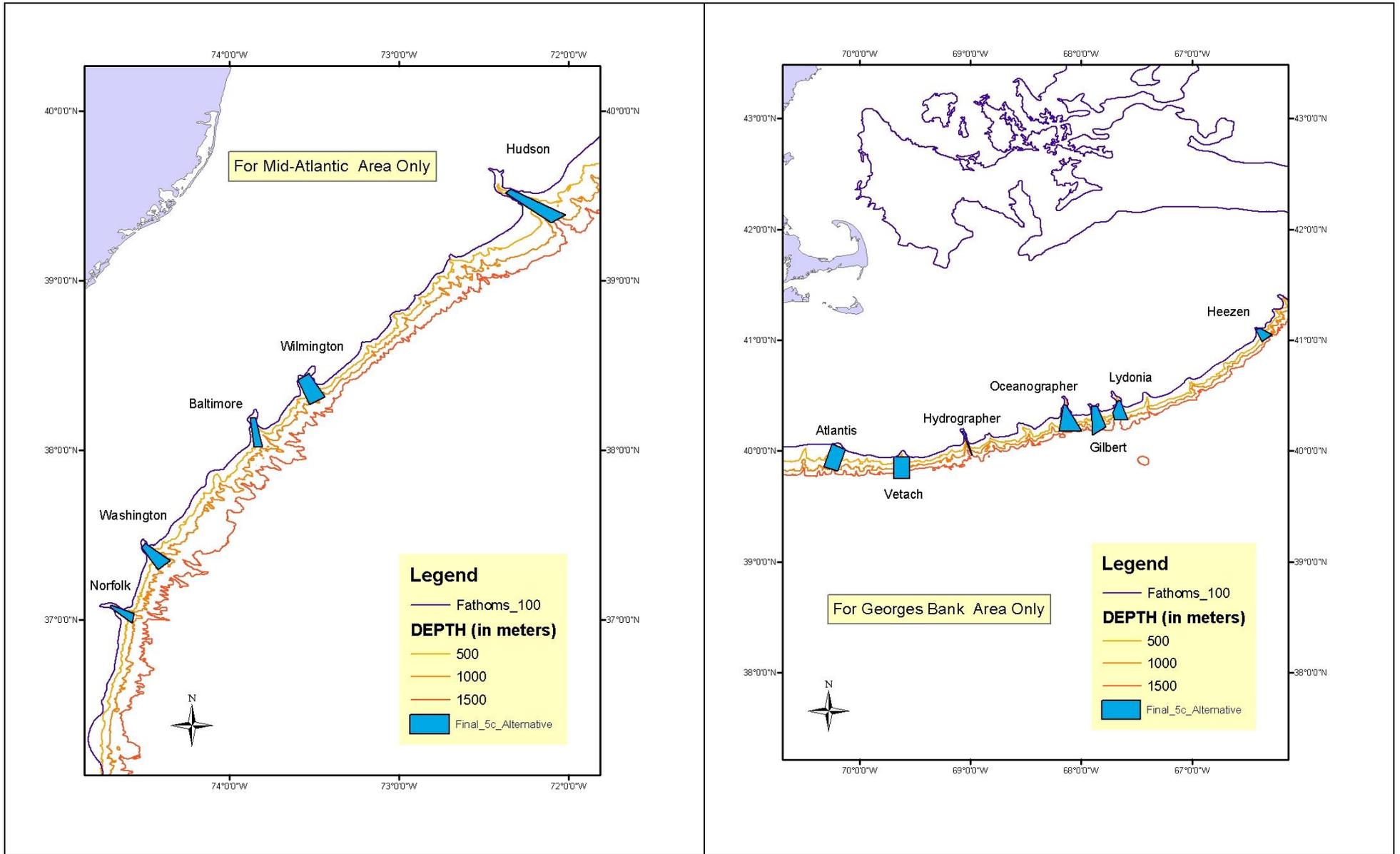


Figure 7 – Habitat Alternative 5 C –

Note that two maps are provided so the areas can be seen more clearly, but this alternative contains areas in all 12 deep-water canyons

	Latitude		Longitude			Latitude		Longitude	
Norfolk	36	58	74	34	Veatch	39	45	69	41
	37	4	74	41		39	56	69	41
	37	5	74	41		39	56	69	32
	37	2	74	33		39	45	69	32
Washington	37	17	74	25	Hydrographer	39	57	68	59
	37	25	74	30		40	10	69	4
	37	27	74	29		40	10	69	3
	37	21	74	20		39	57	68	58
Baltimore	38	1	73	51	Oceanographer	40	10	68	12
	38	11	73	52		40	24	68	9
	38	11	73	50		40	24	68	8
	38	0	73	48		40	10	67	59
Wilmington	38	16	73	31	Gilbert	40	8	67	53
	38	24	73	35		40	23	67	54
	38	27	73	31		40	24	67	51
	38	18	73	26		40	13	67	46
Hudson	39	20	72	6	Lydonia	40	16	67	34
	39	31	72	22		40	16	67	42
	39	32	72	20		40	20	67	43
	39	23	72	1		40	27	67	40
Atlantis	39	51	70	19	Heezen	40	59	66	22
	40	3	70	14		41	5	66	25
	40	0	70	7		41	6	66	23
	39	49	70	12		41	2	66	16

Table 18 – Coordinates for Habitat Alternative 5C

4.2.2.10 Cooperative research programs funding – no action

This is Alternative 3, Decision 12 in Appendix I. The Councils propose two alternatives in this amendment for facilitating and streamlining cooperative research programs under the FMP (Section 4.1.9), one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research.

Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application and/or respond to a NMFS Request for Proposals. If a vessel submits an experimental fishery permit application it may have to also submit an Environmental Assessment (EA) to determine the impacts of the experiment on the environment, particularly if the vessel seeks an exemption from DAS usage requirements and intends to land the fish caught while participating in the cooperative research activity. The preparation and review of EA's are time consuming, and may discourage potential applicants from conducting such research as a result.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.11 Clarification of vessel baseline history – no action

This is Alternative 1, Decision 13 in Appendix I. The Councils are proposing in this amendment to eliminate the dual vessel-upgrading baseline that exists on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (Section 4.1.10). Currently, Category C and D permits have two baselines, one associated with the multispecies or scallop limited access permit, and one associated with the monkfish permit that was issued several years later. If the permit had not been transferred, or the vessel had not been upgraded prior to issuing the monkfish permit, the baseline characteristics would be the same for both the monkfish and multispecies or scallop permit, and the same length, tonnage and horsepower upgrading restrictions apply. But if the vessel characteristics were different when the monkfish permit was issued (through upgrading or permit transfer), then there are now two baselines associated with individual permits. If a vessel owner now wanted to upgrade the vessel or transfer the permits to another vessel, the more restrictive baseline would govern the transaction, unless the owner relinquished the species permit with the more restrictive baseline.

For example, if a vessel's baseline length under the multispecies limited access permit is 60 feet, and that permit was transferred to a vessel 50 feet long prior to receiving the monkfish permit, the vessel would have dual baselines (60 ft. on the multispecies permit and 50 ft. on the monkfish permit). A current permit transfer would be restricted to a vessel 55 ft. or less (50 ft. plus the 10 percent upgrading restriction). On the other hand, if the owner relinquished the monkfish permit, the transfer of the multispecies permit could apply to a vessel up to 66 ft. (60 ft. plus 10 percent upgrading limit).

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.12 NFMA Monkfish trawl experimental fishery

This is Alternative 2, Decision 14 in Appendix I. The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA. Currently, there is no monkfish trawl exempted fishery in the NFMA, although, a monkfish gillnet exempted fishery already exists. The Councils proposed establishing a trawl experimental fishery in the NFMA in this amendment to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. The need for such an exempted fishery existed primarily if the Councils had decided to separate DAS usage requirements. If monkfish DAS were separated from multispecies DAS usage requirements, trawl vessels in the NFMA would not be able to target monkfish unless they also used a multispecies DAS, or they propose an experimental fishery through one of the procedures outlined in the alternatives in Section 4.1.9, including the no action alternative.

Under the non-preferred proposal, participants in the experimental fishery would operate under a Letter of Authorization (LOA) from the Regional Administrator, and would not have to obtain an Experimental Fisheries Permit. This experimental fishery would not be subject to the RFP or grants administrative process. Monkfish Category C and D vessels participating in the experimental fishery would be exempt from up to one percent of the total allocation of Monkfish DAS to C and D vessels (approximately 300 DAS total). This exemption would be subtracted from the research DAS exemption or set-aside outlined in Section 4.1.9.

Vessels participating in the experimental fishery under the LOA would be required to fish under their multispecies DAS but would be allowed to land their multispecies catch (as long as the vessel complies with other multispecies regulations, such as mesh size) as well as the monkfish catch (under the monkfish DAS exemption). Those vessels could seek an exemption from the multispecies DAS usage requirement by submitting an EFP request that would have to be made available for public comment. Under this approach, the monkfish DAS exemption provided for and analyzed in this amendment would still apply. Vessels would use any of the gear configurations and mesh sizes being considered in this amendment to evaluate their efficacy in minimizing bycatch of regulated multispecies, or any other configurations to determine the optimal trawl net that could be used in an exempted fishery. Gear could also be evaluated for its effectiveness in minimizing the impact of the trawl fishery on EFH of regulated species.

The trawl experimental fishery would take place in any of three areas shown in Figure 8 during the times outlined in the following tables:

Wilkinson Basin - October – April

North Lat.	West Long.
42°00'	70°00'
42°00'	69°00'
43°00'	69°00'
43°00'	70°00'

Franklin Basin – March – May, October – December

North Lat.	West Long.
41°40'	68°50'
42°00'	68°50'
42°00'	68°20'
42°05'	68°20'
42°20'	67°50'
42°10'	67°50'
41°40'	68°30'

Central/Inshore Gulf of Maine – October – January

North Lat.	West Long.
43°50'	68°30'
43°00'	68°30'
43°00'	69°30'
43°50'	69°30'

Table 19 Proposed area/seasons for NFMA trawl experimental fisheries

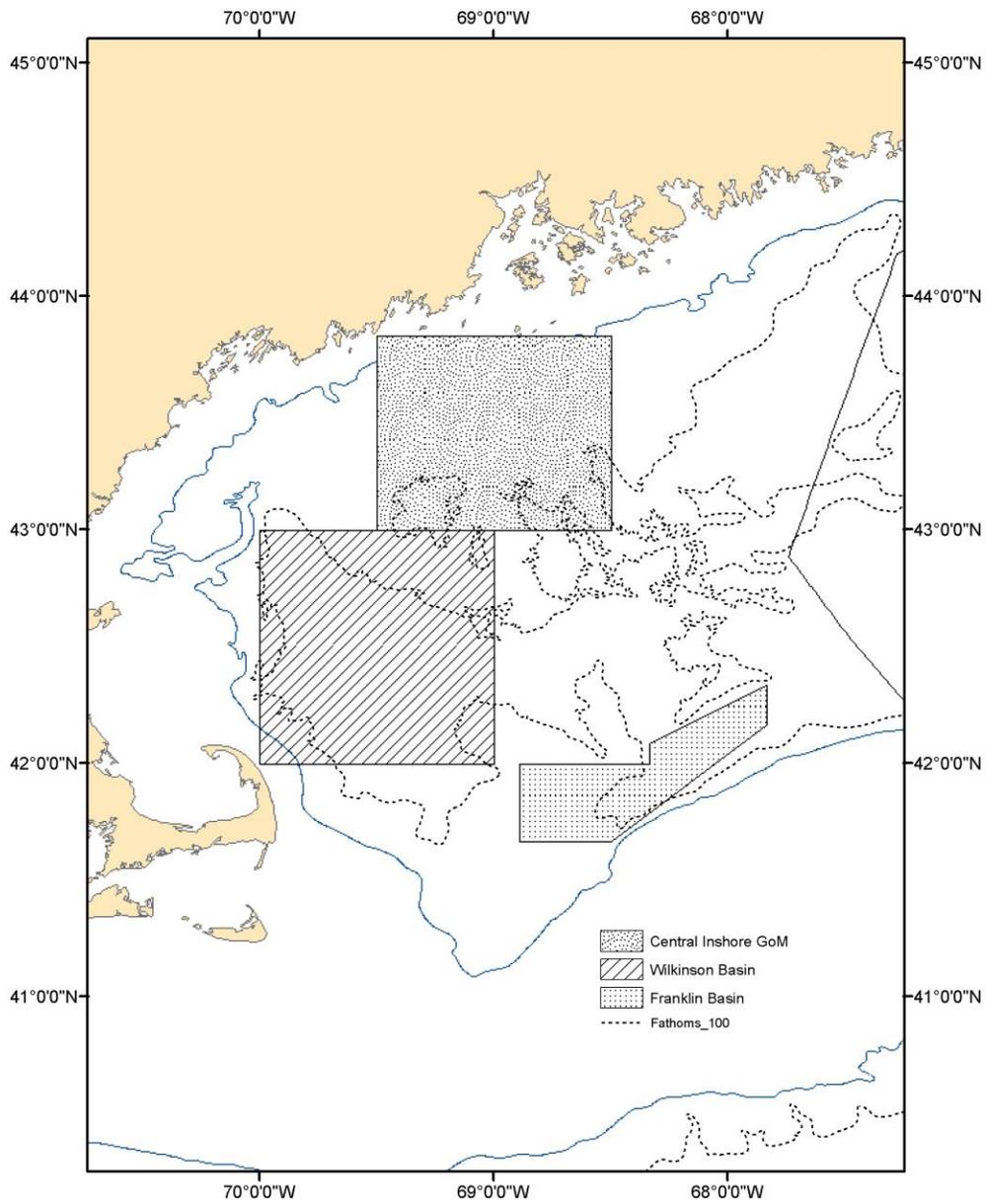


Figure 8 Proposed Gulf of Maine monkfish trawl experimental fishery areas.

Discussion/Rationale: The primary purpose of the experimental fishery is to determine if, and under what circumstances (gear, area, season) a monkfish trawl exempted fishery can be established under the multispecies regulations. Vessels and technical collaborators would submit proposals to NMFS along with the request for Letters of Authorization that would include number of participating vessels, DAS to be used, gear, area and season. Vessels seeking to participate in the experimental fishery would need to seek funding from outside sources to cover the cost of data collection and analysis, and any vessel and crew costs not covered by monkfish and/or multispecies landings. The experimental fishery will also be used to evaluate the efficacy of the monkfish trawl in reducing bycatch (compared to the nets currently being used) and in minimizing impacts of the fishery on essential fish habitat of other species. Researchers will submit their results to NMFS for consideration in establishing a trawl exempted fishery, and NMFS will consult with the Councils prior to implementing any exemptions.

The Councils rejected this proposal primarily for two reasons: since they are not de-coupling monkfish DAS usage requirements, the need to establish a trawl exempted fishery in the NFMA is greatly diminished; and, vessels can already conduct experimental fisheries through the existing procedures, and in fact, just such an experiment is taking place this year under the same area, gear and season parameters outlined in this proposal.

4.2.2.13 Change fishing year

This is Decision 15 in Appendix I. The NEFMC considered three alternatives for changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Amendment 13. The NEFMC has decided to retain the current multispecies fishing year, but the Councils still considered changing the monkfish fishing year in the Amendment 2 DSEIS based on public comment on the following alternatives specifically as they pertain to the monkfish management program. Changing the fishing year would require pro-rating of DAS allocations to account for partial years during the transition period, and three alternatives are under consideration.

The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP. The fishing year under the Sea Scallop FMP runs from March 1 through February, thus, vessels with monkfish Category C and D permits that also have limited access scallop permits operate under two different fishing years.

4.2.2.13.1 Fishing year – Alternative 2 (calendar year)

Under this alternative, the monkfish fishing year would be changed to a calendar year.

4.2.2.13.2 Fishing year – Alternative 3 (October- September)

This alternative would change the start of the fishing year to October 1.

4.2.2.13.3 Fishing year – Alternative 4 (July – June)

This alternative would change the start of the fishing year to July 1.

Discussion/Rationale: The Councils initially considered these alternatives to keep the monkfish fishing year on the same schedule as the multispecies fishing year, since more than half of all

monkfish limited access vessels also have multispecies limited access permits. Even when it became clear that the multispecies fishing year would not be changed, the Councils retained these alternatives because they felt there are circumstances unique to the monkfish fishery that warrant consideration.

Discussion/Rationale: Based on the TAC and trip limit setting procedure established in Framework 2, a May 1 start date (no action alternative) results in the shortest possible gap between the availability of the NMFS bottom trawl survey indices (used to set the trip limits and TACs) and implementation of the management measures, while allowing sufficient time for the publication of a proposed rule. Traditionally, peak monkfish landings and prices occur from November through May, which aligns well with the management cycle of a calendar year.

Changing the fishing year to a calendar year (Alternative 2) would align the fishing year data with stock assessment data that are based on a calendar year. As long as the fishery management program is based on the autumn trawl survey, however, such an alignment is not as important in monkfish as it would be in stocks where the management measures are based on stock assessment results. Basing the management measures on a calendar year would result in a 13-month gap between the autumn survey and the effectiveness date of the associated management measures, compared to six months under the no action alternative. Since several other fisheries in the northeast region are already on a calendar year basis, changing the monkfish fishing year to a calendar year would add to the Councils' and NMFS' workload as these plans would be converging on the review and implementation process simultaneously, a problem that would be exacerbated if multispecies also changes to a calendar year.

Alternative 3 (October 1 start date) would result in management measures taking effect just before the start of the peak monkfish fishing period, while Alternative 4 (July 1) would take effect at the low point in the annual landings/price cycle. The gap between the autumn survey and the start of the fishing year would be 11 months and 9 months, for Alternatives 3 and 4, respectively.

The Councils determined that the current fishing year (no action alternative) is best suited to the circumstances of the fishery and management program, including the availability of current scientific data used to monitor the rebuilding program.

4.2.2.14 DAS prorating alternatives if the fishing year is changed

This is Decision 16 in Appendix I. Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The following two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment.

4.2.2.14.1 DAS prorating – Alternative 1

New DAS allocations would become effective at the start of the next fishing year after implementation of the Amendment (that is, May 1, 2005, if Amendment 2 is implemented in November 2004). If the fishing year is changed under Amendment 2, the period between May 1, 2005 and the start of the new fishing year is defined as a transition period. Under the Multispecies proposals, during this period, a vessel will be limited to its 2003 allocation, including any carry-over DAS allowed, times the number of months in the transition period, divided by 12. Any revised DAS allocations (either Individual DAS or a Fleet DAS allocation other than the current

40) would not take effect until the start of the 2005 fishing year. The base number of monkfish DAS for the prorating will be the Amendment 2 DAS allocation plus any carryover from the 2004 fishing year. (The number of months will be rounded up to the next whole value: three months and one day will be treated as four months.) A vessel can carry over up to ten DAS into the new, revised fishing year. The following formula is shown schematically in Table 20 for the four fishing year alternatives (including no action).

$$\text{Transition period DAS} = (\text{Number of months}/12) \times (\text{Amendment 2 DAS})$$

For example, if the Councils select the calendar year (Jan. – Dec.) alternative, and a vessel has 40 DAS under Amendment 2, the vessel would have 9/12ths (for May through December) of 40 DAS, or 30 DAS, to use between May and December, 2005, and 40 DAS for the calendar year starting January 1, 2006.

4.2.2.14.2 DAS prorating – Alternative 2

Under this alternative, the transition period would extend from the time the Amendment 2 DAS allocations take effect (that is, May 1, 2005, if Amendment 2 is implemented in November 2004) through the next full fishing year (12 months from the start of the revised fishing year start date). A vessel would be limited to its new allocation times the number of months in the transition period, divided by 12, plus the new allocation. So, for example, if Amendment 2 is implemented in November 2004, any new DAS allocations would become effective May 1, 2005. If the new fishing year starts in October, the vessel would be allocated 5/12 of its DAS (for the May-October period) plus a full year's DAS allocation, which it could use between May 1, 2005 and September 30, 2006 (plus any carryover from the 2004 fishing year). A vessel can carry over up to ten DAS into the new, revised fishing year. The following formula is shown schematically in Table 21 for the four fishing year alternatives (including no action).

$$\text{Transition period DAS} = [(\text{Number of months from May 1 to new fishing year start date}/12) \times (\text{Amendment 2 allocation})] + \text{Amendment 2 allocation}$$

With

Transition period running from May 1, 2005 through first full revised fishing year

Under this alternative, using the same example as in the previous one, the vessel would have 70 DAS to use between May, 2005 and December 31, 2006, and 40 DAS for the calendar year starting January 1, 2007.

Discussion/Rationale: These alternatives were designed to facilitate a transition from the current fishing year (May-April) to one of three alternative proposals through a pro-ration of DAS for any partial year. Since the Councils are not changing the fishing year, these alternatives are no longer relevant.

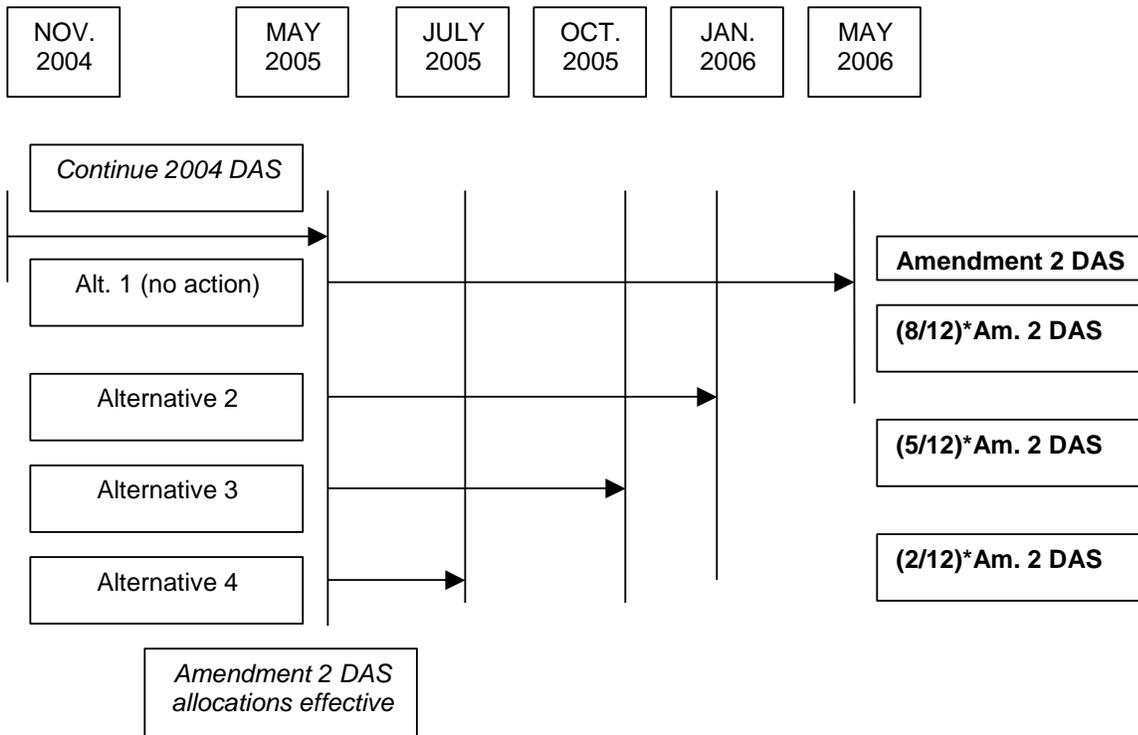


Table 20 DAS prorating Alternative 1 schematic diagram

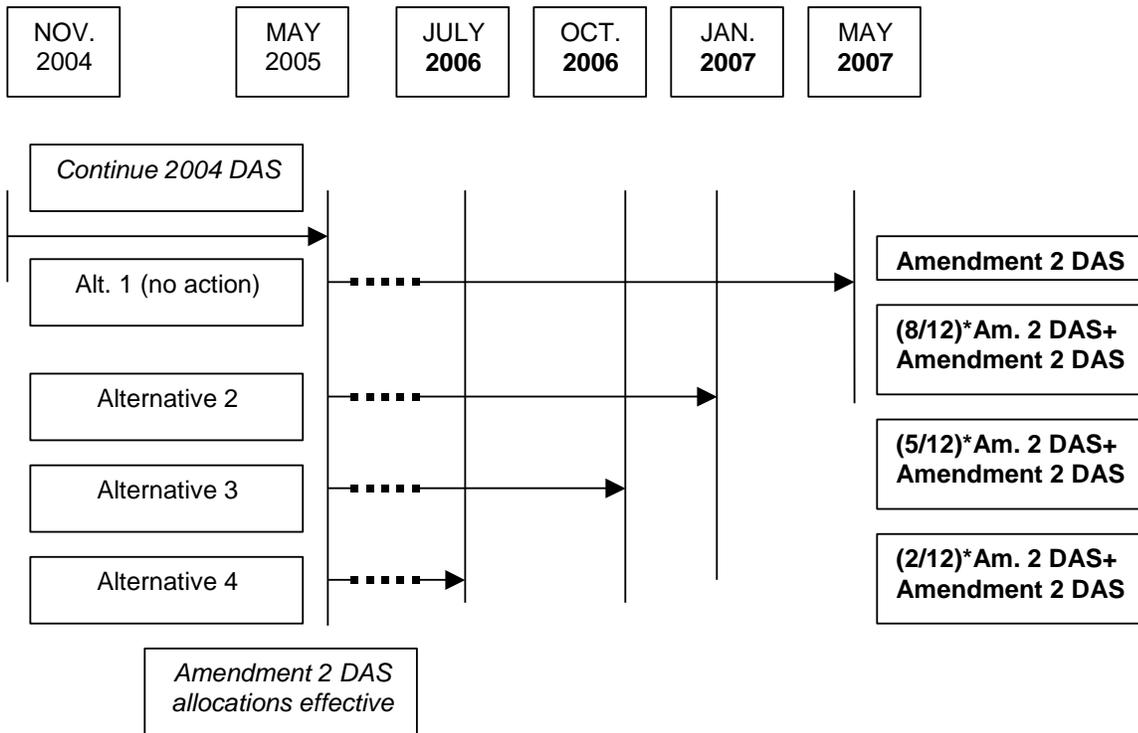


Table 21 DAS prorating Alternative 2 schematic diagram

4.2.2.15 Modifications to the framework adjustment process

The Councils are proposing to include three types of actions to the current list of actions that can be taken under the framework adjustment process (see Section 4.1.6). These are:

- Implement transferable monkfish DAS
- Implement measures to minimize fishery impact on protected species, and
- Implement requirements to use bycatch reduction devices.

When considering each of these items on the DSEIS, the Councils also considered the no-action alternative, see Decision 1c and Decision 7, Appendix I.

Discussion/rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

5.0 AFFECTED ENVIRONMENT

5.1 Biological Environment of the Fishery

5.1.1 Monkfish Life History and habitat requirements

This section contains a description of the biological environment of the monkfish fishery, including biological habitat conditions in the Gulf of Maine, Georges Bank, southern New England and Mid-Atlantic regions. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a). For more information on monkfish life history, habitat characteristics and geographical distribution see Steimle et al., 1998). For more information on biological characteristics of monkfish see Bigelow and Schroeder (1953) and Caruso (2002).

Fish pass through a series of stages and conditions throughout their life histories. The probability of successfully surviving and reproducing subsequent generations varies from species to species and for individuals of a species. One of the main values of habitat lies in the provision of adequate food for all metabolic considerations of fish, ultimately for both individual and population growth. Habitat can also provide refugia from predation, aggregation of prey for more effective feeding (i.e., minimized foraging costs), aggregation of individuals to enhance spawning, shelter from extreme physio-chemical events, adequate physio-chemical environment (e.g., oxygen production, detritus conversion, etc.), cycling of nutrients into “packaged” forms amenable for propagation up through the food web, etc. Thus, available habitat can improve the probabilities of successful survival and reproduction of fish.

Additionally, the degree of habitat complexity and utilization can mitigate some of the effects of predatory losses of fishes, particularly for juvenile stages. However, competition is another major biological consideration facing fish that is difficult to directly demonstrate in marine ecosystems. Knowing patterns of shared prey use (e.g., diet similarities) and spatio-temporal overlap can provide some insight into the potential competitors of a given fish species. Other biotic concerns such as parasitism, commensalism, or mutualism are recognized as factors but cannot be assessed effectively on the broad oceanographic and fish community scales at which fish are typically sampled.

Monkfish is widely distributed throughout the northeast region as shown in the four summary maps of monkfish caught during NMFS bottom trawl surveys (Figure 9).

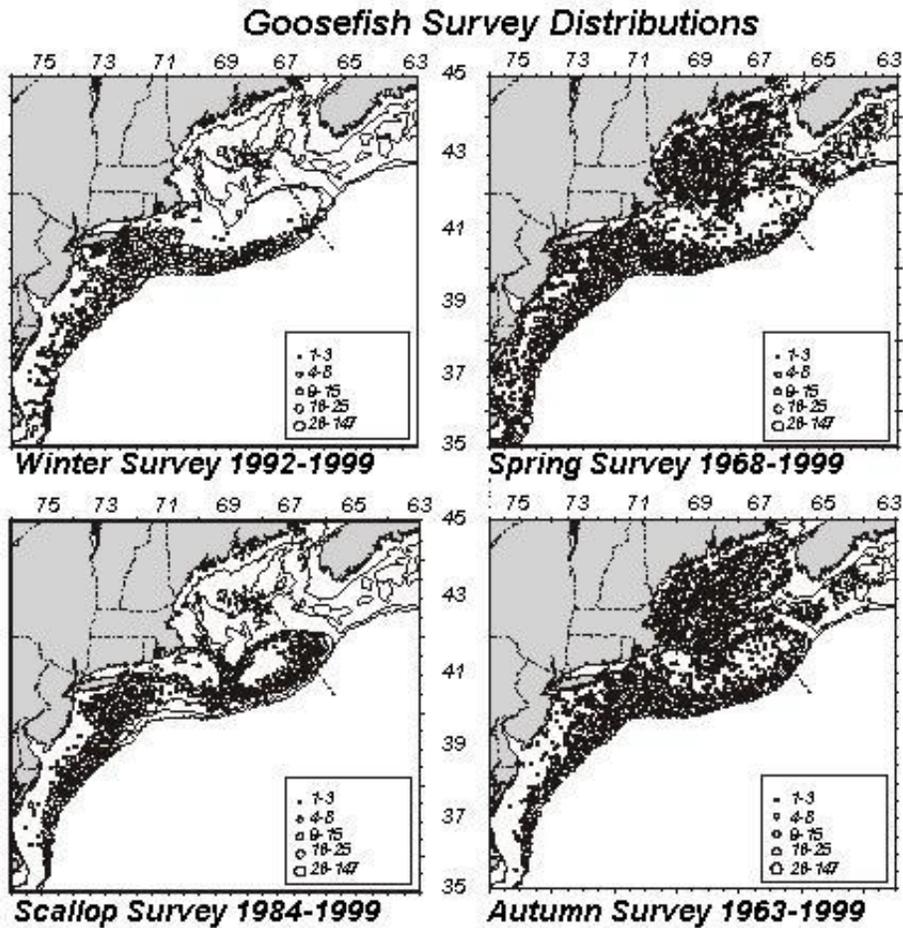


Figure 9 Monkfish distribution on four NMFS bottom trawl surveys (entire time series). The scallop survey is conducted during the summer.

The 2001 cooperative monkfish survey covered deeper waters than the NMFS surveys, but only shows the distribution at the time of the survey.

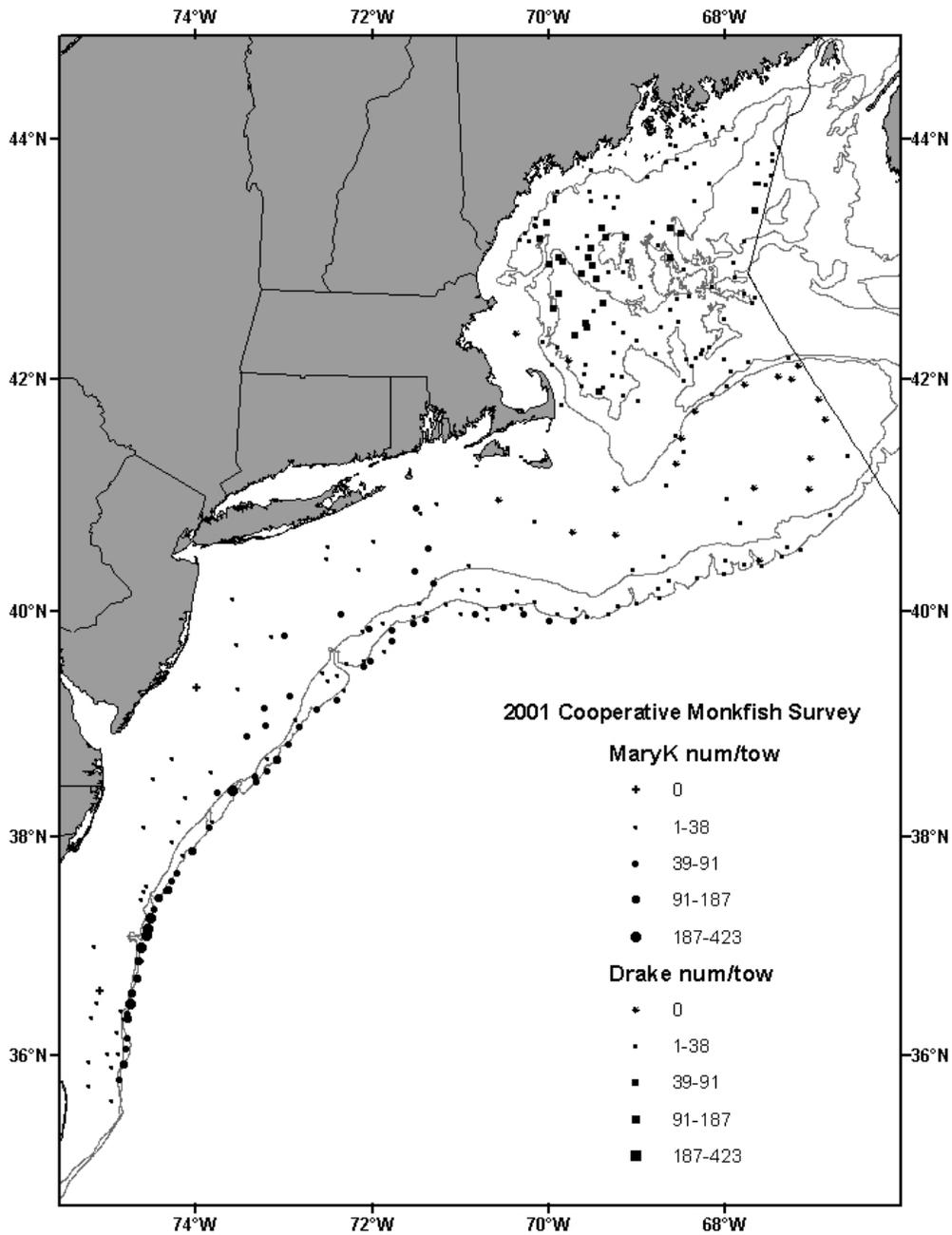


Figure 10 Distribution of monkfish catches (number per tow) during the Spring 2001 cooperative monkfish survey.

Below is a compilation of the general biological setting or “environment” within which monkfish are found. This mosaic of information is not intended to provide conclusive specific details regarding ecological processes that affect a particular fish species or life stage, rather a general background of the biological community surrounding these fish.

5.1.2 Stock Status

Framework 2, implemented May 2003, incorporated revised overfishing definition reference points and status determination criteria. Biomass reference points and status determination continues to be based on the NMFS autumn bottom trawl survey (three-year running average), although the minimum biomass threshold was revised to equate to 1/2 the biomass target. The fishing mortality threshold reference point was revised to Fmax. Both stocks have increased since 1999 when the FMP was implemented. At that time the northern and southern stock 3-year average biomass indices were 0.82 and 0.47 kg./tow, respectively. Framework 2 implemented a biomass rebuilding program based on achieving annual incremental biomass targets and revised the minimum biomass threshold.

The status of the stocks with respect to fishing mortality reference points is unknown, since there are no estimates of current fishing mortality. The following table shows the status of the stocks with respect to the biomass targets (annual and overall) and threshold:

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

Table 22 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 11 and Figure 12, for the northern and southern stocks, respectively. Based on the current reference points and estimates of stock status, the Monkfish Monitoring Committee concluded that both stocks are no longer overfished, but, while the northern stock is ahead of the annual rebuilding targets, the southern stock is still lagging behind the rebuilding schedule.

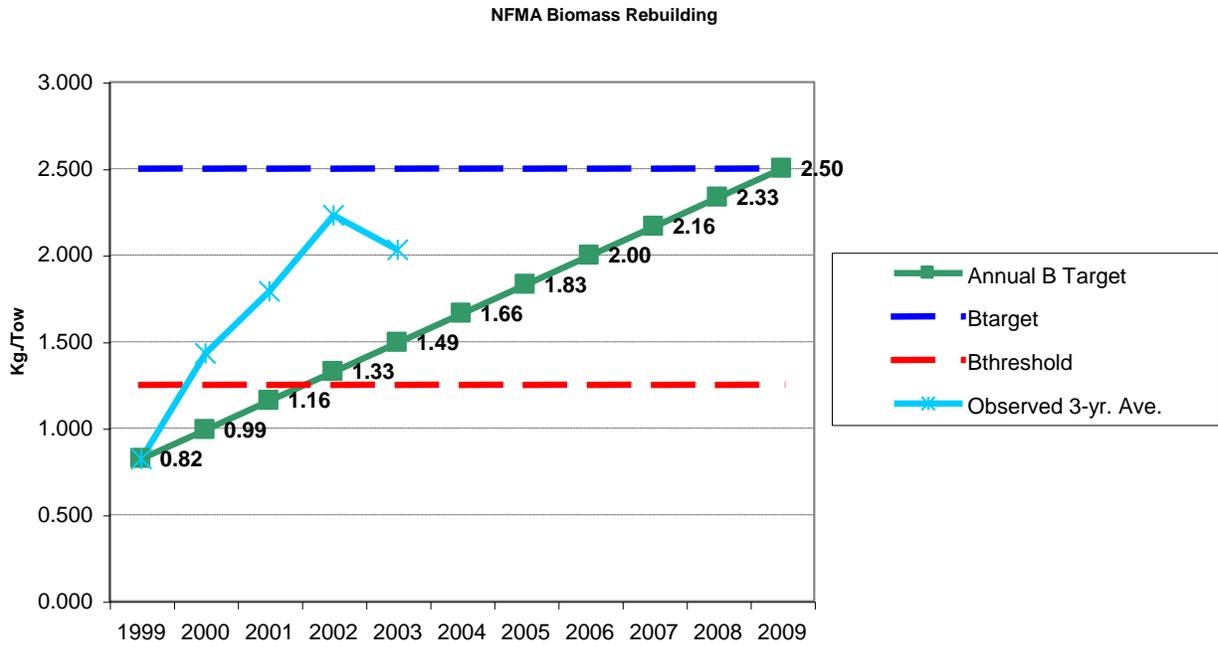


Figure 11 NFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

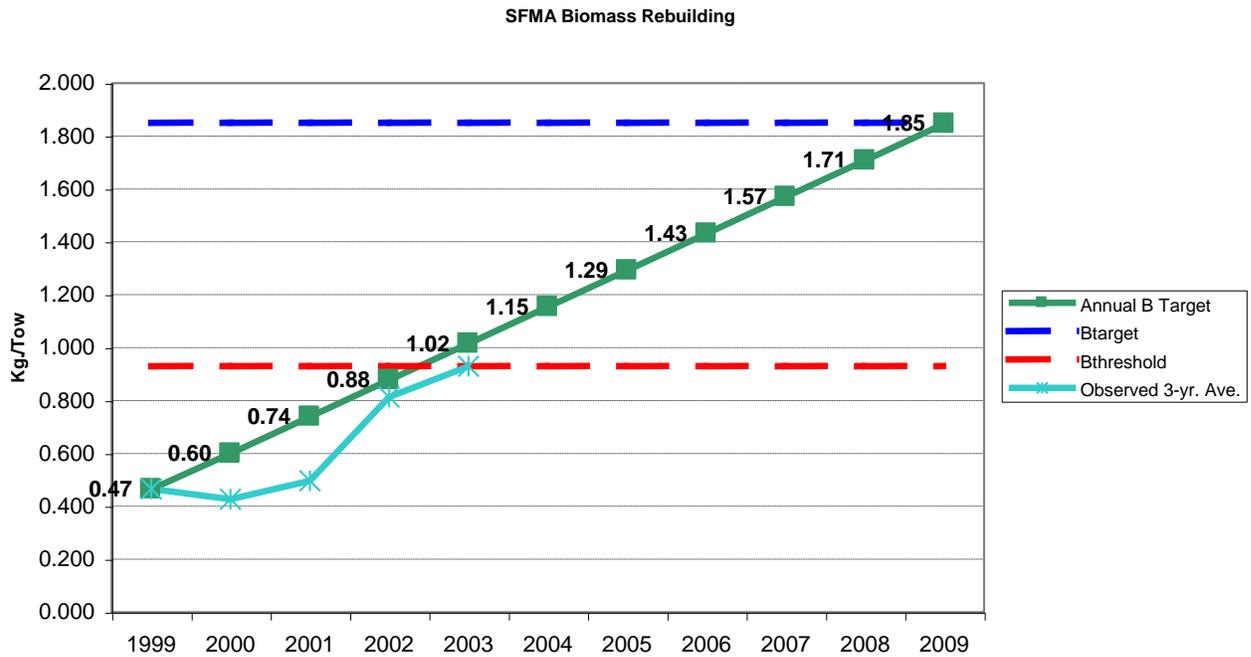


Figure 12– SFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

The assumed natural mortality rate for monkfish adopted by the Stock Assessment Review Committee is $M=0.2$, based on an expected maximum age of 15-20 years given previous studies of age and growth. The maximum fishing mortality threshold adopted in Framework 2 is $F=F_{max}$, which is currently estimated to be $F=0.2$. Estimates of current fishing mortality are not available, so the status of the stock with respect to the “overfishing” definition reference point is unknown.

5.1.3 Habitat Associations and Functions

From a biological perspective, habitats provide living things with the basic life requirements of nourishment and shelter. Habitats may also provide a broader range of benefits to the ecosystem. An illustration of the broader context is the way seagrasses physically stabilize the substrate and help recirculate oxygen and nutrients. In this general discussion, we will focus on the primary, direct value of habitats to federally managed species—feeding and shelter from predation.

The spatial and temporal variation of prey abundance influences the survivorship, recruitment, development, and spatial distribution of organisms at every trophic level. For example, phytoplankton abundance and distribution are a great influence on ichthyoplankton community structure and distribution. In addition, the migratory behavior of juvenile and adult fish is directly related to seasonal patterns of prey abundance and changes in environmental conditions, especially water temperature. Prey supply is particularly critical for the starvation-prone early life history stages of fish.

The availability of food for planktivores is highly influenced by oceanographic properties. The seasonal warming of surface waters in temperate latitudes produces vertical stratification of the water column, which isolates sunlit surface waters from deeper, nutrient-rich water, leading to reduced primary productivity. In certain areas, upwelling, induced by wind, storms, and tidal mixing, inject nutrients back into the photic zone, stimulating primary production. Changes in primary production from upwelling and other oceanographic processes affect the amount of organic matter available for other organisms higher up in the food chain, and thus influence their abundance and distribution. Some of the organic matter produced in the photic zone sinks to the bottom and provides food for benthic organisms. In this way, oceanographic properties can also influence the food availability for sessile benthic organisms. In shallower water, benthic macro and microalgae also contribute to primary production. Recent research on benthic primary productivity indicates that benthic microalgae may contribute more to primary production than has been originally estimated (Cahoon 1999).

Benthic organisms provide an important food source for many managed species. Populations of bottom-dwelling sand lance are important food sources for many piscivorous species, and benthic invertebrates are the main source of nutrition for many demersal fishes. Temporal and spatial variations in benthic community structure affect the distribution and abundance of bottom-feeding fish. Likewise, the abundance and species composition of benthic communities are affected by a number of environmental factors including temperature, sediment type, and the amount of organic matter.

A number of recent studies illustrate the research that has addressed habitat associations for demersal juvenile fish. In shallow, nearshore coastal and estuarine waters of the northeast region, effects of physical habitat factors and prey availability on the abundance and distribution of young-of-the-year flounder (various species) have been investigated in nearshore and estuarine habitats in Connecticut, New Jersey, and North Carolina (Phelan et al. 2001, Stoner et al. 2001, Manderson et

al. 2000, Howell et al. 1999, Walsh et al. 1999, and Rountree and Able 1992). There are few comparable studies of more open, continental shelf environments. In the northeast U.S., Steves et al. (1989) identified depth, bottom temperature, and time of year as primary factors delineating settlement and nursery habitats for juvenile silver hake and yellowtail flounder in the mid-Atlantic Bight. Also, in a series of publications, Auster et al. (1991, 1995, 1997) correlated the spatial distributions of benthic juvenile fish (e.g. silver hake) with changes in microhabitat type on sand bottom at various open shelf locations in southern New England.

In addition to providing food sources, another important functional value of benthic habitat is the shelter and refuge from predators provided by structure. Three dimensional structure is provided by physical features such as boulders, gravel and cobble, sand waves and ripples, and mounds, burrows and depressions created by organisms. Structure is also provided by emergent epifauna.

The importance of benthic habitat complexity was discussed by Auster (1998a) and Auster and Langton (1999) in the context of providing a conceptual model to visualize patterns in fishing gear impacts across a gradient of habitat types. Based on this model, habitat value increases with increased structural complexity, from the lowest value in flat sand and mud to the highest value in piled boulders. The importance of habitat complexity to federally managed species is a key issue in the Northeast region. The information that is known about monkfish habitat associations and functions, as well as the habitats potentially impacted by the monkfish fishery are described in Section 5.4.

5.1.4 Biological Characteristics of Regional Systems

5.1.4.1 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 23 and their distribution is depicted in Figure 13. This classification system considers benthic assemblage, substrate type and water properties.

An in-depth review of GOM habitat types has been prepared by Brown (1993). Although still preliminary, this classification system is a promising approach. It builds on a number of other schemes, including Cowardin et al. (1979), and tailors them to Maine's marine and estuarine environments. A significant factor that is included in this review (but has been neglected in others) is a measure of "energy" in a habitat. Energy could be a reflection of wind, waves, or currents present. This is a particularly important consideration in a review of fishing gear impacts since it indicates the natural disturbance regime of a habitat. The amount and type of natural disturbance is in turn an indication of the habitat's resistance to and recoverability from disturbance by fishing gear. Although this work appears to be complete in its description of habitat types, unfortunately, the distribution of many of the habitats are unknown.

Demersal fish assemblages for the Gulf of Maine and Georges Bank were part of broad scale geographic investigations conducted by Mahon et al. (1998) and Gabriel (1992). Both these studies and a more limited study by Overholtz and Tyler (1985) found assemblages that were consistent over space and time in this region. In her analysis, Gabriel found that the most persistent

feature over time in assemblage structure from Nova Scotia to Cape Hatteras was the boundary separating assemblages between the Gulf of Maine and Georges Bank, which occurred at approximately the 100 m isobath on northern Georges Bank.

Overholtz & Tyler (1985) identified five assemblages for this region (Table 24). The Gulf of Maine-deep assemblage included a number of species found in other assemblages, with the exception of American plaice and witch flounder, which was unique to this assemblage. Gabriel's approach did not allow species to co-occur in assemblages, and also classified these two species as unique to the deepwater Gulf of Maine-Georges Bank assemblage. Results of these two studies are compared in Table 24. Auster et al. (2001) went a step further, and related species clusters on Stellwagen Bank to reflectance values of different substrate types in an attempt to use fish distribution as a proxy for seafloor habitat distribution. They found significant reflectance associations for twelve of 20 species, including American plaice (fine substrate), and haddock (coarse substrate). Species clusters and associated substrate types are given in Table 25.

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

Table 23- Gulf of Maine benthic assemblages as identified by Watling (1998).

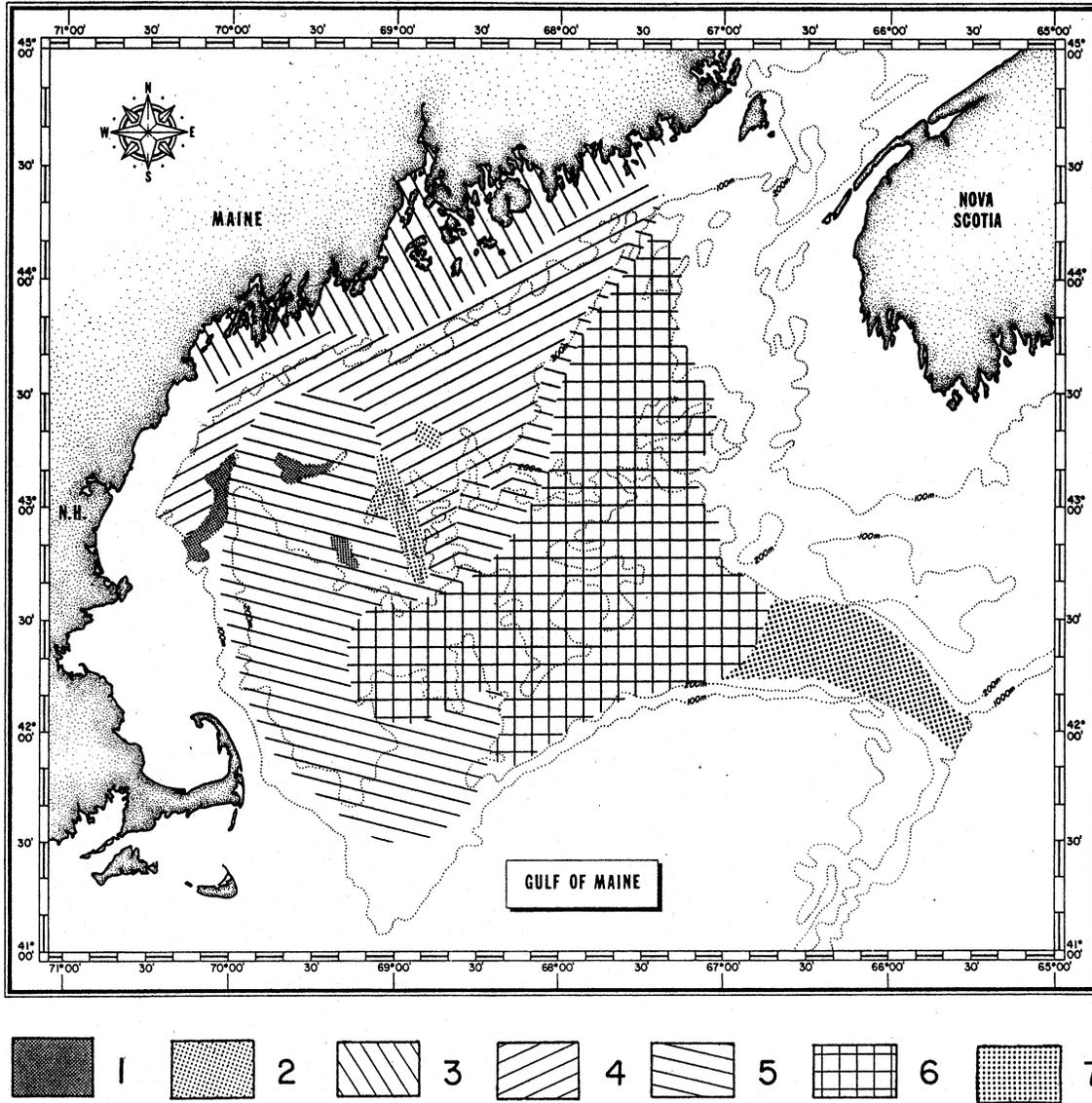


Figure 13- Distribution of the seven major benthic assemblages in the Gulf of Maine as determined from both soft bottom quantitative sampling and qualitative hard bottom sampling.

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 24- 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.

SUBSTRATE TYPE									
Coarse		Coarse		Wide Range		Fine		Fine	
Species	Mean	Species	Mean	Species	Mean	Species	Mean	Species	Mean
N. Sand Lance	1172.0	Haddock	13.1	American		American plaice	152.0	Whiting	275.0
Atlantic herring	72.2	Atlantic cod	7.3	plaice	63.3	Acadian redfish	31.3	American plaice	97.1
Spiny dogfish	38.4	American plaice	5.3	N. sand lance	53.0	Whiting	29.5	Atlantic mackerel	42.0
Atlantic cod	37.4	Whiting	3.3	Atlantic herring	28.5	Atlantic herring	28.0	Pollock	41.1
Longhorn sculpin	29.7	Longhorn sculpin	2.0	Whiting	22.4	Red hake	26.1	Alewife	37.2
American plaice	28.0	Yellowtail flounder	1.9	Acadian redfish	16.0	Witch flounder	23.8	Atlantic herring	32.0
Haddock	25.7	Spiny dogfish	1.6	Atlantic cod	14.0	Atlantic cod	13.1	Atlantic cod	18.1
Yellowtail flounder	20.2	Acadian redfish	1.6	Longhorn sculpin	9.5	Haddock	12.7	Longhorn sculpin	16.8
Whiting	7.5	Ocean pout	1.3	Haddock	9.1	Longhorn sculpin	12.5	Daubed shanney	11.4
Ocean pout	9.0	Alewife	1.1	Pollock	7.9	Daubed shanney	11.4	Red hake	15.2
No. tows = 83		No. tows = 60		Red hake	6.2	No. tows = 66		Haddock	13.2
				No. tows = 159				No. tows = 20	

Table 25- Ten dominant species and mean abundance/tow⁻¹ from each cluster species group and its associated substrate type as determined by reflectance value, from Stellwagen Bank, Gulf of Maine (Auster et al. 2001).

5.1.4.2 Georges Bank

The interaction of several environmental factors including availability and type of sediment, current speed and direction, and bottom topography have been found to combine to form seven sedimentary provinces on eastern Georges Bank (Valentine et al. 1993), which are outlined in Table 26 and depicted in Figure 14.

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

The Western Basin assemblage (Theroux and Grosslein 1987) is found in the upper Great South Channel region at the northwestern corner of the bank, in comparatively deep water (150-200 m) with relatively slow currents and fine bottom sediments of silt, clay and muddy sand. 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 queden*). 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 23, Figure 13).

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

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

The Southern Georges assemblage is found on the southern and southwestern flanks at depths from 80 m to 200 m, where fine grained sands and moderate currents predominate. Many

southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids and starfish genus *Astropecten*. Representative organisms include amphipods (*Ampelisca compressa*, *Erichthonius rubricornis*, *Synchelidium americanum*), the cumacean *Diastylis quadrispinosa*, annelids (*Aglaophamus circinata*, *Nephtys squamosa*, *Apistobanchus tullbergi*), crabs (*Euprognatha rastellifera*, *Catapagurus sharreri*) and the shrimp *Munida iris*.

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, <i>anemones</i> , and <i>calcareous</i> worm tubes) are abundant in areas of boulders. <i>Strong tidal and storm currents.</i>	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. <i>Strong tidal and storm currents.</i>	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. <i>Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.</i>	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. <i>Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.</i>	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.) <i>Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.</i>	Central Georges
Southeastern Shelf (6)	80-200	Rippled gravel-sand (medium and fine-grained sand) with patchy large bedforms and gravel lag. Weaker currents; ripples are formed by intermittent storm currents. Representative epifauna include sponges attached to shell fragments and amphipods.	Southern Georges
Southeastern Slope (7)	400-2000	Dominated by silt and clay with portions of sand (medium and fine) with rippled sand on shallow slope and smooth silt-sand deeper.	none

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

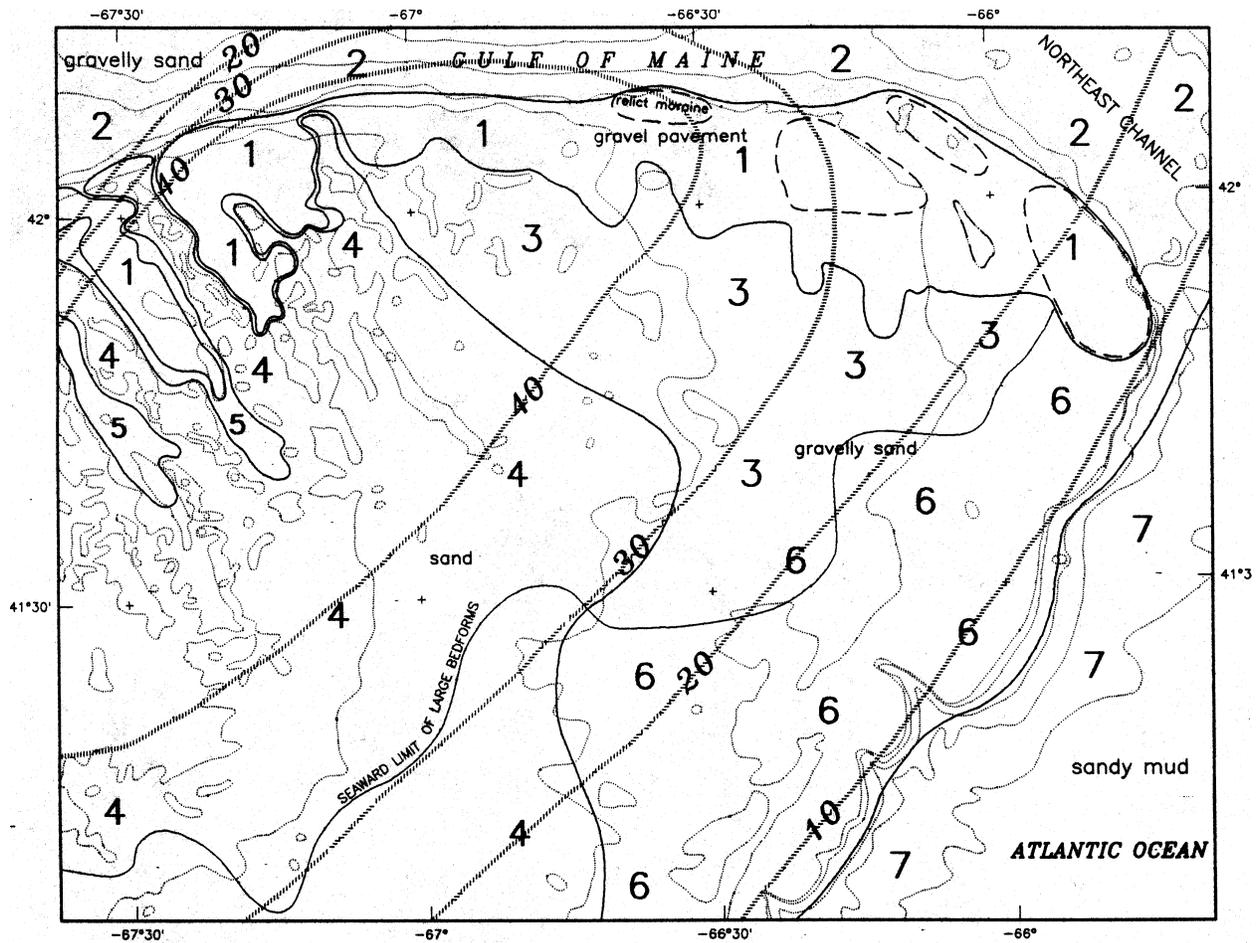


Figure 14- Sedimentary provinces of eastern Georges Bank based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/sec).

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

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 24. Mahon et al. (1998) found similar results.

A few recent studies (Garrison 2000, Garrison and Link 2000, Garrison 2001) demonstrate the persistence of spatio-temporal overlap among numerically dominant, commercially valuable and /or ecologically important species. The studies by Garrison and associates utilized an index of spatial overlap based on the NOAA spring and fall surveys (Figure 15 -Figure 17). He found that among the community of fish species on Georges Bank, only a very few species have high spatial overlaps with other species. The most notable example is silver hake (whiting), which had a very high overlap with most other species, suggestive of a broad distribution. Trends in spatial overlap over time generally reflect changes in species abundance. During the 1960s, haddock and yellowtail flounder were both widely distributed and had high spatial overlaps with other species. As abundance of these species declined through the 1970s into the 1990s, their spatial range contracted and their overlaps with other species subsequently declined. In contrast to this, species whose abundance has increased through time show an expansion of ranges and increased spatial overlap with other species. Interestingly and to confirm other studies of fish assemblages, the major species assemblages have been generally consistent across time given the changes in relative abundance.

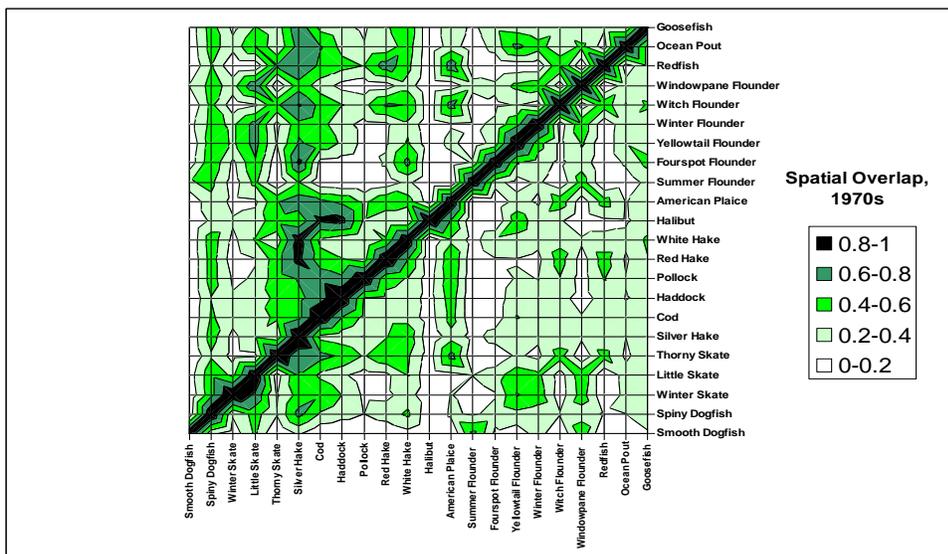


Figure 15- Spatial overlap of primary finfish species on Georges Bank, 1970s (as modified from Garrison and Link 2000)

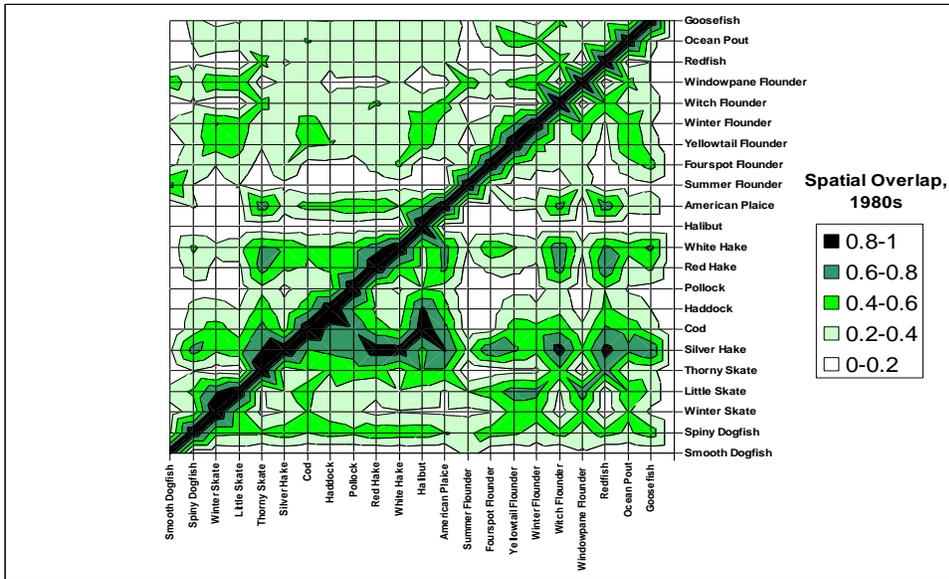


Figure 16- Spatial overlap of primary finfish species on Georges Bank, 1980s (as modified from Garrison and Link 2000)

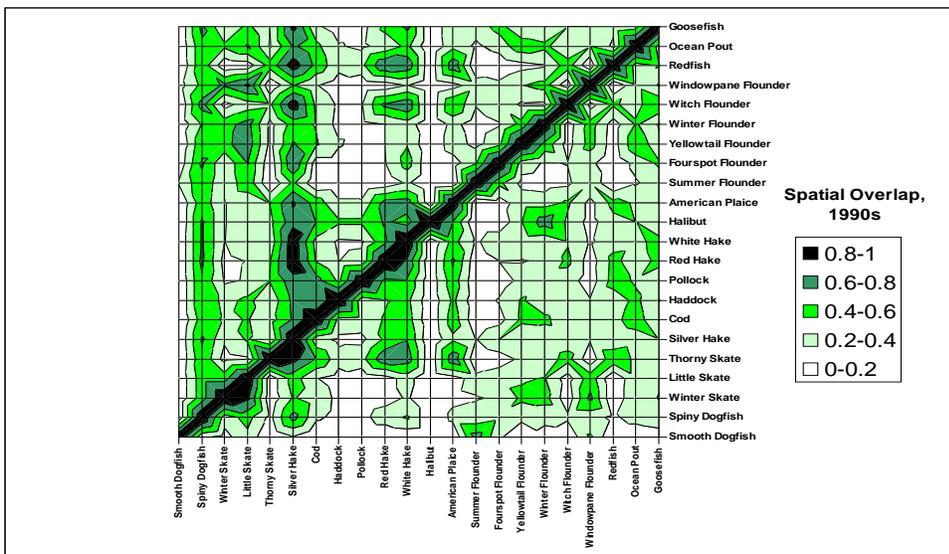


Figure 17- Spatial overlap of primary finfish species on Georges Bank, 1990s (as modified from Garrison and Link 2000)

Seasonal trends in spatial overlap are also apparent (Figure 18 - Figure 21). Spiny dogfish, for example, has a far stronger association and a far broader range of species' associations in the winter than it does in the summer. Similarly, winter skate is a more prevalent co-correspondent in winter than other times of the year. This metric, like the spatial overlap trend over time (above), is sensitive to abundance as evidenced by the lack of spatial overlap between Atlantic halibut and any other species.

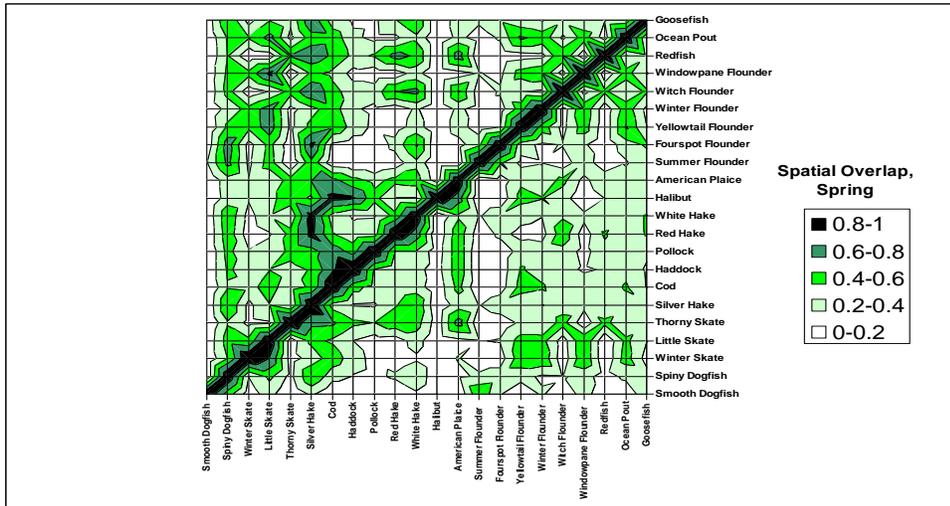


Figure 18- Spatial overlap of primary finfish species on Georges Bank, spring 1970-1998 (as modified from Garrison and Link 2000)

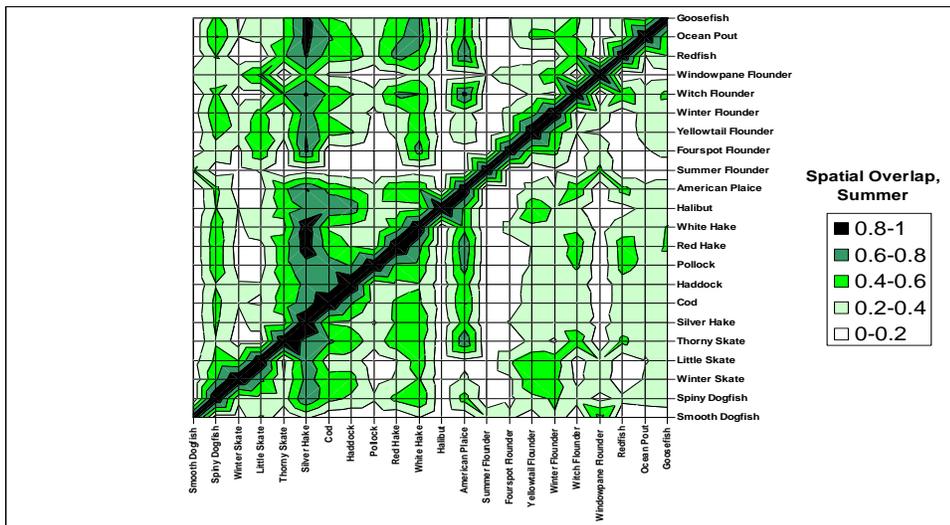


Figure 19- Spatial overlap of primary finfish species on Georges Bank, Summer 1970-1998 (as modified from Garrison and Link 2000)

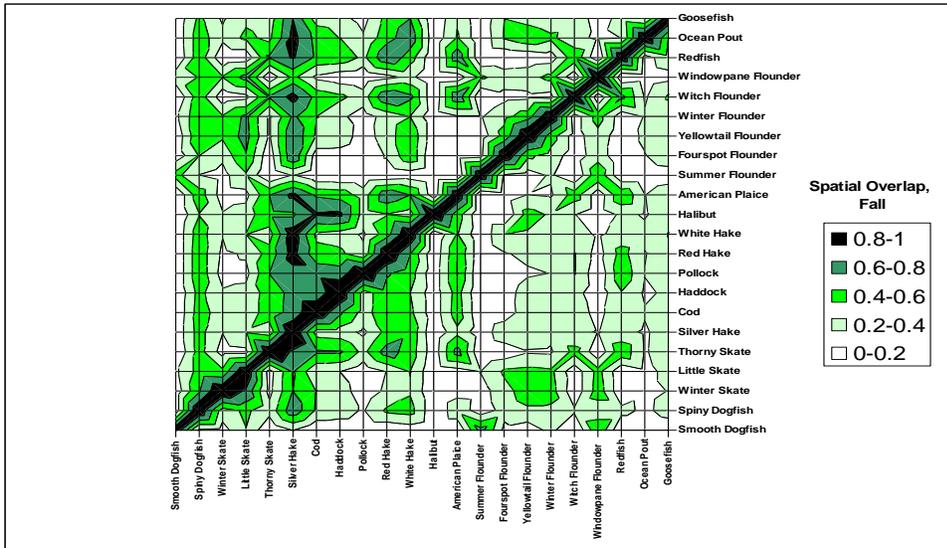


Figure 20- Spatial overlap of primary finfish species on Georges Bank, fall 1970-1998 (as modified from Garrison and Link 2000)

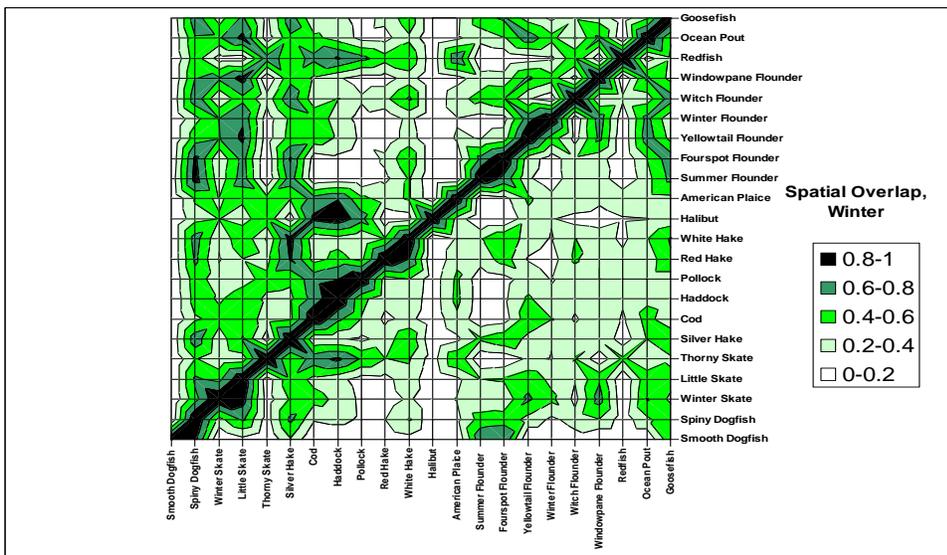


Figure 21- Spatial overlap of primary finfish species on Georges Bank, winter 1970-1998 (as modified from Garrison and Link 2000)

5.1.4.3 Mid-Atlantic Bight

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

Building on Pratt's work, the Mid-Atlantic shelf was further divided by Boesch (1979) into seven bathymetric/morphologic subdivisions based on faunal assemblages (Table 27, Figure 22). Sediments in the region studied (Hudson Shelf Valley south to Chesapeake Bay) were dominated by sand with little finer material. Ridges and swales are important morphological features in this area. Sediments are coarser on the ridges, and the swales have greater benthic macrofaunal density, species richness and biomass. Faunal species composition differed between these features, and Boesch incorporated this variation in his subdivisions (Table 27). Much overlap of species distributions was found between depth zones, so the faunal assemblages represented more of a continuum than distinct zones.

Habitat Type (after Boesch 1979)	Description		
	Depth (m)	Characterization (Pratt faunal zone)	Characteristic Benthic Macrofauna
Inner shelf	0-30	characterized by coarse sands with finer sands off MD and VA (sand zone)	Polychaetes: Polygordius, Goniadella, Spiophanes
Central shelf	30-50	(sand zone)	Polychaetes: Spiophanes, Goniadella Amphipod: Pseudunciola
Central and inner shelf swales	0-50	occurs in swales between sand ridges (sand zone)	<i>Polychaetes</i> : Spiophanes, Lumbrineris, Polygordius
Outer shelf	50-100	(silty sand zone)	Amphipods: Ampelisca vadorum, Erichthonius Polychaetes: Spiophanes
Outer shelf swales	50-100	occurs in swales between sand ridges (silty sand zone)	Amphipods: Ampelisca agassizi, Unciola, Erichthonius
Shelf break	100-200	(silt-clay zone)	not given
Continental slope	>200	(none)	not given

Table 27- Mid-Atlantic habitat types as described by Pratt (1973) and Boesch (1979) with characteristic macrofauna as identified in Boesch 1979.

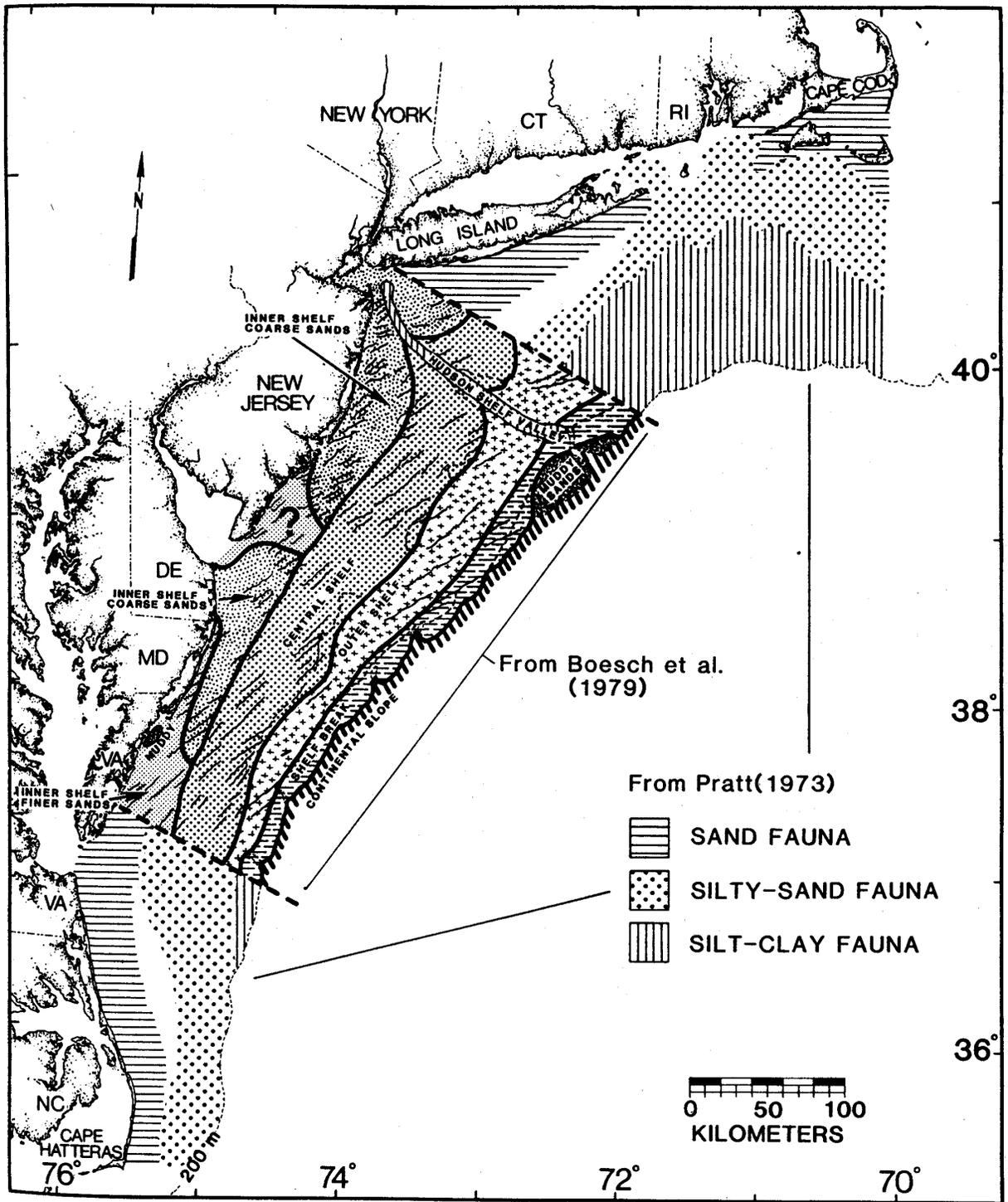


Figure 22- Schematic representation of major macrofaunal zones on the Mid-Atlantic shelf. Approximate location of ridge fields indicated. Source: Reid and Steimle (1988).

Wigley and Theroux (1981) found a general trend in declining macrobenthic invertebrate density from coastal areas offshore to the slope, and on the shelf from southern New England south to Virginia/North Carolina. There were no detectable trends in density from north to south on the slope. Number of individuals was greatest in gravel sediments, and declined in sand-gravel, sand-shell, sand, shell, silty sand, silt and finally clay. However, biomass of benthic macrofauna was greatest in shell habitat, followed by silty sand, gravel, sand-gravel, sand, sand-shell, silt and clay.

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 28). 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 28- Major Recurrent Demersal Finfish Assemblages of the Mid-Atlantic Bight During Spring and Fall as Determined by Colvocoresses and Musick (1983).

Steimle and Zetlin (2000) described representative finfish species and epibenthic/epibiotic and motile epibenthic invertebrates associated with mid-Atlantic reef habitats (Table 29). Most of these reefs are human-made structures.

Location (Type)	Representative Flora & Fauna		
	Epibenthic/Epibiotic	Motile Epibenthic Invertebrates	Fish
Estuarine (Oyster reefs, blue mussel beds, other hard surfaces, semi-hard clay and Spartina peat reefs)	Oyster, barnacles, ribbed mussel, blue mussel, algae, sponges, tube worms, anemones, hydroids, bryozoans, slipper shell, jingle shell, northern stone coral, sea whips, tunicates, caprellid amphipods, wood borers	Xanthid crabs, blue crab, rock crabs, spider crab, juvenile American lobsters, sea stars	Gobies, spot, striped bass, black sea bass, white perch, toadfish, scup, drum, croaker, spot, sheepshead porgy, pinfish, juvenile and adult tautog, pinfish, northern puffer, cunner, sculpins, juvenile and adult Atlantic cod, rock gunnel, conger eel, American eel, red hake, ocean pout, white hake, juvenile pollock
Coastal (exposed rock/soft marl, harder rock, wrecks & artificial reefs, kelp, other materials)	Boring mollusks (piddocks), red algae, sponges, anemones, hydroids, northern stone coral, soft coral, sea whips, barnacles, blue mussel, horse mussel, bryozoans, skeleton and tubiculous amphipods, polychaetes, jingle shell, sea stars	American lobster, Jonah crab, rock crabs, spider crab, sea stars, urchins, squid egg clusters	Black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black brouper, smooth dogfish, sumemr flounder, scad, bluefish amberjack, Atlantic cod, tautog, ocean pout, conger eel, sea raven, rock gunnel, radiated shanny
Shelf (rocks & boulders, wrecks & artificial reefs, other solid substrates)	Boring mollusks (piddocks) red algae, sponges, anemones, hydroids, stone coral, soft coral, sea whips, barnacles, blue mussels, horse mussels, bryozoans, amphipods, polychaetes	American lobster, Jonah crabs, rock crabs, spider crabs, sea stars, urchins, squid egg clusters (with addition of some deepwater taxa at shelf edge)	Black sea bass, scup, tautog, cunner, gag, sheepshead porgy, round herring, sardines, amberjack, spadefish, gray triggerfish, mackerels, small tunas, spottail pinfish, tautog, Atlantic cod, ocean pout, red hake, conger eel, cunner, sea raven, rock gunnel, pollock, white hake
Outer shelf (reefs and clay burrows including "pueblo village community")			Tilefish, white hake, conger eel

Table 29- Mid-Atlantic Reef Types, Location, and Representative Flora and Fauna, as Described in Steimle and Zetlin (2000)

5.1.4.4 Continental Slope

Polychaetes represent the most important slope faunal group in terms of numbers of individuals and species (Wiebe et al. 1987). Ophiuroids are considered to be among the most abundant slope organisms, but this group is comprised of relatively few species. The taxonomic group with the highest species diversity includes the peracarid crustaceans represented by Amphipoda, Cumacea, Isopoda, and the Tanaidacea. Some species of the slope are widely distributed, while others appear to be restricted to particular ocean basins. The ophiuroids and bivalves appear to have the broadest distributions, while the peracarid crustaceans appear to be highly restricted because they brood their young, and lack a planktonic stage of development. In general, gastropods do not appear to be very abundant, however, past studies are inconclusive since they have not collected enough individuals for large-scale community and population studies.

In general, slope-inhabiting benthic organisms are strongly zoned by depth and/or water temperature, although these patterns are modified by the presence of topography, including canyons, channels, and current zonations (Hecker 1990). Moreover, at depths of less than 800 meters, the fauna is extremely variable and the relationships between faunal distribution and substrate, depth, and geography are less obvious (Wiebe et al. 1987). Fauna occupying hard-surface sediments are not as dense as in comparable shallow-water habitats (Wiebe et al. 1987), but there is an increase in species diversity from the shelf to the intermediate depths of the slope. Diversity then declines again in the deeper waters of the continental rise and plain. Hecker (1990) identified four megafaunal zones on the slope of Georges Bank and southern New England (Table 30).

Zone	Approximate Depth (m)	Gradient	Current	Fauna
Upper Slope	300-700	Low	strong	Dense filter feeders; Scleratinians (<i>Dasmosmilia lymani</i> , <i>Flabellum alabastrum</i>), quill worm (<i>Hyalinoecia</i>)
Upper Middle Slope	500-1300	High	moderate	Sparse scavengers; red crab (<i>Geryon quinqueidens</i>), long-nosed eel (<i>Synaphobranchus</i>), common grenadier (<i>Nezumia</i>). Alcyonarians (<i>Acanella arbuscula</i> , <i>Eunephthya florida</i>) in areas of hard substrate
Lower Middle Slope/Transition	1200-1700	High	moderate	Sparse suspension feeders; cerianthids, sea pen (<i>Distichoptilum gracile</i>)
Lower Slope	>1600	Low	strong	Dense suspension & deposit feeders; ophiurid (<i>Ophiomusium lymani</i>), cerianthid, sea pen

Table 30- Faunal zones of the continental slope of Georges Bank and southern New England (from Hecker 1990)

One group of organisms of interest because of the additional structure they can provide for habitat and their potential long life span are the Alcyonarian soft corals. Soft corals can be bush or treelike in shape; species found in this form attach to hard substrates such as rock outcrops or gravel. These species can range in size from a few millimeters to several meters, and the trunk diameter of large specimens can exceed 10 cm. Other Alcyonarians found in this region include

sea pens and sea pansies (Order Pennatulacea), which are found in a wider range of substrate types. In their survey of northeastern U.S. shelf macrobenthic invertebrates, Theroux and Wigley (1998) found Alcyonarians (including soft corals *Alcyonium sp.*, *Acanella sp.*, *Paragorgia arborea*, *Primnoa reseda* and sea pens) in limited numbers in waters deeper than 50 m, and mostly at depths from 200-500 m. Alcyonarians were present in each of the geographic areas identified in the study (Nova Scotia, Gulf of Maine, Southern New England Shelf, Georges Slope, Southern New England Slope) except Georges Bank. However, *Paragorgia* and *Primnoa* have been reported in the Northeast Peak region of Georges Bank (Theroux and Grosslein 1987). Alcyonarians were most abundant by weight in the Gulf of Maine, and by number on the Southern New England Slope (Theroux and Wigley 1998). In this study, Alcyonarians other than sea pens were collected only from gravel and rocky outcrops. Theroux and Wigley (1998) also found stony corals (*Astrangia danae* and *Flabellum sp.*) in the northeast region, but they were uncommon. In similar work on the mid-Atlantic shelf, the only Alcyonarians encountered were sea pens (Wigley and Theroux 1981). The stony coral *Astrangia danae*, was also found, but its distribution and abundance was not discussed, and is assumed to be minimal.

As opposed to most slope environments, canyons may develop a lush epifauna. Hecker et al. (1983) found faunal differences between the canyons and slope environments. Hecker and Blechschmidt (1979) suggested that faunal differences were due at least in part to increased environmental heterogeneity in the canyons, including greater substrate variability and nutrient enrichment. Hecker et al. (1983) found highly patchy faunal assemblages in the canyons, and also found additional faunal groups located in the canyons, particularly on hard substrates, that do not appear to occur in other slope environments. Canyons are also thought to serve as nursery areas for a number of species (Hecker 2001; Cooper et al. 1987). The canyon habitats in Table 31 were classified by Cooper et al. (1987).

Most finfish identified as slope inhabitants on a broad spatial scale (Gabriel 1992, Overholtz and Tyler 1985, and Colvocoresses and Musick 1983) (Table 24) are associated with canyon features as well (Cooper et al. 1987). Finfish identified by broad studies that were not included in Cooper et al. (1987) include offshore hake, fawn cusk-eel, longfin hake, witch flounder and armored searobin. Canyon species (Cooper et al. 1987) that were not discussed in the broad scale studies include squirrel hake, conger eel and tilefish. Cusk and ocean pout were identified by Cooper et al. (1987) as canyon species, but classified in other habitats by the broad scale studies.

Habitat Type	Geologic Description	Canyon Locations	Most Commonly Observed Fauna
I	Sand or semi-consolidated silt substrate (claylike consistency) with less than 5% overlay of gravel. Relatively featureless except for conical sediment mounds.	Walls & axis	Cerianthid, pandalid shrimp, white colonial anemone, Jonah crab, starfishes, portunid crab, greeneye, brittle stars, mosaic worm, red hake, four spot flounder, shell-less hermit crab, silver hake, gulf stream flounder
II	Sand or semi-consolidated silt substrate (claylike consistency) with more than 5% overlay of gravel. Relatively featureless.	Walls	Cerianthid, galatheid crab, squirrel hake, white colonial anemone, Jonah crab, silver hake, starfishes, ocean pout, brittle stars, shell-less hermit crab, greeneye
III	Sand or semi-consolidated silt (claylike consistency) overlain by siltstone outcrops and talus up to boulder size. Featured bottom with erosion by animals and scouring.	Walls	White colonial anemone, pandalid shrimp, cleaner shrimp, rock anemone, white hake, starfishes, ocean pout, conger eel, brittle star, Jonah crab, lobster, black-bellied rose fish, galatheid crab, mosaic worm, tilefish
IV	Consolidated silt substrate, heavily burrowed/excavated. Slope generally more than 5° and less than 50° Termed "pueblo village" habitat.	Walls	Starfishes, black-bellied rosefish, Jonah crab, lobster, white hake, cusk, ocean pout, cleaner shrimp, conger eel, tilefish, galatheid crab, shell-less hermit crab
V	Sand dune substrate.	Axis	Starfishes, white hake, Jonah crab, and monkfish

Table 31- Habitat Types for the Canyons of Georges Bank Described by Geologic Attributes and Characteristic Fauna (from Cooper *et al.* 1987).

Faunal characterization is for depths < 230 m only

5.1.4.5 Assemblages of Northeast Shelf Finfish Species Based on Feeding Habits

A guild is defined by Root (1967) as ‘a group of species that exploit the same class of environmental resources in a similar way’ and explicitly focuses on classifying species based upon their functional role in a community without regard to taxonomy. The guild is used to simplify the structure and dynamics of complex ecosystems regardless of the mechanism generating resource partitioning. Guild members play similar functional roles within ecosystems (Garrison and Link 2000).

Cluster analysis modified from Garrison and Link (2000) found 14 groups of finfish in the Northeast region with significant dietary similarities. These 14 guilds were broadly categorized into six trophic groups, emphasizing similarities in diet at very broad taxonomic levels. Within these groups, the trophic guilds reflect utilization of specific prey types. For example, Guild 6b (Figure 23) consumed primarily engraulids in contrast to other guilds in the piscivore group. The dietary guilds in the Northeast US shelf fish community reflect similarity in the utilization of specific prey categories. Within guilds, 10 to 15 prey taxa generally accounted for greater than 70% of predator diets and usually less than five prey accounted for greater than 50% of the diet. A relatively small set of prey taxa distinguishes the observed dietary guild structure.

The general guild structure and levels of dietary overlap in this system are consistent across both temporal and spatial scales. Complimentary analyses to the current study within the Georges Bank region identified similar trophic guilds, similar patterns of size-based shifts in diets, and general stability in the trophic guild structure over the last three decades (Garrison 2000). Despite the notable changes in species composition in the Northeast shelf fish community, the patterns of trophic resource use and guild structure are remarkably consistent (2000).

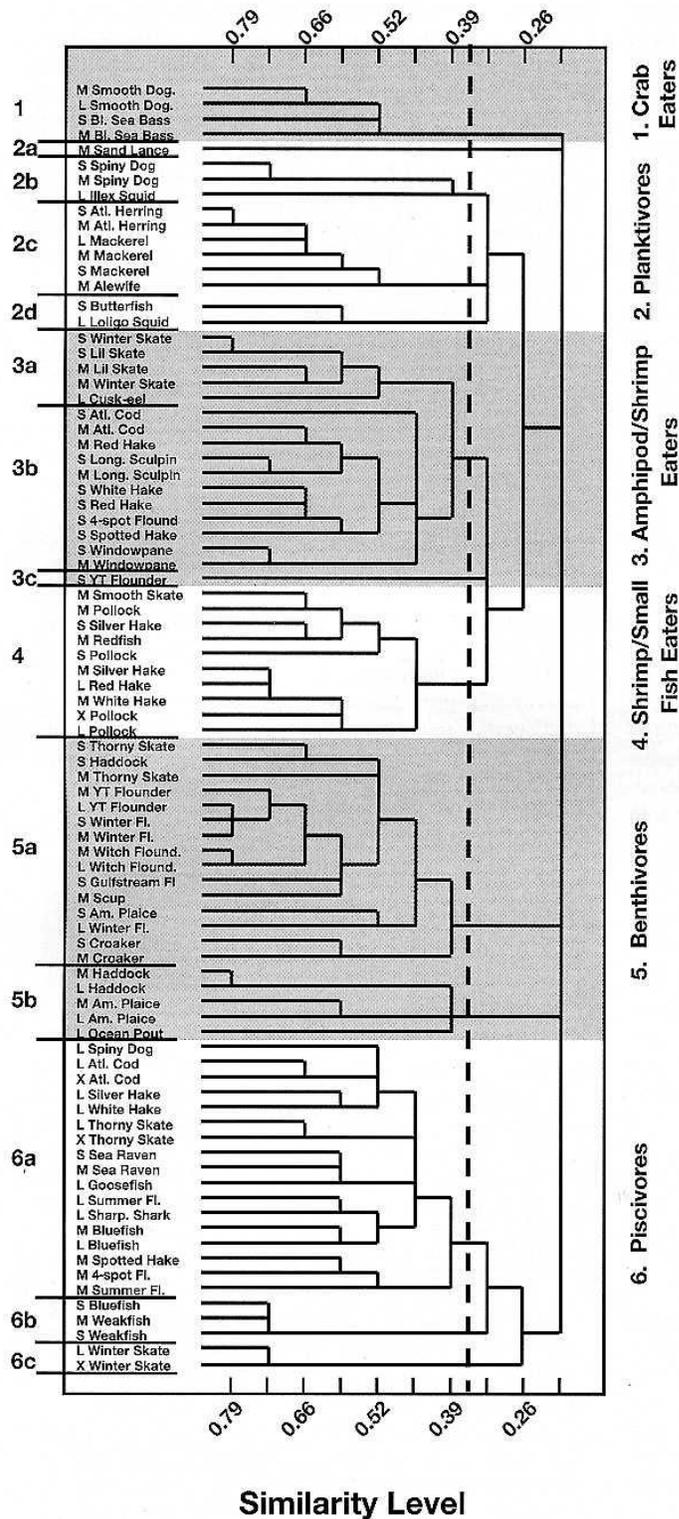


Figure 23- Dietary guild structure of Northeast finfish species

5.1.5 Predator/Prey relationships

5.1.5.1 Predators

Based on information summarized in “Bigelow and Schroeder’s Fishes of the Gulf of Maine, 3rd Ed.”, Collette and Klein-MacPhee, editors, adult monkfish appear to have few predators, although on occasion adult monkfish have been observed in the stomachs of other monkfish. Small monkfish are eaten by various predacious fish, including swordfish, sharks (dusky, sandbar, spiny dogfish and smooth dogfish), thorny skate, and monkfish.

5.1.5.2 Prey

Monkfish are opportunistic feeders with a wide range of prey species, including birds and other monkfish. The three main groups of prey are crustaceans, mollusks and fish. Fish make up the majority of prey for all sizes of monkfish, while cephalopods are only important in monkfish >40cm. For small monkfish <20cm, silver hake and sand lance are major prey species. Monkfish diet also varies by region. Squid, clupeids, silver hake and American plaice were more prevalent in the diet of monkfish in the Gulf of Maine, while little skates, red hake, monkfish and sand lance are more prevalent in the diet in southern New England, according to Bigelow and Schroeder. Unpublished food habits data suggest that the composition of the diet also changes over time, perhaps in relation to the availability of prey species. Observed diets include the following species (Table 32):

LIFE STAGE	FOOD HABITS/PREY
LARVAE	Zooplankton: copepods, crustacean larvae, chaetognaths
JUVENILE	Small fish, sand lance, invertebrates such as red shrimp and squid
ADULT	Opportunistic feeders on benthic and pelagic species. Larger monkfish eat larger prey. Cannibalism occurs but at a low (insignificant) level based on 2001 commercial survey. Prey includes crustaceans, cephalopods, and fish, as well as sea birds and diving ducks. Prey species include: spiny dogfish, skates, eels, sand lance, herring, menhaden, smelt, mackerel, weakfish, cunner, black sea bass, butterfish, pufferfish, sculpin, sea raven, searobin, silver hake, tomcod, cod, haddock, hake, witch and other flounders, squid, large crustaceans and other benthic invertebrates.

Table 32 Monkfish food habits/prey species

5.1.6 Deep-sea canyons

The U.S. Atlantic coast continental shelf margin is cut by a number of submarine canyons (See Section 5.2.1.4). Two of these canyons (Oceanographer and Lydonia) will be described in more detail in this section of the FSEIS because the two habitat closures that are proposed for implementation in this amendment are located in these two canyons. The information summarized in the following two sections was extracted from Hecker et al. (1980) and Valentine et al. (1980).

A database of existing geo-referenced records for deep-sea coral records for 25 species of soft corals and sea fans of the Suborder Alcyonacea has been assembled from survey data and other sources of information (Watling and Auster, in press). A preliminary version of the database is available from the authors on a CD-ROM (Watling et al. 2003); the database is in the process of

being developed with new records. Information for hard (scleractinian) corals) is also available. Distribution maps for hard and soft corals (Figure 24 and Figure 25). While no “reefs” have been found off the northeast coast of the U.S., the coral fauna is diverse. Seventeen species of hard corals are known from Cape Hatteras to the Gulf of Maine (Cairns and Chapman 2001), 71% of which occur deeper than 1000 meters. Surveys on the continental slope and in canyons south of Georges Bank recorded over 25 species of both hard and soft corals (Hecker et al. 1980, 1983; Valentine et al. 1980; Cooper et al. 1987; Hecker 1990). Most of the corals found in Lydonia and Oceanographer canyons were attached to hard substrate.

Deepwater corals are especially vulnerable to damage by fishing gear because of their often complex, branching form of growth and because many of them are extremely slow-growing (Packer et al., Draft). Growth rates of about 1-2 cm/year have been reported for *Primnoa resedaeformis* and *Desmophyllum cristagalli* (Andrews et al. 2002 and Risk et al. 2002), two species that are present in Lydonia and Oceanographer canyons (Table 33). *P. resedaeformis* colonies reach heights of 1 meter or more (Opresko 1980). At 1-2 cm/year, it would take 100-200 years to replace one of these colonies. Deep-water corals are also particularly susceptible to damage and loss caused by bottom trawling. Severe damage to reefs formed by the deepwater hard corals *Lophelia* off Norway and *Oculina* off the east coast of Florida has been documented (Fossa et al. 2002; Koenig et al. in press), but has also been reported by Krieger (2001) for a gorgonian (soft coral) in Alaska. In the Alaska study, a single trawl tow through *Primnoa* habitat landed 1000 kg of coral. Seven years later, 7 of 31 coral colonies remaining in the trawl path were missing 80-99% of their branches and boulders with corals attached had been tipped and dragged. *Primnoa* is one of the soft coral species known to be present in Lydonia and Oceanographer canyons (Table 33). Other species of coral present in these two canyons are probably equally vulnerable to bottom trawling. It can also be inferred that bottom gill nets would damage and remove corals from the bottom since they tend the bottom in the same way as longlines, which have been observed entangled in deepwater corals such as *Paragorgia* and *Primnoa* (Breeze et al. 1997; Mortensen et al., in press).

Corals provide structure for shelter seeking fishes and may enhance rates of prey capture for fish which feed on smaller organisms that also find shelter in the corals. In a study area in the Gulf of Alaska, Krieger and Wing (2002) noted that less than 1% of the boulders contained coral coral, but 85% of the large rockfish (*Sebastes* spp.) were found next to boulders with corals (i.e., *Primnoa* sp.). Data from research trawl surveys in Alaska showed rockfish was one of the most common species collected with gorgonian, cup, and hydrocorals while flounders and gadids were the most common species associated with *Gersemia*, a soft coral (Heifetz 2002). Surveys in relatively deep water (50-240 m) in the Gulf of Maine have shown that bottom habitats composed of rock outcrops and boulders with dense coral cover (*Paragorgia*, *Primnoa*, *Paramuricea*) supported an abundance of redfish, but densities were not any higher than in a boulder and cobble habitat with dense epifauna cover (sponges and cerianthid anemones) (Auster, in press). This study suggests that corals are an important habitat feature and are equivalent to other structures that provide cover for fish. The frequent occurrence of shrimp on the largest soft corals in Lydonia and Oceanographer canyons (Hecker et al. 1980) suggests that the corals also provide feeding opportunities for fish that congregate near them.

5.1.6.1 Oceanographer Canyon

Oceanographer Canyon has a mosaic of substrate types that are dependent on depth, currents,

geology, relief, and biological activity. Shelf sediments are transported over the eastern rim of the canyon by the southwest drift and storm currents. Tidal currents and internal waves move sediments downcanyon along the axis and walls. The extensive exposure of outcrops (clay and boulders) indicates modern day erosional activities. The outcrops of clay and boulders are present on the canyon walls. Where exposed, the silty clay is burrowed by benthic species such as red crab and Jonah crab. The activities of these and possibly other organisms cause extensive erosion at depths between 100 to 1300 m. Bioerosion is minimal along on the rocky cliffs, in areas of sediment movement, and along the gravel pavement. Rippled, unconsolidated silt and sand are found along the canyon walls and in the axis. Large erratic boulders are present on the gently sloping upper canyon walls. Gravel up to cobble size forms a pavement throughout the northern part of the canyon and isolated patches are also found on the canyon walls and along the axis.

The fauna within the heavily graveled area is sparse but diverse and is dominated by epibenthic invertebrates and fish. In general, faunal density is low between 400 and 1600 m; however, there are high densities of brittle stars between 1600 and 1700 m. Both hard and soft corals are present at depths between 400 and 1100 m. Two gorgonians, *Paramuricea grandis* and *Acanthogorgia armata*, were the most abundant corals found in this canyon during a photographic survey conducted in 1979; other species that are known to be present are listed in Table 33. Corals are more abundant in Oceanographer Canyon than in Lydonia Canyon and substrates are more variable.

A number of federally-managed species were directly observed in Oceanographer Canyon using submersibles (see more detailed analysis in section 6.3.1.5). These include red crab, tilefish, witch flounder, redfish, silver hake, pollock, and red hake. There is also evidence that redfish use the large cerianthiid anemones found in the canyon as shelter. Northeast Fisheries Science Center (NEFSC) groundfish trawl data indicated that between 1968 and 2001, only two otter trawl tows had been taken within Oceanographer Canyon. One station, sampled in 1968, was at a mean depth of 229m. Four managed species were found at this station: little skate, thorny skate, silver hake and red hake. The station sampled in 1999 was at a mean depth of 181 m. Eight managed species were found at this station: spiny dogfish, butterflyfish, longfin squid, offshore hake, red hake, silver hake, pollock, and barndoor skate.

5.1.6.2 Lydonia Canyon

Lydonia Canyon has a mosaic of substrate types that are dependent on depth, currents, geology, relief, and biological activity. Silty sediments are found on the walls and flanks of Lydonia Canyon and there are also sporadic rock outcrops. Rock outcrops are more common along the axis. There are rippled silty sediments in the axis of the canyon along most of its length. There are clay and rock outcrops on the west wall and flank of the canyon. Cobbles, pebbles, and shell hash are found above 400m on the east wall and flank. There is a good deal of erosion of sediments particularly along the axis.

Faunal density is high above 400m and is dominated by anemones and the quill worm, *Hyalinoecia artifex*. Below 400 m, faunal density is low and is dominated by shrimp, and to a lesser degree by red crab and long-nosed eel. Most of the corals found in Lydonia Canyon are restricted to hard surfaces; the coral fauna is diverse and abundant. The most abundant species identified between 300 and 1100 m in the 1979 survey was *Eunephthya* (now *Capnella*) *florida*.

Other species present in this canyon are listed in Table 33.

A number of managed species were directly observed in Lydonia Canyon using submersibles. These include red crab, tilefish, witch flounder, silver hake, pollock, and red hake. NEFSC groundfish trawl data indicated that four stations within Lydonia Canyon were sampled between 1968 and 2001 (see more detailed analysis in section 6.3.1.5). Mean depths of the trawls ranged from 174 to 196 m. The data indicate that 17 managed species were caught at least once over that time period. These include redfish, American plaice, butterfish, cod, haddock, little skate, longfin squid, ocean pout, offshore hake, pollock, red hake, shortfin squid, silver hake, spiny dogfish, white hake, winter skate, and witch flounder.

Species	Oceanographer	Lydonia
Soft corals		
<i>Anthomastus agassizii</i>	✓	✓
<i>Acanthogorgia armata</i>	✓	✓
<i>Trachythela rudis</i>	✓	✓
<i>Paragorgia arborea</i>	✓	✓
<i>Distichoptilum gracile</i>	✓	
<i>Primnoa resedaeformis</i>	✓	✓
<i>Anthothela grandiflora</i>	✓	✓
<i>Capnella florida</i>	✓	✓
<i>Capnella glomerata</i>	✓	✓
<i>Acanella arbuscula</i>	✓	
<i>Thouarella</i> sp.	✓	
<i>Paramuricea grandis</i>	✓	✓
<i>Pennatula aculeata</i>	✓	✓
Hard corals		
<i>Desmophyllum cristagalli</i>		✓
<i>Desmophyllum lymani</i>		✓
<i>Flabellum</i> sp.		✓
<i>Javanis cailleti</i>		✓
<i>Solenosmilla variabilis</i>		✓

Table 33 - Species of coral known to be present in Oceanographer and Lydonia Canyons

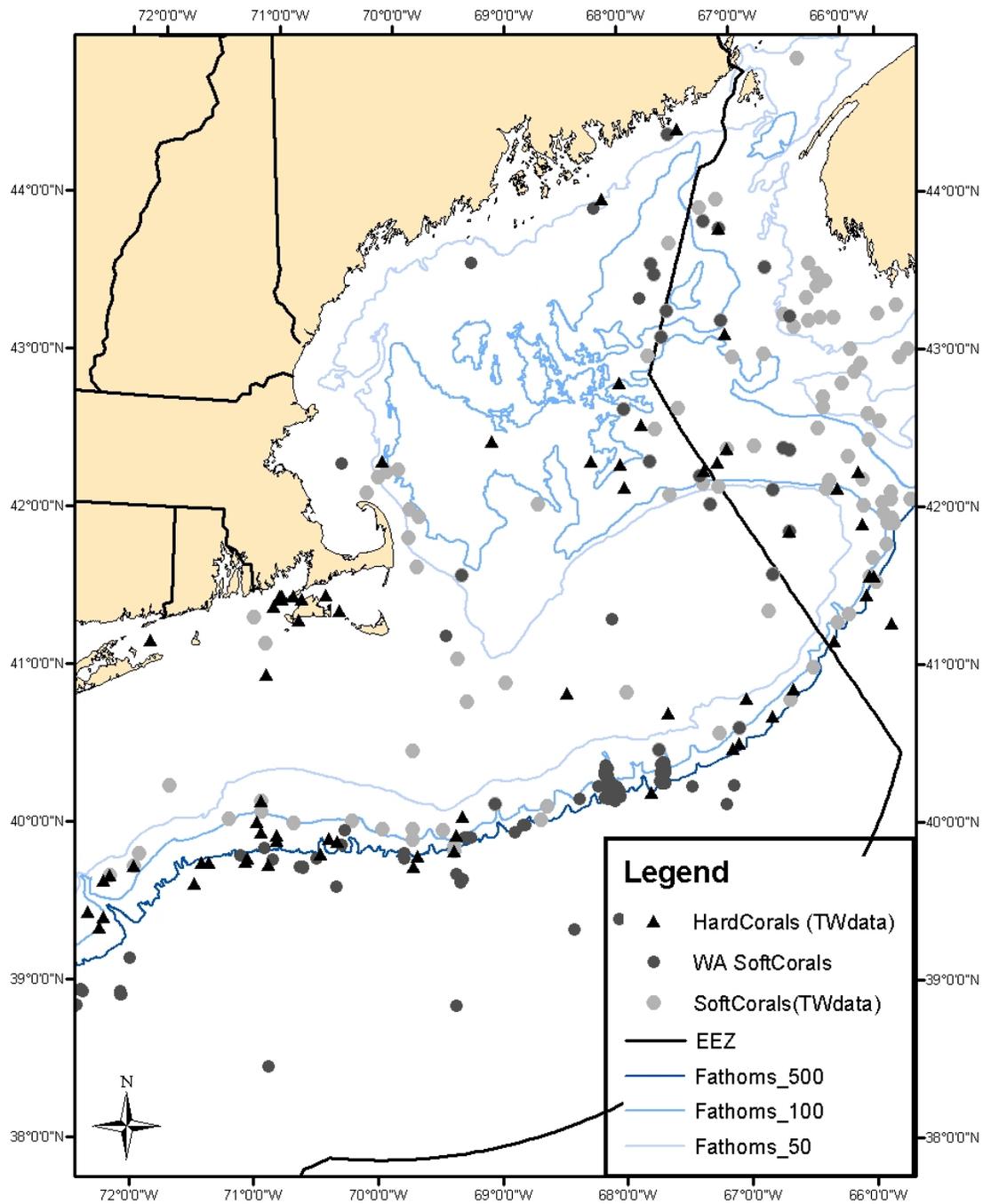


Figure 24 - Known distribution of hard and soft corals in the Gulf of Maine, Georges Bank and Southern New England area.

Source: Coral presence data based on two databases, Watling et al., 2003(WA) and Theroux and Wigley, 1998 (TW).

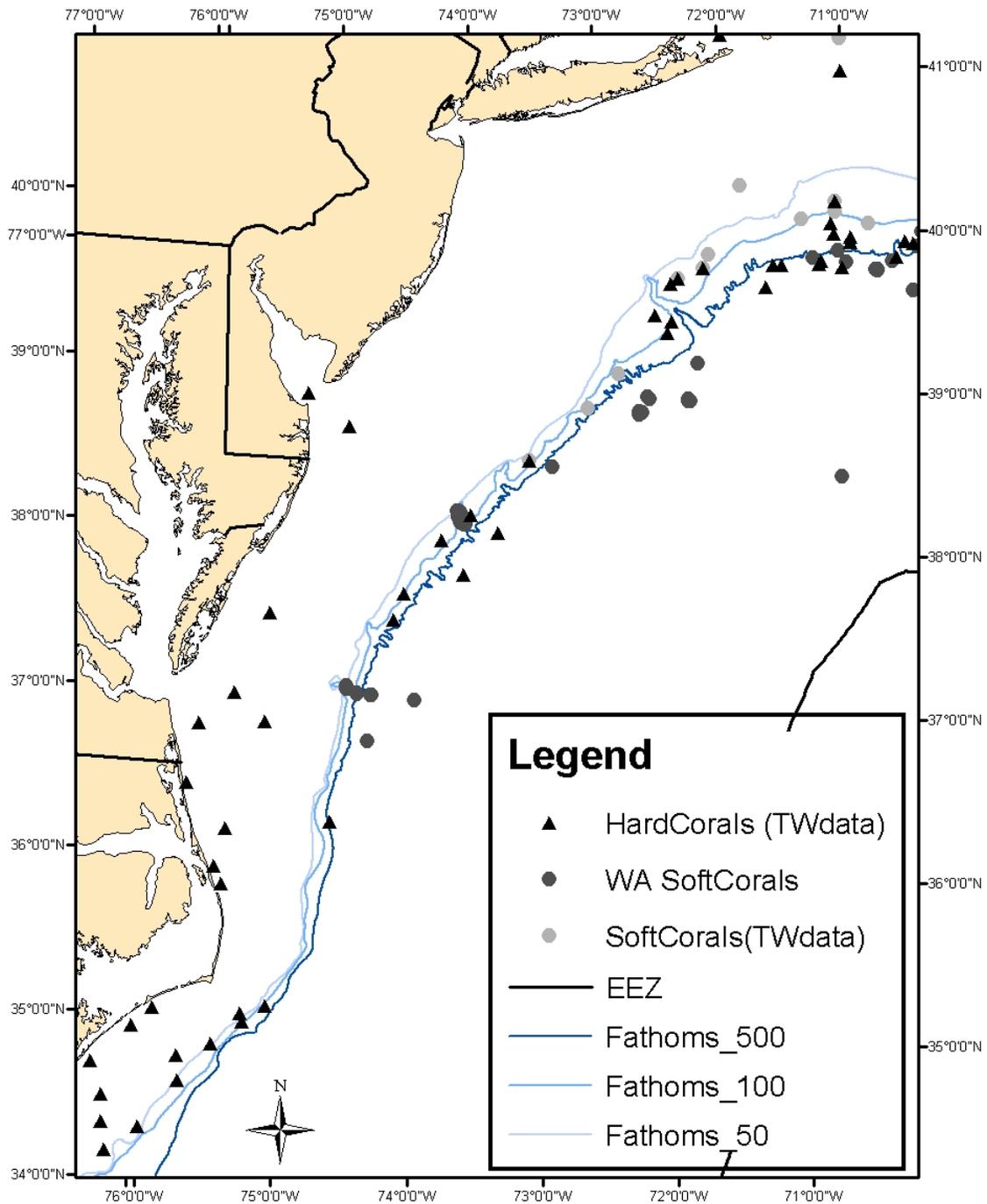


Figure 25 - Known distribution of hard and soft corals in the Mid-Atlantic area.

Source: Coral presence data based on two databases, Watling et al., 2003(WA) and Theroux and Wigley, 1998 (TW).

5.1.7 Marine Mammals and Protected Species in the Management Area

The following species are found in the area of the fisheries regulated through the Monkfish FMP and are listed under the Endangered Species Act of 1973 (ESA) as endangered, threatened, or as candidate species. The Council has also included in the list below a number of species that are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA) as well as two right whale critical habitat designations that are found in the same area.

Cetaceans

Northern right whale (<i>Eubalaena glacialis</i>)	Endangered
Humpback whale (<i>Megaptera novaeangliae</i>)	Endangered
Fin whale (<i>Balaenoptera physalus</i>)	Endangered
Blue whale (<i>Balaenoptera musculus</i>)	Endangered
Sei whale (<i>Balaenoptera borealis</i>)	Endangered
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected
Risso's dolphin (<i>Grampus griseus</i>)	Protected
Pilot whale (<i>Globicephala</i> spp.)	Protected
White-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected
Common dolphin (<i>Delphinus delphis</i>)	Protected
Spotted and striped dolphins (<i>Stenella</i> spp.)	Protected
Bottlenose dolphin (<i>Tursiops truncatus</i>)	Protected

Seals

Harbor seal (<i>Phoca vitulina</i>)	Protected
Gray seal (<i>Halichoerus grypus</i>)	Protected
Harp seal (<i>Phoca groenlandica</i>)	Protected

Sea Turtles

Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	Endangered
Green sea turtle (<i>Chelonia mydas</i>)	Endangered
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	Endangered
Loggerhead sea turtle (<i>Caretta caretta</i>)	Threatened

Fish

Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered
Atlantic salmon (<i>Salmo salar</i>)	Endangered
Barndoor skate (<i>Dipturus laevis</i>)	Candidate Species

Birds

Roseate tern (<i>Sterna dougallii dougallii</i>)	Endangered
Piping plover (<i>Charadrius melodus</i>)	Endangered

Critical Habitat Designations

Right whale	Cape Cod Bay Great South Channel
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Although all of the protected species listed above may be found in the general geographical area covered by the Monkfish 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 2 while the second group is the subject of a more detailed assessment.

5.1.7.1 Protected Species Not Likely to be Affected by the Monkfish 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 monkfish fishing operations and the measures proposed in Amendment 2 to the Monkfish FMP unlikely to affect the shortnose sturgeon (*Acipenser brevirostrum*), the Gulf of Maine distinct population segment (DPS) of Atlantic salmon (*Salmo salar*), or the hawksbill sea turtle (*Eretmochelys imbricata*), all of which are species listed under the ESA.

Additionally, there are several cetaceans protected under the MMPA that are found in the action area: Risso's dolphin (*Grampus griseus*), spotted and striped dolphins (*Stenella* spp.), and coastal forms of Atlantic bottlenose dolphin (*Tursiops truncatus*). Although these species may occasionally become entangled or entrapped in certain fishing gear such as pelagic longline and mid-water trawls, these gear types are not used in the monkfish fishery.

The Council also believes that monkfish fishing operations will not adversely affect the right whale critical habitat areas listed above.

Shortnose Sturgeon

The shortnose sturgeon is benthic fish that mainly occupies the deep channel sections of several Atlantic coast rivers. They can be found in most major river systems from St. Johns River, Florida to the Saint John River in New Brunswick, Canada. The species is considered truly anadromous in the southern portion of its range (*i.e.*, south of Chesapeake Bay). However, they spend the majority of their life history within the fresh water sections of the northern rivers with only occasional forays into salt water, and are thus considered to be "freshwater amphidromous" (NMFS 1998a). There have been no documented cases of shortnose sturgeon taken in gear used in the monkfish fishery.

The monkfish fishery in Northeast and Mid-Atlantic may extend to shallow waters, but not into the intertidal zone of major river systems where shortnose sturgeon are likely to be found. Therefore, there appears to be adequate separation between the two species making it highly unlikely that the monkfish fisheries will affect shortnose sturgeon.

Atlantic Salmon

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S.-Canada border are listed as endangered. These rivers include the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove

Brook. Atlantic salmon are an anadromous species with spawning and juvenile rearing occurring in freshwater rivers followed by migration to the marine environment.

Juvenile salmon in New England rivers typically migrate to sea in May after a two to three year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn from mid October through early November. While at sea, salmon generally undergo an extensive northward migration to waters off Canada and Greenland. Historical commercial harvest data indicate that post-smolts overwinter in the southern Labrador Sea and in the Bay of Fundy. The numbers of wild Atlantic salmon that return to these rivers are perilously small, with total run sizes of approximately 150 spawners occurring in 1999 (Baum 2000).

Capture of Atlantic salmon has occurred in U.S. commercial fisheries or by research/survey vessels, although none have been documented since 1992. No monkfish landings have been recorded for the areas adjacent to the Atlantic salmon rivers. In addition, NMFS fishery research surveys have not found monkfish in the nearshore regions adjacent to the Atlantic salmon rivers, nor does the monkfish fishery operate in or near the rivers where concentrations of Atlantic salmon are most likely to be found.

Hawksbill Sea Turtle

The hawksbill turtle is relatively uncommon in the action area. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America where they feed primarily on a wide variety of sponges and mollusks. There are accounts of small hawksbills stranded as far north as Cape Cod, Massachusetts. Many of these strandings, however, were observed after hurricanes or offshore storms. No takes of hawksbill sea turtles have been recorded in Northeast or Mid-Atlantic fisheries where observers have been deployed in the otter trawl (including the Mid-Atlantic) and sink gillnet fisheries that catch multispecies and also participate in the monkfish fishery.

Hawksbills may occur in the southern range of the action area (i.e., North Carolina and South Carolina), but their distribution is not known to overlap significantly with monkfish fishing activity. It is unlikely, therefore, that interactions between hawksbill sea turtles and vessels that catch monkfish will occur.

Right Whale Critical Habitat

Critical habitat for right whales has been designated for Cape Cod Bay, Great South Channel, and coastal Florida and Georgia (outside of the action area for this action). Cape Cod Bay and the Great South Channel areas were designated critical habitat for right whales due to their importance as spring/summer foraging grounds for this species. There is no evidence to suggest that operation of the monkfish fishery adversely affects the value of critical habitat designated for the right whale. Right whale critical habitat, therefore, is not discussed further in this document.

5.1.7.2 Protected Species Potentially Affected by this FMP

The status of the various ESA-listed species affected by the monkfish fishery is described in the Biological Opinions prepared by the National Marine Fisheries Service, beginning in 1998. The most recent Opinions are dated May 14, 2002 and April 14, 2003. The information provided in

these documents on the status of species listed as endangered, threatened, or candidate species is incorporated herein by reference. Information on protected species that are potentially affected by the monkfish fishery is provided below.

Right Whale

Right whales were found historically in all the world's oceans within the temperate to subarctic latitudes. There are three major subdivisions of right whales: North Pacific, North Atlantic, and Southern Hemisphere; with eastern and western subunits found in the North Atlantic (Perry et al. 1999). Because of our limited understanding of the genetic structure of the species, the conservative approach to conservation of this species has been to treat the subunits as separate groups whose survival and recovery is critical to the health of the species.

The northern right whale has the highest risk of extinction of all large whales. Scarcity of right whales is the result of an 800-year history of whaling that continued into the 1960s (Klumov 1962). Records indicate that right whales were subject to commercial whaling in the North Atlantic as early as 1059, with an estimated 25,000-40,000 right whales believed to have been taken between the 11th and 17th centuries. The size of the western North Atlantic right whale population at the termination of whaling is unknown. The stock was first recognized as seriously depleted as early as 1750. However, right whales continued to be taken in shore-based operations or opportunistically by whalers in search of other species as late as the 1920s. By the time the species was internationally protected in 1935 there may have been fewer than 100 North Atlantic right whales in the western North Atlantic (Hain 1975; Reeves et al. 1992; Kenney et al. 1995).

Intense whaling was also the cause of the critically endangered status of the North Pacific right whale. Currently, the North Pacific population is so small that no reliable estimate can be given. In the Atlantic, the eastern subpopulation of the North Atlantic population may already be extinct. The fact that the western North Atlantic subpopulation is the most numerous right whale population in the northern hemisphere, and is only estimated to number approximately 300 animals, is testimony to the severely depleted status of this species in the northern hemisphere. In contrast, the southern right whale is recovering with a growth rate of 7% in many areas.

Right whales appear to prefer shallow coastal waters, but their distribution is also strongly correlated to zooplankton prey distribution (Winn et al. 1986). In both northern and southern hemispheres, right whales are observed in the lower latitudes and more coastal waters during winter, where calving takes place, and then migrate to higher latitudes during the summer. In the western North Atlantic, they are found west of the Gulf Stream and are most commonly associated with cooler waters (<21° C). They are not found in the Caribbean and have been recorded only rarely in the Gulf of Mexico.

NMFS designated three right whale critical habitat areas on June 3, 1994 (59 FR 28793) to help protect important right whale foraging and calving areas within the U.S. These areas are: Cape Cod Bay; the Great South Channel (both off Massachusetts); and the waters adjacent to the southern Georgia and northern Florida coast. In 1993, Canada's Department of Fisheries declared two conservation areas for right whales; one in the Grand Manan Basin in the lower

Bay of Fundy, and a second in Roseway Basin between Browns and Baccaro Banks (Canadian Recovery Plan for the North Atlantic Right Whale 2000).

Right whales feed on zooplankton through the water column, and in shallow waters may feed near the bottom. 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 1991b; 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. 2001). New England waters include important foraging habitat for right whales and at least some portion of the right whale population is present in these 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. 2001). 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.

However, much about right whale movements and habitat use are still unknown. Approximately 85% of the population is unaccounted for during the winter (Waring et al. 2001). Radio and satellite tagging has been used to track right whales, and has shown lengthy and somewhat distant excursions into deep water off the continental shelf (Mate et al. 1997). In addition photographs of identified individuals have documented movements of the western North Atlantic right whales as far north as Newfoundland, the Labrador Basin and southeast of Greenland (Knowlton et al. 1992). Sixteen satellite tags were attached to right whales in the Bay of Fundy, Canada, during summer 2000 in an effort to further elucidate the movements and important habitat for North Atlantic right whales. The movements of these whales varied, with some remaining in the tagging area and others making periodic excursions to other areas before returning to the Bay of Fundy. Several individuals were observed to move along the coastal waters of Maine, while others traveled to the Scotian Shelf off Nova Scotia. One individual was successfully tracked throughout the fall, and was followed on her migration to the Georgia/Florida wintering area.

Recognizing the precarious status of the right whale, the continued threats present in its coastal habitat throughout its range, and the uncertainty surrounding attempts to characterize population trends, the International Whaling Commission (IWC) held a special meeting of its Scientific Committee from March 19-25, 1998, in Cape Town, South Africa, to conduct a comprehensive assessment of right whales worldwide. The workshop's participants reviewed available information on the North Atlantic right whale. The conclusions of Caswell et al. (1999) were particularly alarming. Using data on reproduction and survival through 1996, Caswell determined that the western North Atlantic right whale population was declining at a rate of 2.4% per year, with one model suggesting that the mortality rate of the right whale population had increased five-fold in less than one generation. According to Caswell, if the mortality rate as of 1996 does not decrease and the population's reproductive performance does not improve, extinction could occur in 191 years and would be certain within 400 years.

The IWC Workshop participants expressed “considerable concern” in general for the status of the western North Atlantic right whales. This concern was based on recent (1993-1995) observations of near-failure of calf production, the significantly high mortality rate, and an observed increase in the calving interval. It was suggested that the slow but steady recovery rate published in Knowlton et al. (1994) may not be continuing. Workshop participants urgently recommended increased efforts to reduce the human-caused mortality factors affecting this right whale population.

As stated in the IWC Workshop, there is been concern over the decline in birth rate. In the three calving seasons following Caswell’s analysis, only 10 calves are known to have been born into the population, with only one known right whale birth in the 1999/2000 season. However, the 2000/2001 calving season had 31 right whale calves sighted, with 27 surviving. Although these births are encouraging, biologists recognize that there may be some additional natural mortality with the 2000/2001 calves and cautious optimism is necessary because of how close the species is to extinction. In addition, efforts to reduce human-caused mortality must be accelerated if these individuals are to survive to sexual maturity and help reverse the population decline.

One question that has repeatedly arisen regarding the western North Atlantic population of right whales is the effect that “bottlenecking” may have played on the genetic integrity of right whales. Several genetics studies have attempted to examine the genetic diversity of right whales. Results from a study by Schaeff et al. (1997) indicate that North Atlantic right whales are less genetically diverse than southern right whales; a separate population that numbers at least four times as many animals with an annual growth rate of nearly seven percent. A recent study compared the genetic diversity of North Atlantic right whales with the genetic diversity of southern right whales. The researchers found only five distinct haplotypes (a maternal genetic marker) exist amongst 180 different North Atlantic right whales sampled, versus 10 haplotypes among just 16 southern right whales sampled. In addition, one of the five haplotypes found in the North Atlantic right whales was observed in only four animals; all males born prior to 1982 (Malik et al. 2000). Because this genetic marker can be passed only from female to offspring, there is an expectation that it will be lost from the population. Two interesting facts about this haplotype are: (1) the last known female with this type was the animal killed by the shore fishery at Amagansett, Long Island in 1907; and (2) this haplotype is basal to all others worldwide (i.e., it is the most ancient of all right whales).

Low genetic diversity is a general concern for wildlife populations. It has been suggested that North Atlantic right whales have been at a low population size for hundreds of years and, while the present population exhibits very low genetic diversity, the major effects of harmful genes are thought to have occurred well in the past, effectively eliminating those genes from the population (Kenney 2000). To determine how long North Atlantic right whales have exhibited such low genetic diversity, researchers have analyzed DNA extracted from museum specimens. Rosenbaum et al. (2000) found these samples represented four different haplotypes, all of which are still present in the current population, suggesting there has not been a significant loss of genetic diversity within the last 191 years. Although his sample size (n=6) was small, it supports the theory that significant reduction in genetic diversity likely occurred prior to the late 19th century.

The role of contaminants or biotoxins in reducing right whale reproduction has also been raised. Contaminant studies have confirmed that right whales are exposed to and accumulate

contaminants, but the effect that such contaminants might be having on right whale reproduction or survivability is unknown.

Competition for food resources is another possible factor impacting right whale reproduction. Researchers have found that North Atlantic right whales appear to have thinner blubber than right whales from the South Atlantic (Kenney, 2000). It has also been suggested that oceanic conditions affecting the concentration of copepods may in turn have an effect on right whales since they rely on dense concentrations of copepods to feed efficiently (Kenney 2000). However, evidence is lacking to demonstrate either that a decline in birth rate is related to depleted food resources or that there is a relationship between oceanic conditions and copepod abundance to right whale fitness and reproduction rates.

General Human Impacts and Entanglement

Right 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. However, the major known sources of anthropogenic mortality and injury of right whales clearly are ship strikes and entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies.

Based on photographs of catalogued animals from 1959 and 1989, Kraus (1990) estimated that 57% of right whales exhibited scars from entanglement and 7% from ship strikes (propeller injuries). Hamilton et al. (1998) updated this work using data from 1935 through 1995. The new study estimated that 61.6% of right whales exhibit injuries caused by entanglement, and 6.4% exhibit signs of injury from vessel strikes. These data may be misleading, as a ship strike may be less of a “recoverable” event than entanglement in rope. It is also known that several whales have apparently been entangled on more than one occasion, and that some right whales that have been entangled were subsequently involved in ship strikes. Furthermore, these numbers are based on sightings of free-swimming animals that initially survive the entanglement or ship strike. Therefore, the actual number of interactions may be higher as some animals are likely drowned or killed immediately, and the carcass never recovered or observed.

The most recent data describing the observed entanglements of right whales is found in Table 34. It should be noted that no information is currently available on the response of the right whale population to recent (1997-1999) efforts to mitigate the effects of entanglement and ship strikes. However, as noted above, both entanglements and ship strikes have continued to occur. Therefore, it is not possible to determine whether the trend through 1996, as reported by Caswell, is continuing. Furthermore, results reported by Caswell suggest that it is not possible to determine that anthropogenic mortalities alone are responsible for the decline in right whale survival. However, the IWC concluded that reduction of anthropogenic mortalities would significantly improve the species’ survival probability.

The best available information makes it reasonable to conclude that the current death rate exceeds the birth rate in the western North Atlantic right whale population. The nearly complete reproductive failure in this population from 1993 to 1995 and again in 1998 and 1999 suggests that this pattern has continued for almost a decade. Because no population can sustain a high death rate and low birth rate indefinitely, this combination places the North Atlantic right whale population at high risk of extinction. The one bright spot is the 2000/2001 calving season that is

the most promising in the past 5 years in terms of calves born. However, these young animals must be provided with protection so that they can mature and contribute to future generations in order to be a factor in stabilizing of the population.

SPECIES	Right		Humpback		Fin		Minke		TOTAL	
	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive
1997										
Gillnet	0	1	0	0	0	2	0	0	0	3
Pot/Trap	0	2	0	1	0	1	0	2	0	6
UNK/Other	0	1	0	1	0	0	0	0	0	2
TOTAL	0	4	0	2	0	3	0	2	0	11
1998										
Gillnet	0	0	1	4	0	0	1	0	2	4
Pot/Trap	0	2	0	1	0	0	0	0	0	3
UNK/Other	0	1	0	0	0	0	0	1	0	2
TOTAL	0	3	1	5	0	0	1	1	2	9
1999										
Gillnet	1	0	0	2	0	0	0	0	1	2
Pot/Trap	0	2	0	1	0	1	0	1	0	5
UNK/Other	0	1	0	1	0	0	2	0	2	2
TOTAL	1	3	0	4	0	1	2	1	3	9
2000										
Gillnet	0	0	0	2	0	0	0	0	0	2
Pot/Trap	0	0	0	0	0	0	0	2	0	2
UNK/Other	0	2	0	1	0	0	0	0	0	3
TOTAL	0	2	0	3	0	0	0	2	0	7
2001										
Gillnet	0	0	1	1	0	0	0	0	1	1
Pot/Trap	0	1	0	1	0	0	0	0	0	2
UNK/Other	1	1	0	1	0	0	0	0	1	2
TOTAL	1	2	1	3	0	0	0	0	2	5
TOTAL ALL	2	14	2	17	0	4	3	6	7	41

Table 34 Large Whale Entanglements, 1997-2001*

* Data from NMFS entanglement reports where some gear was recovered and/or observed allowing experts to attempt to ID gear. Other entanglement records exist but gear was not recovered or observed.

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. 2001). 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 41° N and 43° 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).

Data from a photographic identification catalogue of over 600 individual humpback whales have described the majority of the habitats used by this species (Barlow and Clapham 1997; Clapham et al. 1999). The photographic data have identified that reproductively mature western North Atlantic humpbacks winter in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks north of the Dominican Republic. The primary winter range where calving and copulation is believed to take place also includes the Virgin Islands and Puerto Rico (NMFS 1991a). Calves are born from December through March and are about 4 meters at birth. Sexually mature females give birth approximately every 2 to 3 years. Sexual maturity is reached between 4 and 6 years of age for females and between 7 and 15 years for males. Size at maturity is about 12 meters.

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. Strandings and entanglements of humpback whales have increased between New Jersey and Florida during the same period (Wiley et al. 1995).

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. 2001). 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 10,600 (95% c.i. = 9,300 - 12,100) is regarded as the best available estimate for that population.

General Human Impacts and Entanglement

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. Several whales have apparently been entangled on more than one occasion. These estimates are based on sightings of free-swimming animals that initially survive the encounter. The most recent data describing the observed entanglements of humpback whales is found in Table 64. Because some whales may drown immediately, the actual number of interactions may be higher. In addition, the actual number of species-gear interactions is contingent on the intensity of observations from aerial and ship surveys.

Humpback whales may also 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.

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).

As was the case for the right and humpback whales, fin whale populations were heavily affected by commercial whaling. However, commercial exploitation of fin whales occurred much later than for right and humpback whales. Wide-scale commercial exploitation of fin whales did not occur until the 20th century when the use of steam power and harpoon-gun technology made exploitation of this faster, more offshore species feasible. In the southern hemisphere, over 700,000 fin whales were landed in the 20th century. More than 48,000 fin whales were taken in the North Atlantic between 1860 and 1970 (Perry et al. 1999). Fisheries existed off of Newfoundland, Nova Scotia, Norway, Iceland, the Faroe Islands, Svalbard (Spitsbergen), the islands of the British coasts, Spain and Portugal. Fin whales were rarely taken in U.S. waters, except when they ventured near the shores of Provincetown, MA, during the late 1800's (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. 2001). NMFS has designated one

stock of fin whale for U.S. waters of the North Atlantic (Waring et al. 2001) 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. Based on the history and trends of whaling catch, an estimate of 3,590 to 6,300 fin whales was obtained for the entire western North Atlantic (Perry et al. 1999). Hain et al. (1992) estimated that about 5,000 fin whales inhabit the Northeastern United States continental shelf 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.

Despite our broad knowledge of fin whales, less is known about their life history as compared to right and humpback whales. Age at sexual maturity for both sexes ranges from 5-15 years. Physical maturity is reached at 20-30 years. Conception occurs during a 5 month winter period in either hemisphere. After a 12-month gestation, a single calf is born. The calf is weaned between 6 and 11 months after birth. The mean calving interval is 2.7 years, with a range of between 2 and 3 years (Agler et al. 1993). Like right and humpback whales, fin whales are believed to use western North Atlantic waters primarily for feeding and migrate to more southern waters for calving. However, the overall pattern of fin whale movement consists of a less obvious north-south pattern of migration than that of right and humpback whales.

Based on acoustic recordings from hydrophone arrays, Clark (1995) reported the fin whale as the most acoustically common whale species heard in the North Atlantic and described a general pattern of fin whale movements in the fall from the Labrador/Newfoundland region, south past Bermuda, and into the West Indies. However, evidence regarding where the majority of fin whales winter, calve, and mate is still scarce.

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).

As discussed above, fin whales were the focus of commercial whaling, primarily in the 20th century. The IWC did not begin to manage commercial whaling of fin whales in the North Atlantic until 1976 and were not given total protection until 1987, with the exception of a subsistence whaling hunt for Greenland. In total, there have been 239 reported kills of fin whales from the North Atlantic from 1988 to 1995.

General Human Impacts and Entanglement

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, (see Table 64) 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. Fin whales may also 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.

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). The IWC recognized three stocks in the North Atlantic based on past whaling operations: (1) Nova Scotia; (2) Iceland Denmark Strait; (3) Northeast Atlantic (Donovan 1991 in 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. 2001). This is the only sei whale stock within the management unit of this FMP.

Sei whales became the target of modern commercial whalers primarily in the late 19th and early 20th century after stocks of other whales, including right, humpback, fin and blues, had already been depleted. Sei whales were taken in large numbers by Norway and Scotland from the beginning of modern whaling (NMFS 1998b). Small numbers were also taken off of Spain, Portugal, and West Greenland from the 1920's to 1950's (Perry et al. 1999). In the western North Atlantic, a total of 825 sei whales were taken on the Scotian Shelf between 1966-1972, and an additional 16 were by a shore-based Newfoundland whaling station (Perry et al. 1999). The species continued to be exploited in Iceland until 1986 even though measures to stop whaling of sei whales in other areas had been put into place in the 1970s (Perry et al. 1999). There is no estimate for the abundance of sei whales prior to commercial whaling. Based on whaling records, approximately 14,295 sei whales were taken in the entire North Atlantic from 1885 to 1984 (Perry et al. 1999).

Sei whales winter in warm temperate or subtropical waters and summer in more northern latitudes. In the North Atlantic, most births occur in November and December when the whales are on the wintering grounds. Conception is believed to occur in December and January. Gestation lasts for 12 months and the calf is weaned at 6-9 months when the whales are on the

summer feeding grounds (NMFS 1998b). Sei whales reach sexual maturity at 5-15 years of age. The calving interval is believed to be 2-3 years (Perry et al. 1999).

Sei whales occur in deep water throughout their range, typically over the continental slope or in basins situated between banks (NMFS 1998b). 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. Sei whales are occasionally seen feeding in association with right whales in the southern Gulf of Maine and in the Bay of Fundy, although there is no evidence of interspecific competition for food resources. There is very little information on natural mortality factors for sei whales. Possible causes of natural mortality, particularly for young, old or otherwise compromised individuals are shark attacks, killer whale attacks, and endoparasitic helminthes (Perry et al. 1999).

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. 2001). 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.

General Human Impacts and Entanglement

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 monkfish 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). Three subspecies have been identified: *Balaenoptera musculus musculus*, *B.m. intermedia*, and *B.m. brevicauda* (NMFS 1998c). 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. The IWC currently recognizes these whales as one stock (Perry et al. 1999).

Blue whales were intensively hunted in all of the world's oceans from the turn of the century to the mid-1960's when development of steam-powered vessels and deck-mounted harpoon guns in the late 19th century made it possible to exploit them on an industrial scale (NMFS 1998c). Blue whale populations declined worldwide as the new technology spread and began to receive widespread use (Perry et al. 1999). Subsequently, the whaling industry shifted effort away from declining blue whale stocks and targeted other large species, such as fin whales, and then resumed hunting for blue whales when the species appeared to be more abundant (Perry et al. 1999). The result was a cyclical rise and fall, leading to severe depletion of blue whale stocks worldwide (Perry et al. 1999). In all, at least 11,000 blue whales were taken in the North Atlantic from the late 19th century through the mid-20th century.

Blue whales were given complete protection in the North Atlantic in 1955 under the International Convention for the Regulation of Whaling. There are no good estimates of the pre-exploitation size of the western North Atlantic blue whale stock but it is widely believed that this stock was severely depleted by the time legal protection was introduced in 1955 (Perry et al. 1999). Mitchell (1974) suggested that the stock numbered in the very low hundreds during the late 1960's through early 1970's (Perry et al. 1999). Photo-identification studies of blue whales in the Gulf of St. Lawrence from 1979 to 1995 identified 320 individual whales (NMFS 1998c). The NMFS recognizes a minimum population estimate of 308 blue whales within the Northeast Region (Waring et al. 2001).

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 (NMFS 1998c). In the Gulf of St. Lawrence, blue whales appear to predominantly feed on several copepod species (NMFS 1998c).

Compared to the other species of large whales, relatively little is known about this species. Sexual maturity is believed to occur in both sexes at 5-15 years of age. Gestation lasts 10-12 months and calves nurse for 6-7 months. The average calving interval is estimated to be 2-3 years. Birth and mating both take place in the winter season (NMFS 1998c), but the location of wintering areas is speculative (Perry et al. 1999). In 1992 the U.S. Navy and contractors conducted an extensive blue whale acoustic survey of the North Atlantic and found concentrations of blue whales on the Grand Banks and west of the British Isles. One whale was tracked for 43 days during which time it traveled 1,400 nautical miles around the general area of Bermuda (Perry et al. 1999).

There is limited information on the factors affecting natural mortality of blue whales in the North Atlantic. Ice entrapment is known to kill and seriously injure some blue whales during late winter and early spring, particularly along the southwest coast of Newfoundland. Habitat degradation has been suggested as possibly affecting blue whales such as in the St. Lawrence River and the Gulf of St. Lawrence where habitat has been degraded by acoustic and chemical pollution. However, there is no data to confirm that blue whales have been affected by such habitat changes (Perry et al. 1999).

General Human Impacts and Entanglement

Entanglements in fishing gear such as the sink gillnet gear used in the monkfish 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. 2001). The IWC recognizes one stock for the entire North Atlantic (Waring et al. 2001).

The IWC estimates that nearly a quarter-million sperm whales were killed worldwide in whaling activities between 1800 and 1900 (IWC 1971). With the advent of modern whaling the larger rorqual whales were targeted. However as their numbers decreased, whaling pressure again focused on smaller rorquals and sperm whales. From 1910 to 1982 there were nearly 700,000 sperm whales killed worldwide from whaling activities (Clarke 1954). Some sperm whales were also taken off the U.S. Mid-Atlantic coast (Reeves and Mitchell 1988; Perry et al. 1999), and in the northern Gulf of Mexico (Perry et al. 1999). Recorded North Atlantic sperm whale catch numbers for Canada and Norway from 1904 to 1972 total 1,995. All killing of sperm whales was banned by the IWC in 1988.

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. 2001).

Mature females in the northern hemisphere ovulate April through August. A single calf is born after a 15-month gestation. A mature female will produce a calf every 4-6 years. Females attain sexual maturity at a mean age of nine years, while males have a prolonged puberty and attain sexual maturity at about age 20 (Waring et al. 2001). Male sperm whales may not reach physical maturity until they are 45 years old (Waring et al. 2001). The sperm whales prey consists of

larger mid-water squid and fish species (Perry et al. 1999). 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.

General Human Impacts and Entanglement

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 monkfish 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. Other impacts noted above for baleen whales may also occur.

Leatherback Sea Turtle

Leatherback turtles are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour 1972). 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.

Compared to the current knowledge regarding loggerhead populations, the genetic distinctness of leatherback populations is less clear. However, genetic analyses of leatherbacks to date indicate female turtles nesting in St. Croix/Puerto Rico and those nesting in Trinidad differ from each other and from turtles nesting in Florida, French Guiana/Suriname and along the South African Indian Ocean coast. Since populations or subpopulations of leatherback sea turtles have not been formally recognized, the conservative approach is to treat leatherback nesting populations as distinct.

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.

Leatherbacks are a long lived species (> 30 years), with an estimated age at sexual maturity reported as about 13-14 years for females, and an estimated minimum age at sexual maturity of 5-6 years, with (Zug and Parham 1996 and NMFS 2001). Leatherbacks nest from March through July and produce 100 eggs or more in each clutch, or a total of 700 eggs or more per nesting season (Schultz 1975). The eggs will incubate for 55-75 days before hatching. The habitat requirements for post-hatchling leatherbacks that reach the ocean are virtually unknown (NMFS and USFWS 1992).

Status and Trends of Leatherback Sea Turtles

Estimated to number approximately 115,000 adult females globally in 1980 (Pritchard 1982) and only 34,500 by 1995 (Spotila et al. 1996), leatherback populations have been decimated worldwide, not only by fishery related mortality but, at least historically, primarily due to exploitation of eggs (Ross 1979). On some beaches nearly 100% of the eggs laid have been harvested (Eckert 1996).

Data collected in southeast Florida clearly indicate increasing numbers of nests over the past twenty years (9.1-11.5% increase), although it is critical to note that there was also an increase in the survey area in Florida over time (NOAA Fisheries SEFSC 2001). The largest leatherback rookery in the western Atlantic remains along the northern coast of South America in French Guiana and Suriname. More than half of the present world leatherback population is estimated to be nesting on the beaches in and close to the Marowijne River Estuary in Suriname and French Guiana (Hilterman and Goverse 2004). Nest numbers in Suriname have shown an increase and the long-term trend for the Suriname and French Guiana nesting group seems to show an increase. In 2001, the number of nests for Suriname and French Guiana combined was 60,000, one of the highest numbers observed for this region in 35 years. Studies by Girondot, et al. (in review) also suggest that the trend for the Suriname-French Guiana nesting population over the last 36 years is stable or slightly increasing.

General Human Impacts and Entanglement

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. Zug and Parham (1996) attribute the sharp decline in leatherback populations to the combination of the loss of long-lived adults in fishery related mortality, and the lack of recruitment stemming from elimination of annual influxes of hatchlings because of egg harvesting.

Poaching is not known to be a problem for U.S. nesting populations. However, 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).

Leatherback interactions with the southeast shrimp fishery, which operates from North Carolina through southeast Florida (NOAA Fisheries 2002), are also common. The National Research Council Committee on Sea Turtle Conservation identified incidental capture in shrimp trawls as the major anthropogenic cause of sea turtle mortality (NRC 1999). Leatherbacks are likely to encounter shrimp trawls working in the coastal waters off the Atlantic coast (from Cape Canaveral, Florida through North Carolina) as they make their annual spring migration north. For many years, TEDs that were required for use in the southeast shrimp fishery were less effective for leatherbacks, compared to the smaller, hard-shelled turtle species, because the TED openings were too small to allow leatherbacks to escape. To address this problem, on February 21, 2003, NOAA Fisheries issued a final rule to amend the TED regulations. Modifications to the design of TEDs are now required in order to exclude leatherbacks as well as large benthic immature and sexually mature loggerhead and green turtles.

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.

As noted, there are many human-related sources of mortality to leatherbacks. A tally of all leatherback takes anticipated annually under current biological opinions was projected to be as many as 801 leatherback takes, although this sum includes many takes expected to be non-lethal.

Leatherbacks have a number of pressures on their populations, including injury or mortality in fisheries, other federal activities (e.g., military activities, oil and gas development, etc.), degradation of nesting habitats, direct harvest of eggs, juvenile and adult turtles, the effects of ocean pollutants and debris, lethal collisions, and natural disturbances such as hurricanes that are capable of destroying nesting beaches. Spotila et al. (1996) conclude, “stable leatherback populations could not withstand an increase in adult mortality above natural background levels without decreasing the Atlantic population is the most robust, but it is being exploited at a rate that cannot be sustained and if this rate of mortality continues, these populations will also decline.”

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. Kemp’s ridleys nest in daytime aggregations known as arribadas, primarily on a stretch of beach in Mexico called Rancho Nuevo. Most of the population of adult females nest in this single locality (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963).

By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s.

Status and Trends of Kemp's Ridley Sea Turtles

The TEWG (1998; 2000) 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. For example, nesting data indicated that the number of adults declined from a population that produced 6,000 nests in 1966 to a population that produced 924 nests in 1978 and 702 nests in 1985 then increased to produce 1,940 nests in 1995. Estimates of adult abundance followed a similar trend from an estimate of 9,600 in 1966 to 1,050 in 1985 and 3,000 in 1995. The increased recruitment of new adults is illustrated in the proportion of neophyte, or first time nesters, which has increased from 6% to 28% from 1981 to 1989 and from 23% to 41% from 1990 to 1994.

Kemp's ridley nesting occurs from April through July each year. Little is known about mating but it is believed to occur before the nesting season in the vicinity of the nesting beach. Hatchlings emerge after 45-58 days. Once they leave the beach, neonates presumably enter the Gulf of Mexico where they feed on available sargassum and associated infauna or other epipelagic species (USFWS and NMFS, 1992). Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. However, at least some juveniles will travel northward as water temperatures warm to feed in productive coastal waters off Georgia through New England (USFWS and NMFS, 1992).

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. Ridleys found in Mid- Atlantic waters are primarily post-pelagic juveniles averaging 40 centimeters in carapace length, and weighing less than 20 kilograms (Terwilliger and Musick 1995). 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 who 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. For example, in the winter of 1999/2000, there was a major cold-stunning event where 218 Kemp's ridleys, 54 loggerheads, and 5 green turtles were found on Cape Cod beaches. The severity of cold stun events depends on: the numbers of turtles utilizing Northeast waters in a given year; oceanographic conditions; and the occurrence of storm events in the late fall. Cold-stunned turtles have also been found on beaches in New York and New Jersey. Cold-stunning

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.

General Human Impacts and Entanglement

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. From the 1940s through the early 1960s, nests from Ranch Nuevo were heavily exploited (USFWS and NMFS, 1992), but beach protection in 1966 helped to curtail this activity (USFWS and NMFS, 1992). 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.

Kemp's ridleys may also be affected by large-mesh gillnet fisheries. In the spring of 2000, a total of five Kemp's ridley carcasses were recovered from a North Carolina beach where 277 loggerhead carcasses were found. Cause of death for most of the turtles recovered was unknown, but the mass mortality event was suspected to have been from a large-mesh gillnet fishery operating offshore in the preceding weeks. It is possible that strandings of Kemp's ridley turtles in some years have increased at rates higher than the rate of increase in the Kemp's ridley population (TEWG 1998).

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). Most green turtle nesting in the continental United States occurs on the Atlantic Coast of Florida (Ehrhart 1979). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and directed fisheries in the United States and throughout the Caribbean are largely to blame for the decline of the species. In the Gulf of Mexico, green turtles were once abundant enough in the shallow bays and lagoons to support a commercial fishery. However, declines in the turtle fishery throughout the Gulf of Mexico were evident by 1902 (Doughty 1984).

In the continental United States, green turtle nesting occurs on the Atlantic coast of Florida (Ehrhart 1979). Occasional nesting has been documented along the Gulf coast of Florida, at southwest Florida beaches, as well as the beaches on the Florida panhandle (Meylan et al., 1995). The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring, perhaps due to increased protective legislation throughout the Caribbean (Meylan et al., 1995). Increased nesting has also been observed along the Atlantic Coast of Florida, on beaches where only loggerhead nesting was observed in the past). Recent population estimates for the western Atlantic area are not available.

While nesting activity is obviously important in determining population distributions, the remaining portion of the green turtle's life is spent on the foraging and breeding grounds. Juvenile green sea turtles occupy pelagic habitats after leaving the nesting beach. Pelagic juveniles are assumed to be omnivorous, but with a strong tendency toward carnivory during early life stages. At approximately 20 to 25 cm carapace length, juveniles leave pelagic habitats and enter benthic foraging areas, shifting to a chiefly herbivorous diet (Bjorndal 1997). 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.

General Human Impacts and Entanglement

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, continental shelves, bays, lagoons, and estuaries (NMFS and USFWS 1995). Loggerhead sea turtles are primarily benthic feeders, opportunistically foraging on crustaceans and mollusks (Wynne and Schwartz 1999). Under certain conditions they may also scavenge fish (NMFS and USFWS 1991b). Horseshoe crabs are known to be a favorite prey item in the Chesapeake Bay area (Lutcavage and Musick 1985).

Status and Trends of Loggerhead Sea Turtles

The loggerhead sea turtle was listed as threatened under the ESA on July 28, 1978. The species was considered to be a single population in the North Atlantic at the time of listing. However, further genetic analyses conducted at nesting sites indicate the existence of five distinct subpopulations ranging from North Carolina, south along the Florida east coast and around the keys into the Gulf of Mexico, to nesting sites in the Yucatan peninsula and Dry Tortugas (TEWG 2000 and NMFS SEFSC 2001). Natal homing to those nesting beaches is believed to provide the genetic barrier between these nesting aggregations, preventing recolonization from turtles from other nesting beaches.

The threatened loggerhead sea turtle is the most abundant of the sea turtles listed as threatened or endangered in the U.S. waters. In the western North Atlantic, most loggerhead sea turtles nest from North Carolina to Florida and along the gulf coast of Florida. The southeastern U.S. nesting aggregation is the second largest and represents about 35 % of the nests of this species. The total number of nests along the U.S. Atlantic and Gulf coasts between 1989 and 1998, ranged from 53,014 to 92,182 annually, with a mean of 73,751. Since a female often lays multiple nests in any one season, the average adult female population was estimated to be 44,780 (Murphy and Hopkins 1984).

However, the status of the northern loggerhead subpopulation is of particular concern. Based on the above, 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).

All five loggerhead subpopulations are subject to natural phenomena that cause annual fluctuations in the number of young produced. For example, there is a significant overlap between hurricane seasons in the Caribbean Sea and northwest Atlantic Ocean (June to November), and the loggerhead sea turtle nesting season (March to November). Sand accretion and rainfall that result from these storms as well as wave action can appreciably reduce hatchling success. In 1992, Hurricane Andrew affected turtle nests over a 90-mile length of coastal Florida; all of the eggs were destroyed by storm surges on beaches that were closest to the eye of this hurricane (Milton et al. 1994). Other sources of natural mortality include cold stunning and biotoxin exposure.

General Human Impacts and Entanglement

The diversity of the sea turtles life history leaves them susceptible to many 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.

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. Loggerhead sea turtles are impacted by a completely different set of threats from human activity once they migrate to the ocean. During that period, they are exposed to a series of long-line fisheries that include the U.S. Atlantic tuna and swordfish longline fisheries, an Azorean long-line fleet, a Spanish long-line fleet, and various fleets in the Mediterranean Sea (Aguilar et al. 1995, Bolten et al. 1994, Crouse 1999). Observer records indicate that, of the 6,544 loggerheads estimated to be captured by the U.S. Atlantic tuna and swordfish longline fleet between 1992-1998, an estimated 43 were dead (Yeung 1999). For 1998, alone, an estimated 510 loggerheads (225-1250) were captured in the longline fishery. Aguilar et al. (1995) estimated that the Spanish swordfish longline fleet, which is only one of the many fleets operating in the region, captures more than 20,000 juvenile loggerheads annually (killing as many as 10,700).

Once loggerheads enter the benthic environment in 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.

In addition to fishery interactions, loggerhead sea turtles also face other man-made threats in the marine environment. These include oil and gas exploration and coastal development, as well as marine pollution, underwater explosions, and hopper dredging. Offshore artificial lighting, power plant entrainment and/or impingement, and entanglement in debris or ingestion of marine debris are also seen as possible threats. Boat collisions and poaching are two direct impacts that affect loggerheads.

Barndoor Skate

Barndoor skate is considered a candidate species under the ESA as a result of two petitions to list the species as endangered or threatened that were received in March and April 1999. In June 1999, the agency declared the petitioned actions to be warranted and requested additional information on whether or not to list the species under the ESA. At the 30th Stock Assessment Workshop (SAW 30) held in November 1999, the Stock Assessment Research Committee (SARC) reviewed the status of the barndoor skate stock relative to the five listing criteria of the ESA. The SARC provided their report to the NMFS in the SAW 30 document (NEFSC 2000). NMFS published a decision on the petitions on September 27, 2002 (67FR61055-61061) that the petitioned actions are not warranted at this time. However, NMFS is leaving barndoor skate on the agency's list of candidate species due to remaining uncertainties regarding the status and population structure of the species

The barndoor skate occurs from Newfoundland, the Gulf of St. Lawrence, off Nova Scotia, the Gulf of Maine, and the northern sections of the Mid-Atlantic Bight down to North Carolina. It is one of the largest skates in the Northwest Atlantic and is presumed to be a long-lived, slow growing species. Barndoor skates inhabit mud and sand/gravel bottoms along the continental shelf, generally at depths greater than 150 meters. They are believed to feed on benthic invertebrates and fishes (Bigelow and Schroeder 1953).

The barndoor skate is often caught as a bycatch species in the offshore trawl and sink gillnet fisheries that target multispecies. When landed, barndoor skate are often used in the skate wing fishery.

The abundance of barndoor skate declined continuously through the 1960's. Since 1990, their abundance has increased slightly on Georges Bank, the western Scotian shelf, and in Southern New England, although the current NEFSC autumn survey biomass index is less than 5% of the peak observed in 1963. The species was identified as an overfished species at the SAW 30 (NEFSC 2000). Skates are sensitive to overutilization generally because of their limited reproductive capacity. This is a characteristic of all of the larger species in the Northeast skate complex that are relatively slow-growing, long-lived, and late maturing.

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 monkfish, although no mortalities have been recorded since 1991. 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 used to catch monkfish. 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, including the monkfish fishery, 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. While it is unclear whether sink gillnets with takes of white-sided dolphins were engaged in the monkfish fishery, the inference can be made that the gear type is capable of interactions with this species. 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, but have not reported this species in monkfish gear (Waring et al. 2002), although takes have been documented in the Northeast multispecies sink gillnet fishery. Since both fisheries use similar gear, Risso's dolphin could be vulnerable to entanglement in the directed monkfish fishery, although it may be a rare occurrence. This conclusion is based on their preference for pelagic prey species (squid and schooling fishes) and because their general distribution makes encounters with monkfish gear unlikely. Therefore although takes in this fishery could occur, they should not that compromise the ability of this species to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

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). While takes are documented in pelagic drift gillnet and pelagic longline gear, NOAA's 2003 MMPA List of Fisheries lists this species as taken Northeast sink gillnet, gear that is also used in the monkfish fishery. Despite some level of interactions, the pelagic prey species of

these animals and their habitat preferences make it unlikely that takes in this fishery will occur at levels that compromise their ability to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

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 monkfish fishery may take this species.

Although one or more of the management units of this stock may 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 monkfish fishery, its continued operation as well as the proposed measures are not expected to affect the status of coastal bottlenose dolphins.

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. Although takes have occurred in the bottom trawl fishery and gillnet fisheries, their pelagic prey species suggest they do not forage near the bottom, making it unlikely that interactions in the monkfish fishery would compromise the ability of these species to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

Harbor seal

The harbor seal is found in all nearshore waters of the Atlantic Ocean above about 30 degrees latitude (Waring et al. 2001). In the western North Atlantic they are distributed from the eastern Canadian Arctic and Greenland south to southern New England and New York, and occasionally the Carolinas (Boulva and McLaren 1979; Gilbert and Guldager 1998). It is believed that the harbor seals found along the U.S. and Canadian east coasts represent one population (Waring et al. 2001). 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. 2001). 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 used to catch monkfish. 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 monkfish 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 Arctic 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 Arctic. The Canadian kill is controlled by DFO who set the allowed kill at 275,000 in 1997. Mortality in Greenland and the Arctic may exceed 100,000 (Waring et al. 2002). Harp seals are also taken in sink gillnet gear used to catch multispecies. Waring et al. (2001) 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. .

Additional background information on the range-wide status of these species can be found in a number of published documents, including sea turtle status reviews and biological reports (NOAA Fisheries and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998 & 2000), recovery plans for the humpback whale (NOAA Fisheries 1991a), right whale (1991b), loggerhead sea turtle (NOAA Fisheries and USFWS 1991a), Kemp's ridley sea turtle (USFWS and NOAA Fisheries 1992), green sea turtle (NOAA Fisheries and USFWS 1991b) and leatherback sea turtle (NOAA Fisheries and USFWS 1992), the Marine Mammal Stock Assessment Reports (SAR) (Waring *et al.* 2000; Waring *et al.* 2001), and other publications

(e.g., Perry *et al.* 1999; Clapham *et al.* 1999; IWC 2001a). A draft recovery plan for fin and sei whales is available at http://www.NOAA Fisheries.noaa.gov/prot_res/PR3/recovery.html (NOAA Fisheries 1998b, unpublished). An updated draft recovery plan for right whales (Silber and Clapham 2001) is also available at the same web address.

5.2 Physical Environment

This section contains a description of the physical environment of the Northeast monkfish fishery, including oceanographic and physical habitat conditions in the Gulf of Maine, Georges Bank, Southern New England and Mid-Atlantic regions. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a).

5.2.1 Physical Characteristics of Regional Systems

The Northeast Shelf Ecosystem (Figure 26) 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, we incorporated the distinctive features of this region into the descriptions of Georges Bank and the Mid-Atlantic Bight.

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

Pertinent aspects of the physical characteristics of each of these systems are described in sections that follow. This review is based on several summary reviews (Abernathy 1989, Backus 1987, Beardsley et al. 1996, Brooks 1996, Cook 1988, Dorsey 1998, Kelley 1998, Wiebe et al. 1987, Mountain 1994, NEFMC 1998, Schmitz et al. 1987, Sherman et al. 1996, Steimle et al. 1999b, Stumpf and Biggs 1988, Townsend 1992, Tucholke 1987). Literature citations are not included for generally accepted concepts; however, new research and specific results of research findings are cited.

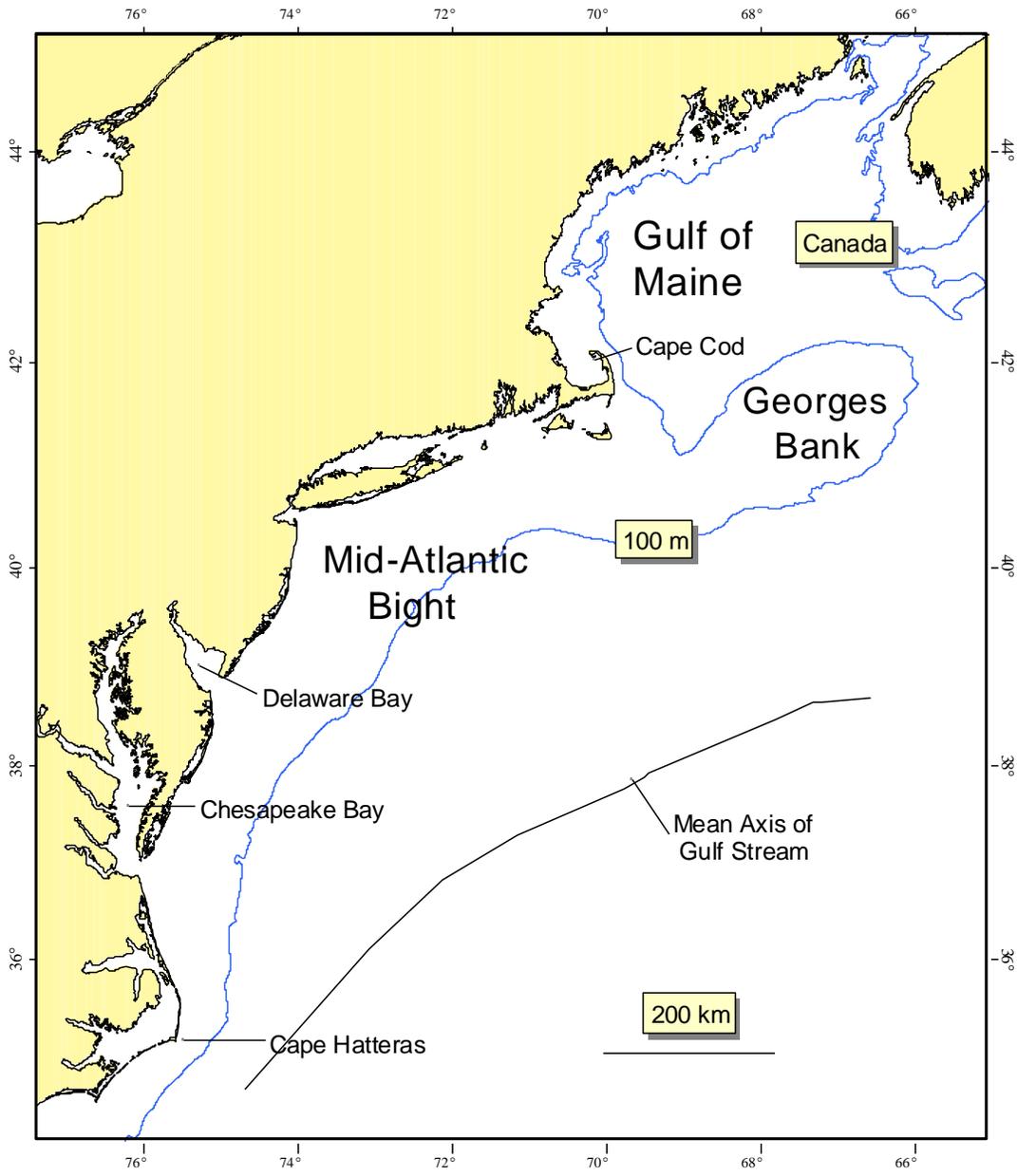


Figure 26- U.S. Northeast shelf ecosystem.

5.2.1.1 Gulf of Maine

Although not obvious in appearance, the Gulf of Maine is actually an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states and on the south by Cape Cod and Georges Bank (Figure 26). The Gulf of Maine (GOM) was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes which result in a rich biological community.

The Gulf of Maine is topographically unlike any other part of the continental border along the U.S. east coast. It contains 21 distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. The Northeast Channel between Georges Bank and Browns Bank, leads into Georges Basin, and is one of the primary avenues for exchange of water between the GOM and the North Atlantic Ocean.

High points within the GOM include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat-topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf left after the glaciers removed most of it. Others are glacial moraines and a few, like Cashes Ledge, are out-croppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the Gulf of Maine, particularly in its deep basins (Figure 27). These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the Gulf of Maine north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often border abruptly on rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20-40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

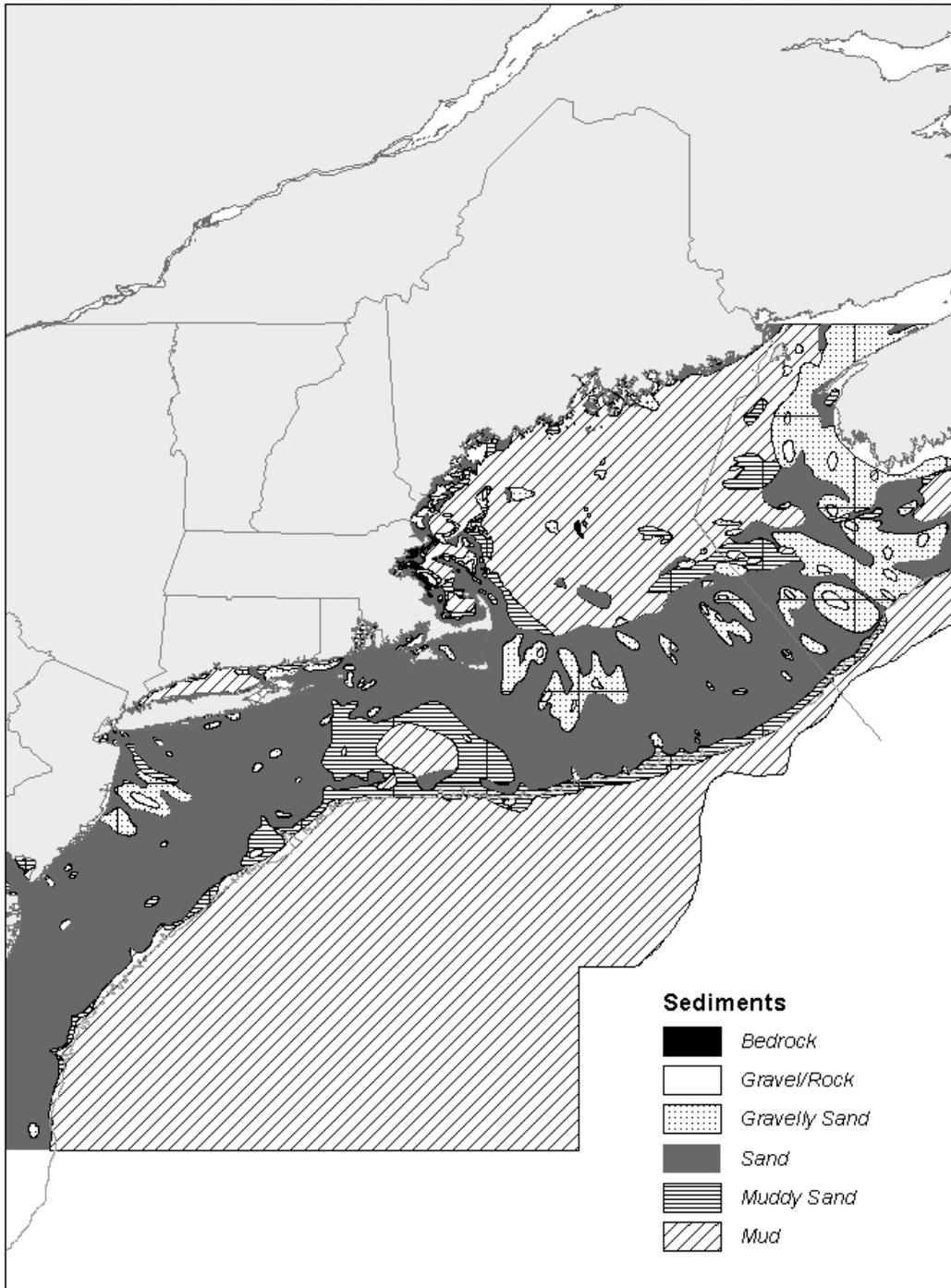


Figure 27- Map showing distribution of surficial sediments, Gulf of Maine, Georges Bank, and the Mid-Atlantic Bight (modified from original map by Poppe *et al.* 1989).

An intense seasonal cycle of winter cooling and turnover, springtime freshwater runoff, and summer warming influences oceanographic and biologic processes in the Gulf of Maine. The Gulf has a general counterclockwise nontidal surface current that flows around its coastal margin. It is primarily driven by fresh, cold Scotian Shelf water that enters over the Scotian Shelf and through the Northeast Channel, and freshwater river runoff, which is particularly important in the spring. Dense relatively warm and saline slope water entering through the bottom of the Northeast Channel from the continental slope also influences gyre formation. Counterclockwise gyres generally form in Jordan, Wilkinson, and Georges Basins and the Northeast Channel as well. These surface gyres are more pronounced in spring and summer; with winter, they weaken and become more influenced by the wind.

Stratification of surface waters during spring and summer seals off a mid-depth layer of water that preserves winter salinity and temperatures. This cold layer of water is called “Maine intermediate water” (MIW) and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western GOM. Tidal mixing of shallow areas prevents thermal stratification and results in thermal fronts between the stratified areas and cooler mixed areas. Typically, mixed areas include Georges Bank, the southwest Scotian Shelf, eastern Maine coastal waters, and the narrow coastal band surrounding the remainder of the Gulf. The Northeast Channel provides an exit for cold MIW and outgoing surface water while it allows warmer more saline slope water to move in along the bottom and spill into the deeper basins. The influx of water occurs in pulses, and appears to be seasonal, with lower flow in late winter and a maximum in early summer.

Gulf of Maine circulation and water properties can vary significantly from year to year. Notable episodic events include shelf-slope interactions such as the entrainment of shelf water by Gulf Stream rings (see *Gulf Stream and Associated Features*), and strong winds that can create currents as high as 1.1 meters/second over Georges Bank. Warm core Gulf Stream rings can also influence upwelling and nutrient exchange on the Scotian shelf, and affect the water masses entering the GOM. Annual and seasonal inflow variations also affect water circulation.

Internal waves are episodic and can greatly affect the biological properties of certain habitats. Internal waves can shift water layers vertically, so that habitats normally surrounded by cold MIW are temporarily bathed in warm, organic-rich surface water. On Cashes Ledge, it is thought that deeper nutrient rich water is driven into the photic zone, providing for increased productivity. Localized areas of upwelling interaction occur in numerous places throughout the Gulf.

5.2.1.2 Georges Bank

Georges Bank is a shallow (3-150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf which was formed by the Wisconsinian glacial episode and is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments will reduce the amount of sand available to the sand sheets, and cause an overall coarsening of the bottom sediments (Valentine et al. 1993).

Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the eastern section of Georges Bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. The strong, erosive currents affect the character of the biological community. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement, and steeper and smoother topography incised by submarine canyons on the southeastern margin (see *Continental Slope* for more on canyons). The nature of the seabed sediments varies widely, ranging from clay to gravel (Figure 27). The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

The central region of the bank is shallow; shoals and troughs characterize the bottom, with sand dunes superimposed upon them. The two most prominent elevations on the ridge-and-trough area are Cultivator and Georges Shoals. This ridge-and-trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km per hour, and as high as 7 km per hour. The dunes migrate at variable rates, and the ridges may move, also. In an area that lies between the central part and northeast peak, Almeida et al. (2000) identified high energy areas as between 35 – 65 m deep, where sand is transported on a daily basis by tidal currents; and a low energy area at depths > 65 m that is affected only by storm currents. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of the bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of traveling dune and swale morphology is also found in the Mid-Atlantic Bight.

The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm generated ripples, scattered shell and mussel beds. Tidal and storm currents may range from moderate to strong, depending upon location and storm activity (Valentine, pers. comm.).

Oceanographic frontal systems occur between water masses from the Gulf of Maine and Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution. Currents on Georges Bank include a weak, persistent clockwise gyre around the bank, a strong semidiurnal tidal flow predominantly northwest and southeast, and very strong, intermittent storm-induced currents, which can all occur simultaneously. Tidal currents over the shallow top of Georges Bank can be very strong, and keep the waters over the bank well mixed vertically. This results in a tidal front that separates the cool waters of the well-mixed shallows of the central bank from the warmer, seasonally stratified shelf waters on the seaward and shoreward sides of the bank. The clockwise gyre is instrumental in distribution of the planktonic community, including larval fish. For example, Lough and Potter (1993) describe passive drift of Atlantic cod and haddock eggs and larvae in a southwest residual pattern around Georges Bank. Larval concentrations are found at varying depths along the southern edge between 60 – 100 m.

5.2.1.3 Mid Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 26). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5-10 cm/second at the surface and 2 cm/second or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/second that increases to 100 cm/second near inlets.

Slope water tends to be warmer than shelf water because of its proximity to the Gulf Stream, and also tends to be more saline. The abrupt gradient where these two water masses meet is called the shelf-slope front. This front is usually located at the edge of the shelf and touches bottom at about 75-100 m depth of water, and then slopes up to the east toward the surface. It reaches surface waters approximately 25-55 km further offshore. The position of the front is highly variable, and can be influenced by many physical factors. Vertical structure of temperature and salinity within the front can develop complex patterns because of the interleaving of shelf and slope waters – for example cold shelf waters can protrude offshore, or warmer slope water can intrude up onto the shelf.

The seasonal effects of warming and cooling increase in shallower, near shore waters. Stratification of the water column occurs over the shelf and the top layer of slope water during the spring-summer and is usually established by early June. Fall mixing results in homogenous shelf and upper slope waters by October in most years. A permanent thermocline exists in slope waters from 200-600 m. Temperatures decrease at the rate of about 0.02° C per meter and remain relatively constant except for occasional incursions of Gulf stream eddies or meanders. Below 600 m, temperature declines, and usually averages about 2.2° C at 4000 m. A warm, mixed layer approximately 40 m thick resides above the permanent thermocline.

The “cold pool” is an annual phenomenon particularly important to the Mid-Atlantic Bight. It stretches from the Gulf of Maine along the outer edge of Georges Bank and then southwest to Cape Hatteras. It becomes identifiable with the onset of thermal stratification in the spring and lasts into early fall until normal seasonal mixing occurs. It usually exists along the bottom between the 40 m and 100 m isobaths and extends up into the water column for about 35 m, to the bottom of the seasonal thermocline. The cold pool usually represents about 30% of the volume of shelf water. Minimum temperatures for the cold pool occur in early spring and summer, and range from 1.1° C to 4.7° C.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 – 200 m water depth) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (see

section on *Continental Slope*). The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales (Figure 28 & Figure 29).

Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of melted glaciers that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf, with the exception of the Hudson Shelf Valley, which is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of gravel and gravelly sand (Figure 27). On the slope, muddy sand and mud predominate. Sediments are fairly uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 to 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the "mud line," and sediments are 70-100% fines on the slope.

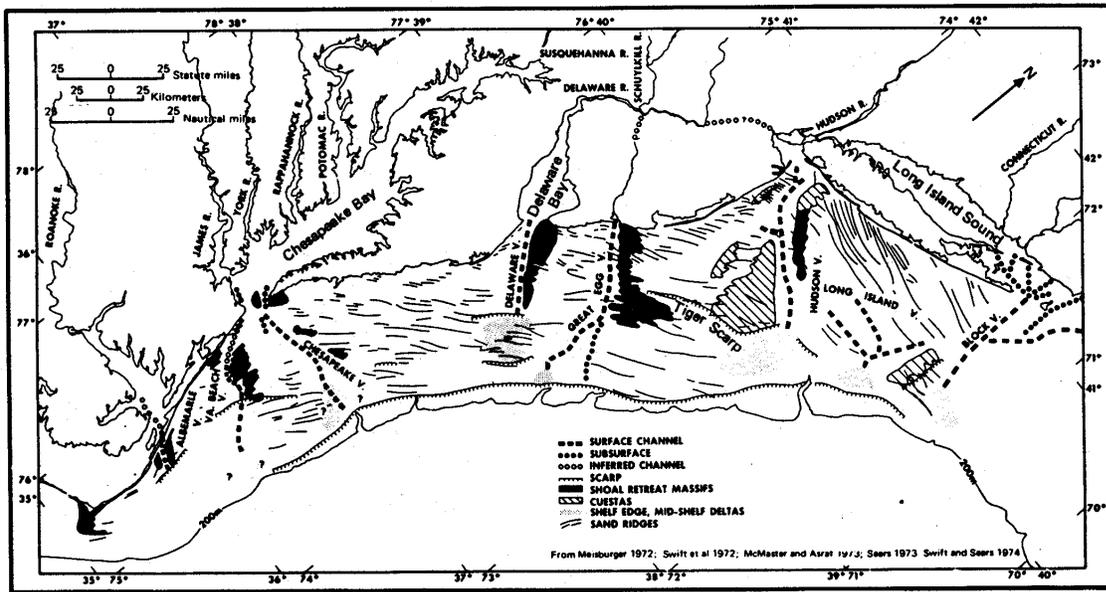


Figure 28- Mid-Atlantic Bight submarine morphology. Source: Stumpf and Biggs (1988).

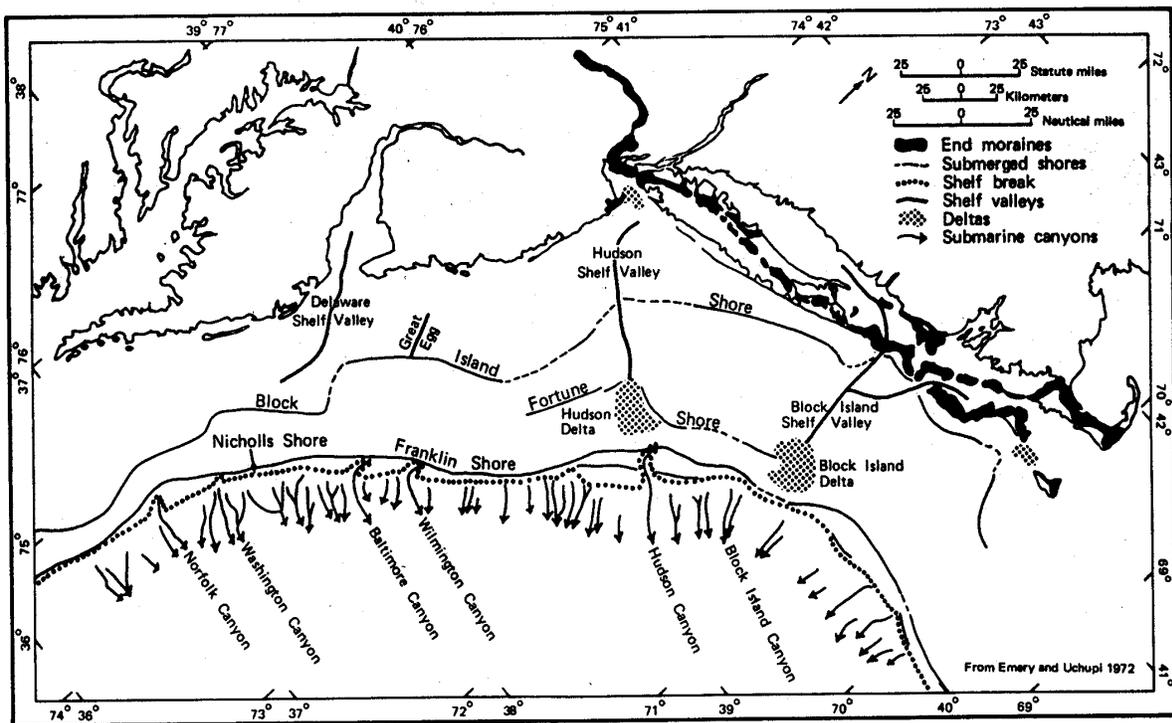


Figure 29- Major features of the Mid-Atlantic and Southern New England continental shelf. Source: Stumpf and Biggs (1988).

In addition to sand ridges that were formed by the glaciers, some sand ridges have been formed since the end of the last ice age. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10-50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents, and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the physically less rigorous conditions.

Sand waves are usually found in patches of 5-10 with heights of about 2 m, lengths of 50-100 m and 1-2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3-5 m with heights of 0.5-1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50-100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1-150 cm and heights of a few centimeters.

The northern portion of the mid-Atlantic bight is sometimes referred to as southern New England. Some of the features of this area were described earlier (see *Georges Bank*); however, one other formation of this region that deserves note is the "mud patch" which is located just southwest of Nantucket Shoals and southeast of Long Island. Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally re-suspended by large storms. This habitat is an anomaly of the outer continental shelf.

Artificial reefs are another significant mid-Atlantic habitat, formed much more recently on the geologic time-scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of these materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

5.2.1.4 Continental Slope

The continental slope extends from the continental shelf break, at depths between 60 m and 200 m, eastward to a depth of 2000 m. The width of the slope varies from 10-50 km, with an average gradient of 3-6°; however, local gradients can be nearly vertical. The base of the slope is defined by a marked decrease in seafloor gradient where the continental rise begins.

The morphology of the present continental slope appears largely to be a result of sedimentary processes that occurred during the Pleistocene, including:

- 1) slope upbuilding and progradation by deltaic sedimentation principally during sea-level low-stands;
- 2) canyon-cutting by sediment mass movements during and following sea-level low-stands;
- 3) sediment slumping.

The slope is cut by at least 70 large canyons between Georges Bank and Cape Hatteras (Figure 30) and numerous smaller canyons and gullies, many of which may feed into the larger canyon systems. The New England Seamount Chain including Bear, Mytilus, Balanus, etc. occurs on the slope southwest of Georges Bank. A smaller chain (Caryn, Knauss, etc.) occurs in the vicinity in deeper water.

A “mud line” occurs on the slope at a depth of 250 m – 300 m, below which fine silt and clay-size particles predominate (Figure 27). Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope as a result of glacial rafting. Sand pockets may also be formed as a result of downslope movements.

Gravity induced downslope movement is the dominant sedimentary process on the slope, and includes slumps, slides, debris flows, and turbidity currents, in order from thick cohesive movement to relatively non-viscous flow. Slumps are localized blocks of sediment that may involve short downslope movement. However, turbidity currents can transport sediments thousands of kilometers.

Submarine canyons are not spaced evenly along the slope, but tend to decrease in areas of increasing slope gradient (Figure 30). Canyons are typically “v”-shaped in cross section and often have steep walls and outcroppings of bedrock and clay. The canyons are continuous from the canyon heads to the base of the continental slope. Some canyons end at the base of the slope, but others continue as channels onto the continental rise. Larger and more deeply incised canyons are generally significantly older than smaller ones, and there is also evidence that some older canyons have experienced several episodes of filling and re-excavation. Many, if not all, submarine canyons may first form by mass-wasting processes on the continental slope, although there is evidence that some canyons formed as a result of fluvial drainage (i.e., Hudson Canyon).

Canyons can alter the physical processes in the surrounding slope waters. Fluctuations in the velocities of the surface and internal tides can be large near the heads of the canyons, leading to enhanced mixing and sediment transport in the area. Shepard et al. (1979) concluded that the

strong turbidity currents initiated in study canyons were responsible for enough sediment erosion and transport to maintain and modify those canyons. Since surface and internal tides are ubiquitous over the continental shelf and slope, it can be anticipated that these fluctuations are important for sedimentation processes in other canyons as well. In Lydonia Canyon, Butman et al. (1982) found that the dominant source of low-frequency current variability was related to passage of warm core Gulf Stream rings rather than the atmospheric events that predominate on the shelf.

The water masses of the Atlantic continental slope and rise are essentially the same as those of the North American Basin (defined in Wright and Worthington 1970). Worthington (1976) divided the water column of the slope into three vertical layers: deep water (colder than 4°C), the thermocline (4°-17°C), and warm water (warmer than 17°C). In the North American Basin the deep water accounts for two-thirds of all the water, the thermocline for about one quarter, and the warm water the remainder. In the slope water north of Cape Hatteras, the only warm water occurs in the Gulf Stream and seasonally influenced summer waters.

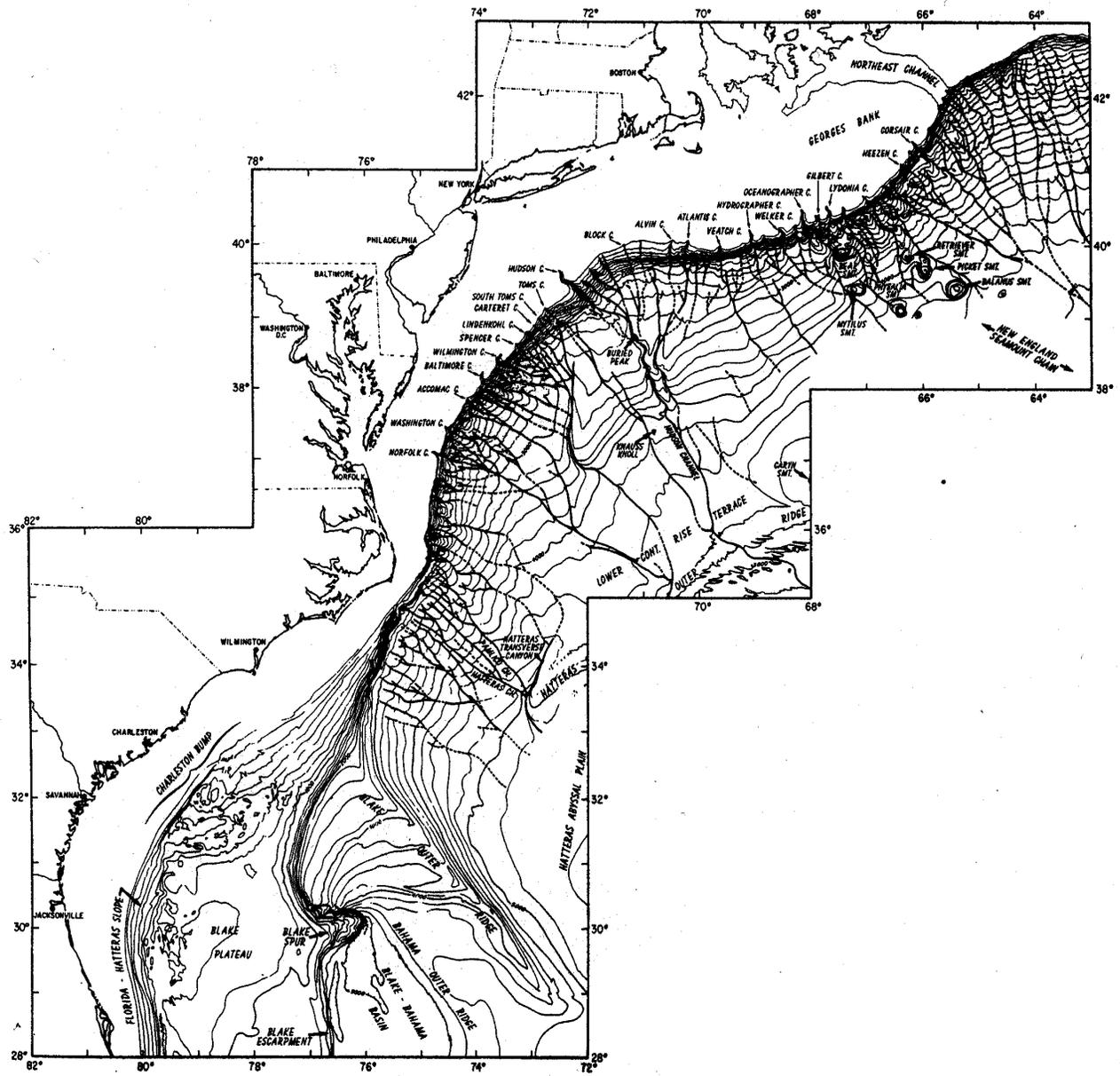


Figure 30- Bathymetry of the U.S. Atlantic continental margin. Contour interval is 200 m below 1000 m water depth and 100 m above 1000 m. Axes of principal canyons and channels are shown by solid lines (dashed where uncertain or approximate). Source: Tucholke (1987)

The principal cold-water mass in the region is the North Atlantic Deep Water. North Atlantic Deep Water is comprised of a mixture of five sources: Antarctic Bottom Water, Labrador Sea Water, Mediterranean Water, Denmark Strait Overflow Water, and Iceland-Scotland Overflow Water. The thermocline represents a fairly straightforward water mass compared with either the deep water or the surface water. Nearly 90% of all thermocline water comes from the water mass called the Western North Atlantic Water. This water mass is slightly less saline northeast of Cape Hatteras due to the influx of southward flowing Labrador Coastal Water.

Seasonal variability in slope waters penetrates only the upper 200 m of the water column. In the winter months, cold temperatures and storm activity create a well-mixed layer down to about 100-150 m, but summer warming creates a seasonal thermocline overlain by a surface layer of low-density water. The seasonal thermocline, in combination with reduced storm activity in the summer, inhibits vertical mixing and reduces the upward transfer of nutrients into the photic zone.

Two currents found on the slope, the Gulf Stream and Western Boundary Undercurrent, together represent one of the strongest low frequency horizontal flow systems in the world. Both currents have an important influence on slope waters. Warm and cold core rings that spin off the Gulf Stream are a persistent and ubiquitous feature of the Northwest Atlantic Ocean (see section on *Gulf Stream*). The Western Boundary Undercurrent flows to the southwest along the lower slope and continental rise in a stream about 50 km wide. The boundary current is associated with the spread of North Atlantic Deep Water, and it forms part of the generally westward flow found in slope water. North of Cape Hatteras it crosses under the Gulf Stream in a manner not yet completely understood.

5.2.1.5 Gulf Stream and Associated Features

Shelf and slope waters of the Northeast are intermittently but intensely affected by the Gulf Stream. The Gulf Stream begins in the Gulf of Mexico and flows northeastward at an approximate rate of 1 m/second (2 knots), transporting warm waters north along the eastern coast of the United States, and then east towards the British Isles. Conditions and flow of the Gulf Stream are highly variable on time scales ranging from days to seasons. The principal sources of variability in slope waters off the northeastern shelf are intrusions from the Gulf Stream.

The location of the Gulf Stream's shoreward, western boundary is variable because of meanders and eddies. Gulf Stream eddies are formed when extended meanders enclose a parcel of seawater and pinch off. These eddies can be cyclonic, meaning they rotate counterclockwise and have a cold-core formed by enclosed slope water (cold core ring), or anticyclonic, meaning they rotate clockwise and have a warm core of Sargasso Sea water (warm core ring). The rings are shaped like a funnel, wider at the top and narrower at the bottom, and can have depths of over 2000 m. They range in size from approximately 150-230 km in diameter. There are 35% more rings and meanders in the vicinity of Georges Bank than in the Mid-Atlantic region. A net transfer of water on and off the shelf may result from the interaction of rings and shelf waters. These warm or cold core rings maintain their identity for several months until they are reabsorbed by the Gulf Stream. The rings and the Gulf Stream itself have a great influence over oceanographic conditions all along the continental shelf.

5.2.1.6 Coastal Features

Coastal and estuarine features such as salt marshes, mud flats, rocky intertidal zones, sand beaches, and submerged aquatic vegetation are critical to inshore and offshore habitats and fishery resources of the Northeast. For example, coastal areas and estuaries are important for nutrient recycling and primary production, and certain features serve as nursery areas for juvenile stages of economically important species. Salt marshes are found extensively throughout the region. Tidal and subtidal mud and sand flats are general salt marsh features and also occur in other estuarine areas. Salt marshes provide nursery and spawning habitat for many finfish and shellfish species. Salt marsh vegetation can also be a large source of organic material that is important to the biological and chemical processes of the estuarine and marine environment.

Rocky intertidal zones are periodically submerged, high-energy environments found in the northern portion of the Northeast system. Sessile invertebrates and some fish inhabit rocky intertidal zones. A variety of algae, kelp, and rockweed are also important habitat features of rocky shores. Fishery resources may depend upon particular habitat features of the rocky intertidal that provide important levels of refuge and food.

Sandy beaches are most extensive along the Northeast coast. Different zones of the beach present suitable habitat conditions for a variety of marine and terrestrial organisms. For example, the intertidal zone presents suitable habitat conditions for many invertebrates, and transient fish find suitable conditions for foraging during high tide. Several invertebrate and fish species are adapted for living in the high-energy subtidal zone adjacent to sandy beaches.

5.2.1.7 Recent Oceanographic Conditions

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.

Monitoring of the Middle Atlantic Bight (MAB) and Gulf of Maine (GOM) has been conducted by the Marine Resources Monitoring, Assessment, and Prediction Program’s (MARMAP’s) Ships of Opportunity Program (SOOP) since the early 1970s. Jossi and Benway (2003) recently published a summary of temporal and spatial patterns of surface and bottom temperature and surface salinity for SOOP transects crossing these regions during 1991-2001, including time plots of anomalous conditions for spatially coherent sections of these transects during the period 1978-2001, as well as annual transect averages and departures for both regions.

Lowest average annual surface temperature in the MAB during 1978-2001 and in the GOM during 1978-97 (after which coverage was insufficient) occurred in 1996, departing from baselines in both regions by an average of 1.1°C. Highest average annual surface temperature during the same respective periods occurred in 1995 for the MAB, and in 1991 for the GOM, departing from baselines by 1.3°C for the MAB, and by 0.4°C for the GOM. Three years of consistently low average surface temperatures in the MAB ended in 1999, followed by two more years of positive departures. Surface salinities in the MAB had their lowest annual averages in 1998, departing from baselines by 1.1 practical salinity units. Four years of consistently low surface salinities in the MAB ended in 2000.

According to the SOOP data, bottom temperatures in the MAB were lowest in 1994, averaging 1.4°C below the baseline, while bottom temperatures in the GOM were lowest in 1997, averaging 0.5°C below the baseline. From 1999 through 2001, the MAB bottom temperatures were consistently above the baseline, with the maximum departure for the entire period of record of 1.8°C in 1999. The annual transect average data and the time plots reveal that the magnitude of departures from long-term means was greater for all features and in all regions during the 1990s than during earlier years.

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. Whether or not a similar effect occurred in monkfish is not certain. NMFS trawl survey data through Fall 2002 show a relative increase in the abundance of small (<20 cm) monkfish in the northern area since 1999, less so in the southern area with the exception of 2002 where abundance increased noticeably.

5.3 Human Environment of the Fishery

This updates information provided in the Final Environmental Impact Statement for the Monkfish Fishery Management Plan (submitted 9/15/98) and economic sections of the annual Stock Assessment and Fishery Evaluation (SAFE) Report on the Monkfish fishery. In many instances, the original EIS contained inconsistent time periods for analysis. Wherever possible this DSEIS uses a consistent time period for all analyses. Where appropriate, notable changes that may have occurred since the September, 1998 EIS are highlighted.

Until recently, monkfish (goosefish or angler) was an incidental catch in groundfish and sea scallop fisheries but had little or no commercial value. Around the turn of this century, fishermen had little use for monkfish: *“Two or more men, armed with pitchforks, attack a pile of fish in the checker, heaving overboard the skates, dogfish, monkfish, and other species considered worthless, and tossing haddock, cod, and other marketable fish into separate checkers”* (Alexander et al. 1915:21). Even by mid-century, *“[n]o commercial use has been made of the goosefish in America up to the present time”* (Bigelow and Schroeder 1953: 541).

Government records of monkfish catches were not kept until the 1960's when reported landings averaged less than a million pounds and a few hundred thousand dollars a year (Monkfish FEIS 1998: 116). During the 1970's however, a ten-fold increase in the price of tails lead to a 17-fold increase in trips reporting landings and in landings themselves. Also, during this decade, gillnet and sea scallop fishermen joined trawlers in reporting landings. Further growth in the demand for tails by Europe and livers by Japan and other Asian countries (South Korea in particular) fueled growth of U.S. dockside markets into the 1990s.

5.3.1 Vessels and Fishery Sectors

The gears used in the directed monkfish fishery are otter trawls and sink gillnets. Historically, vessels using scallop dredges also directed effort on monkfish, but the use of a dredge on a monkfish DAS was prohibited under the original FMP. Nevertheless, if a scallop dredge vessel catches its incidental limit of 300 lbs. of tails per DAS (or 996 lbs. whole wt. equivalent), and that vessel catches less than 1,000 lbs. of scallops per DAS, the trip could be identified by the standard threshold for analyzing “directed” fishing effort (that is, 50 percent of the total weight of fish on board). The following sections show the distribution of effort and landings by permit category, area and gear type.

The configuration of otter trawl nets used in the monkfish fishery varies by area, bottom type and other fisheries in which each particular vessel participates. For example, the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more consistent over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for

monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

5.3.1.1 Permits

In 2002, there were 718 monkfish limited access vessels of which 92 percent were Category C and D vessels, that is they also held a limited access Multispecies (531 permits) or Scallop permit (176 permits) (Table 35). These have been essentially unchanged since implementation of the FMP in 1999. The remaining vessels (Categories A and B) do not hold scallop or monkfish permits, but have permits in other limited access fisheries.

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	NUMBER OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/MACK./BUT.	TILEFISH
A	15	9	3	8	0	0	0	0	6	2	1
B	40	21	5	15	0	0	0	0	11	0	3
C	328	122	247	265	200	0	0	155	139	105	1
D	335	117	195	296	331	0	0	21	148	100	5
Total	718	269	450	584	531	0	0	176	304	207	10

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENT OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/MACK./BUT.	TILEFISH
A	15	60%	20%	53%	0%	0%	0%	0%	40%	13%	7%
B	40	53%	13%	38%	0%	0%	0%	0%	28%	0%	8%
C	328	37%	75%	81%	61%	0%	0%	47%	42%	32%	0%
D	335	35%	58%	88%	99%	0%	0%	6%	44%	30%	1%
Total	718	37%	63%	81%	74%	0%	0%	25%	42%	29%	1%

Table 35 Number and Percent of monkfish limited access vessels also issued a limited access permit in other fisheries in 2002, by permit category and fishery.

5.3.1.2 Fishing effort

The total number of trips where monkfish were landed hovered around 20,000 from 1982 to 1985 but averaged 17,500 trips from 1986 to 1993 (Figure 31). An apparent near-doubling in number of trips in 1994-onward was due to a combination of factors that included a change in data collection systems and implementation of major amendments for scallops and multispecies. The conversion from a voluntary to a mandatory data collection system in 1994 also included a change in reporting of so-called “under-tonnage” vessels (less than 5 gross registered tons). Prior to 1994 these vessels were not uniquely identified so their activity could not be tracked. From 1994 to 2002 the number of trips taken by vessels less than 5 GRT averaged just over 5,000 or about 15% of total trips. Assuming that this proportion of small vessel to total trips reflects pre-1993 conditions, the combined effect of growing monkfish export markets and changes in scallop and multispecies management could have resulted in an average increase of 14,000 trips landing monkfish in the Northeast region. With increasing price during the 1990’s, and the lack of regulation, monkfish was an attractive alternative fishery for trawl, dredge and gillnet vessels facing restrictions in major northeast fisheries such as multispecies, scallops and summer flounder.

Starting in Year 2 of the FMP (May, 2000 –April, 2001) limited access monkfish vessels (Categories A, B, C, and D) were allocated 40 monkfish DAS. By definition, Category A and B

vessels do not qualify for limited access multispecies or scallop permits, and Category C and D vessels must use either a multispecies or scallop DAS while on a monkfish DAS. However, in the NFMA, there is no monkfish trip limit when a vessel is on either a combined (monkfish/multispecies or monkfish/scallop) DAS or a multispecies-only DAS. Therefore, multispecies vessels in Categories C and D and fishing in the NMFA did not call-in monkfish DAS.

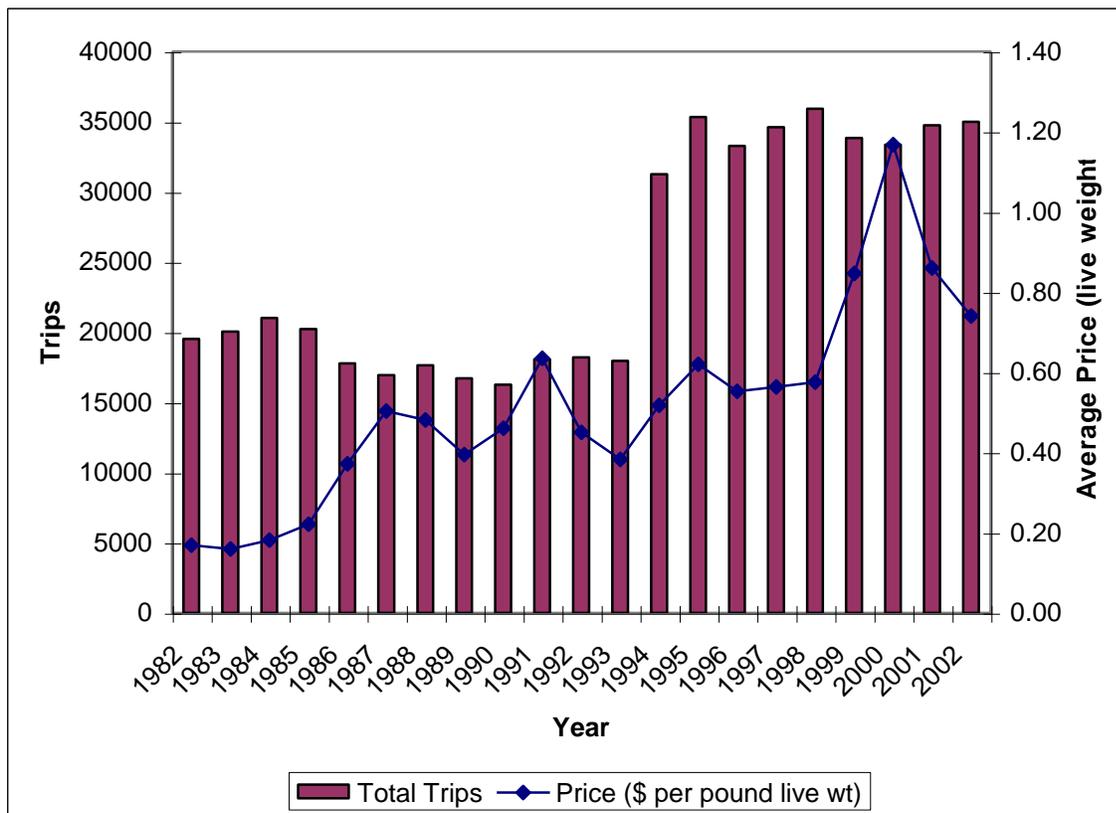


Figure 31 Total number of reported trips landing monkfish, and average price per pound, calendar years 1982-2002

Table 36 and Figure 32 show the monthly DAS usage for vessels calling-in for the three years since DAS were implemented under the FMP. While DAS usage in December and January of FY2002 were the highest of the three years for those months, overall DAS usage has declined each year, and was 18 percent lower in FY2002 than in FY2000, the first year of the DAS program.

Figure 33 shows the monthly monkfish DAS usage by permit category. All permit categories exhibit essentially the same seasonal pattern with peak effort on monkfish taking place during November-February. During this period, demand in both Asia (for livers and whole monkfish) and Europe (for tails) is highest, and the livers are at their peak size relative to body weight.

	Cumulative DAS		
	FY2000	FY2001	FY2002
May	705	772	398
June	1213	1329	930
July	1354	1455	1029
Aug	1434	1602	1070
Sept	1658	1696	1135
Oct	1946	2046	1371
Nov	3003	2620	1941
Dec	3749	3171	2715
Jan	4353	3713	3345
Feb	4690	4025	3642
Mar	4858	4250	3873
Apr	5292	4802	4359

Table 36 Cumulative monthly monkfish DAS usage by vessels fishing in the SFMA, FY2000-FY2002

SFMA DAS - Monthly and Cumulative

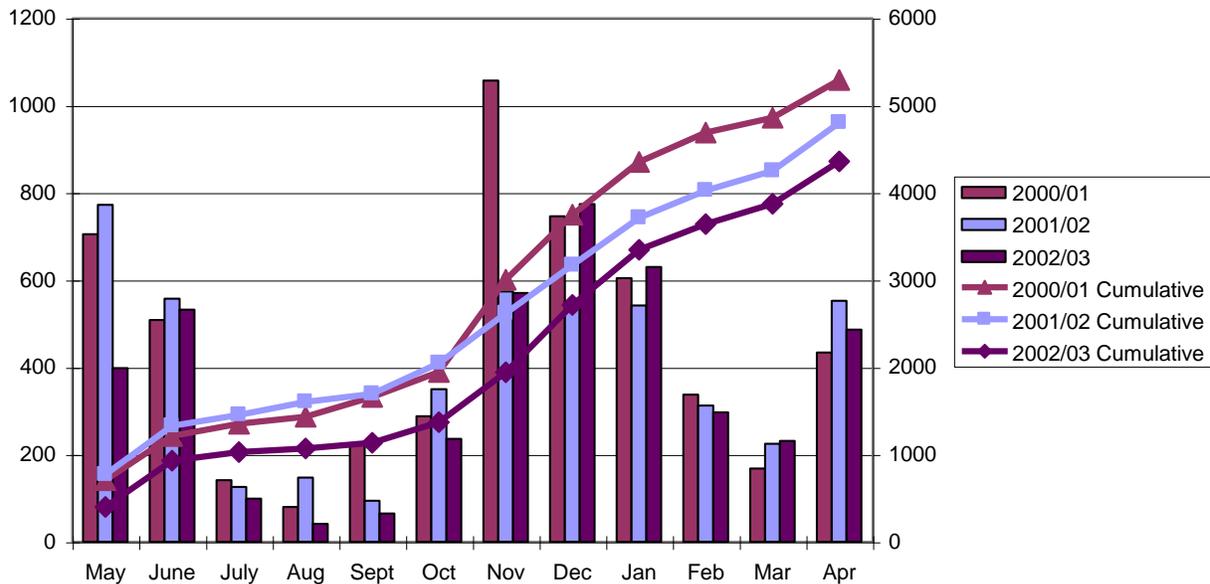


Figure 32 Monthly and cumulative monkfish DAS usage, SFMA, FY2000 – FY2002.

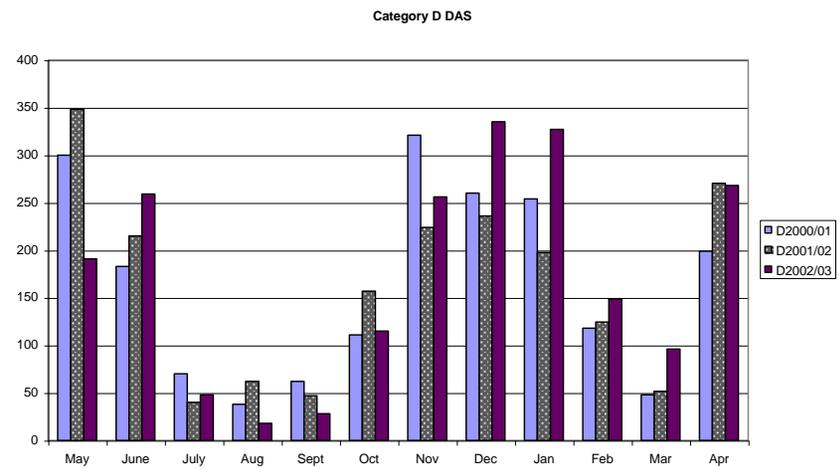
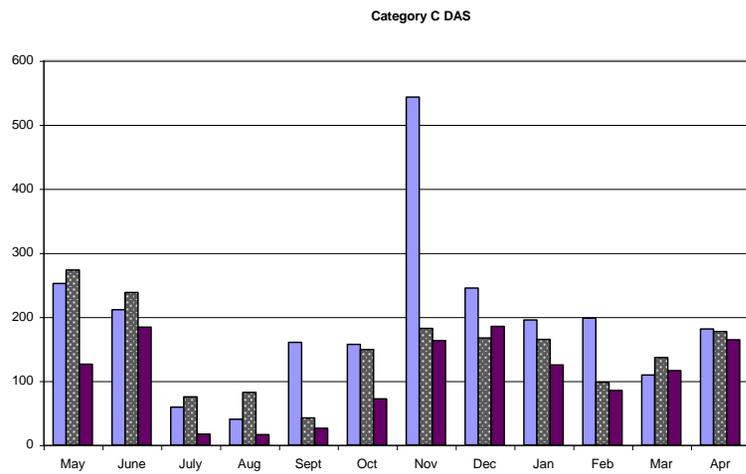
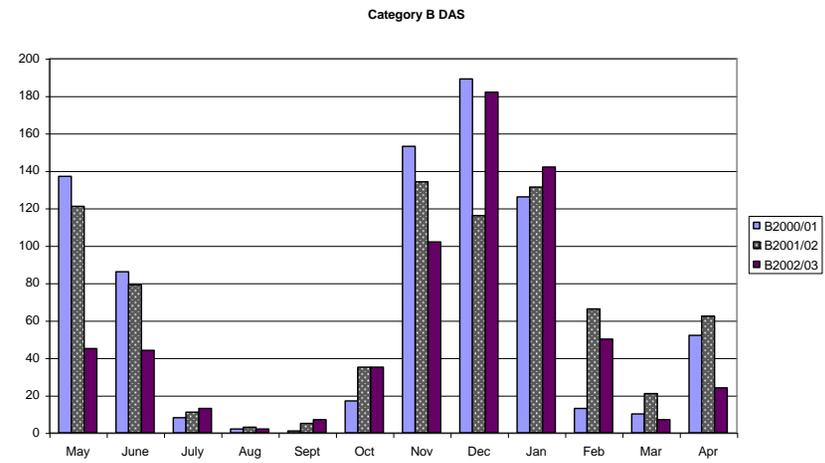
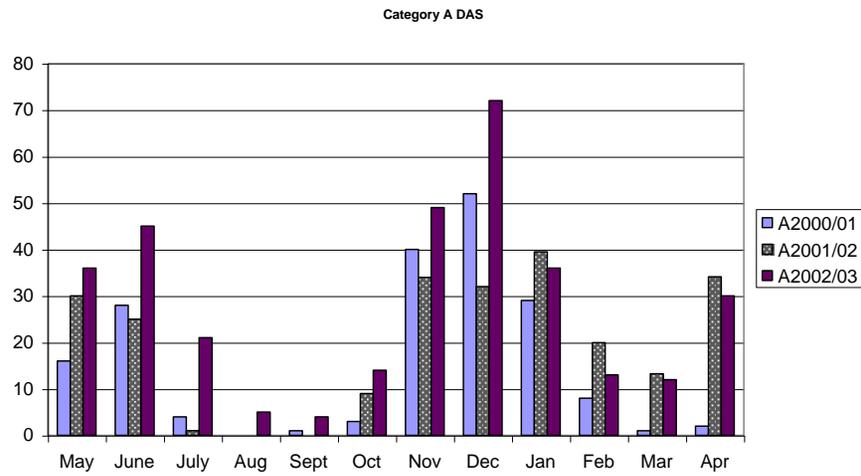


Figure 33 Monthly monkfish DAS usage by permit category, FY2000-FY2002

Table 37 shows the distribution of DAS allocated and used by all vessels and those that called in on a monkfish DAS in FY2000 and FY2001, respectively. The call-in vessels represent effort only in the SFMA since vessels in the NFMA on a multispecies DAS have no monkfish trip limit and do not call in a monkfish DAS, although some vessels fished in both areas.

Permit Category	All Vessels		Call-in Vessels	
	DAS Allocated	DAS Used	DAS Allocated	DAS Used
A	608	336	518	336
B	1,633	653	1,303	653
C	16,086	1,281	3,076	1,281
D	16,600	2,090	5,192	2,090
TOTAL	34,927	4,360	10,089	4,360

Source: NMFS Office of Law Enforcement, DAS call-in database

Table 37 Monkfish DAS allocated and used by permit category, FY2002 used by vessels calling in a monkfish DAS (SFMA only)

Table 38 shows the DAS usage by vessels that called in to use monkfish DAS broken down into monkfish-only, monkfish/multispecies and monkfish/scallop vessels in FY2002, and the usage rate in FY2001. According to public comment, many vessel operators in the SFMA, particularly in the scallop and multispecies trawl fisheries chose not to call-in their monkfish DAS because they opted to target scallops or groundfish. Unused monkfish DAS in Category C and D vessels most likely reflects the impact of restrictive trip limits combined with increased catch rates in scallops and groundfish fisheries on the decisions of vessel operators about where to direct their effort. Changes in either parameter (that is, increased monkfish trip limits or reduced catch rates in groundfish or scallops) could result in greater utilization of monkfish DAS, as directing effort on monkfish would become relatively more profitable. Furthermore, as multispecies DAS allocations are reduced below the 40 monkfish DAS allocation, some vessels may fish the difference as monkfish only DAS. Also, as noted in the preceding paragraph, Multispecies/Monkfish vessels that fished in both SFMA and NFMA only called in monkfish DAS when fishing in the SFMA, therefore, monkfish DAS used for those vessels do not reflect their fishing effort on monkfish in the NFMA.

Permit Category	DAS Allocated	DAS Used					
		Monkfish	Monkfish/ Multispecies	Monkfish/ Scallop	Total	% Used FY2002	% Used FY2001
A	518	336	0	0	336	65%	65%
B	1,303	653	0	0	653	50%	63%
C	3,076	0	1,281	0	1,281	42%	49%
D	5,192	0	2,090	0	2,090	40%	41%
TOTAL	10,089	989	3,371	0	4,360	43%	0%

Source: NMFS Office of Law Enforcement, DAS call-in database

Table 38 Monkfish DAS usage rate FY2001 and FY2002, showing monkfish only, monkfish/multispecies and monkfish/scallop DAS used by vessels calling in a monkfish DAS (SFMA only)

5.3.2 Landings and Revenues

5.3.2.1 Long term overview and trend in distribution of revenues by gear

From 1982 to 1988 monkfish landings ranged from 16 to 21 million pounds (live weight) while gross revenue increased steadily from \$2.8 to \$10.1 million (Figure 34). Both landings and value more than tripled over the next nine years and landings reached an historic high of 62.1 million pounds in 1997. Although international demand for monkfish was strong during this time, the increased landings were also attributable to changes in both groundfish and scallop management that made monkfish a more attractive alternative fishery which also prompted development of the monkfish FMP (implemented in October, 1999). Following implementation, landings fell about 10 million pounds to 46 million pounds in 2000 but have since risen to approximately 50 million pounds in 2001 and 2002.

The relative importance of monkfish has changed compared to groundfish and scallops. From 1985 to 1990 monkfish revenue ranged from 3 to 5-percent of combined revenues from scallops, monkfish, and groundfish (Figure 35). As both groundfish and scallop revenues were declining from 1991 through 1998 monkfish revenues were increasing and contributed over 17% of combined fishing revenues in 1998. From 1999 onward, both groundfish and scallop revenues have increased, and while the proportion of monkfish revenues kept pace in 1999 and 2000, the proportion of total combined revenue from monkfish, scallops, and groundfish coming from monkfish has declined to under 11-percent.

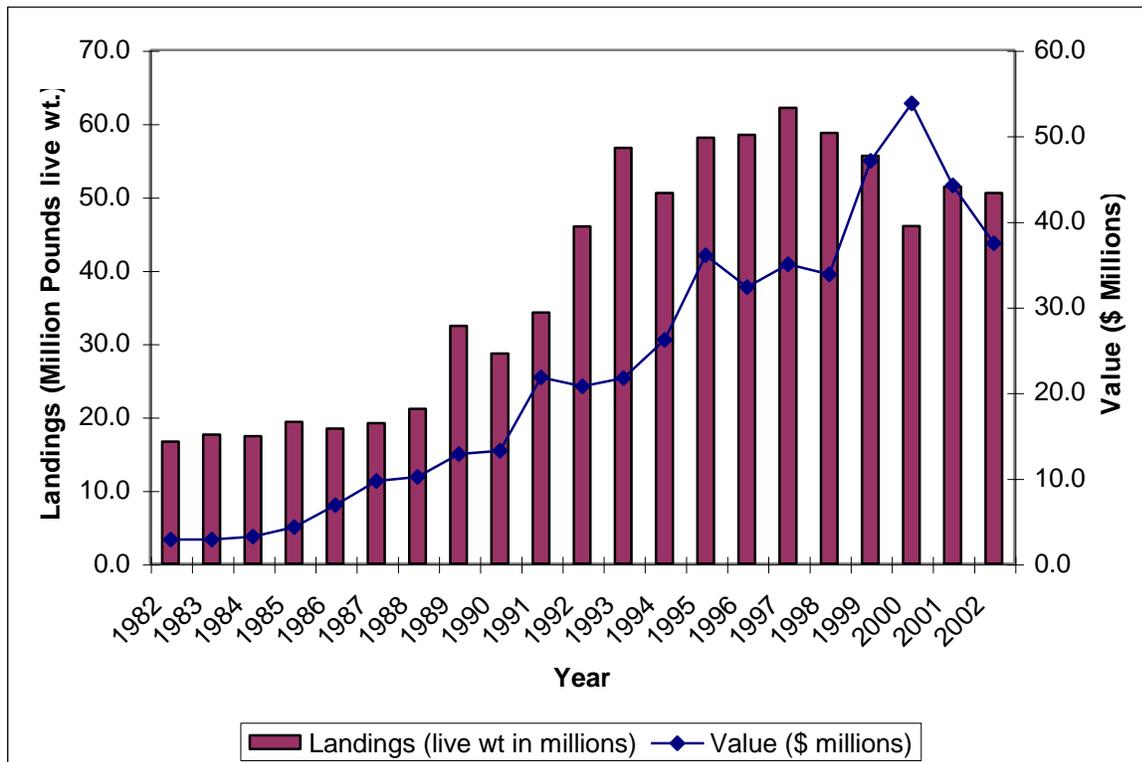


Figure 34 Monkfish landings and value, calendar years 1982-2002

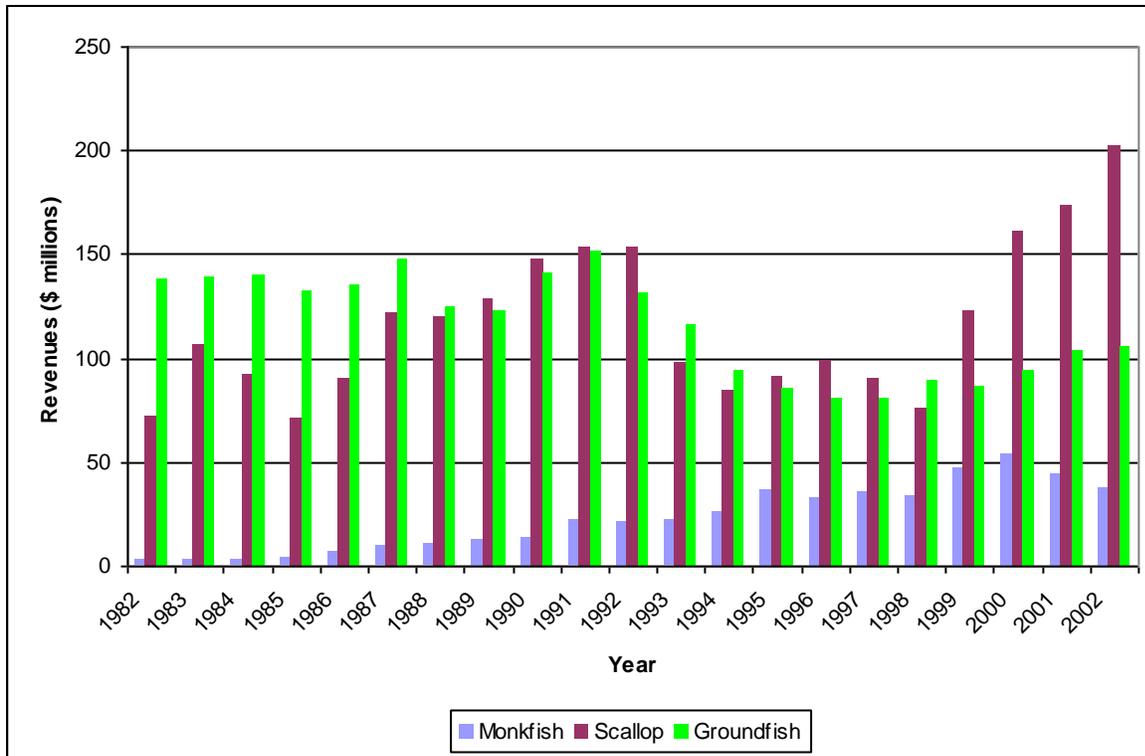


Figure 35 Comparison of revenues from monkfish, groundfish and scallops, 1982-2002

Prior to the mid-1970's, only groundfish trawlers reported monkfish landings, and their number of trips remained below 2,000 annually (Monkfish FMP at page 130). During the mid-1970's gillnet and scallopers began to report monkfish landings. From 1982 through 1993 the total number of trips where monkfish were landed ranged from 21 to 16 thousand of which the majority were taken by trawl gear (Figure 36). However, the number of trips reporting monkfish with either gillnet or scallop dredge gear was increasing over this time period while the number of trawl gear trips was declining. As noted earlier, the conversion to a mandatory data collection system in 1994 brought a larger number of vessels into the weighout system. Thus, the apparent large increase in number of trips occurring in 1994 was, in part, an artifact of this changeover (earlier estimated to represent about 15% of total trips taken from 1994 to 2002), but in no small measure, was also due to; 1) continued development of monkfish markets; 2) declining stock status of major Northeast region fisheries; and 3) significant management changes in groundfish and scallop fisheries.

In 1982 trawl gear accounted for about 70% of monkfish revenue (Figure 37). However, over the next 10 years the share of monkfish revenue going to scallop dredge vessels increased from 25% to 50% in 1990 before declining steadily over the next 12 years to less than 5% in 2002. Note that significant improvements in scallop resource conditions as well as more restrictive trip limits when using scallop dredge gear has reduced the incentive of scallop vessels to direct on monkfish. As scallop dredge revenue share was declining, the proportion of monkfish revenue going to gillnet gear was increasing from less than 3% in 1990 to more than 50% in 2002. Trawl vessel revenue share has declined but remained relatively stable ranging between 47 and 55% from 1993 through 2001 before falling to 41% in 2002.

The seasonal pattern of monkfish revenues varies by gear with gillnet gear exhibiting a bimodal fishing pattern while scallop dredge and trawl vessel revenue exhibits a distinct cyclical pattern. Scallop dredge vessel revenues peak in late fall - October and November - decline through March before rising gradually through the summer and into the fall (Figure 38). Trawl vessel revenues follow a similar pattern peaking in late fall and the winter but remain relatively high through April (Figure 39). Trawl vessel landings are lowest May through August before picking up again in September. Like both scallop dredge and trawl gear, monkfish revenues by gillnet vessels peak in late fall and early winter but revenues also peak during early spring/late summer when both scallop dredge and trawl revenues are lowest (Figure 40). Gillnet revenues are lowest in late winter/early spring and again in late summer/early fall.

In addition to differences in seasonal revenue patterns there are difference in product form landed by gear. In every year from 1982 to 2002, revenue from the sale of tails comprised over 70% of total sales by scallop dredge vessels (Figure 41). The proportion of revenue from liver sales increased to 25% of scallop dredge revenue in 1994 but has since declined to less than 5% of total monkfish in 2002 where revenue from tails was almost 92% of total revenue. Trawl vessels also earn the majority of monkfish revenue from tails but the proportion of monkfish sales from whole monkfish has been increasing (Figure 42). As a proportion of total monkfish revenue, the sale of whole monkfish has increased significantly for gillnet vessels and in 2002 was more than 80% of total monkfish sales (Figure 43).

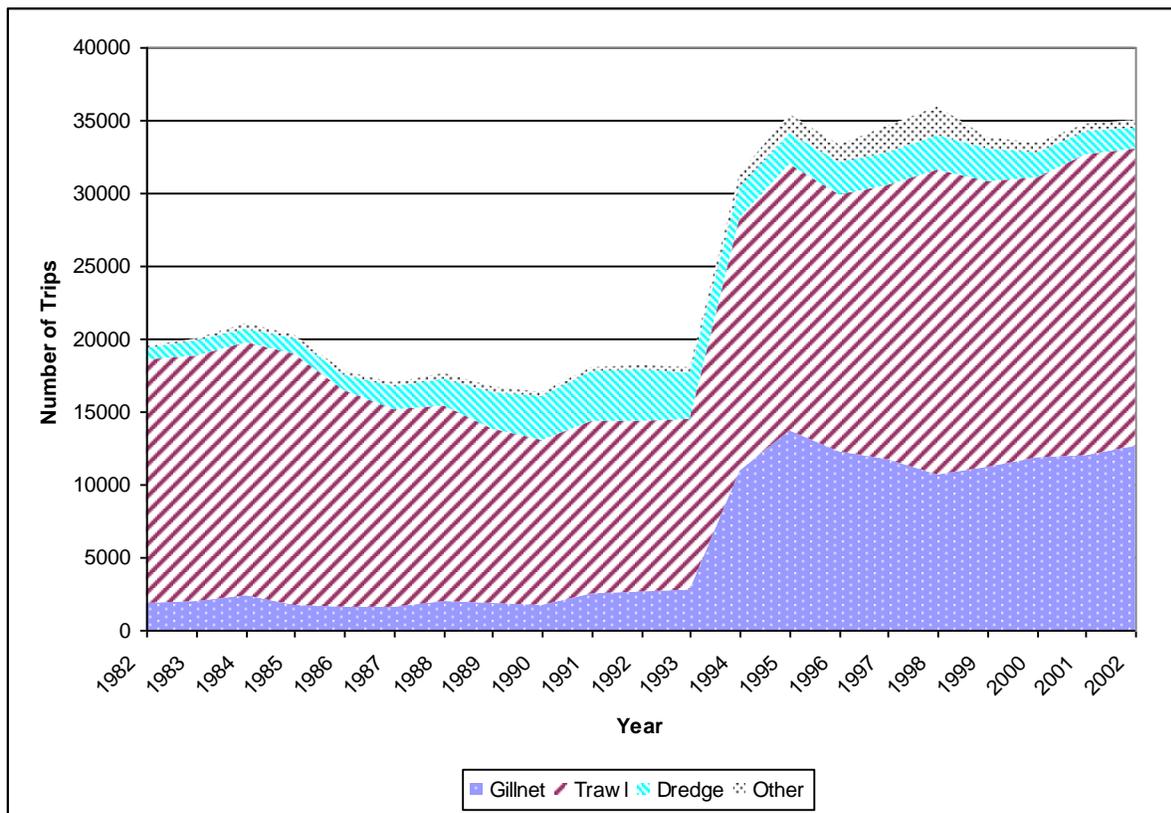


Figure 36 Monkfish landings by gear, 1982-2002

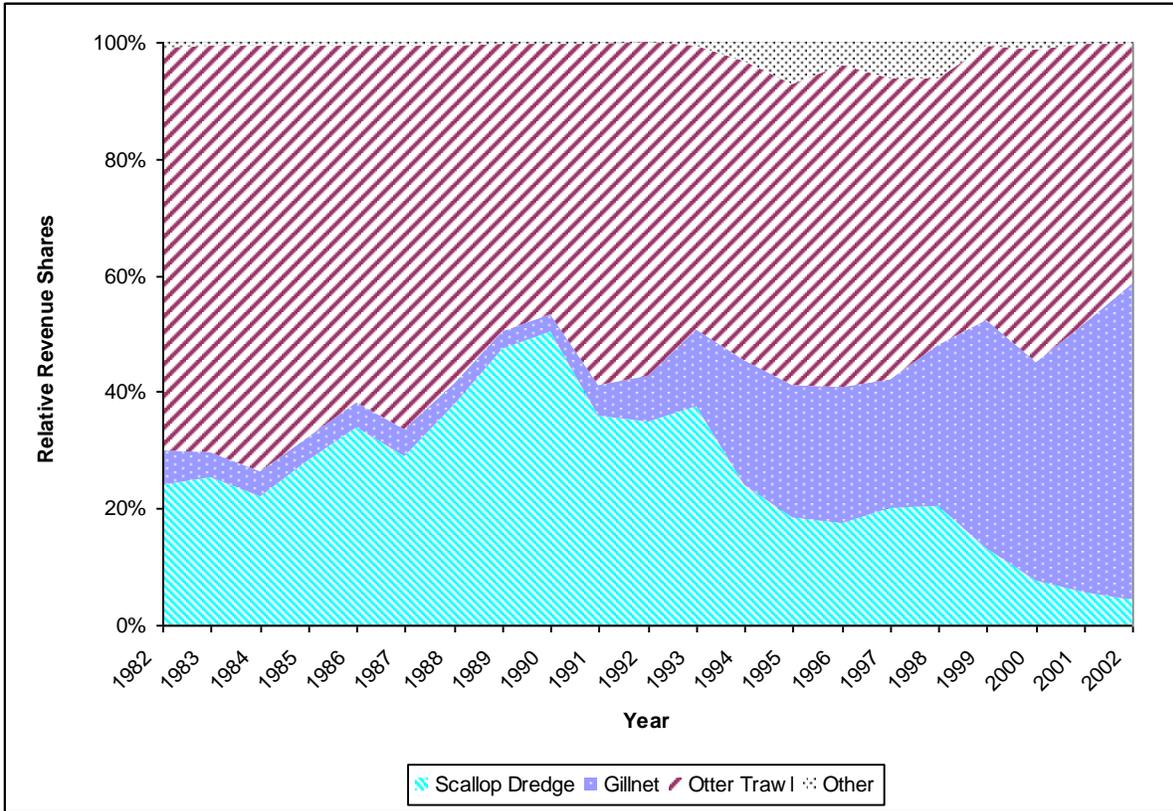


Figure 37 Relative distribution of monkfish landings by gear, 1982-2002.

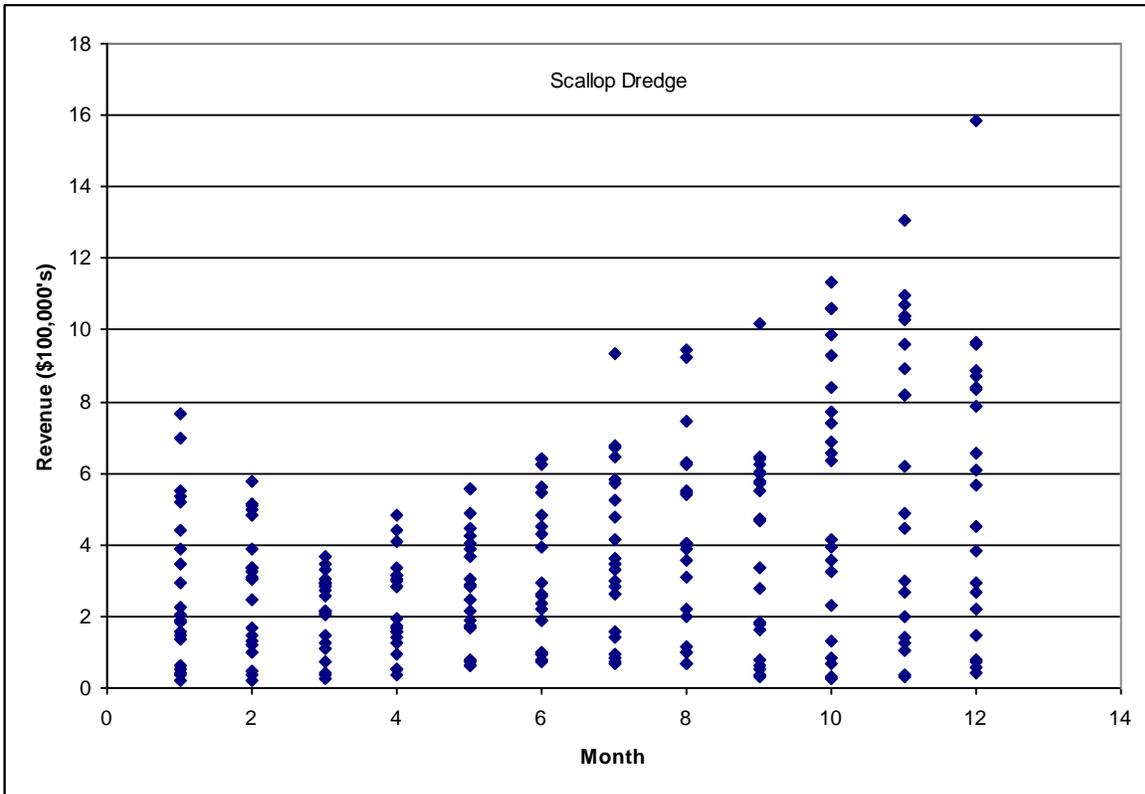


Figure 38 Monthly monkfish landings by scallop dredge, 1982-2002

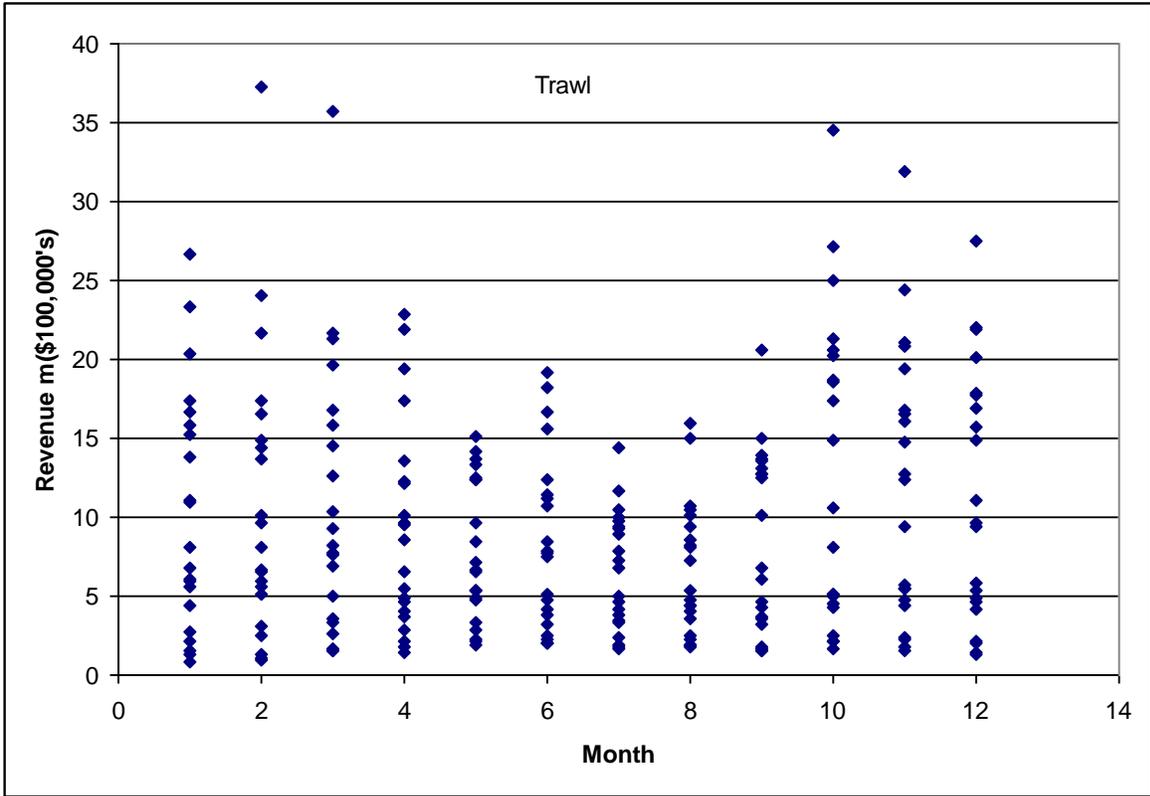


Figure 39 Monthly monkfish landings by otter trawl, 1982-2002

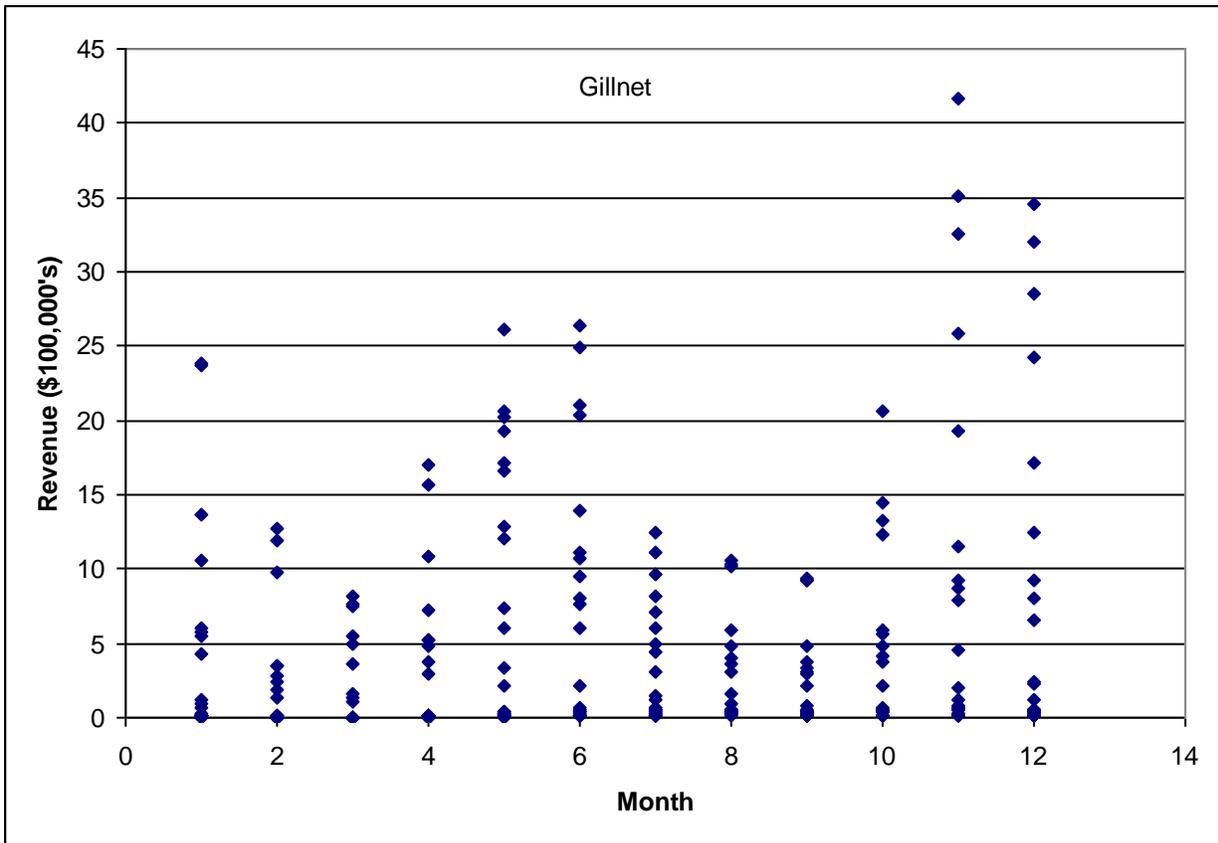


Figure 40 Monthly monkfish landings by gillnet, 1982-2002

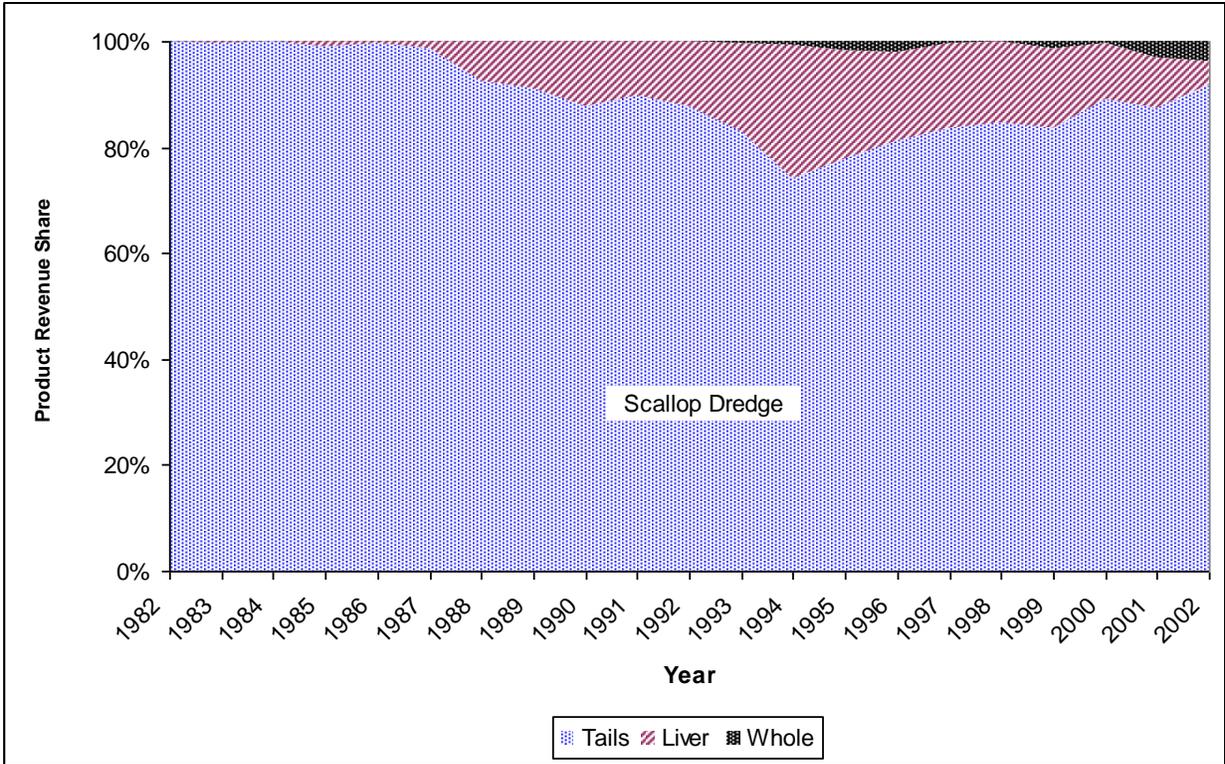


Figure 41 Scallop dredge monkfish revenue share by product form, 1982-2002

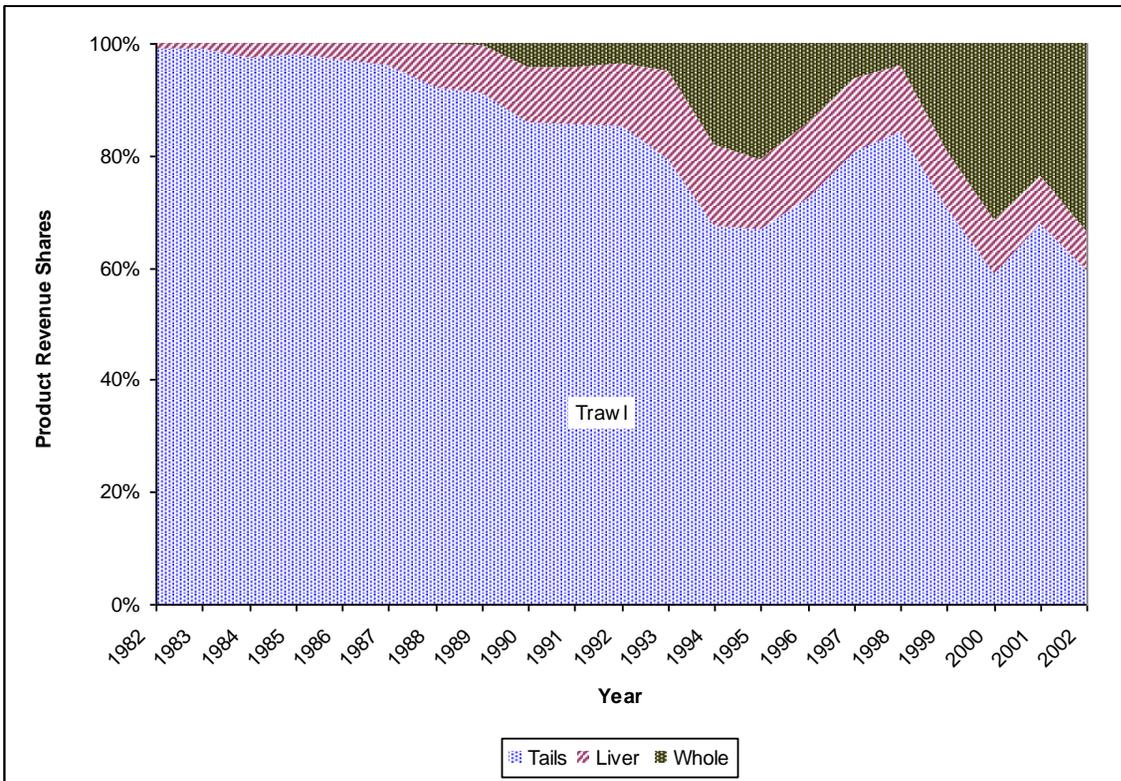


Figure 42 Otter trawl monkfish revenue share by product form, 1982-2002

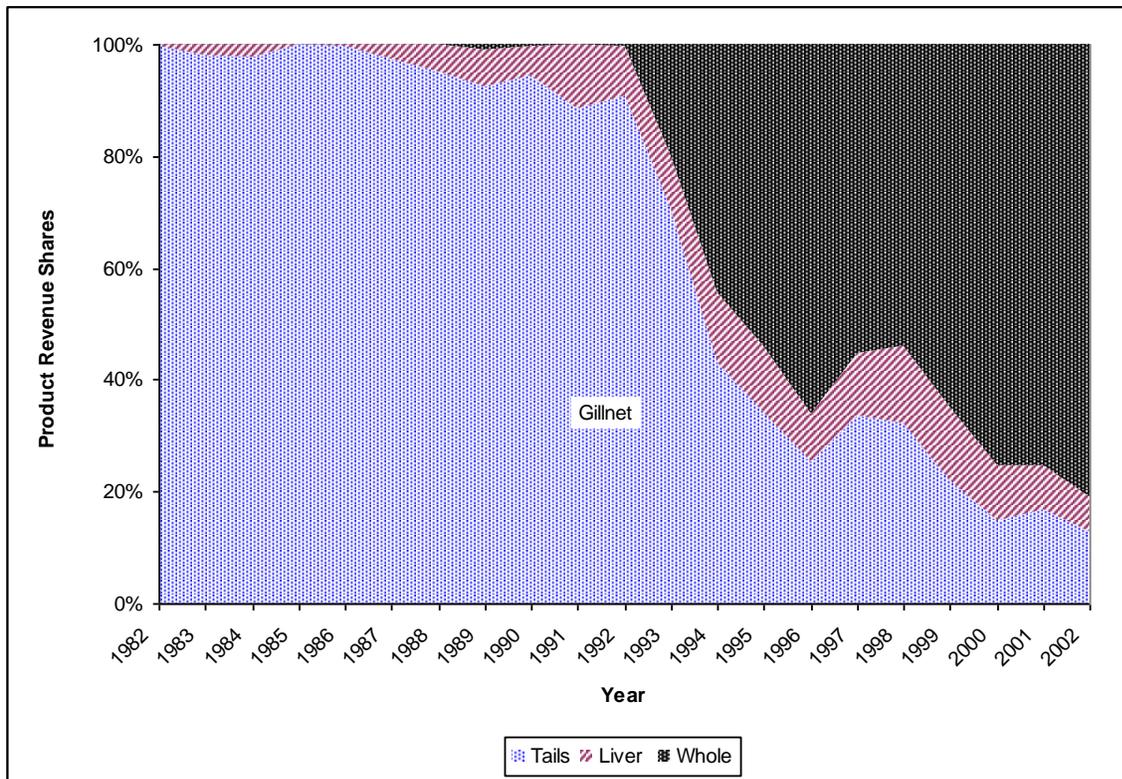


Figure 43 Gillnet monkfish revenue share by product form, 1982-2002

5.3.2.2 Post-FMP trend in landings and revenues

5.3.2.2.1 Overview

Since implementation of the FMP on November 8, 1999, all monkfish permit holders are required to report landings on their vessel trip reports (VTR). All permitted dealers must submit dealer reports. While dealer data are more complete, they do not show the area from which the landings are caught. Table 39 shows landings by month, management area and gear type for FY2002. (Note: the following discussion is based on fishing year landings, not calendar year landings as above). Since VTR data only captures about 70 percent of the landings in the dealer reports, Table 39 shows dealer data that have been prorated by the VTR data to each management area. For comparison, Table 40 shows monthly landings by gear from the dealer reports in FY2002 as both landed weights (B) and converted to live weights (A). Landed weight is the actual weight of the landings regardless of product form (whole, tails, etc.), while live weight shows a conversion to the weights of the fish that those landings represent. Figure 44 shows the ratio of live weight to landed weight by gear. A higher ratio, such as for gillnets, indicates that more fish are landed whole or headed and gutted, rather than in tail form.

In FY2002 the NFMA, landings declined 3 percent from the previous year to 31.4 million pounds (14,259 mt), while in the SFMA they declined 34 percent to 16 million pounds (7,276 mt) (Table 41 and Figure 45). The decline in SFMA landings was largely due to the lower trip limit in FY2002. The percentage of total landings by gear type has remained fairly constant over the past three years in the NFMA, but has changed significantly in the SFMA (Table 42, and Figure 46). Gillnets accounted for 49 percent of the total SFMA landings in FY1999, and for 40

percent in FY2000, but increased to 60 percent in FY2001 and 71 percent in FY2002. The increase in the proportion of SFMA landings attributed to gillnets in FY2001 is due to a combination of factors, such as the negative effect of the trip limits and DAS system on trawl vessels (without the ability to use a “running clock”). However, the primary cause is the impact starting in November, 2001 of a federal court decision in the case of *Hall et al. v. Evans et al.* (C.A. No. 99-5491[D.R.I.]) eliminating the gear-based trip limit differential. (See Section 2.5.2.1)

1,000 Lbs.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY 02- APR 03
NORTHERN	1,151	2,237	2,284	2,622	3,058	2,833	2,295	2,492	2,770	2,792	4,919	1,982	31,436
OTTER TRAWL	1,038	1,435	1,128	1,407	2,169	2,215	1,660	1,930	2,633	2,762	4,885	1,933	25,194
GILLNET	113	791	1,100	1,149	867	612	606	557	135	30	33	49	6,042
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	1
OTHER GEARS	0	11	56	66	21	6	29	5	2	0	1	0	198
SOUTHERN	2,354	2,263	649	374	277	769	1,925	2,341	1,673	1,093	882	1,441	16,040
OTTER TRAWL	182	165	147	91	125	212	226	266	260	338	348	111	2,472
GILLNET	1,712	1,875	284	56	68	411	1,508	1,948	1,331	667	384	1,206	11,450
HOOK	0	0	0	0	0	0	1	0	0	0	0	0	2
OTHER GEARS	460	223	218	227	84	146	190	127	82	88	149	124	2,116
ALL AREAS	3,505	4,500	2,933	2,996	3,334	3,603	4,220	4,833	4,443	3,885	5,801	3,423	47,476
OTTER TRAWL	1,220	1,600	1,275	1,498	2,294	2,428	1,886	2,196	2,893	3,100	5,233	2,044	27,666
GILLNET	1,825	2,665	1,384	1,205	935	1,024	2,114	2,505	1,466	697	417	1,255	17,493
HOOK	0	0	0	0	0	0	1	0	0	0	0	0	3
OTHER GEARS	460	234	274	293	105	151	219	132	84	88	150	124	2,314

Source: NMFS Statistics Office, dealer weighout database

1. The three digit statistical areas defined below are for statistical and management purposes and may not be consistent with stock area delineation used for biological assessment (see the attached statistical chart)

Monkfish Stock Areas: Northern: 464-465, 467, 511-515, 521-522, 561-562

Southern: 525-526, 533-534, 537-539, 541-543, 611-639

2. State landings for CT are estimated for 2002 & 2003

3. Landings in live weight

4. Gear data are based on vessel trip reports

Table 39 Fishing year (May 2002 – April 2003) monkfish landings by Area, Gear and Month.

A) Live weight

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	1,271,595	482,443	1,663,934	4,323	212,865	3,635,160
June	1,738,119	429,624	2,346,149	39,669	439,166	4,992,727
July	1,523,318	406,917	1,311,041	2,978	106,354	3,350,608
August	1,531,911	303,722	1,154,958	6,290	134,748	3,131,629
September	2,281,196	114,196	932,758	19,801	27,335	3,375,286
October	2,315,820	155,073	1,089,536	697	165,086	3,726,212
November	1,822,539	252,796	2,142,192	2,178	139,734	4,359,439
December	2,308,734	232,735	2,280,831	763	85,003	4,908,066
January	3,019,185	118,660	1,544,475	816	1,494	4,684,630
February	3,043,287	126,410	695,512	299	4,281	3,869,789
March	5,132,879	174,019	482,921	129	2,459	5,792,407
April	2,214,685	243,237	977,282	1,502	2,586	3,439,292
TOTAL	28,203,268	3,039,832	16,621,589	79,445	1,321,111	49,265,245

Source: NMFS Statistics Office, dealer weighout database

* May include data from CT vessels without a 2002 Monkfish permit

B) Landed weight

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	568,094	146,182	1,408,575	1,404	151,657	2,275,912
June	768,645	137,234	1,898,292	34,418	301,444	3,140,033
July	604,969	123,368	964,773	1,085	39,166	1,733,361
August	576,869	91,618	814,399	3,144	43,593	1,529,623
September	945,211	34,554	669,487	12,952	8,445	1,670,649
October	1,007,273	50,330	903,383	381	101,477	2,062,844
November	779,272	81,099	1,787,964	922	63,777	2,713,034
December	980,728	77,710	1,965,277	308	28,840	3,052,863
January	1,220,946	38,119	1,389,044	377	567	2,649,053
February	1,164,014	38,504	631,226	117	1,289	1,835,150
March	1,993,588	52,737	403,909	52	741	2,451,027
April	859,859	74,679	826,863	568	778	1,762,747
TOTAL	11,469,468	946,134	13,663,192	55,728	741,774	26,876,296

Table 40 FY2002 monkfish landings (A-live weight, B-landed weight) by month, gear, from dealer reports

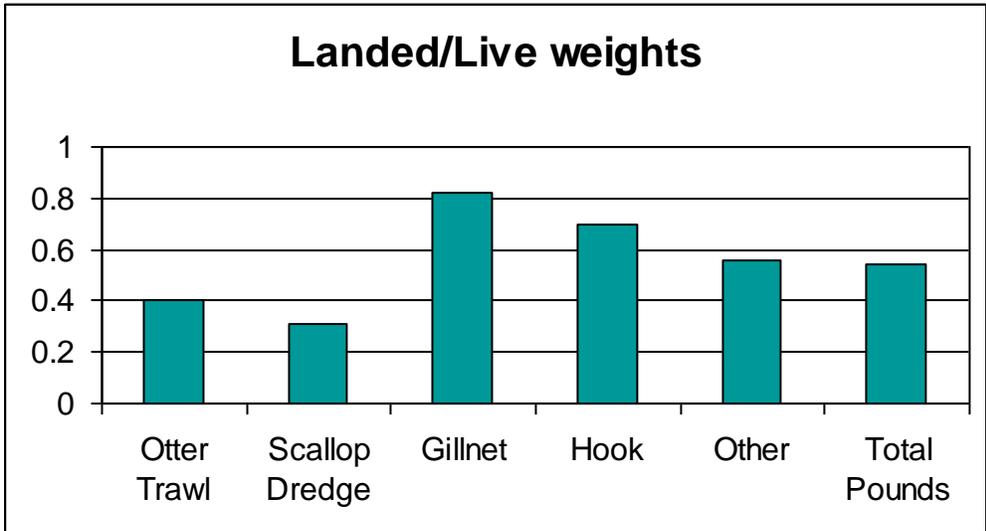


Figure 44 Ratio of landed weight to live weight in NMFS dealer data. Higher ratio indicates greater percentage of whole fish landed, as opposed to tails

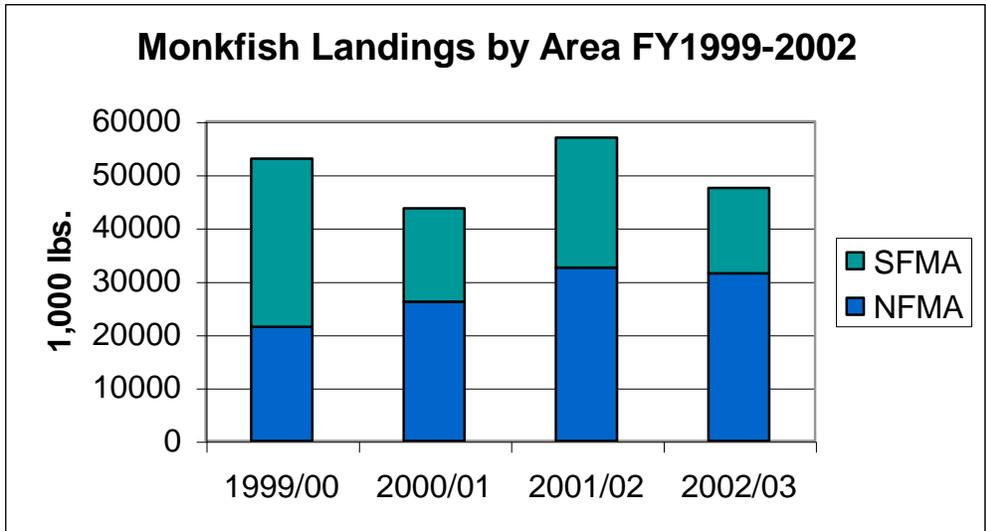


Figure 45 Monkfish landings by management area FY1999-2002

1,000 lbs.	1999/00	2000/01	2001/02	2002/03
NORTHERN	21,429	26,145	32,523	31,436
OTTER TRAWL	16,684	18,977	24,812	25,194
GILLNET	3,640	6,497	7,037	6,042
HOOK	1	1	2	1
OTHER GEARS	1,104	670	672	198
SOUTHERN	31,550	17,549	24,400	16,040
OTTER TRAWL	11,865	7,406	5,981	2,472
GILLNET	15,329	6,955	14,686	11,450
HOOK	2	3	1	2
OTHER GEARS	4,353	3,185	3,732	2,116
ALL AREAS	52,979	43,694	56,923	47,476
OTTER TRAWL	28,549	26,383	30,793	27,666
GILLNET	18,969	13,452	21,723	17,493
HOOK	3	3	3	3
OTHER GEARS	5,457	3,855	4,404	2,314

Table 41 Monkfish landings by gear and management area FY1999-2002

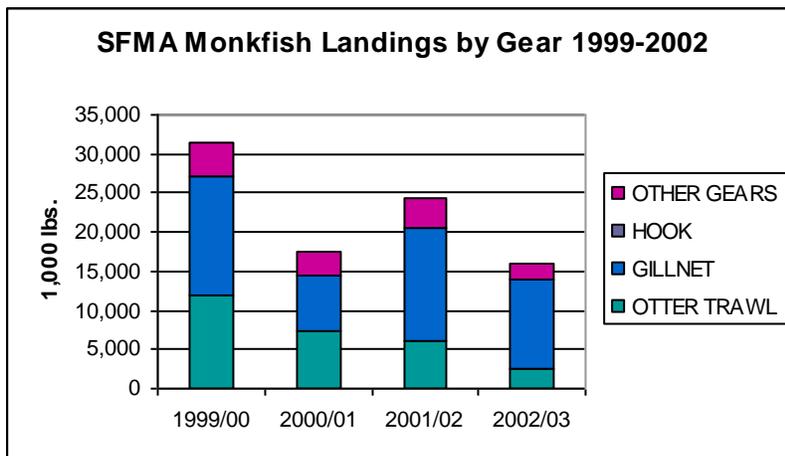
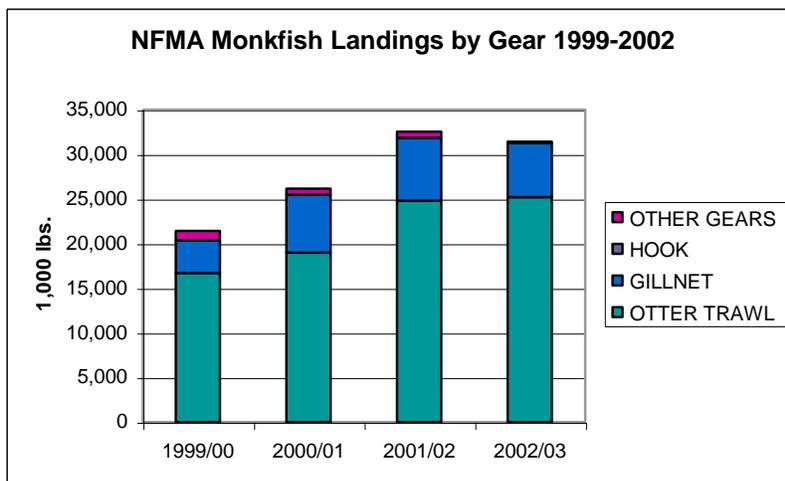


Figure 46 Monkfish landings by area and gear FY1999-2002

	1999/00	2000/01	2001/02	2002/03
NORTHERN				
OTTER TRAWL	78%	73%	76%	80%
GILLNET	17%	25%	22%	19%
HOOK	0%	0%	0%	0%
OTHER GEARS	5%	3%	2%	1%
SOUTHERN				
OTTER TRAWL	38%	42%	25%	15%
GILLNET	49%	40%	60%	71%
HOOK	0%	0%	0%	0%
OTHER GEARS	14%	18%	15%	13%

Table 42 Percentage of total monkfish landings by gear for NFMA and SFMA, FY1999-2002

The landings and revenue data in the following section are presented only for vessels that were issued a federal monkfish permit for FY2001 (for pre-FY2002 data) and FY2002, except Connecticut data that includes all landings. Federal permits for monkfish did not exist prior to implementation of the FMP on November 8, 1999. However, in order to generate a consistent time series of data across fishing years 1995-2001, landings and revenues were only queried for vessels that have permits for the current fishing year.

NOTE: Unless otherwise noted, landings in this section are “landed weights”, that is, weight of whole fish, tails and livers landed. These weights are not converted to “live weights” and, thus, do not match landings presented in other sections of this report. For a comparison of landed weights to live weights, see Figure 44. **Also note:** revenue data are based on *fishing year* while in other sections, data are presented for calendar year.

Table 43 reports monkfish landings for the approximately 2,600 vessels issued a monkfish permit (limited access and open access) for the FY2001 and FY2002. Monkfish landings and revenues increased steadily and significantly during 1995-1999, declined in FY2000 and increased in FY2001 to the highest level since 1995. Overall, landings (by “landed weight”) increased 41 percent and revenues increased 98 percent from FY 1995 to FY1999, declined by nine and 3.7 percent, respectively, in FY2000. In FY2001, landed weights increased by 30 percent but revenues declined by nine percent, reflecting depressed prices during the year. In FY2002, both landings (landed wts.) and revenues declined about 17 percent due, most likely, to the impact of the lower trip limit.

Fishing Year (May 1 - April 30)	Landings* (1,000 lbs. landed wt.)	Revenues* (\$1,000)
1995	18,415.6	\$24,758.8
1996	20,732.6	\$26,188.5
1997	21,774.3	\$30,127.0
1998	24,156.0	\$34,682.0
1999	26,077.2	\$48,713.7
2000	23,422.8	\$46,122.9
2001	31,079.3	\$43,122.0
2002	25,816.8	\$35,885.1

Source: NMFS Statistics Office, dealer weighout database & permit database

* May include data from CT vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 43 Fishing year 1995-2002 monkfish landings (landed wt.) and revenues for vessels holding a monkfish permit during FY2001 or FY2002.

5.3.2.2.2 Distribution of effort by area fished

Due to issues related to conversion of the Northeast region data collection system that took place in 1994, data were not available to describe the distribution of fishing effort among management areas for any years later than 1993 at the time the EIS for the Monkfish FMP was prepared (see p. 126-129 of the EIS dated 10/23/98). Nevertheless data for calendar year 1993 were examined and the findings are summarized below.

In 1993, 55% of monkfish revenues were derived from Southern Management area landings, of which, three-quarters were delivered to ports in New England states. Vessels operating out of Maine ports concentrated almost exclusively on the Northern area while vessels from Rhode Island and Mid-Atlantic states relied on Southern area. Vessels from Massachusetts were evenly split between the two management areas.

To examine contemporary distribution of effort over the most recent years for which complete logbook data are available (fishing years 1997-2001), activity for vessels holding a 2002 limited access monkfish permit were analyzed. Since separation of monkfish DAS would not affect other monkfish permit categories, vessels with a category A, B, or E permit were excluded. In this manner, a study fleet approach was adopted where activity data over the past 5 years for a common number of permit holders (672) is described.

In the two years prior to FMP implementation in 1999, approximately 85% of the 672 category C and D permit holders landed monkfish whereas the proportion of these vessels that landed at least one pound of monkfish has increased to over 90% in 2000 and 2001. The number of vessels that fished exclusively in the Northern area has increased from 183 in 1997 to 196 in 2001 (Table 42) although the proportion of vessels concentrating on monkfish in the Northern area has not changed very much (32% in most years). By contrast, the number of vessels that landed monkfish exclusively in the Southern area declined from 163 in 1997 to 109 and 130 in 1999 and 2000 respectively. Note that the majority of this change was due to temporary opening of closed Area 2 which would have attracted scallop effort.

On average, vessels that fish exclusively in one area or another tend to be smaller than vessels that fish in both management areas (Table 44) although the difference in average size is less pronounced in the Southern area. Among vessels that rely exclusively in the Northern area, average dependence (the proportion of total landed weight of monkfish to total weight of all species) on monkfish has increased from a low of 7.4% in 1997 to 17.6% in 2001. Compared to vessels that fish in both areas, vessels fishing only in the Northern area were less dependent on monkfish in 1997 and 1998 and more dependent in 2000. However, in 1999 and 2001 there was no significant difference in dependence on monkfish between Northern-only vessels and vessels fishing in both areas. Vessels operating exclusively in the Southern area were more dependent on monkfish than vessels fishing in both areas from 1998 to 2000, but like the Northern-only vessels there was no significant difference in 2001.

From 1997 to 1999 Northern area monkfish landings were nearly evenly split between Northern-only vessels and vessels fishing both areas even though the former accounted for about 70% of total trips (Table 45). In 2000 and 2001, even though the proportion of trips did not change, the relative share of landings by Northern-only vessels increased to nearly two-thirds. The proportion of Southern area landings by Southern-only vessels has been more varied and has fluctuated between 40 and 54% although the number of trips has been less variable (ranging from 57 to 67%).

Among vessels that fish in both areas, dependence on monkfish from the Northern management areas has been increasing over time from about 40% in 1997 to 47% in 2001 (Figure 47). Note that not all vessels fishing in both areas have increased their dependence on Northern area monkfish as dependence at the 5th and 10th percentiles (i.e. vessels that are least dependent on the Northern area) has changed very little. Similarly, dependence on the Northern area has increased only modestly for vessels that have historically fished mostly in the Northern area (i.e. at and above the 90th percentile). Thus, dependence on the Northern area has changed relatively less for the 20% of vessels (about 50 vessels) at the upper and lower end of the Northern area dependence spectrum. The remaining 200 or so vessels have experienced varying degrees of increased dependence on monkfish coming out of the Northern area.

As noted previously, the proportion of vessels fishing in both management areas increased in both 1999 and 2000 which corresponded with special access programs to groundfish closed areas for scallop vessels. This effect is evident in the types of permits held by the study fleet of monkfish category C and D permit holders. Specifically, the number of limited access scallop permit holders that landed monkfish exclusively in the Southern area dropped from 74 in 1998 to 13 and 46 in 1999 and 2000 respectively and back up to 78 in 2001 (Table 46). Note that there was a corresponding increase in the number of scallop permit holders that fished in both areas so the reduction in Southern-only scallop vessels was due to an effort change and not to a reduction in scallop vessel participation in the monkfish fishery. As was the case in 1993, the majority of vessels that land monkfish only in the Northern area were almost exclusively groundfish permit holders.

Compared to vessels that fish in both areas, proportionally more vessels that fished for monkfish exclusively in one management area used gillnet gear as the primary gear when fishing for monkfish (Table 47). Note that this difference was evident in all years except for the Northern area in 2001. For vessels fishing exclusively in the Northern area proportionally more vessels used trawl gear (statistically significant difference in all years except 1998) and proportionally

fewer vessels used scallop dredge gear (significant in all years) than primary gears used by vessels that fish in both areas. In the Southern area, proportionally fewer vessels that fished exclusively in the Southern area used trawl gear (statistically significant difference in all years except 1999) compared to vessels that fished in both areas. The proportion of vessels using scallop dredge gear exclusively in the Southern area was no different than that of vessels fishing in both areas in 1997 and 2000; was lower in 1999; and was higher in both 1998 and 2001.

Exclusive reliance on monkfish from one management area from 1997 to 2001 was similar to what had been observed in 1993. Specifically, very few vessels with a Maine home port fished monkfish outside the Northern management area (Table 48). Similarly, New Hampshire vessels either fish only in the Northern area (70 to 80%) or in both areas but do not fish exclusively in the Southern management area. About half of Massachusetts vessels fished in both management areas but of the vessels that did operate in only one management area the majority fished in the Northern area. Overall, only 10% of Massachusetts vessels operated exclusively in the Southern area. The majority of vessels in both Rhode Island and Connecticut fish in both management areas (about 50% in the former and 60% in the latter). Unlike Massachusetts vessels, however, vessels from these two states that do fish in only one area, with few exceptions, fish in the Southern area. For vessels with a home port in most Mid-Atlantic states the majority (two-thirds in most instances) fish exclusively in the Southern area.

	Fish in NMA Only			Fish in SMA Only			Fish in Both Areas		
	Number of Vessels	Average Length	Average Dependence	Number of Vessels	Average Length	Average Dependence	Number of Vessels	Average Length	Average Dependence
1997	184	54.54*	7.4%*	163	68.72*	16.5%	223	74.75	17.6%
1998	183	54.74*	8.7%*	164	68.91*	21%*	230	74.73	15.4%
1999	170	55.16*	11.8%	109	60.46*	25.1%*	309	75.63	13.4%
2000	199	56.61*	16.8%*	132	64.77*	18.0%*	274	74.57	12.7%
2001	196	56.06*	17.6%	170	68.24*	19.5%	243	72.50	15.6%

* Denotes statistically significant at the .05 level

Table 44 Number of vessels, average length and dependence on monkfish by area fished

	Fish in NMA Only		Fish in Both Areas		Fish in SMA Only		Fish in Both Areas	
	NMA Landings	NMA Trips	NMA Landings	NMA Trips	SMA Landings	SMA Trips	SMA Landings	SMA Trips
1997	47.5%	72.3%	52.5%	27.7%	40.7%	64.9%	59.3%	35.1%
1998	52.9%	70.4%	47.1%	29.6%	53.8%	67.1%	46.2%	32.9%
1999	48.7%	65.8%	51.3%	34.2%	48.9%	56.6%	51.1%	43.4%
2000	64.0%	68.1%	36.0%	31.9%	40.8%	57.8%	59.2%	42.2%
2001	66.6%	68.1%	33.4%	31.9%	51.7%	61.3%	48.3%	38.7%

Table 45 Landings and trips in NFMA and SFMA by area fished

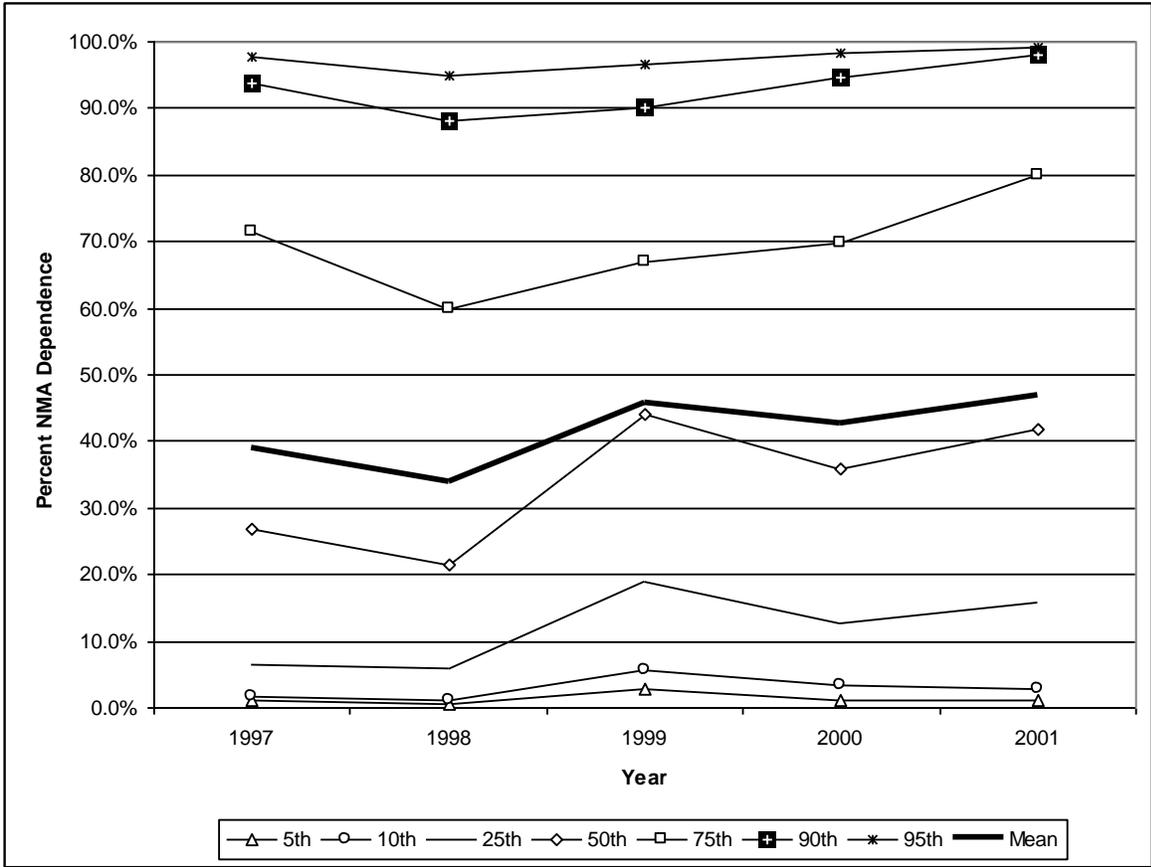


Figure 47 Dependence on NFMA monkfish on vessels fishing for monkfish in both areas

	Fish in NMA Only		Fish in SMA Only		Fish in Both Areas	
	Scallop Permit	Groundfish Permit	Scallop Permit	Groundfish Permit	Scallop Permit	Groundfish Permit
1997	15	172	66	110	79	110
1998	11	177	74	98	80	98
1999	5	168	13	102	150	102
2000	6	194	46	95	118	95
2001	2	195	78	107	80	107

Table 46 Permits held by area fished

	1997	1998	1999	2000	2001
NMA-Only					
Gillnet	24.6%	25.6%	22.9%	26.8%	23.5%
Trawl	68.7%	70.6%	75.9%	71.2%	75.5%
Dredge	6.7%	3.9%	1.2%	2.0%	1.0%
SMA-Only					
Gillnet	20.1%	22.2%	41.3%	31.0%	26.2%
Trawl	45.9%	37.0%	52.9%	37.2%	31.5%
Dredge	34.0%	40.7%	5.8%	31.8%	42.3%
Both Areas					
Gillnet	10.5%	9.3%	9.5%	10.9%	17.7%
Trawl	57.7%	63.1%	48.8%	50.4%	55.1%
Dredge	31.8%	27.6%	41.7%	38.7%	27.2%

Table 47 Primary gear used by area fished (shaded cells not statistically significant)

HPST	Fish in Both Areas					Fish in NFMA Only					Fish in SFMA Only				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
CT	6	7	7	8	7	2	0	0	0	0	3	4	4	3	4
MA	147	151	176	160	160	113	112	104	126	119	33	35	19	21	35
ME	8	7	10	12	4	48	50	47	49	57	1	1	0	0	0
NC	4	6	13	11	7	1	0	0	1	1	13	11	8	10	13
NH	5	4	5	3	6	13	14	14	16	15	0	0	0	1	0
NJ	6	4	25	19	7	3	3	0	0	0	38	41	24	33	46
NY	9	12	12	11	12	0	1	1	1	2	25	21	22	23	21
RI	24	31	34	33	34	3	2	2	4	0	33	28	27	26	29
VA	11	5	20	10	4	0	0	0	1	0	11	17	3	12	15
Other	3	3	7	7	2	1	1	2	1	2	6	6	2	3	7

Table 48 Homeport state by area fished

5.3.2.2.3 Landings and revenues by permit and vessels size class

Monkfish landings and revenues, and the percent of total landings and revenues for those vessels, are reported in Table 49 and Table 50 based on vessels' monkfish permit category in FY2001 and FY2002. As expected, Category A and Category B vessels are the most dependent on monkfish revenues since those vessels, by definition, do not have either a scallop or multispecies limited access permit. In FY2002 Category A and B vessels depended on monkfish for 49 percent and 54 percent, respectively, compared to 7.6 percent and 17 percent on Category C and D. For Category E (open access) vessels, less than one percent of landings and less than two percent of revenues on those vessels came from monkfish in years FY1995 through FY2002.

Monkfish Permit Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
A	453	817	563	1,093	1,277	845	1,152	1,074
% of Total A Landings	49.1%	54.1%	13.4%	10.0%	20.5%	6.5%	6.8%	6.4%
B	322	583	479	992	1,474	1,050	2,084	1,593
% of Total B Landings	14.0%	18.2%	23.4%	24.1%	36.9%	30.2%	46.4%	40.6%
C	11,504	12,322	12,364	12,144	11,876	10,583	13,289	11,169
% of Total C Landings	10.4%	9.3%	7.5%	8.2%	8.5%	6.9%	6.6%	8.8%
D	4,094	5,020	6,139	7,509	8,982	8,905	12,154	10,469
% of Total D Landings	4.6%	5.3%	5.8%	6.7%	11.1%	9.7%	11.7%	9.9%
E (Open Access)	1,014	1,257	1,637	1,845	1,911	1,459	1,823	1,512
% of Total E Landings	0.5%	0.6%	0.5%	0.6%	0.8%	0.6%	0.7%	0.7%
CT	1,029	733	592	574	557	580	577	0
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	5.8%	0.0%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 49 Monkfish Landings, 1995-2002, as a percentage of total landings by permit category for vessels issued a monkfish permit during FY2001 and FY2002

Monkfish Permit Category	\$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
A	\$582	\$849	\$663	\$1,262	\$2,011	\$1,428	\$1,615	\$1,441
% of Total A Revenues	36.9%	41.4%	35.7%	51.2%	63.5%	46.6%	50.6%	48.9%
B	\$391	\$583	\$552	\$1,183	\$2,528	\$1,699	\$2,828	\$2,097
% of Total B Revenues	24.6%	33.5%	38.7%	49.6%	62.2%	48.1%	60.3%	54.0%
C	\$16,014	\$16,423	\$18,091	\$18,501	\$23,250	\$22,380	\$18,293	\$15,735
% of Total C Revenues	13.0%	12.0%	13.3%	14.0%	13.5%	11.5%	9.3%	7.6%
D	\$4,736	\$5,649	\$7,514	\$10,076	\$16,043	\$16,620	\$17,085	\$14,555
% of Total D Revenues	8.2%	9.3%	11.2%	14.9%	20.4%	19.9%	20.1%	17.0%
E (Open Access)	\$1,263	\$1,452	\$2,270	\$2,642	\$3,471	\$2,848	\$2,515	\$2,057
% of Total E Revenues	1.1%	1.2%	1.7%	2.1%	2.4%	1.9%	1.6%	1.3%
CT	\$1,772	\$1,233	\$1,036	\$1,018	\$1,410	\$1,148	\$786	\$0
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	6.0%	0.0%
TOTAL MONK REVENUE	\$24,759	\$26,188	\$30,127	\$34,682	\$48,714	\$46,123	\$43,122	\$35,885

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 50 Monkfish Revenues, 1995-2002, as a percentage of total revenues by permit category for vessels issued a monkfish permit during FY2001 and FY2002

Monkfish landings and revenues, and the percent of total landings and revenues for those vessels, by vessel length for FY1995-2002 are reported in Table 51 and Table 52, respectively. For the 1995-1998 period, vessels in the 70-89 feet category landed the largest amounts of monkfish and generated the most revenues from monkfish. In FY2000, however, both landings and revenues on vessels in the 30-49 feet category exceeded those of the 70-89 feet category vessels, and has remained the highest class since then. The dependence of 30-49 feet category vessels on monkfish revenues, the size class most dependent on monkfish, has remained around 30 percent of total revenues since FY1999,.

Vessel Length Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
0-29 Feet	70	61	21	20	50	62	73	56
% of Total 0-29 Landings	11.7%	10.5%	3.1%	2.5%	6.9%	7.1%	6.8%	6.0%
30-49 Feet	5,303	6,317	6,415	8,458	10,537	9,291	13,485	12,134
% of Total 30-49 Landings	8.7%	10.3%	10.7%	13.3%	18.5%	17.0%	24.3%	24.2%
50-69 Feet	2,675	3,771	3,398	4,057	4,550	4,983	7,080	5,964
% of Total 50-69 Landings	3.5%	4.7%	3.2%	4.7%	5.5%	5.9%	8.6%	7.6%
70-89 Feet	7,228	8,208	9,629	9,217	8,904	7,469	8,510	6,989
% of Total 70-89 Landings	4.0%	4.4%	3.6%	3.8%	4.0%	3.4%	3.6%	3.3%
90+ Feet	2,109	1,643	1,718	1,830	1,480	1,038	1,353	674
% of Total 90+ Landings	2.1%	1.3%	1.2%	1.1%	1.2%	0.7%	0.6%	0.5%
CT	1,029	733	592	574	557	580	577	0
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	5.8%	0.0%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 51 Monkfish Landings, FY1995-2002, as a percentage of total landings by vessel length for vessels issued a monkfish permit during the FY2001 and FY2002

Vessel Length Category	\$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
0-29 Feet	\$72	\$60	\$34	\$25	\$99	\$98	\$98	\$68
% of Total 0-29 Revenues	8.3%	8.3%	3.3%	2.4%	8.9%	9.4%	8.4%	5.4%
30-49 Feet	\$5,657	\$6,474	\$7,049	\$9,933	\$16,887	\$16,199	\$19,009	\$16,289
% of Total 30-49 Revenues	13.1%	15.1%	15.4%	20.2%	29.3%	29.3%	31.4%	28.1%
50-69 Feet	\$3,524	\$4,530	\$4,488	\$5,718	\$8,669	\$9,963	\$9,968	\$8,529
% of Total 50-69 Revenues	7.2%	8.4%	7.7%	10.3%	13.0%	13.6%	13.4%	11.2%
70-89 Feet	\$10,548	\$11,509	\$14,712	\$14,957	\$18,420	\$16,034	\$11,489	\$10,099
% of Total 70-89 Revenues	7.1%	7.2%	8.6%	8.8%	8.7%	6.8%	4.8%	4.0%
90+ Feet	\$3,186	\$2,383	\$2,808	\$3,031	\$3,228	\$2,682	\$1,772	\$900
% of Total 90+ Revenues	5.6%	3.8%	4.7%	5.4%	4.9%	3.8%	2.4%	1.3%
CT	\$1,772	\$1,233	\$1,036	\$1,018	\$1,410	\$1,148	\$786	\$0
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	6.0%	0.0%
TOTAL MONK REVENUE	\$24,759	\$26,188	\$30,127	\$34,682	\$48,714	\$46,123	\$43,122	\$35,885

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 52 Monkfish Revenues, FY1995-2002, as a percentage of total revenues by vessel length for vessels issued a monkfish permit during the FY2001 and FY2002

Landings and revenues from monkfish and other species as a percentage of total landings and revenues for vessels with a monkfish permit in FY2001 and 2002 are reported in Table 53 and Table 54, respectively. In terms of landings by weight, most (60 percent) of the landings on vessels that land monkfish are species other than monkfish, dogfish, fluke, regulated

multispecies, scallops, and skates. "Other species" include squid, herring, shrimp, whiting, and other high volume species.

While "other species" accounted for 60 percent of the total weight of FY2002 landings for vessels with a monkfish permit, they accounted for only 22 percent of the total revenues. The revenue dependence on other species has declined steadily from an average of 46 percent from 1995 to 1997. This is consistent with the lower prices paid (on a per-pound basis) for the high volume species and increased revenues in the latter years from scallop and multispecies fisheries. As a group, monkfish permitted vessels received 44 percent of their revenues from scallops and 21.5 percent from multispecies in FY2002, increasing steadily since FY1995. Even though monkfish contributed only about 8 percent of the total revenues on vessels with monkfish permits in FY2002, it is important to remember that some vessel subgroups (by permit category, size or area) are significantly more dependent on monkfish for their total revenues, as noted in the previous paragraphs.

Species Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Dogfish	33,914	32,392	23,902	34,127	22,942	6,742	4,129	3,644
Dogfish % of Total Landings	7.8%	6.8%	4.0%	5.9%	4.6%	1.3%	0.7%	0.8%
Fluke	7,829	7,941	7,732	9,396	9,478	8,670	11,757	12,090
Fluke % of Total Landings	1.8%	1.7%	1.3%	1.6%	1.9%	1.7%	1.9%	2.5%
Monkfish	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817
Monkfish % of Total Landings	4.2%	4.3%	3.7%	4.2%	5.2%	4.5%	5.1%	5.3%
Other	306,209	329,535	448,958	412,327	334,735	343,322	388,479	290,197
Other % of Total Landings	70.0%	69.0%	75.6%	71.2%	66.5%	65.6%	64.3%	60.1%
Multispecies	47,365	53,830	62,951	67,977	68,654	88,095	103,027	83,647
Multispecies % of Total Landings	10.8%	11.3%	10.6%	11.7%	13.6%	16.8%	17.0%	17.3%
Scallops	14,535	15,852	11,834	12,565	23,332	35,380	48,140	50,953
Scallops % of Total Landings	3.3%	3.3%	2.0%	2.2%	4.6%	6.8%	8.0%	10.6%
Skates	9,134	17,503	16,740	18,756	18,061	17,643	18,020	16,378
Skates % of Total Landings	2.1%	3.7%	2.8%	3.2%	3.6%	3.4%	3.0%	3.4%
TOTAL LBS. LANDED	437,402	477,786	593,890	579,303	503,280	523,275	604,631	482,726

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 53 Landings of monkfish and other species, FY1995-2002, as a percentage of total landings for vessels issued a monkfish permit during FY2001 and FY2002

Species Category	\$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Dogfish	\$6,610	\$6,003	\$3,555	\$5,876	\$4,072	\$1,798	\$1,110	\$872
Dogfish % of Total Revenues	1.9%	1.6%	1.0%	1.6%	0.9%	0.4%	0.2%	0.2%
Fluke	\$13,961	\$13,243	\$14,061	\$14,418	\$16,148	\$13,663	\$14,877	\$16,631
Fluke % of Total Revenues	4.1%	3.6%	3.8%	3.9%	3.7%	2.9%	3.2%	3.6%
Monkfish	\$24,759	\$26,188	\$30,127	\$34,682	\$48,714	\$46,123	\$43,122	\$35,885
Monkfish % of Total Revenues	7.3%	7.1%	8.2%	9.5%	11.0%	9.9%	9.4%	7.8%
Other	\$159,711	\$163,907	\$171,432	\$152,363	\$162,812	\$138,606	\$120,929	\$101,574
Other % of Total Revenues	46.9%	44.5%	46.4%	41.6%	36.9%	29.7%	26.3%	22.1%
Multispecies	\$57,323	\$60,825	\$71,309	\$82,758	\$83,994	\$93,601	\$102,609	\$99,102
Multispecies % of Total Revenues	16.8%	16.5%	19.3%	22.6%	19.0%	20.1%	22.3%	21.5%
Scallops	\$75,624	\$92,763	\$76,005	\$72,999	\$122,812	\$169,409	\$174,760	\$202,704
Scallops % of Total Revenues	22.2%	25.2%	20.6%	19.9%	27.8%	36.3%	37.9%	44.1%
Skates	\$2,708	\$5,440	\$3,071	\$3,471	\$3,234	\$3,598	\$3,116	\$3,373
Skates % of Total Revenues	0.8%	1.5%	0.8%	0.9%	0.7%	0.8%	0.7%	0.7%
TOTAL LBS. LANDED	\$340,696	\$368,369	\$369,559	\$366,568	\$441,785	\$466,797	\$460,523	\$460,141

Source: NMFS Statistics Office, dealer weighout database

* CT data may include landings from vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 54 Revenues from monkfish and other species, FY1995-2002, as a percentage of total revenues for vessels issued a monkfish permit during FY2001 and FY2002

5.3.3 Ports and Communities

Table 55 presents 1995-2002 landings (in landed weights) of monkfish for vessels issued a monkfish permit for FY2001 or FY2002 by the vessels' homeport state. Vessels homeported in Massachusetts clearly dominated monkfish landings, followed by vessels from Rhode Island, New Jersey, and Maine. In FY2002, all states saw a decline in monkfish landings (landed weights) on vessels homeported in each state.

Massachusetts ports have accounted for the largest quantity of monkfish revenues in every year from 1982 through 2002 (Table 56, calendar year data). Due to changes in data collection methods over time data for New York was not added until 1986, while the states of Connecticut and Delaware were added in 1989. North Carolina data were not collected until 1997. Since 1997, Massachusetts landings accounted for at least 40% of total revenues but the State's share of total revenue has declined slightly since 1999. By contrast, revenue shares in the states of Maine, New Hampshire, and New Jersey increased somewhat over the past two years compared to the revenues earned prior to 1999.

There are only ten ports that have had a long-term involvement in the monkfish fishery at a relatively high level, that is, where monkfish were landed every year between 1982 and 2002 and that were among the top twenty ports in terms of monkfish value in every single year. These ten ports were identified by ranking all ports and summing across all years for ports that had reported landings in every year. This means that any port with a cumulative ranking score less than or equal to 420 would be in the top 20 in each of the past 21 years and the port with the lowest score would be the top ranked port. Since some states were added to the dealer weighout database in different years a similar ranking of ports was conducted for the period 1989 to 2002 and 1997 to 2002 where the latter is the longest time series over which ports in all states (including North Carolina) could be included.

STATE	Thousands of Pounds of Monkfish							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
CT*	1,029	733	592	574	557	603	1,337	957
MA	10,023	8,955	9,893	11,353	11,167	10,643	12,305	10,690
MD	178	524	382	322	341	107	158	38
ME	1,815	1,932	2,102	1,986	3,193	3,993	5,012	4,963
NC	0	431	445	395	432	166	167	116
NH	329	401	523	452	801	1,477	1,928	1,233
NJ	1,414	2,321	2,680	3,903	4,371	2,825	5,261	3,893
NY	248	513	654	775	573	435	709	681
RI	2,829	4,080	3,732	3,597	3,969	2,720	3,519	2,814
VA	550	841	773	799	671	455	683	431
TOTAL	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database & permit database

* May include data from CT vessels without a 2001 or 2002 Monkfish permit

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 55 Landed weight of monkfish by state for fishing years 1995-2002, for vessels issued a federal monkfish permit in FY2001 or FY2002 (except CT, which may include vessels not issued a federal permit).

	CT	DE	MA	MD	ME	NC	NH	NJ	NY	RI	VA
1982	-	-	0.99	0.01	0.58	-	0.07	0.20	-	0.71	0.26
1983	-	-	0.82	0.01	0.64	-	0.09	0.21	-	0.71	0.32
1984	-	-	1.00	0.01	0.68	-	0.14	0.23	-	0.85	0.23
1985	-	-	1.83	0.02	0.85	-	0.09	0.25	-	0.92	0.30
1986	-	-	3.48	0.02	1.38	-	0.14	0.21	0.20	1.13	0.29
1987	-	-	3.96	0.01	2.95	-	0.25	0.27	0.31	1.43	0.46
1988	-	-	4.90	0.02	2.43	-	0.29	0.26	0.26	1.62	0.37
1989	0.10	0.00	7.63	0.01	2.10	-	0.26	0.34	0.25	1.81	0.31
1990	0.08	0.00	7.59	0.01	1.90	-	0.14	0.54	0.28	2.22	0.42
1991	0.49	0.00	9.70	0.02	2.98	-	0.17	1.47	0.32	5.83	0.78
1992	0.65	0.00	8.23	0.02	3.19	-	0.14	1.78	0.49	5.23	0.99
1993	0.45	0.00	9.80	0.01	4.68	-	0.17	1.73	0.53	3.60	0.73
1994	0.59	0.00	14.34	0.09	4.66	-	0.39	1.51	0.49	3.62	0.45
1995	1.94	0.11	19.94	0.44	4.71	-	0.74	2.65	0.45	4.10	0.91
1996	1.55	0.02	15.82	0.43	4.57	-	0.81	2.70	1.03	4.59	0.76
1997	1.15	0.00	15.31	0.54	4.09	0.75	0.80	4.11	1.26	5.95	1.03
1998	1.00	0.00	15.81	0.40	3.13	0.54	0.67	5.81	1.25	4.09	1.08
1999	0.79	0.00	21.85	0.38	5.21	0.59	1.71	7.78	1.15	6.65	0.94
2000	1.56	0.00	24.12	0.27	8.88	1.06	2.71	6.51	0.91	6.89	0.84
2001	1.20	0.00	18.26	0.14	7.99	0.21	2.81	6.13	1.29	5.45	0.70
2002	0.79	0.00	15.57	0.14	6.25	0.20	1.85	5.90	1.25	4.76	0.70

Table 56 Monkfish revenues by state, 1982-2002, calendar year. (\$millions)

Given the two criteria of top-20 in landed value and having some reported landings in every year means that some ports may be eliminated if either criterion is not met over a specified time period. For the three different time periods examined herein only seven ports appeared in the port rankings each time. These ports were New Bedford, Portland, Point Judith, Gloucester, Newport, Point Pleasant, and Chatham (Table 57). Over the past 21 years these seven ports (all of which are located in either Maine, Massachusetts, Rhode Island, or New Jersey) accounted for at least 50% of total monkfish value in every year and averaged 60% of total revenues over the past six years (Table 58). Based on more recent and more complete data (1997-2002), ports from Maine, Massachusetts, and Rhode Island remain dominant in the monkfish fishery but at least one port was identified in every state except, Delaware, Maryland, and Virginia.

The discussion presented in this section is based on a select group of ports identified as primary ports. These ports were drawn from an evaluation of both weighout port landings and homeport landings value data following the *primary* and *secondary* port criteria used in the initial fishery management plan and subsequently in annual SAFE report analysis. Primary ports for this and earlier analysis are considered to be ports with average landings value for the periods 1994-1997 and 1999-2002 above \$1,000,000 (Table 59), while secondary ports are those showing average annual landings value of \$50,000 to \$1,000,000

The discussion provided in this section combines the results from the homeport and weighout port analysis by including all ports that qualified as primary ports. It additionally includes five top producing secondary ports with landings value in excess of \$800,000 that were found to be highly dependent on monkfish relative to the total value of all species landed. Data by dealer

without port value showed some shifts in port rankings for these two time periods. New Bedford, MA, Portland, ME, and Gloucester, MA were ranked first, second, and fourth place for both time periods. Barnegat Light, NJ rose from sixth to third place while Point Judith, RI fell from third to fifth and Boston, MA from fifth to seventh place. The number of ports with four year average landings above \$1,000,000 rose from six (New Bedford, Gloucester, Boston, MA; Portland, NH; and Barnegat Light/ Long Beach, NJ; and Point Judith, RI) totaling \$23,485,704 for the 1994-1997 period to eight for the 1998-2001 period (adding Point Pleasant, NJ and Portsmouth, NH) totaling \$33,496,244. Notable increases in landings value between the two periods were found for Portland, ME; Barnegat Light, Point Pleasant, NJ; Gloucester, MA; and Portsmouth, NH.

	Rank		
	1982-2002	1989-2002	1997-2002
New Bedford, MA	1	1	1
Portland, ME	2	2	2
Point Judith, RI	3	3	4
Gloucester, MA	4	4	5
Newport, RI	5	6	9
Cape May, NJ	6	9	
Point Pleasant, NJ	7	7	6
Chatham, MA	8	11	16
Hampton, VA	9		
Provincetown, MA	10		
Long Beach, NJ		5	3
Hampton Bay, NY		8	10
Fall River, MA		10	
Portsmouth, NH		12	8
Boston, MA			7
Stonington, CT			11
Little Compton, RI			12
Westport, MA			13
Tiverton, RI			14
Port Clyde, ME			15
Wanchese, NC			17
Scituate, MA			18

Table 57 Long-term rankings of top monkfish ports, by revenues, 1982-2002

Port	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
NEW BEDFORD, MA	90	107	194	734	2,051	2,400	3,530	6,182	5,622	7,256	6,455	6,912	8,355	12,650	10,067	11,583	12,291	14,818	13,291	10,099	6,568
PORTLAND, ME	174	197	271	413	855	2,092	1,783	1,664	1,432	2,154	2,265	3,858	3,809	4,156	4,078	3,599	2,491	3,931	6,898	6,363	4,991
LONG BEACH, NJ	0	0	0	0	17	36	51	73	144	345	341	519	644	1,522	1,626	1,943	3,020	4,333	3,973	4,090	3,870
POINT JUDITH, RI	328	410	513	642	766	947	879	755	1,100	4,198	3,710	1,850	1,935	2,307	3,271	4,172	2,316	3,113	3,753	3,095	2,316
GLOUCESTER, MA	501	339	465	748	857	926	780	686	935	949	872	1,433	1,892	2,425	1,807	1,050	1,175	2,925	4,619	4,216	4,329
POINT PLEASANT, NJ	50	51	17	30	52	57	72	59	89	122	174	298	286	550	571	1,353	2,152	2,913	1,902	1,552	1,587
BOSTON, MA	0	0	0	0	1	1	68	70	4	0	2	3	1,034	1,897	1,440	1,398	1,144	1,890	2,647	1,247	1,516
PORTSMOUTH, NH	0	0	0	0	0	0	0	1	0	38	108	142	336	694	754	741	597	1,359	2,163	2,242	1,377
NEWPORT, RI	313	290	328	273	345	468	723	962	1,105	1,501	1,146	813	727	436	458	677	598	1,220	1,093	694	805
HAMPTON BAY, NY	0	0	0	0	75	107	144	65	75	170	249	385	280	186	680	691	796	760	686	936	754
STONINGTON, CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	939	866	624	1,462	656	294
LITTLE COMPTON, RI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	648	837	1,002	617	713
TIVERTON, RI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	509	1,418	926	690	753
PORT CLYDE, ME	0	0	0	0	0	0	0	67	0	197	234	188	216	144	169	193	297	550	637	692	505
CHATHAM, MA	46	33	49	58	118	209	168	143	172	212	137	137	240	301	210	159	241	350	774	506	1,005
WANCHESE, NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	534	519	527	1,010	174	158
SCITUATE, MA	3	4	5	22	69	93	43	45	80	79	11	6	57	78	55	60	279	559	927	436	463
WESTPORT, MA	0	0	0	0	0	0	0	0	0	1	24	70	280	785	568	515	333	651	826	583	553
OTHER	1,308	1,372	1,303	1,345	1,641	2,311	1,903	2,027	2,418	4,530	4,984	5,085	6,046	7,871	6,530	5,101	3,514	4,278	5,160	5,306	4,863
TOTAL	2,812	2,803	3,144	4,266	6,847	9,647	10,144	12,799	13,178	21,750	20,709	21,699	26,136	36,001	32,284	34,983	33,787	47,056	53,751	44,194	37,419

Table 58 Value (in \$1,000s) of monkfish at 18 ports, 1982-2002.

State	Weighout port	1994	1995	1996	1997	94-97 Ave.	Rank	1999	2000	2001	2002	99-02 Ave	Rank
MA	NEW BEDFORD	8,354,978	12,649,556	10,066,892	11,582,790	10,663,554	1	14,817,704	13,290,773	10,098,665	6,567,550	11,193,673	1
ME	PORTLAND	3,808,962	4,155,643	4,077,642	3,598,869	3,910,279	2	3,930,590	6,898,445	6,362,710	4,990,587	5,545,583	2
RI	POINT JUDITH	1,935,215	2,306,957	3,271,140	4,172,223	2,921,384	3	3,112,997	3,752,758	3,095,247	2,315,556	3,069,140	5
MA	GLOUCESTER	1,891,754	2,424,811	1,806,593	1,050,336	1,793,374	4	2,924,883	4,619,082	4,215,528	4,328,985	4,022,120	4
MA	BOSTON	1,034,367	1,896,661	1,439,569	1,397,836	1,442,108	5	1,889,944	2,647,061	1,247,044	1,516,002	1,825,013	7
NJ	BARNEGAT LIGHT	643,873	1,522,436	1,626,209	1,943,018	1,433,884	6	4,333,180	3,973,119	4,090,454	3,870,007	4,066,690	3
NJ	POINT PLEASANT	285,688	550,131	570,970	1,352,620	689,852		2,913,175	1,902,120	1,552,085	1,587,001	1,988,595	6
NH	PORTSMOUTH	335,572	694,405	754,277	740,821	631,269		1,359,427	2,163,205	2,242,047	1,377,046	1,785,431	8
						23,485,704						33,496,244	

Note: This table includes all ports with reported landings in at least one year from 1994 to 1997 and from 1998 to 2001. Weighout values are listed by weighoutport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. This includes Connecticut landings values otherwise underreported in this analysis. Can not report value related information for ports with fewer than four active vessels. Barnegat Light, Barnegat, and Long Beach, NJ are combined. Source: Calendar year weighout data.

Table 59 Primary port comparison of pre-FMP (1994-1997) and post-FMP (1999-2002) landings values (\$) for primary ports identified in the original FMP or subsequently meeting the primary port criteria.

Port level activity for monkfish landings in pounds relative to all other species landed is related to port size and the species diversification of ports. Westport, MA, Tiverton, RI, Little Compton, RI, and Barnegat Light, NJ all show a dependency on monkfish landings in excess of 40% of total species landed (Table 60). Less species diversified, more specialized ports such as these are potentially more reactive to changes in the monkfish fishery than other ports such as Point Judith, RI that is more species diversified. Nine of the fifteen ports (Westport, Fairhaven, Boston, Chatham, and Gloucester, MA; Tiverton and Little Compton, RI; Barnegat Light, NJ; Port Clyde and Portland, ME) evaluated show an increasing dependency on monkfish in pounds. Fairhaven and New Bedford, MA show decreasing activity due in part to improved conditions in the scallop fishery. Port level dependency contrasts with port level production of monkfish for the primary producing ports (Table 61). While the most dependent ports, in pounds, tend to be smaller ports, larger ports are the producers of the greatest quantities of monkfish.

State	Homeport	1997	1998	1999	2000	2001	Ave.
MA	WESTPORT	55%	54%	66%	70%	61%	61%
RI	TIVERTON	26%	47%	63%	45%	72%	51%
RI	LITTLE COMPTON	45%	47%	44%	42%	51%	46%
NJ	BARNEGAT LIGHT	32%	38%	50%	46%	57%	44%
MA	FAIRHAVEN	36%	37%	29%	17%	20%	28%
RI	NEWPORT	16%	22%	28%	18%	20%	21%
ME	PORT CLYDE	13%	16%	19%	24%	26%	20%
NJ	POINT PLEASANT	14%	22%	20%	20%	19%	19%
MA	BOSTON	13%	18%	19%	18%	18%	17%
NH	PORTSMOUTH	9%	7%	14%	20%	29%	16%
MA	CHATHAM	8%	8%	12%	22%	24%	15%
MA	GLOUCESTER	8%	8%	13%	21%	19%	14%
MA	NEW BEDFORD	21%	20%	11%	8%	8%	14%
ME	PORTLAND	7%	8%	15%	14%	16%	12%
RI	POINT JUDITH	6%	5%	5%	5%	5%	5%

Note: only includes ports with average (1999-2002) landings value in excess of \$1,000,000 for either homeport or weighout port and select highly dependent (\$) ports with average landings value in excess of \$800,000. Base measurement is pounds landed by homeport. Percent values are weighted within port. Data source: logbooks.

Table 60 Port Level Landings Activity for Monkfish as a Percentage of Total Pounds Landed

Homeport	1997	1998	1999	2000	2001	Ave.
BOSTON	3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654
NEW BEDFORD	4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247
BARNEGAT LIGHT	819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611
GLOUCESTER	685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680
PORTLAND	441,526	460,030	1,019,863	1,012,746	1,271,608	841,155
POINT JUDITH	893,737	751,284	765,534	576,671	460,958	689,637
WESTPORT	581,765	548,134	536,200	528,532	671,004	573,127
NEWPORT	353,809	478,854	804,735	463,521	616,939	543,572
CHATHAM	220,541	285,743	351,809	625,771	681,309	433,035
PORTSMOUTH	230,226	202,657	367,036	469,916	751,024	404,172
TIVERTON	247,575	199,780	401,312	208,618	520,996	315,656
POINT PLEASANT	290,856	530,852	352,166	161,159	133,136	293,634
FAIRHAVEN	278,762	325,136	210,425	217,708	400,625	286,531
PORT CLYDE	177,741	173,563	245,874	342,768	464,790	280,947
LITTLE COMPTON	218,808	168,084	140,373	132,100	256,832	183,239
Total	12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896

Note: only includes ports with average (1999-2002) landings value in excess of \$1,000,000 for either homeport or weighout port and select highly dependent (\$) ports with average landings value in excess of \$800,000. Base measurement is pounds landed by homeport. Data source: logbooks.

Table 61 Port Level Production of Monkfish in Pounds

For the primary producing ports, gillnets are the main gear used in landing monkfish approaching 40% of monkfish landings across all vessel size classes. Thirty percent of monkfish landings are from small vessels (Table 62). For these ports only medium and large vessels in Boston, Fairhaven, and New Bedford, MA; Portsmouth, NH; and Barnegat Light and Point Pleasant, NJ fished monkfish using scallop dredge gear. Small vessels using gillnets to land monkfish are the most common gear across ports (Table 63).

Average of dep		year					
Vessel Size	monkgear	1997	1998	1999	2000	2001	Ave.
L	Gill	2%	27%	52%	41%	60%	40%
	Dredge	28%	25%	10%	5%	6%	14%
	Other	14%	9%	6%	2%	0%	10%
	Trawl	12%	14%	14%	11%	9%	12%
M	Gill	21%	23%	33%	43%	55%	37%
	Dredge	23%	22%	8%	4%	4%	12%
	Other	3%	3%	8%	8%	0%	5%
	Trawl	7%	8%	10%	9%	10%	9%
S	Gill	24%	30%	42%	46%	52%	39%
	Other	0%	0%	0%	0%	0%	0%
	Trawl	8%	11%	10%	15%	15%	12%
L Average		0.18	0.18	0.13	0.09	0.09	0.13417
M Average		0.1	0.1	0.12	0.14	0.16	0.12519
S Average		0.18	0.24	0.32	0.37	0.41	0.30835

*Vessel size classes: L> 70 feet, M= 50-70 feet, S<50 feet

Table 62 Primary Producing Port Dependency on Monkfish Relative to Vessel Size Class and Gear Used

In terms of tonnage, groundfish and small mesh multispecies are the highest producing of

the four primary species evaluated for both large and medium vessel classes with monkfish a tertiary species. Scallops rank third and fourth for these vessel classes. Smaller vessels produce a more equitable balance of groundfish and monkfish (Table 64). At the port level, Boston, Gloucester, and New Bedford, MA; Portland, ME; and Portsmouth, NH are larger ports showing primary tonnage activity coming from groundfish with Chatham, MA; Newport, RI; and Port Clyde, ME smaller ports with high volume activity (Table 65). Ports where monkfish represents the highest volume of activity relative to the other primary species evaluated include Little Compton, Westport, and Tiverton, RI; and Barnegat Light, NJ. While groundfish received the highest overall ranking (27) in importance of groundfish to port volume production, scallop received the lowest (53). This indicates the importance of the volume of landings in homeports. The value per pound of specific species (e.g., in 1999 prices (\$): monkfish - 0.85, haddock – 1.31, and whiting - 0.46 relative to scallops 5.50) is considered separately for primary and secondary ports in the affected human environment section of this document.

Average of dependency				YEAR							
HPST	Home Port	VSIZE	Gear	1997	1998	1999	2000	2001	Total		
MA	BOSTON	L	Gill	1%	1%	47%	64%	75%	37%		
			Dredge	21%	44%	14%	7%	6%	15%		
			Other	18%	0%	16%	0%	0%	17%		
			Trawl	13%	18%	18%	12%	12%	15%		
		M	Gill	9%	7%	26%	55%	45%	31%		
			Trawl	7%	12%	13%	11%	12%	11%		
		S	Gill	27%	36%	40%	40%	52%	39%		
			Trawl	10%	11%	12%	22%	18%	15%		
		BOSTON Average				13%	18%	19%	18%	18%	17%
		CHATHAM	M	Gill	1%	1%	1%	28%	34%	13%	
				Gill	11%	11%	19%	25%	28%	20%	
			Trawl	6%	7%	5%	7%	5%	6%		
	CHATHAM Average				8%	8%	12%	22%	24%	15%	
	FAIRHAVEN	L	Dredge	34%	30%	14%	7%	8%	18%		
			Trawl	46%	51%	24%	0%	17%	33%		
		M	Trawl	0%	0%	0%	2%	11%	7%		
		S	Gill	0%	0%	100%	89%	85%	91%		
	FAIRHAVEN Average				36%	37%	29%	17%	20%	27%	
	GLOUCESTER	L	Gill	3%	1%	12%	19%	9%	9%		
			Dredge	48%	52%	10%	3%	6%	24%		
			Other	12%	0%	0%	0%	0%	12%		
			Trawl	8%	9%	12%	9%	12%	10%		
		M	Gill	16%	7%	12%	39%	48%	33%		
			Other	1%	2%	4%	0%	0%	3%		
			Trawl	4%	4%	8%	8%	6%	6%		
		S	Gill	10%	10%	25%	47%	38%	26%		
			Other	0%	0%	0%	0%	0%	0%		
			Trawl	8%	5%	5%	7%	9%	7%		
	GLOUCESTER Average				8%	8%	13%	21%	19%	14%	
	NEW BEDFORD	L	Gill	0%	0%	0%	0%	55%	55%		
			Dredge	28%	23%	10%	5%	6%	14%		
			Other	12%	9%	0%	0%	0%	11%		
Trawl			15%	16%	12%	11%	9%	13%			
M		Dredge	8%	11%	5%	4%	4%	6%			
		Trawl	10%	9%	9%	7%	4%	8%			
S		Gill	26%	75%	80%	63%	56%	60%			
	Trawl	8%	36%	0%	0%	0%	22%				
NEW BEDFORD Average				21%	20%	11%	8%	8%	14%		
WESTPORT	M	Gill	91%	89%	97%	90%	81%	90%			
	S	Gill	43%	43%	56%	63%	57%	53%			
WESTPORT Average				55%	54%	66%	70%	61%	61%		

Table 63 Dependency on Monkfish Relative to Vessel Size and Gear Configuration by Primary Port

Average of dependency				YEAR					
HPST	Home Port	VSIZE	Gear	1997	1998	1999	2000	2001	Total
ME	PORT CLYDE	M	Trawl	12%	15%	20%	25%	28%	20%
		S	Trawl	14%	17%	18%	22%	24%	19%
	PORT CLYDE Average			13%	16%	19%	24%	26%	20%
	PORTLAND	L	Trawl	7%	8%	20%	14%	13%	13%
		M	Other	6%	4%	15%	8%	0%	7%
			Trawl	8%	9%	14%	18%	20%	14%
	S	Trawl	4%	7%	8%	9%	14%	8%	
PORTLAND Average			7%	8%	15%	14%	16%	12%	
NH	PORTSMOUTH	L	Dredge	0%	0%	2%	0%	0%	2%
			Trawl	0%	1%	0%	11%	13%	8%
		M	Gill	6%	1%	14%	10%	11%	8%
			Trawl	2%	3%	5%	14%	20%	11%
	S	Gill	11%	11%	17%	26%	38%	21%	
Trawl	7%	7%	16%	7%	12%	10%			
PORTSMOUTH Average			9%	7%	14%	20%	29%	16%	
NJ	BARNEGAT LIGHT	L	Gill	0%	78%	97%	0%	100%	91%
			Dredge	26%	24%	10%	4%	7%	14%
			Trawl	0%	0%	0%	98%	0%	98%
		M	Gill	61%	70%	95%	56%	84%	75%
	Dredge		29%	24%	9%	4%	4%	14%	
	S	Gill	31%	39%	59%	59%	70%	53%	
	BARNEGAT LIGHT Average			32%	38%	50%	46%	57%	45%
	POINT PLEASANT	L	Dredge	12%	10%	4%	2%	4%	6%
			Other	0%	0%	1%	2%	0%	1%
			Trawl	0%	1%	0%	0%	3%	1%
M		Trawl	1%	1%	0%	1%	1%	1%	
S	Gill	44%	86%	92%	91%	82%	79%		
POINT PLEASANT Average			14%	22%	20%	20%	19%	19%	
RI	LITTLE COMPTON	M	Gill	13%	0%	1%	22%	21%	14%
		S	Gill	61%	47%	65%	51%	67%	58%
	LITTLE COMPTON Average			45%	47%	44%	42%	51%	46%
	NEWPORT	L	Trawl	8%	12%	17%	10%	12%	12%
			Gill	1%	21%	2%	15%	0%	10%
		M	Other	0%	0%	0%	0%	0%	0%
			Trawl	2%	8%	19%	7%	4%	8%
	S	Gill	52%	61%	79%	50%	59%	60%	
	NEWPORT Average			16%	22%	28%	18%	20%	21%
	POINT JUDITH	L	Other	0%	0%	0%	0%	0%	0%
			Trawl	5%	4%	7%	3%	1%	4%
		M	Gill	0%	0%	0%	0%	58%	58%
			Trawl	6%	4%	4%	4%	3%	4%
		S	Gill	0%	30%	16%	37%	40%	31%
	POINT JUDITH Average			6%	5%	5%	5%	5%	5%
TIVERTON	M	Gill	0%	0%	0%	0%	85%	85%	
		Trawl	7%	1%	0%	0%	0%	2%	
	S	Gill	36%	63%	63%	61%	64%	59%	
TIVERTON Average			26%	47%	63%	45%	72%	52%	
Grand Total				16%	18%	17%	17%	19%	17%

Table 63 Dependency on Monkfish Relative to Vessel Size and Gear Configuration by Primary Port (cont'd.)

The larger producing ports (Boston and New Bedford, MA; Portland, ME; and Point Judith, RI) analyzed in this assessment tend to produce the greatest quantities of monkfish, groundfish, small mesh multispecies, and scallops. These ports are homeport to a greater proportion of larger vessels, while medium and smaller ports are more likely to homeport medium and small vessels. The latter ports (Westport, MA; Tiverton and Little Compton, RI; and Barnegat Light, NJ) are more dependent on monkfish as the primary species landed in pounds and, therefore, tend to be more reactive to changes in fishing activity levels (Table 65).

Pounds Landed		YEAR					
VSIZE	Data	1997	1998	1999	2000	2001	Ave.
L	Groundfish	22,738,238	25,103,433	26,356,794	33,068,142	38,603,741	29,174,070
	Sm. Mesh Multi.	25,858,124	18,656,748	17,655,822	30,506,705	60,444,137	30,624,307
	Scallops	5,157,351	5,358,315	10,210,653	14,118,783	18,226,501	10,614,321
	Monkfish	7,527,675	8,134,824	7,726,097	6,520,973	7,319,795	7,445,873
M	Groundfish	9,136,660	10,009,552	9,902,470	11,869,686	13,277,532	10,839,180
	Sm. Mesh Multi.	5,304,164	4,903,750	5,317,571	3,881,026	3,422,956	4,565,893
	Scallops	335,823	401,027	713,706	1,129,176	1,251,518	766,250
	Monkfish	2,082,275	2,272,252	2,605,690	2,859,575	3,581,591	2,680,277
S	Groundfish	5,568,402	4,606,464	4,733,122	5,661,254	5,573,025	5,228,453
	Sm. Mesh Multi.	314,757	275,568	218,319	227,047	283,359	263,810
	Scallops	7,364	9,623	4,340	19,027	101,559	28,383
	Monkfish	3,327,441	4,147,455	5,035,427	4,348,816	6,619,593	4,695,746
Total Groundfish		37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703
Total Sm. Mesh Multi.		31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011
Total Scallops		5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953
Total Monkfish		12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896

Note: only includes ports with average (1999-2002) landings value in excess of \$1,000,000 for either homeport or weighout port and select highly dependent (\$) ports with average landings value in excess of \$800,000. Base measurement is pounds landed by homeport. Vessel size classes (L = > 70 feet, M = 50-70 feet, S = < 50 feet). Data source: logbooks.

Table 64 Primary Species Landed by Vessel Size Class for Primary Ports

Home Port	Data	Year					Ave.	Ground fish	Sm. Mesh Multi.	Scallops	Monkfish
		1997	1998	1999	2000	2001					
BOSTON	Groundfish	11,192,224	11,003,031	10,400,741	13,535,834	15,189,096	12,264,185	1	2	4	3
	Sm. Mesh Multi.	15,292,484	5,749,351	4,789,588	7,818,447	4,913,538	7,712,682				
	Scallops	358,243	311,013	846,605	1,099,280	1,401,753	803,379				
	Monkfish	3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654				
GLOUCESTER	Groundfish	5,669,676	5,362,758	6,161,431	7,092,394	8,799,926	6,617,237	1	2	4	3
	Sm. Mesh Multi.	1,083,558	1,064,458	1,871,676	1,678,216	1,478,599	1,435,301				
	Scallops	47,948	33,100	69,460	117,817	115,536	76,772				
	Monkfish	685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680				
PORTLAND	Groundfish	3,720,280	3,891,785	4,264,323	4,699,049	5,734,924	4,462,072	1	2	4	3
	Sm. Mesh Multi.	606,190	229,011	1,655,228	2,428,303	10,645,981	3,112,943				
	Scallops	2,173	205	8	320	325	606				
	Monkfish	441,526	460,030	1,019,863	1,012,746	1,271,608	841,155				
PORTSMOUTH	Groundfish	1,621,183	1,574,345	1,284,264	1,567,659	1,499,708	1,509,432	1	2	4	3
	Sm. Mesh Multi.	199,797	2,707,820	1,897,643	76,668	168,138	1,010,013				
	Scallops	110	931	90,595	115,461	182,208	77,861				
	Monkfish	230,226	202,657	367,036	469,916	751,024	404,172				
NEWPORT	Groundfish	739,217	976,924	814,297	1,201,755	1,269,095	1,000,258	1	2	4	3
	Sm. Mesh Multi.	751,946	501,611	235,975	866,884	778,179	626,919				
	Scallops	48	252	43	283	0	125				
	Monkfish	353,809	478,854	804,735	463,521	616,939	543,572				
CHATHAM	Groundfish	1,619,218	1,189,052	1,561,296	1,807,127	1,472,010	1,529,741	1	3	4	2
	Sm. Mesh Multi.	42,849	5,925	21,513	31,480	18,943	24,142				
	Scallops	200	0	0	7,509	27,211	6,984				
	Monkfish	220,541	285,743	351,809	625,771	681,309	433,035				
PORT CLYDE	Groundfish	758,924	637,377	717,099	903,063	1,226,632	848,619	1	3	4	2
	Sm. Mesh Multi.	0	1,308	365	1,651	1,100	885				
	Scallops	790	1,555	1,835	0	195	875				
	Monkfish	177,741	173,563	245,874	342,768	464,790	280,947				
NEW BEDFORD	Groundfish	9,881,649	10,809,797	12,000,957	14,587,627	18,213,349	13,098,676	1	2	3	4
	Sm. Mesh Multi.	2,058,583	2,931,255	5,469,981	14,068,930	39,410,668	12,787,883				
	Scallops	4,163,998	4,505,347	8,239,359	11,369,373	15,189,880	8,693,591				
	Monkfish	4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247				
POINT JUDITH	Groundfish	1,754,635	3,630,303	3,614,603	4,781,383	3,328,616	3,421,908	2	1	4	3
	Sm. Mesh Multi.	10,826,261	9,892,113	6,909,552	7,199,386	6,447,318	8,254,926				
	Scallops	3,285	567	33,803	127,202	193,076	71,587				
	Monkfish	893,737	751,284	765,534	576,671	460,958	689,637				
LITTLE COMPTON	Groundfish	7,519	11,021	11,986	23,769	4,690	11,797	2	3	4	1
	Sm. Mesh Multi.	2,874	2,112	860	4,881	7,006	3,547				
	Scallops	0	0	0	12	59	14				
	Monkfish	218,808	168,084	140,373	132,100	256,832	183,239				
WESTPORT	Groundfish	15,772	10,804	12,287	4,707	40,363	16,787	2	3	4	1
	Sm. Mesh Multi.	1,525	2,265	0	1,900	1,814	1,501				
	Scallops	0	0	0	0	0	0				
	Monkfish	581,765	548,134	536,200	528,532	671,004	573,127				
TIVERTON	Groundfish	70,492	269,573	20,660	57,385	17,041	87,030	3	2	4	1
	Sm. Mesh Multi.	28,237	370,592	720	39,095	11,211	89,971				
	Scallops	40	0	0	0	0	8				
	Monkfish	247,575	199,780	401,312	208,618	520,996	315,656				
BARNEGAT LIGHT	Groundfish	317,820	236,123	40,919	25,758	329	124,190	3	4	2	1
	Sm. Mesh Multi.	68,064	103,240	5,783	31,426	10,816	43,866				
	Scallops	337,460	417,395	702,900	1,110,300	1,174,244	748,460				
	Monkfish	819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611				
FAIRHAVEN	Groundfish	65,939	68,345	26,425	220,232	613,052	198,799	3	4	1	2
	Sm. Mesh Multi.				65	65	65				
	Scallops	425,552	376,521	739,017	1,023,745	940,838	701,135				
	Monkfish	278,762	325,136	210,425	217,708	400,625	286,531				
POINT PLEASANT	Groundfish	8,752	48,211	61,098	91,340	45,467	50,974	4	1	3	2
	Sm. Mesh Multi.	514,677	275,005	332,828	367,446	257,141	349,419				
	Scallops	160,691	122,079	205,074	295,684	354,253	227,556				
	Monkfish	290,856	530,852	352,166	161,159	133,136	293,634				
Total Groundfish		37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703				
Total Sm. Mesh Multi.		31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011				
Total Scallops		5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953				
Total Monkfish		12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896				

Table 65 Primary Species Landed by Primary Port with Species Ranking

Pounds landed				YEAR						
HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.	
MA	BOSTON	L	Groundfish	7,584,033	7,772,732	7,461,275	9,896,891	11,172,650	8,777,516	
			Sm. Mesh Multi	15,010,401	5,524,098	4,292,388	7,380,936	4,679,117	7,377,388	
			Scallops	344,396	288,730	828,490	1,063,807	1,341,907	773,466	
		M	Monkfish	1,889,374	2,283,190	2,669,004	2,219,475	2,365,472	2,285,303	
			Groundfish	2,140,860	2,233,473	2,064,386	2,409,573	2,766,349	2,322,928	
			Sm. Mesh Multi	270,473	200,052	444,364	386,893	219,465	304,249	
		S	Scallops	11,234	16,119	15,677	29,290	46,965	23,857	
			Monkfish	325,502	494,864	633,289	527,635	562,850	508,828	
			Groundfish	1,467,331	996,826	875,080	1,229,370	1,250,097	1,163,741	
		BOSTON Groundfish			11,192,224	11,003,031	10,400,741	13,535,834	15,189,096	12,264,185
		BOSTON Sm. Mesh Multi.			15,292,484	5,749,351	4,789,588	7,818,447	4,913,538	7,712,682
		BOSTON Scallops			358,243	311,013	846,605	1,099,280	1,401,753	803,379
	BOSTON Monkfish			3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654	
	CHATHAM	M	Groundfish	299,644	212,474	265,988	208,942	153,076	228,025	
			Sm. Mesh Multi	900	0	325	25	2,615	773	
			Scallops	0	0	0	0	0	0	
			Monkfish	4,003	1,959	3,170	83,835	84,300	35,453	
		S	Groundfish	1,319,574	976,578	1,295,308	1,598,185	1,318,934	1,301,716	
			Sm. Mesh Multi	41,949	5,925	21,188	31,455	16,328	23,369	
			Scallops	200	0	0	7,509	27,211	6,984	
			Monkfish	216,538	283,784	348,639	541,936	597,009	397,581	
		CHATHAM Groundfish			1,619,218	1,189,052	1,561,296	1,807,127	1,472,010	1,529,741
		CHATHAM Sm. Mesh Multi.			42,849	5,925	21,513	31,480	18,943	24,142
		CHATHAM Scallops			200	0	0	7,509	27,211	6,984
		CHATHAM Monkfish			220,541	285,743	351,809	625,771	681,309	433,035
	FAIRHAVEN	L	Groundfish	65,939	68,345	26,425	108,225	203,353	94,457	
			Sm. Mesh Multi.							
			Scallops	425,552	376,521	739,017	1,023,745	940,838	701,135	
		M	Monkfish	278,762	325,136	167,701	92,489	152,675	203,353	
			Groundfish				96,935	389,610	243,273	
			Sm. Mesh Multi.							
		S	Scallops				0	0	0	
			Monkfish				2,810	55,769	29,290	
			Groundfish			0	15,072	20,089	11,720	
		FAIRHAVEN Groundfish			65,939	68,345	26,425	220,232	613,052	198,799
		FAIRHAVEN Sm. Mesh Multi.						65		65
		FAIRHAVEN Scallops			425,552	376,521	739,017	1,023,745	940,838	701,135
	FAIRHAVEN Monkfish			278,762	325,136	210,425	217,708	400,625	286,531	
	GLOUCESTER	L	Groundfish	2,809,746	2,816,290	3,067,749	3,889,628	4,473,117	3,411,306	
			Sm. Mesh Multi	50,984	56,192	89,985	53,128	166,294	83,317	
			Scallops	44,069	32,332	69,451	117,383	107,037	74,054	
			Monkfish	259,158	282,366	457,086	438,743	515,859	390,642	
M		Groundfish	1,783,735	1,391,779	1,876,100	1,991,177	2,825,562	1,973,671		
		Sm. Mesh Multi	1,018,168	988,521	1,738,758	1,597,571	1,245,774	1,317,758		
		Scallops	18	0	9	0	730	151		
		Monkfish	113,813	114,645	204,904	510,142	660,968	320,894		
S		Groundfish	1,076,195	1,154,689	1,217,582	1,211,589	1,501,247	1,232,260		
		Sm. Mesh Multi	14,406	19,745	42,933	27,517	66,531	34,226		
		Scallops	3,861	768	0	434	7,769	2,566		
		Monkfish	312,471	372,354	611,428	787,660	646,803	546,143		
GLOUCESTER Groundfish			5,669,676	5,362,758	6,161,431	7,092,394	8,799,926	6,617,237		
GLOUCESTER Sm. Mesh Multi.			1,083,558	1,064,458	1,871,676	1,678,216	1,478,599	1,435,301		
GLOUCESTER Scallops			47,948	33,100	69,460	117,817	115,536	76,772		
GLOUCESTER Monkfish			685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680		

Table 65 Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.	
MA	NEW BEDFORD	L	Groundfish	8,696,655	9,558,041	10,590,509	12,666,840	16,426,395	11,587,688	
			Sm. Mesh Multi	2,046,818	2,897,684	5,329,081	14,052,499	39,409,403	12,747,097	
			Scallops	4,102,933	4,443,365	8,116,564	11,153,826	14,912,996	8,545,937	
			Monkfish	4,019,336	3,968,172	2,745,136	2,384,989	2,917,427	3,207,012	
		M	Groundfish	1,169,758	1,251,334	1,410,448	1,918,319	1,784,982	1,506,968	
			Sm. Mesh Multi	11,765	33,571	140,900	14,070	1,265	40,314	
			Scallops	61,065	61,982	122,795	215,547	276,884	147,655	
			Monkfish	259,457	244,407	187,256	164,887	85,559	188,313	
		S	Groundfish	15,236	422	0	2,468	1,972	4,020	
	Sm. Mesh Multi		0	0	0	2,361	0	2,361		
	Scallops		0	0	0	0	0	0		
	NEW BEDFORD Monkfish				97,643	116,886	83,076	120,777	571,226	197,922
	NEW BEDFORD Groundfish				9,881,649	10,809,797	12,000,957	14,587,627	18,213,349	13,098,676
	NEW BEDFORD Sm. Mesh Multi.				2,058,583	2,931,255	5,469,981	14,068,930	39,410,668	12,787,883
	NEW BEDFORD Scallops				4,163,998	4,505,347	8,239,359	11,369,373	15,189,880	8,693,591
NEW BEDFORD Monkfish				4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247	
ME	PORT CLYDE	M	Groundfish	0	0	0	3,050	39,623	8,535	
			Sm. Mesh Multi	0	0	0	0	1,814	1,814	
			Scallops	0	0	0	0	0	0	
			Monkfish	382,885	417,990	376,320	398,762	291,805	373,552	
		S	Groundfish	15,772	10,804	12,287	1,657	740	8,252	
			Sm. Mesh Multi	1,525	2,265	0	1,900	0	1,423	
			Scallops	0	0	0	0	0	0	
			Monkfish	198,880	130,144	159,880	129,770	379,199	199,575	
		WESTPORT Groundfish				15,772	10,804	12,287	4,707	40,363
	WESTPORT Sm. Mesh Multi.				1,525	2,265	0	1,900	1,814	1,501
	WESTPORT Scallops				0	0	0	0	0	0
	WESTPORT Monkfish				581,765	548,134	536,200	528,532	671,004	573,127
	NH	PORT CLYDE	M	Groundfish	541,733	456,621	416,484	520,190	703,262	527,658
				Sm. Mesh Multi	0	1,308	0	1,000	0	577
				Scallops	425	0	0	0	0	85
Monkfish				118,041	112,013	164,669	218,820	278,370	178,383	
S			Groundfish	217,191	180,756	300,615	382,873	523,370	320,961	
			Sm. Mesh Multi	365	1,555	365	651	1,100	705	
			Scallops	59,700	61,550	1,835	0	195	790	
			Monkfish	59,700	61,550	81,205	123,948	186,420	102,565	
PORT CLYDE Groundfish				758,924	637,377	717,099	903,063	1,226,632	848,619	
PORT CLYDE Sm. Mesh Multi.				0	1,308	365	1,651	1,100	885	
PORT CLYDE Scallops				790	1,555	1,835	0	195	875	
PORT CLYDE Monkfish				177,741	173,563	245,874	342,768	464,790	280,947	
NH		PORTSMOUTH	L	Groundfish	1,722,154	1,917,457	2,403,910	2,477,974	3,272,051	2,358,709
				Sm. Mesh Multi	448,753	61,018	1,634,478	2,382,574	10,558,950	3,017,155
				Scallops	0	0	0	0	0	0
	Monkfish			188,037	218,434	615,761	563,794	624,384	442,082	
	M		Groundfish	1,836,129	1,790,196	1,742,549	1,973,451	2,268,849	1,922,235	
			Sm. Mesh Multi	26,560	48,314	3,137	45,282	85,441	41,747	
			Scallops	2,023	0	8	320	325	535	
			Monkfish	227,644	204,981	369,185	408,076	599,521	361,881	
	S		Groundfish	161,997	184,132	117,864	247,624	194,024	181,128	
			Sm. Mesh Multi	130,877	119,679	17,613	447	1,590	54,041	
			Scallops	150	205	0	0	0	71	
			Monkfish	25,845	36,615	34,917	40,876	47,703	37,191	
	PORTLAND Groundfish				3,720,280	3,891,785	4,264,323	4,699,049	5,734,924	4,462,072
	PORTLAND Sm. Mesh Multi.				606,190	229,011	1,655,228	2,428,303	10,645,981	3,112,943
	PORTLAND Scallops				2,173	205	8	320	325	606
PORTLAND Monkfish				441,526	460,030	1,019,863	1,012,746	1,271,608	841,155	
NH	PORTSMOUTH	L	Groundfish	0	43,550	63,121	227,875	273,710	152,064	
			Sm. Mesh Multi	0	2,356,625	1,725,000	0	14,800	1,365,475	
			Scallops	0	0	90,550	115,436	182,158	97,036	
			Monkfish	0	18,900	29,210	44,400	74,000	41,628	
		M	Groundfish	655,704	688,155	364,677	412,384	493,427	522,869	
			Sm. Mesh Multi	158,054	348,960	98,909	3,713	485	122,024	
			Scallops	0	0	0	0	0	0	
			Monkfish	33,426	17,308	74,989	75,155	99,980	60,172	
		S	Groundfish	965,479	842,640	856,466	927,400	732,571	864,911	
			Sm. Mesh Multi	41,743	2,235	73,734	72,955	152,853	68,704	
			Scallops	110	931	45	25	50	232	
			Monkfish	196,800	166,449	262,837	350,361	577,044	310,698	
	PORTSMOUTH Groundfish				1,621,183	1,574,345	1,284,264	1,567,659	1,499,708	1,509,432
	PORTSMOUTH Sm. Mesh Multi.				199,797	2,707,820	1,897,643	76,668	168,138	1,010,013
	PORTSMOUTH Scallops				110	931	90,595	115,461	182,208	77,861
PORTSMOUTH Monkfish				230,226	202,657	367,036	469,916	751,024	404,172	

Table 65 Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
NJ	BARNEGAT LIGHT	L	Groundfish	551	234	363	0	0	230
			Sm. Mesh Multi.		1,675	56	40		590
			Scallops	79,287	95,084	128,643	223,804	194,661	144,296
			Monkfish	28,911	349,623	151,929	192,328	127,423	170,043
		M	Groundfish	7,165	6,847	6,056	24,675	6	8,950
			Sm. Mesh Multi.	7,830	8,949	1,125	1,896	50	3,970
			Scallops	258,148	322,311	574,235	881,632	926,189	592,503
			Monkfish	244,156	290,661	305,101	163,449	264,431	253,560
		S	Groundfish	310,104	229,042	34,500	1,083	323	115,010
			Sm. Mesh Multi.	60,234	92,616	4,602	29,490	10,766	39,542
			Scallops	25	0	22	4,864	53,394	11,661
			Monkfish	546,825	846,643	1,204,055	819,340	1,753,178	1,034,008
	BARNEGAT LIGHT	Groundfish		317,820	236,123	40,919	25,758	329	124,190
	BARNEGAT LIGHT	Sm. Mesh Multi.		68,064	103,240	5,783	31,426	10,816	43,866
	BARNEGAT LIGHT	Scallops		337,460	417,395	702,900	1,110,300	1,174,244	748,460
	BARNEGAT LIGHT	Monkfish		819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611
	POINT PLEASANT	L	Groundfish	8,566	32,450	45,743	73,272	35,502	39,107
			Sm. Mesh Multi.	314,902	200,822	244,550	266,736	165,551	238,512
			Scallops	160,691	122,079	205,074	295,684	354,193	227,544
			Monkfish	40,483	35,037	21,540	20,605	30,913	29,716
		M	Groundfish	51	15,761	15,355	18,068	9,965	11,840
			Sm. Mesh Multi.	192,500	72,386	87,335	99,755	91,540	108,703
			Scallops	0	0	0	0	60	12
			Monkfish	3,860	3,463	2,967	3,488	4,365	3,629
		S	Groundfish	135	0	0	0	0	27
			Sm. Mesh Multi.	7,275	1,797	943	955	50	2,204
			Scallops	0	0	0	0	0	0
Monkfish			246,513	492,352	327,659	137,066	97,858	260,290	
POINT PLEASANT		Groundfish		8,752	48,211	61,098	91,340	45,467	50,974
POINT PLEASANT		Sm. Mesh Multi.		514,677	275,005	332,828	367,446	257,141	349,419
POINT PLEASANT		Scallops		160,691	122,079	205,074	295,684	354,253	227,556
POINT PLEASANT	Monkfish		290,856	530,852	352,166	161,159	133,136	293,634	

Table 65 Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
RI	LITTLE COMPTON	M	Groundfish	175		11,640	22,045	1,595	8,864
			Sm. Mesh Multi	11		5	2,200	140	589
			Scallops	0		0	0	0	0
			Monkfish	20,900		1,370	31,977	15,785	17,508
		S	Groundfish	7,344	11,021	346	1,724	3,095	4,706
			Sm. Mesh Multi	2,863	2,112	855	2,681	6,866	3,075
			Scallops	0	0	0	12	59	14
			Monkfish	197,908	168,084	139,003	100,123	241,047	169,233
	LITTLE COMPTON Groundfish			7,519	11,021	11,986	23,769	4,690	11,797
	LITTLE COMPTON Sm. Mesh Multi.			2,874	2,112	860	4,881	7,006	3,547
	LITTLE COMPTON Scallops			0	0	0	12	59	14
	LITTLE COMPTON Monkfish			218,808	168,084	140,373	132,100	256,832	183,239
	NEWPORT	L	Groundfish	701,773	867,573	668,000	991,248	1,004,810	846,681
			Sm. Mesh Multi	388,926	447,434	218,117	855,912	732,273	528,532
			Scallops	48	137	43	115	0	69
			Monkfish	248,667	293,824	380,820	289,795	372,049	317,031
		M	Groundfish	36,876	108,815	144,170	192,114	254,792	147,353
			Sm. Mesh Multi	362,962	54,104	15,328	7,650	44,862	96,981
			Scallops	0	115	0	168	0	57
			Monkfish	16,672	52,862	49,642	37,678	17,295	34,830
		S	Groundfish	568	536	2,127	18,393	9,493	6,223
			Sm. Mesh Multi	58	73	2,530	3,322	1,044	1,405
			Scallops	0	0	0	0	0	0
			Monkfish	88,470	132,168	374,273	136,048	227,595	191,711
	NEWPORT Groundfish			739,217	976,924	814,297	1,201,755	1,269,095	1,000,258
	NEWPORT Sm. Mesh Multi.			751,946	501,611	235,975	866,884	778,179	626,919
	NEWPORT Scallops			48	252	43	283	0	125
	NEWPORT Monkfish			353,809	478,854	804,735	463,521	616,939	543,572
	POINT JUDITH	L	Groundfish	1,148,821	2,026,761	2,029,699	2,736,189	1,742,153	1,936,725
			Sm. Mesh Multi	7,597,340	7,111,200	4,122,167	5,514,880	4,717,749	5,812,667
			Scallops	375	67	32,821	124,983	192,711	70,191
			Monkfish	574,947	360,142	487,910	274,355	139,593	367,389
		M	Groundfish	605,814	1,602,926	1,584,617	2,044,963	1,585,978	1,484,860
			Sm. Mesh Multi	3,228,921	2,778,605	2,787,385	1,682,991	1,729,269	2,441,434
			Scallops	2,910	500	982	2,219	365	1,395
			Monkfish	318,790	313,585	232,828	232,741	259,781	271,545
		S	Groundfish		616	287	231	485	405
			Sm. Mesh Multi.		2,308		1,515	300	1,374
			Scallops		0	0	0	0	0
			Monkfish		77,557	44,796	69,575	61,584	63,378
	POINT JUDITH Groundfish			1,754,635	3,630,303	3,614,603	4,781,383	3,328,616	3,421,908
	POINT JUDITH Sm. Mesh Multi.			10,826,261	9,892,113	6,909,552	7,199,386	6,447,318	8,254,926
	POINT JUDITH Scallops			3,285	567	33,803	127,202	193,076	71,587
	POINT JUDITH Monkfish			893,737	751,284	765,534	576,671	460,958	689,637
	TIVERTON	M	Groundfish	59,016	251,171		33,800	456	86,111
			Sm. Mesh Multi	26,020	368,980		37,980	236	108,304
			Scallops	0	0		0	0	0
			Monkfish	13,126	3,514		120	300,812	79,393
		S	Groundfish	11,476	18,402	20,660	23,585	16,585	18,142
			Sm. Mesh Multi	2,217	1,612	720	1,115	10,975	3,328
Scallops			40	0	0	0	0	8	
Monkfish			234,449	196,266	401,312	208,498	220,184	252,142	
TIVERTON Groundfish			70,492	269,573	20,660	57,385	17,041	87,030	
TIVERTON Sm. Mesh Multi.			28,237	370,592	720	39,095	11,211	89,971	
TIVERTON Scallops			40	0	0	0	0	8	
TIVERTON Monkfish			247,575	199,780	401,312	208,618	520,996	315,656	
Total Sum of gfish			37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703	
Total Sum of small			31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011	
Total Sum of scallop			5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953	
Total Sum of monklb			12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896	

Table 65 Primary Species Landed by Primary Port and Vessel Size Class (cont'd)

Since this document also serves as the annual Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 fishing year, regular tables from that document are updated below showing the distribution of permits, landings and revenues on vessels issued a monkfish permit in

FY2002. Data is provided for vessel homeport as indicated on the permit. Table 66 shows the distribution of monkfish permit holders by homeport and monkfish permit category for the six primary, 18 secondary, and “other” monkfish ports for FY2000 – FY2002. Of particular note is the consistency in the numbers of limited access permits homeported in each of the identified ports.

Table 67 and Table 68 show the percentage of monkfish limited access permit holders homeported in primary and secondary ports, respectively, that also hold limited access permits in other fisheries. These tables provide some insight into the range of options available to monkfish vessels when not fishing for monkfish, or if the fishery is reduced to a bycatch-only status. Since the data is broken out by port, it also can be used to determine the relative impact of changes in monkfish regulations on different communities. Ports where a high percentage of vessels have other limited access permits are more likely to be able to offset the impacts of further restrictions in the monkfish fishery than ports where vessels have fewer options, because of the wider range of alternative fisheries. Many of these alternative fisheries, however, are under restrictive management programs that limit the viability of these options.

Table 69 shows the VTR landings for five of the six major ports (as reported by NMFS in their regular “Northeast Preliminary Fisheries Statistics” Report, not including Long Beach/Barnegat Light, NJ) and states, broken down by management area from which landings were reported, as well as by gear type. Virtually all of the monkfish landed in Portland, Gloucester and Boston come from the NFMA, while about 2/3 of New Bedford’s landings and only 5 percent of Pt. Judith’s landings come from the NFMA. Portland and Boston’s landings are almost totally from otter trawls, New Bedford’s are about 2/3 trawl, and Pt. Judith and Gloucester landings are even split by gear. New Hampshire, New York and New Jersey landings are predominately caught by gillnet gear.

Port landings and revenue data based on May-April fishing year is presented in Table 70 and Table 71, for primary and secondary ports (as identified in the original FMP), respectively, for FY1995-FY2002. Data is based on the vessel’s homeport and, for FY2002, on the vessel’s principal port of landing as indicated on the permit application. Note that these figures may differ from the data presented in other tables in this section that may be based on calendar year, dealer weighout, or other perspectives on the landings. While vessels homeported in New Bedford recorded the highest monkfish landings and revenues from 1995-1999, their share declined in more recent years, while the share of vessels homeported in Boston has increased. Of note is the observation that while Boston ranked the highest in landings and revenues based on the vessels’ homeport, Portland was the highest based on principal port in FY2002, while Boston and Pt. Judith were the lowest of the six primary ports.

Landings and revenues from monkfish remained essentially unchanged on vessels homeported in Portland, Boston and Gloucester from the previous year, while they declined in New Bedford, Long Beach/Barnegat Light, and Point Judith, perhaps reflecting the lower SFMA trip limit in FY2002. On vessels homeported in the secondary ports in Maine, New Hampshire, and New Jersey saw a decline in monkfish landings and revenues from the previous year, while those from Chatham and Scituate, MA, and NY ports had a noticeable increase.

HOMEPORT	FY 2000 by Category						FY 2001 by Category						FY 2002 by Category					
	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL
PRIMARY PORTS	4	16	195	151	348	714	4	16	200	161	366	747	4	17	194	158	402	775
Portland ME	0	x	10	16	17	44	0	x	11	10	21	43	0	x	10	14	20	45
Boston MA	x	x	46	47	137	233	x	x	42	49	128	222	x	x	43	43	126	215
Gloucester MA	0	0	18	34	104	156	0	0	19	35	110	164	0	0	18	33	138	189
New Bedford MA	x	0	93	30	41	165	0	0	100	34	53	187	0	0	94	35	68	197
Barnegate Light NJ	x	13	9	11	17	51	x	13	10	17	19	61	x	14	11	17	15	59
Point Judith RI	x	0	19	13	32	65	x	0	18	16	35	70	x	0	18	16	35	70
SECONDARY PORTS	0	6	55	69	322	452	3	7	57	72	354	493	3	7	59	72	376	517
Rockland ME	0	x	x	0	5	7	0	x	x	0	8	10	0	x	0	0	4	5
Port Clyde ME	0	0	3	3	5	11	0	0	5	3	4	12	0	0	5	3	4	12
South Bristol ME	0	0	x	x	5	9	0	0	x	3	5	10	0	0	x	3	4	9
Ocean City MD	0	0	0	0	11	11	0	0	0	0	13	13	0	0	0	0	13	13
Chatham MA	0	0	0	11	47	58	0	0	0	12	46	58	0	0	0	12	68	80
Provincetown MA	0	0	0	5	11	16	0	0	0	6	11	17	0	0	0	5	13	18
Scituate MA	0	0	3	7	27	37	0	0	x	7	26	34	0	0	x	7	30	38
Plymouth MA	0	x	0	x	13	15	0	x	x	x	17	21	0	x	x	x	18	22
Westport MA	0	0	x	5	13	19	0	0	x	6	17	24	0	0	x	5	16	22
Portsmouth NH	0	0	4	14	17	35	0	0	3	12	19	34	0	0	3	10	23	36
Point Pleasant NJ	0	3	x	x	22	28	x	3	x	x	26	33	x	x	x	3	26	33
Cape May NJ	0	0	19	5	49	73	x	0	16	6	55	79	x	0	18	5	58	83
Greenport NY	0	0	x	x	4	6	0	0	x	0	5	6	0	0	x	0	6	7
Montauk NY	0	0	3	5	65	73	0	0	4	6	71	81	0	x	4	7	65	77
Hampton Bay NY	0	x	x	x	5	8	0	x	x	x	4	7	0	x	x	x	5	8
Newport RI	0	0	x	5	13	20	0	x	4	5	16	26	0	x	5	7	12	25
Hampton VA	0	0	4	0	3	7	0	0	4	0	4	8	0	0	5	0	3	8
Newport News VA	0	0	9	3	7	19	0	0	11	x	7	20	0	0	11	x	8	21
OTHER PORTS	8	10	91	128	1,193	1,430	9	16	78	104	1,261	1,468	8	16	75	105	1,359	1,563
TOTAL	12	32	341	348	1,863	2,596	16	39	335	337	1,981	2,708	15	40	328	335	2,137	2,855

Source: NMFS Statistics Office, permit databases

Table 66 Monkfish permits by port for FY2000-FY2002 by permit category.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

PRIMARY HOMEPORT	MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENTAGE OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:											
			BLACK SEA BASS	FLUKE	LOBSTER	MULTISPECIES	OCEAN QUOAHOOG	RED CRAB	SCALLOP	SCUP	SQ/MACK/BUT	TILEFISH		
PORTLAND	ME	B	x	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		C	9	22%	33%	67%	100%	0%	0%	0%	33%	33%	0%	
		D	14	7%	14%	79%	100%	0%	0%	0%	21%	7%	7%	
BOSTON	MA	A	x	100%	0%	100%	0%	0%	0%	0%	100%	0%	0%	
		B	x	0%	50%	100%	0%	0%	0%	0%	50%	0%	0%	
		C	43	26%	56%	84%	86%	0%	0%	19%	51%	33%	0%	
GLOUCESTER	MA	D	43	21%	53%	86%	98%	0%	0%	5%	37%	26%	0%	
		C	18	11%	44%	94%	89%	0%	0%	11%	17%	6%	0%	
		D	33	3%	36%	94%	100%	0%	0%	0%	18%	3%	0%	
NEW BEDFORD	MA	C	94	12%	90%	89%	44%	0%	0%	73%	11%	12%	0%	
		D	35	31%	91%	91%	97%	0%	0%	11%	43%	40%	0%	
BARNEGATE LIGHT	NJ	A	x	50%	0%	50%	0%	0%	0%	0%	0%	0%	50%	
		B	14	64%	0%	7%	0%	0%	0%	0%	21%	0%	21%	
		C	11	27%	73%	73%	45%	0%	0%	64%	27%	9%	0%	
		D	16	31%	50%	88%	100%	0%	0%	0%	50%	13%	13%	
POINT JUDITH	RI	A	x	100%	0%	100%	0%	0%	0%	0%	100%	0%	0%	
		C	18	94%	100%	100%	100%	0%	0%	6%	100%	100%	0%	
		D	15	73%	93%	100%	100%	0%	0%	0%	93%	87%	0%	
TOTAL		A	x	75%	0%	75%	0%	0%	0%	0%	50%	0%	25%	
		B	17	53%	6%	18%	0%	0%	0%	0%	24%	0%	18%	
		C	193	24%	76%	88%	65%	0%	0%	45%	31%	25%	0%	
		D	156	24%	58%	90%	99%	0%	0%	4%	40%	27%	2%	

Source: NMFS Permit Database

Table 67 Percentage of limited access permits by fishery held by monkfish limited access vessels in monkfish primary ports (as identified in the original FMP) in FY2002.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

SECONDARY HOMEPORT	MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENTAGE OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:										
			BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUOAHOOG	RED CRAB	SCALLOP	SCUP	SQ/MACK/BUT	TILE-FISH	
ROCKLAND	ME	B	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PORT CLYDE	ME	C	5	0%	0%	80%	100%	0%	0%	0%	20%	0%	0%
		D	3	0%	33%	0%	100%	0%	0%	0%	0%	0%	0%
SOUTH BRISTOL	ME	C	<3	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%
		D	<3	50%	50%	100%	100%	0%	0%	0%	50%	0%	0%
CHATHAM	MA	D	12	33%	42%	100%	100%	0%	0%	0%	50%	0%	0%
PROVINCETOWN	MA	D	5	20%	80%	100%	100%	0%	0%	0%	60%	40%	0%
SCITUATE	MA	C	<3	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%
		D	7	0%	29%	86%	100%	0%	0%	0%	14%	0%	0%
PLYMOUTH	MA	B	<3	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
		D	<3	0%	100%	50%	100%	0%	0%	0%	0%	0%	0%
WESTPORT	MA	C	<3	100%	100%	100%	100%	0%	0%	0%	100%	0%	0%
		D	5	40%	0%	100%	100%	0%	0%	0%	40%	0%	0%
PORTSMOUTH	NH	C	3	0%	33%	100%	100%	0%	0%	33%	0%	0%	0%
		D	10	10%	40%	80%	100%	0%	0%	0%	10%	0%	0%
POINT PLEASANT	NJ	A	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		B	<3	100%	0%	50%	0%	0%	0%	0%	50%	0%	0%
		C	<3	100%	100%	100%	0%	0%	0%	100%	100%	0%	0%
		D	3	100%	67%	100%	100%	0%	0%	0%	100%	67%	0%
CAPE MAY	NJ	A	<3	100%	100%	100%	0%	0%	0%	0%	100%	100%	0%
		C	18	67%	83%	61%	0%	0%	0%	100%	67%	61%	0%
		D	5	100%	100%	100%	80%	0%	0%	20%	100%	100%	0%
GREENPORT	NY	C	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
MONTAUK	NY	B	<3	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
		D	7	71%	71%	86%	100%	0%	0%	0%	71%	71%	0%
HAMPTON BAYS	NY	B	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		C	<3	100%	100%	0%	100%	0%	0%	0%	100%	0%	0%
		D	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
NEWPORT	RI	B	<3	100%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	5	60%	60%	100%	100%	0%	0%	0%	100%	80%	0%
		D	7	86%	86%	100%	100%	0%	0%	0%	71%	71%	14%
HAMPTON	VA	C	5	40%	80%	0%	0%	0%	0%	100%	40%	40%	0%
NEWPORT NEWS	VA	C	11	64%	100%	36%	18%	0%	0%	100%	64%	45%	0%
		D	<3	100%	100%	100%	100%	0%	0%	100%	100%	0%	0%
TOTAL		A	x	67%	67%	67%	0%	0%	0%	0%	67%	67%	0%
		B	7	43%	0%	57%	0%	0%	0%	0%	14%	0%	0%
		C	58	55%	72%	64%	43%	0%	0%	62%	60%	47%	0%
		D	71	44%	56%	89%	99%	0%	0%	4%	49%	28%	1%

Source: NMFS Permit Database

Table 68 Percentage of limited access permits by fishery held by monkfish limited access vessels in monkfish secondary ports (as identified in the original FMP) in FY2002.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

PORT/ STATE	MAY 02 - APR 03	STOCK AREAS				GEAR TYPES							
		NORTHERN		SOUTHERN		OTTER TRAWL		GILLNET		HOOK		OTHER GEARS	
		1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent
Portland, ME	10,023	9,990	100%	33	0%	9,452	94%	571	6%	0	0%	0	0%
Gloucester, MA	5,064	4,972	98%	93	2%	2,873	57%	2,188	43%	0	0%	3	0%
Boston, MA	3,422	3,405	99%	17	1%	3,422	100%	0	0%	0	0%	0	0%
New Bedford, MA	9,976	6,499	65%	3,477	35%	6,636	67%	1,903	19%	0	0%	1,438	14%
Point Judith, RI	2,382	130	5%	2,251	95%	1,145	48%	1,153	48%	0	0%	84	4%
MAINE	12,278	12,245	100%	34	0%	11,406	93%	872	7%	0	0%	0	0%
NEW HAMPSHIRE	1,756	1,738	99%	18	1%	237	13%	1,511	86%	0	0%	8	0%
MASSACHUSETTS	21,086	16,762	79%	4,324	21%	13,560	64%	6,045	29%	1	0%	1,480	7%
RHODE ISLAND	4,707	648	14%	4,059	86%	1,755	37%	2,823	60%	0	0%	128	3%
CONNECTICUT	557	23	4%	534	96%	51	9%	327	59%	0	0%	179	32%
NEW YORK	1,193	1	0%	1,192	100%	306	26%	885	74%	1	0%	1	0%
NEW JERSEY	4,663	19	0%	4,644	100%	76	2%	4,215	90%	1	0%	371	8%
OTHER NORTHEAST	1,236	0	0%	1,236	100%	275	22%	814	66%	0	0%	146	12%
TOTAL	47,476	31,436	66%	16,040	34%	27,666	58%	17,493	37%	3	0%	2,314	5%

1. The three digit statistical areas defined below are for statistical and management purposes and may not be consistent with stock area delineation used for biological assessment (see the attached statistical chart).

Monkfish stock areas: Northern: 464-465, 467, 511-515, 521-522, 561-562
Southern: 525-526, 533-534, 537-539, 541-543, 611-639

- 2. State landings for CT are estimated for the May 2002 - Apr. 2003 period.
- 3. Landings in live weight.
- 4. Gear data are based on vessel trip reports.

Table 69 Preliminary FY2002 landings by major port (excluding Long Beach/Barnegat Light, NJ) and state, by management area and gear type.

HOME PORT		MONKFISH LANDINGS AND REVENUES								Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2002
Portland, ME	1,000 Lbs.	1,446	1,605	1,692	1,473	2,543	2,996	1,488	1,498	3,303
	\$1,000	\$2,258	\$2,394	\$2,707	\$2,640	\$5,473	\$6,708	\$2,005	\$2,289	\$5,088
Boston, MA	1,000 Lbs.	823	674	918	782	1,268	961	4,964	4,779	1,645
	\$1,000	\$1,083	\$936	\$1,300	\$1,104	\$2,240	\$2,028	\$6,738	\$6,633	\$2,084
Gloucester, MA	1,000 Lbs.	1,676	1,154	844	942	1,701	2,365	2,121	2,211	2,750
	\$1,000	\$1,621	\$1,098	\$1,038	\$1,383	\$3,061	\$4,442	\$3,096	\$3,104	\$3,917
New Bedford, MA	1,000 Lbs.	5,984	5,790	7,346	8,537	7,027	5,515	3,453	2,326	2,714
	\$1,000	\$8,981	\$8,260	\$11,686	\$13,926	\$14,443	\$11,784	\$4,698	\$3,290	\$3,888
Long Beach/Barnegat Light, NJ	1,000 Lbs.	846	1,382	729	1,703	2,569	1,802	3,582	2,451	2,433
	\$1,000	\$1,211	\$1,532	\$978	\$2,100	\$4,431	\$3,049	\$4,808	\$3,248	\$3,238
Point Judith, RI	1,000 Lbs.	1,194	2,445	2,126	1,485	1,709	1,635	645	520	1,373
	\$1,000	\$1,645	\$3,367	\$3,248	\$2,176	\$3,275	\$3,424	\$1,011	\$792	\$2,006

Source: NMFS Statistics Office, dealer weighout database & permit database

Pounds are in landed weight

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year

data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 70 Monkfish landings and revenues for fishing year (May-April) 1995-2002, for permitted vessels homeported in one of the primary monkfish ports in FY 2001 or FY2002.

Revenues are in nominal dollars. FY2002 data is also provided for principal port of landing as indicated on the vessel permit application.

HOME PORT		MONKFISH LANDINGS AND REVENUES								Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2002
Rockland, ME	1,000 Lbs.	48	43	37	56	54	74	8	4	38
	\$1,000	\$61	\$55	\$54	\$90	\$113	\$184	\$15	\$6	\$53
Port Clyde, ME	1,000 Lbs.	119	120	183	210	294	325	544	471	588
	\$1,000	\$149	\$153	\$261	\$328	\$582	\$749	\$748	\$674	\$837
South Bristol, ME	1,000 Lbs.	126	110	90	93	107	219	279	239	227
	\$1,000	\$163	\$145	\$131	\$147	\$217	\$494	\$410	\$344	\$321
Ocean City, MD	1,000 Lbs.	179	521	349	282	314	107	3	3	6
	\$1,000	\$241	\$451	\$310	\$254	\$347	\$154	\$5	\$4	\$9
Chatham, MA	1,000 Lbs.	126	98	117	232	213	475	613	944	1003
	\$1,000	\$111	\$936	\$127	\$237	\$327	\$771	\$830	\$1,229	\$1,308
Provincetown, MA	1,000 Lbs.	83	39	24	86	80	35	26	20	30
	\$1,000	\$108	\$52	\$37	\$142	\$136	\$77	\$38	\$26	\$47
Scituate, MA	1,000 Lbs.	59	45	43	330	331	434	100	207	510
	\$1,000	\$68	\$53	\$50	\$392	\$562	\$746	\$148	\$266	\$660
Plymouth, MA	1,000 Lbs.	54	33	28	42	14	276	586	613	615
	\$1,000	\$62	\$38	\$26	\$56	\$24	\$508	\$826	\$796	\$799
Westport, MA	1,000 Lbs.	810	857	461	539	452	307	686	550	618
	\$1,000	\$765	\$769	\$388	\$543	\$691	\$568	\$1,023	\$739	\$829
Portsmouth, NH	1,000 Lbs.	371	388	520	475	845	1254	1099	672	974
	\$1,000	\$448	\$443	\$637	\$533	\$1,320	\$2,123	\$1,579	\$967	\$1,364
Point Pleasant, NJ	1,000 Lbs.	84	518	1092	1579	1286	772	338	128	252
	\$1,000	\$111	\$566	\$1,097	\$1,885	\$2,320	\$1,208	\$442	\$164	\$325
Cape May, NJ	1,000 Lbs.	273	313	465	316	124	118	187	118	138
	\$1,000	\$370	\$389	\$572	\$398	\$256	\$266	\$248	\$135	\$158
Greenport, NY	1,000 Lbs.	26	49	63	42	12	4	7	20	19
	\$1,000	\$35	\$72	\$86	\$62	\$20	\$9	\$11	\$33	\$32
Montauk, NY	1,000 Lbs.	47	53	92	157	80	47	148	237	237
	\$1,000	\$62	\$74	\$136	\$247	\$170	\$122	\$239	\$355	\$356
Hampton Bays, NY	1,000 Lbs.	87	319	310	454	416	317	94	128	128
	\$1,000	\$121	\$516	\$590	\$733	\$662	\$563	\$135	\$177	\$176
Newport, RI	1,000 Lbs.	312	407	436	407	582	361	614	671	648
	\$1,000	\$388	\$505	\$558	\$584	\$1,229	\$808	\$848	\$918	\$884
Hampton, VA	1,000 Lbs.	256	336	113	135	42	36	21	4	18
	\$1,000	\$327	\$351	\$129	\$179	\$79	\$76	\$24	\$4	\$21
Newport News, VA	1,000 Lbs.	184	254	373	275	96	90	40	47	56
	\$1,000	\$221	\$285	\$454	\$333	\$140	\$106	\$43	\$55	\$65

Source: NMFS Statistics Office, dealer weighout database & permit database

Pounds are in landed weight

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 71 Monkfish landings and revenues for fishing year (May-April) 1995-2002, for permitted vessels homeported in one of the secondary monkfish ports in FY 2001 or FY2002.

Revenues are in nominal dollars. FY2002 data is also provided for principal port of landing as indicated on the vessel permit application.

5.3.4 Markets and Trade

5.3.4.1 Dockside markets

5.3.4.1.1 Products

Monkfish are currently landed in five product forms - tails, livers, cheeks, belly flaps, and whole fish (gutted with and without liver). Prior to 1982 tails were the only reported product form marketed in the Northeast and whole fish were not reported prior to 1989 (Figure 48). Total landings of tails averaged less than 6 million pounds from 1982 through 1988, but rose to over 17 million pounds in 1993. In 1994 landings fell to 13 million pounds but increased in three consecutive years to 16.8 million pounds only to fall again to about 11 million pounds in 2002.

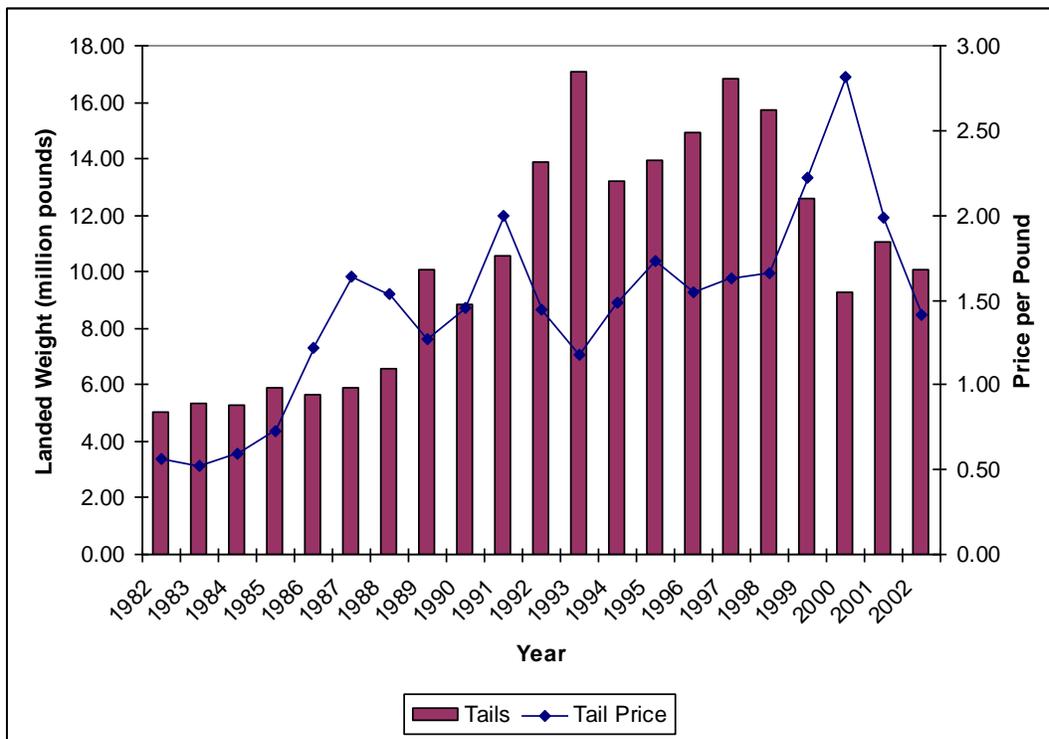


Figure 48 Landed weight and nominal price of monkfish tails 1982-2002

With the exception of 1993 total landings of livers increased in consecutive years from 1982 through 1997 (Figure 49). Since 1997 landings were stable in 1998 and 1999 but fell in 2002 to their lowest level since 1996.

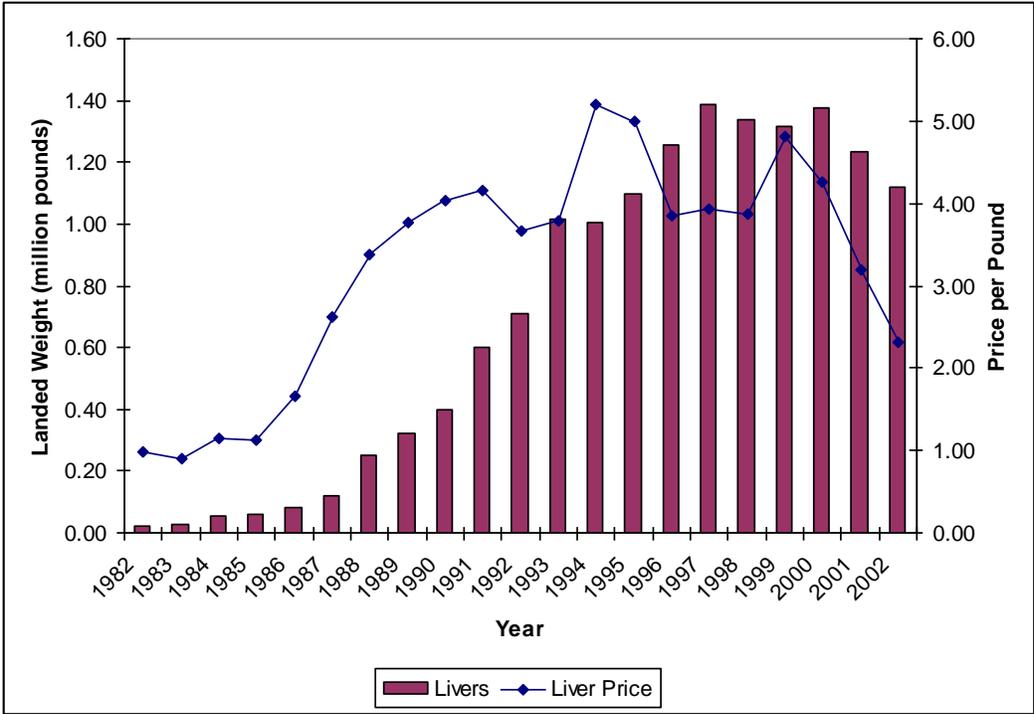


Figure 49 Landed weight and nominal price of monkfish livers, 1982-2002.

Unlike both tail and liver landings, whole monkfish landings increased in 2002 to a time series high of more than 18 million pounds (Figure 50). Whole monkfish landings were less than 2 million pounds annually through 1993 but jumped to between 7 and 12 million pounds from 1994 to 1998. Whole monkfish landings jumped again in 1999 to over 15 million pounds and has remained at that level, or above, ever since.



Figure 50 Landed weight and nominal price of whole monkfish, 1982-2002.

Up until 1999 revenues from tails represented at least 50% of total monkfish sales in the Northeast region but has been declining particularly since 1992 with the expansion of markets for whole fish (Figure 51). In fact, sales of whole fish represented more than half of gross revenues over the last three consecutive years. As a proportion of gross revenues the sale of livers has been relatively constant.

Monkfish tails are marketed in three different size classes; large (generally over 2 pounds and 15 inches), small from about ½ to 2 pounds and 12 to 15 inches), and peewee (less than ½ pounds and 12 inches) where the latter was first distinguished as a separate market category in 1991. In cases where market category cannot be identified, gross sales are reported as “unclassified.” As a proportion of gross revenue the peewee’s market category has never been more than 3% of total sales and has been less than one-tenth of one-percent since implementation of the monkfish FMP due to regulations (minimum size, trip limits and mesh size) that effectively eliminated the supply of peewee product (Figure 52). Given the higher price paid for larger tails, vessels operating under trip limits may select (highgrade) the largest fish to land. Sales of large tails has been at or just slightly above 50% of total tail revenue in every year since 1994 inclusive, while the proportion of sales in the small market category has been increasing over time. Note, however, that the proportion of unclassified monkfish tails has been steadily declining so the change in sales of small tails may be an artifact of a change in reporting rather than an actual change in marketing or landings of small monkfish tails.

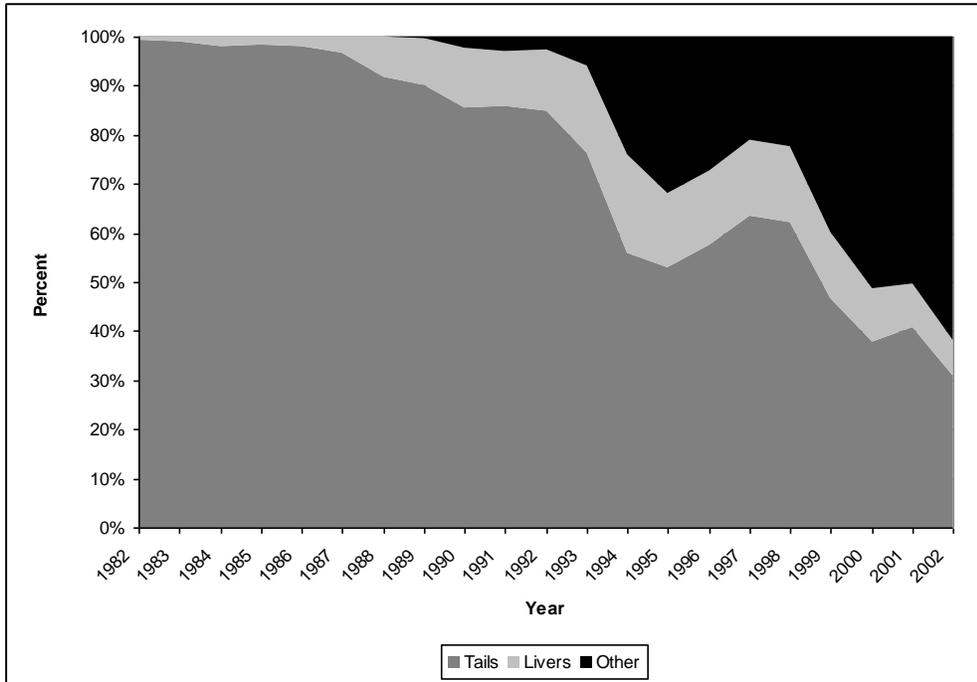


Figure 51 Monkfish landings percentages by product form, 1982-2002.

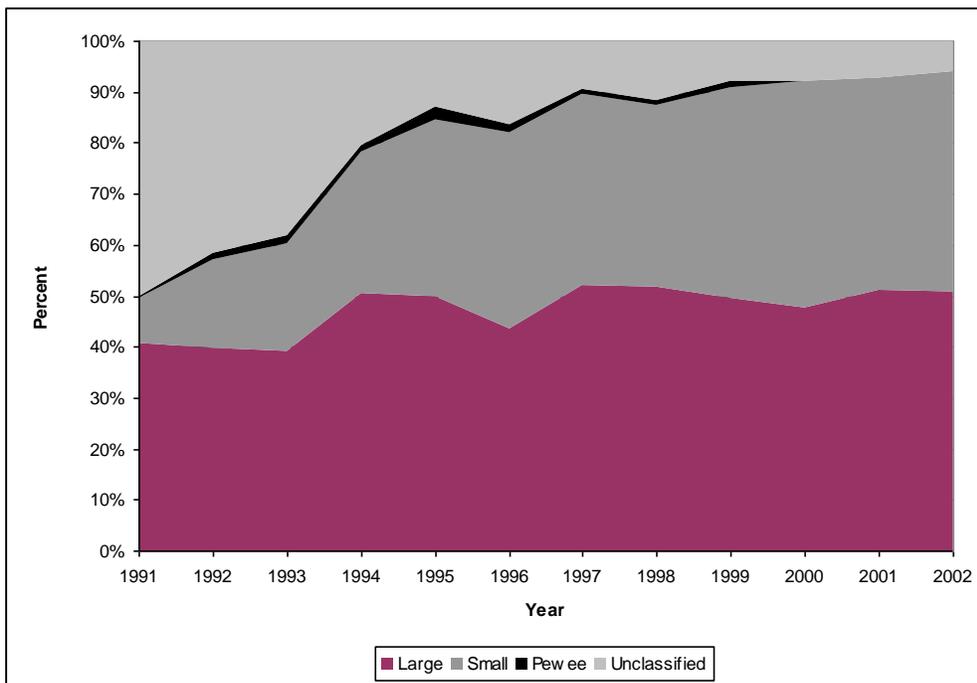


Figure 52 Monkfish landings by market size category, 1982-2002.

5.3.4.1.2 Dockside demand

Dockside prices for monkfish have increased substantially since the days when monkfish was an incidental catch. The nominal price for large tails averaged less than \$0.50 per pound from 1982 to 1985, ranged from \$1.02 to \$1.59 from 1986 to 1990 but averaged more than \$1.80 per pound

from 1991 to 2002 (Table 72). In real terms (i.e. inflation adjusted using the producer price index for unprocessed finfish, base year = 1982) large tail prices ranged from about \$0.80 per pound to \$1.15 per pound from 1986 to 2002 with peaks of \$1.51 and \$1.52 in 1991 and 2000 respectively (Table 73).

Nominal prices for livers reached \$5.00 per pound in 1994 and 1995 and averaged more than \$4.00 per pound from 1998 to 2000 but have fallen in 2002 to their lowest level since 1986. Real liver prices averaged about \$2.50 over the same time period but also fell in 2002 to levels that had not been observed since 1985.

Whole monkfish prices (nominal) averaged about \$0.80 per pound from 1989 to 1998 but have since increased by more than \$0.40 per pound since 1999, inclusive. However, inflation-adjusted whole monkfish prices for 1999 to 2002 averaged just \$0.20 above the longer term average of about \$0.50 per pound.

Year	Tails				Livers	Whole or Round	Cheeks	Belly Flaps
	Large	Small	Pewee	Unclassified				
1982	0.49	0.27	0.00	0.57	0.97	0.00	0.00	0.00
1983	0.46	0.24	0.00	0.55	0.90	0.00	0.00	0.00
1984	0.45	0.25	0.00	0.61	1.14	0.00	0.00	0.00
1985	0.60	0.37	0.00	0.74	1.12	0.00	0.00	0.00
1986	1.02	0.59	0.00	1.23	1.65	0.00	0.00	0.00
1987	1.59	0.83	0.00	1.62	2.62	0.00	0.00	0.00
1988	1.30	0.68	0.00	1.49	3.37	0.00	0.00	0.00
1989	1.55	0.65	0.00	1.18	3.77	0.99	0.00	0.00
1990	1.55	0.74	0.00	1.35	4.02	0.63	0.00	0.00
1991	2.06	1.24	0.51	1.90	4.16	0.64	1.83	0.00
1992	1.67	1.07	0.47	1.20	3.66	0.59	1.26	1.00
1993	1.52	0.86	0.40	0.82	3.80	0.93	0.73	0.00
1994	1.50	0.88	0.39	1.09	5.20	0.82	0.78	0.70
1995	1.70	1.25	0.60	1.26	4.99	0.96	0.70	1.10
1996	1.76	1.07	0.56	1.27	3.85	0.88	1.13	0.78
1997	1.72	1.15	0.74	1.41	3.93	0.83	0.87	1.07
1998	1.64	1.29	0.88	1.30	3.87	0.82	0.73	1.67
1999	2.07	1.87	0.84	1.48	4.80	1.24	0.99	1.43
2000	2.77	2.41	1.71	2.44	4.26	1.56	0.33	1.00
2001	2.12	1.59	0.89	1.69	3.20	1.34	0.42	1.40
2002	1.59	1.07	1.12	1.29	2.32	1.26	0.68	1.50

Table 72 Monkfish nominal price per pound by market category, 1982-2002

Year	Large	Small	Pewee	Unclassified	Livers	Whole or Round	Cheeks	Belly Flaps
1982	0.49	0.27	0.00	0.57	0.97	0.00	0.00	0.00
1983	0.48	0.25	0.00	0.58	0.94	0.00	0.00	0.00
1984	0.39	0.22	0.00	0.54	1.00	0.00	0.00	0.00
1985	0.49	0.31	0.00	0.61	0.92	0.00	0.00	0.00
1986	0.91	0.53	0.00	1.10	1.47	0.00	0.00	0.00
1987	1.10	0.57	0.00	1.12	1.80	0.00	0.00	0.00
1988	0.75	0.40	0.00	0.86	1.95	0.00	0.00	0.00
1989	1.15	0.48	0.00	0.87	2.79	0.73	0.00	0.00
1990	1.09	0.52	0.00	0.95	2.83	0.44	0.00	0.00
1991	1.51	0.91	0.37	1.40	3.05	0.47	1.34	0.00
1992	1.07	0.69	0.30	0.77	2.35	0.38	0.81	0.64
1993	0.89	0.51	0.23	0.48	2.24	0.55	0.43	0.00
1994	0.86	0.50	0.22	0.62	2.97	0.47	0.45	0.40
1995	0.99	0.72	0.35	0.73	2.89	0.56	0.41	0.64
1996	0.95	0.58	0.30	0.68	2.08	0.48	0.61	0.42
1997	1.04	0.69	0.44	0.85	2.37	0.50	0.52	0.64
1998	0.96	0.75	0.51	0.76	2.27	0.48	0.43	0.98
1999	1.08	0.97	0.44	0.77	2.51	0.64	0.52	0.75
2000	1.52	1.32	0.94	1.34	2.34	0.86	0.18	0.55
2001	1.20	0.90	0.51	0.96	1.81	0.76	0.24	0.79
2002	0.79	0.53	0.56	0.64	1.15	0.62	0.34	0.74

Table 73 Real monkfish price per pound by market category, 1982-2002,
(PPI for Unprocessed Finfish Base Year = 1982)

Dockside prices vary on a seasonal basis particularly for livers as the quality and value of the product varies over the year with the spawning cycle and international demand. Specifically, liver landings and prices peak during the late fall and winter months (October through February) (Figure 53). Note that implementation of the monkfish FMP in November, 1999 has had no apparent affect on the seasonal pattern of liver markets although prices did spike to over \$9.00 per pound in December, 1999. Although liver prices follow a distinct seasonal pattern there is no apparent relationship between prices (inflation-adjusted) and quantities supplied (Figure 54).

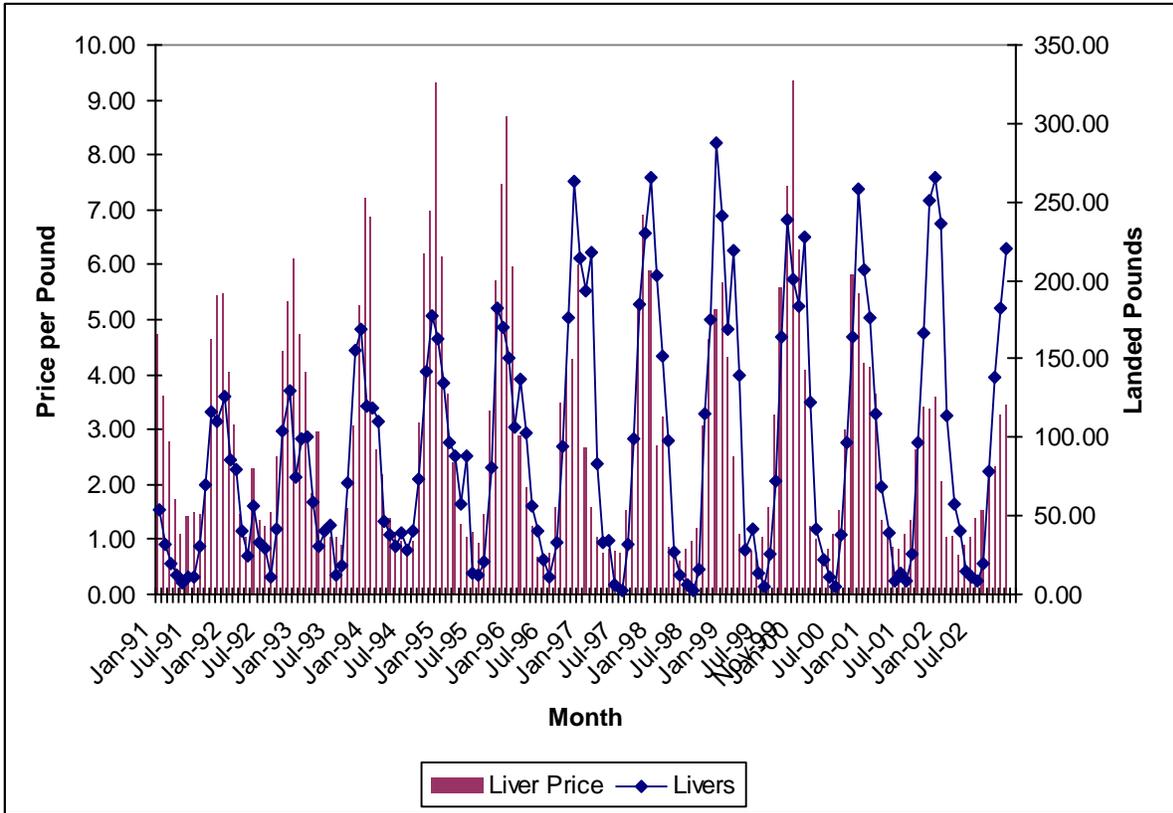


Figure 53 Seasonal pattern of liver landings and price, 1991 –2002.

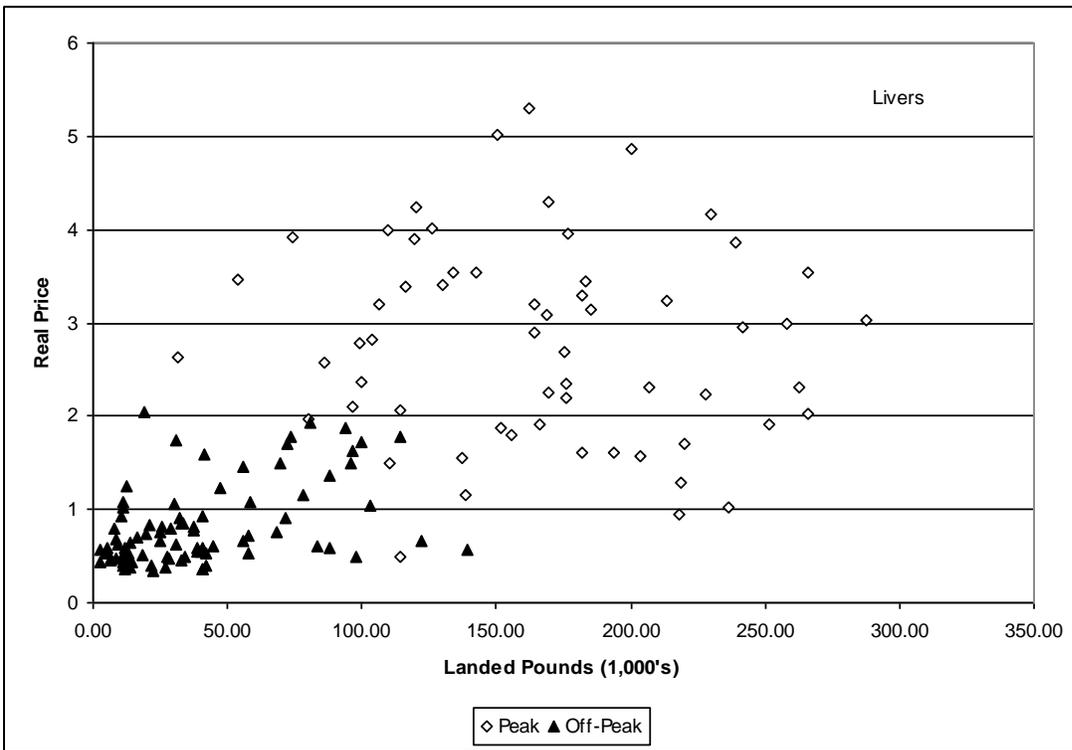


Figure 54 Liver price seasonality, and lack of price-to-quantity-landed relationship.

Prior to FMP implementation, landings of tails followed a bimodal seasonal cycle with landings peaking in June and picking up again October through January (Figure 55). The latter time period closely corresponds with the peak season for monkfish livers. Since plan implementation, this seasonal pattern has been disrupted and landings of tails have not yet returned the bimodal pattern exhibited in the past. Dockside prices for monkfish tails also exhibit no discernible inverse relationship between landed quantities and dockside prices adjusted for inflation, although there does appear to a modest upward shift in the post-FMP price-quantity relationship (Figure 56).

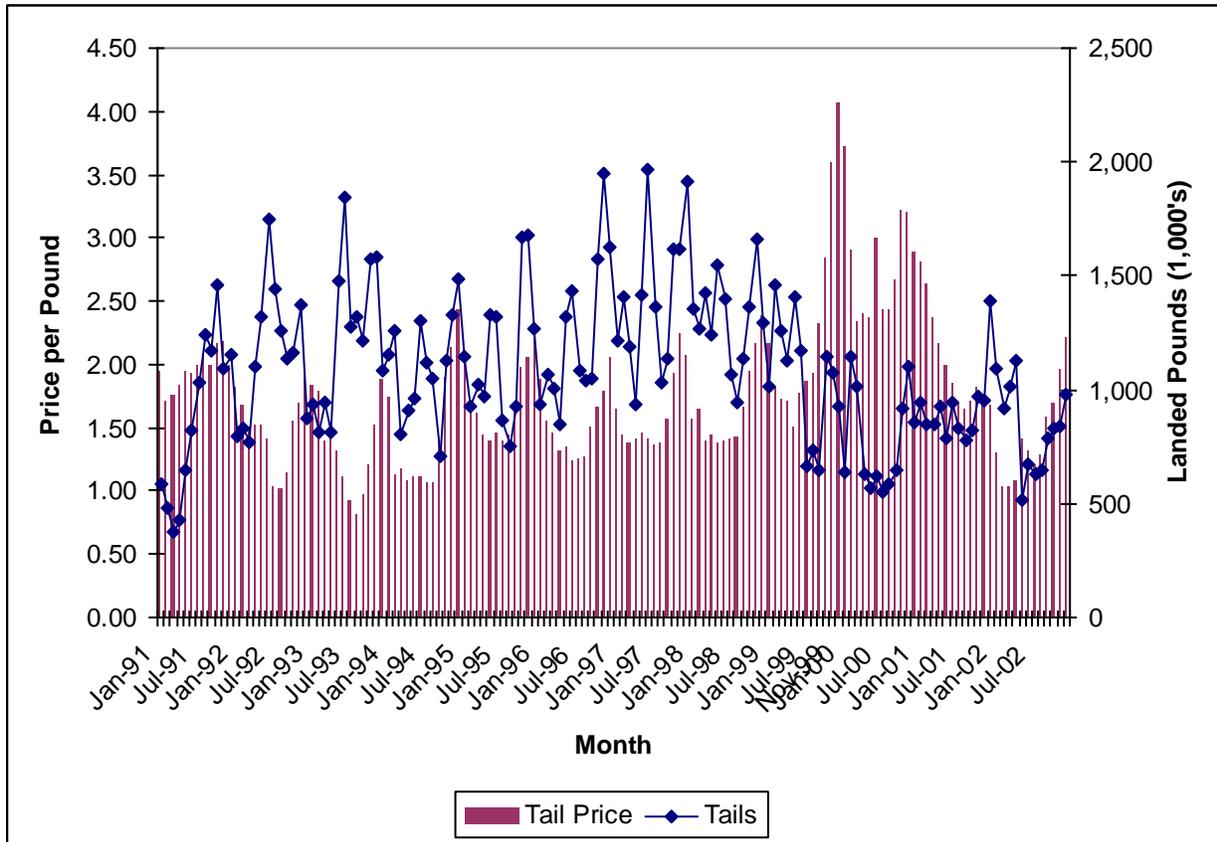


Figure 55 Seasonal pattern of monkfish tail landings and price, 1991 –2002

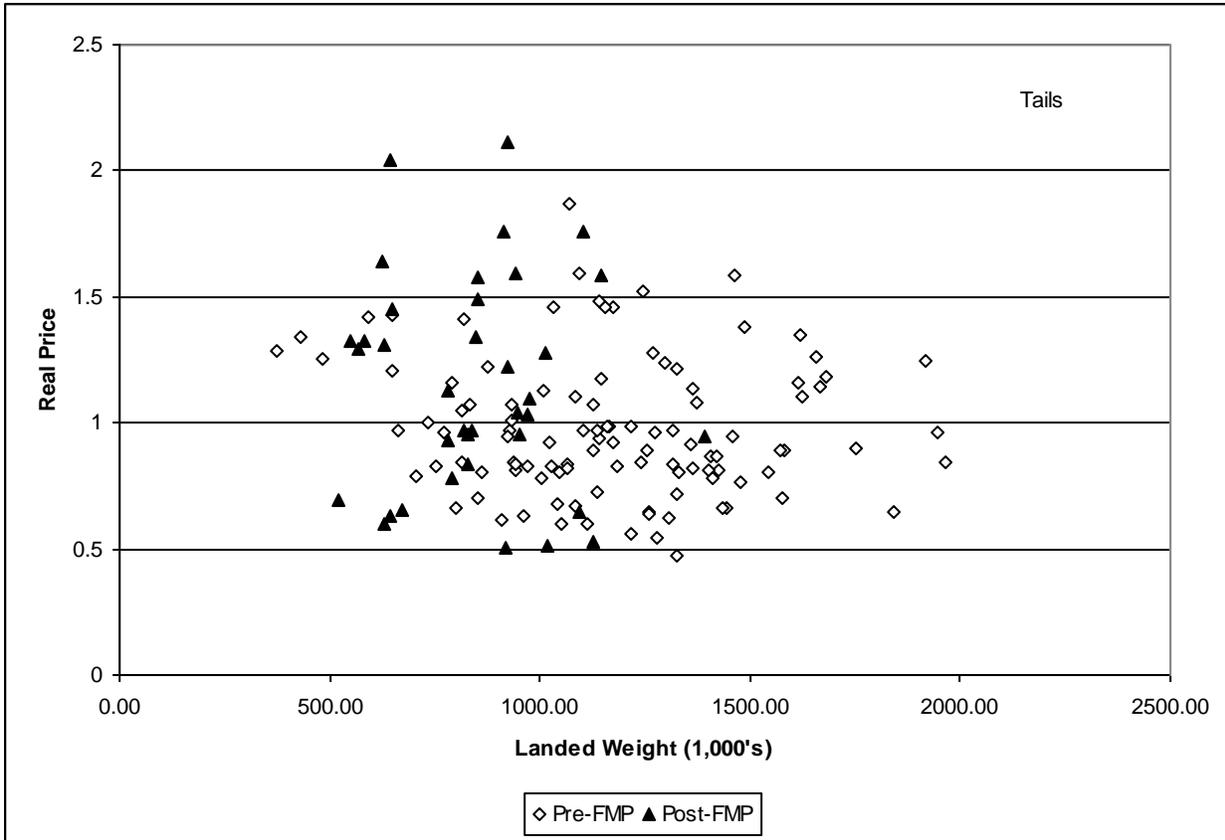


Figure 56 Lack of price-to-quantity landed relationship for monkfish tails.

The seasonal landings pattern for whole fish is similar to that of monkfish tails but the peaks and valleys are more distinct. Specifically, landings tend to increase steadily from February to a peak in May and June followed by a sharp drop-off through September (Figure 57). Whole monkfish landings increase after September through the rest of the year peaking in November, December and January. Dockside prices for whole monkfish follow no discernible seasonal pattern nor do they indicate any strong inverse relationship between landed quantities and inflation-adjusted prices (Figure 58). However, as noted for tails, there does appear to have been a general increase in prices since FMP implementation.

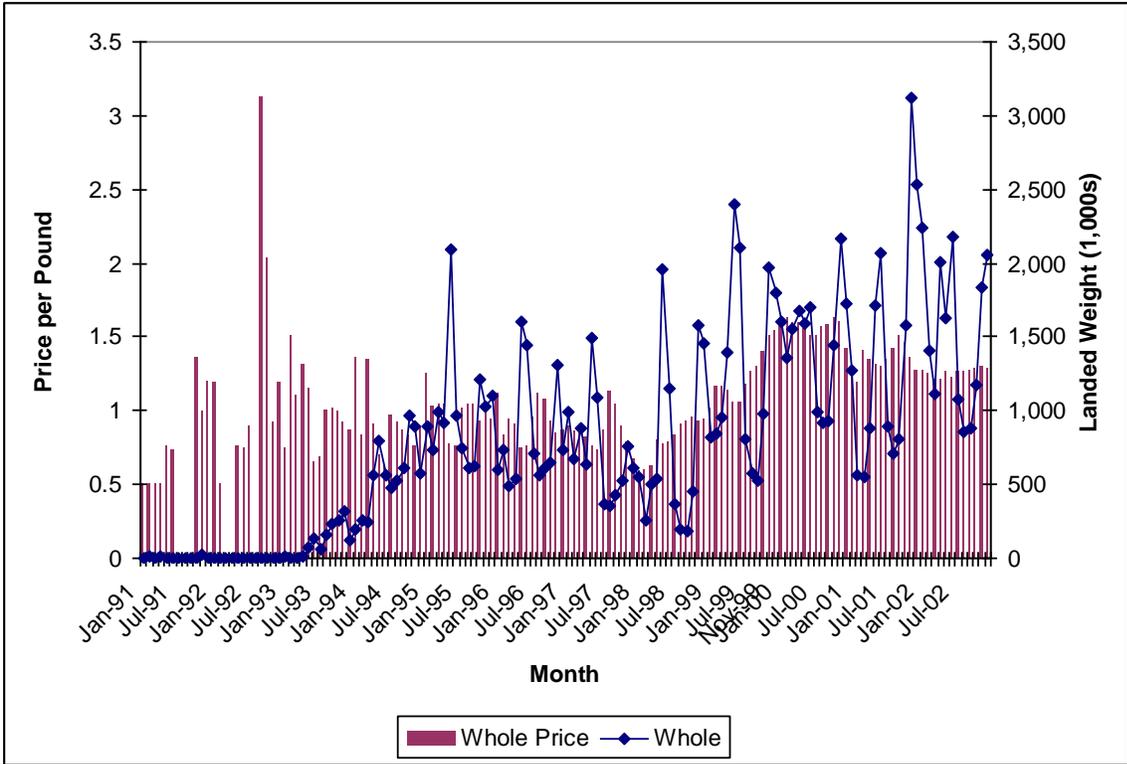


Figure 57 Seasonal pattern of whole monkfish landings and price, 1991 –2002

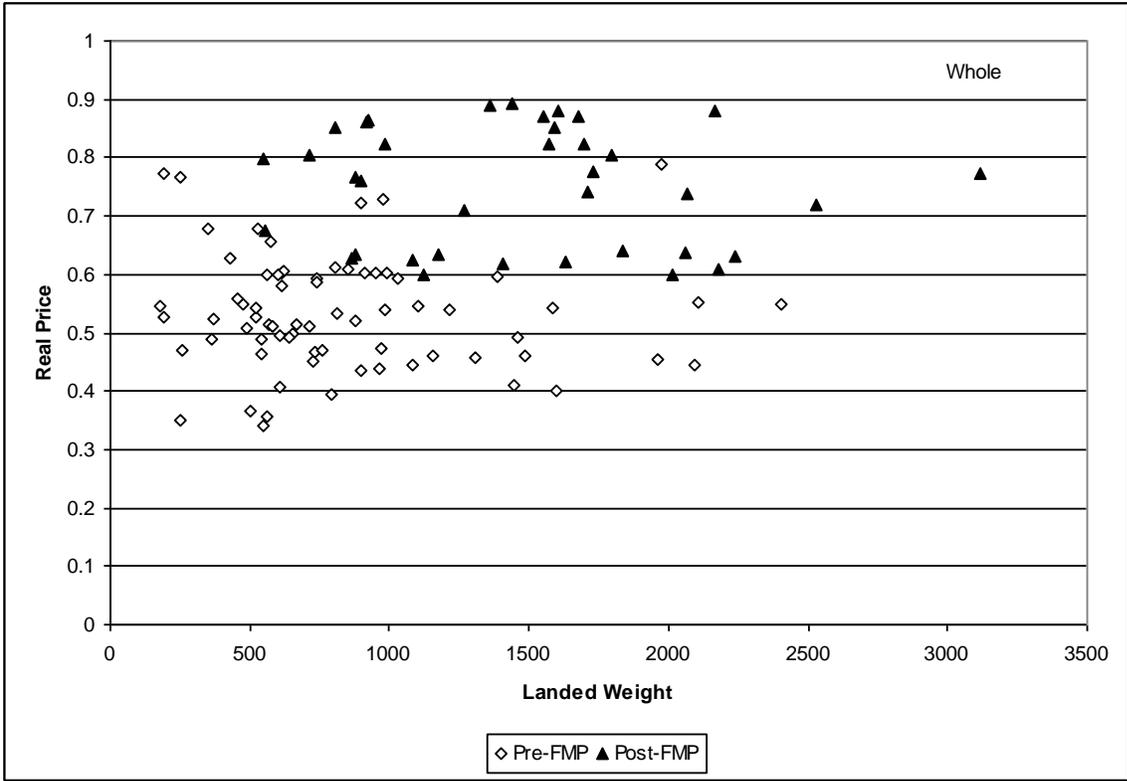


Figure 58 Lack of price-to-quantity landed relationship for whole monkfish.

5.3.4.2 Trade

Unlike many seafood products harvested by Northeast region commercial fishermen that are destined for domestic markets, most monkfish are exported. This means that U.S. monkfish markets compete with larger supplies in global markets where prices are determined primarily by factors that affect international demand in Europe and Asia. According to FAO statistics the global supply of monkfish rose from 67,000 MT in 1982 to 108,000 MT in 1996 with the majority coming from the Northeastern and Northwestern Atlantic (Figure 59). Among Northeast and Northwest Atlantic producers, the U.S. has been the world's largest producer of monkfish since 1992 followed by the United Kingdom and France (Figure 60).

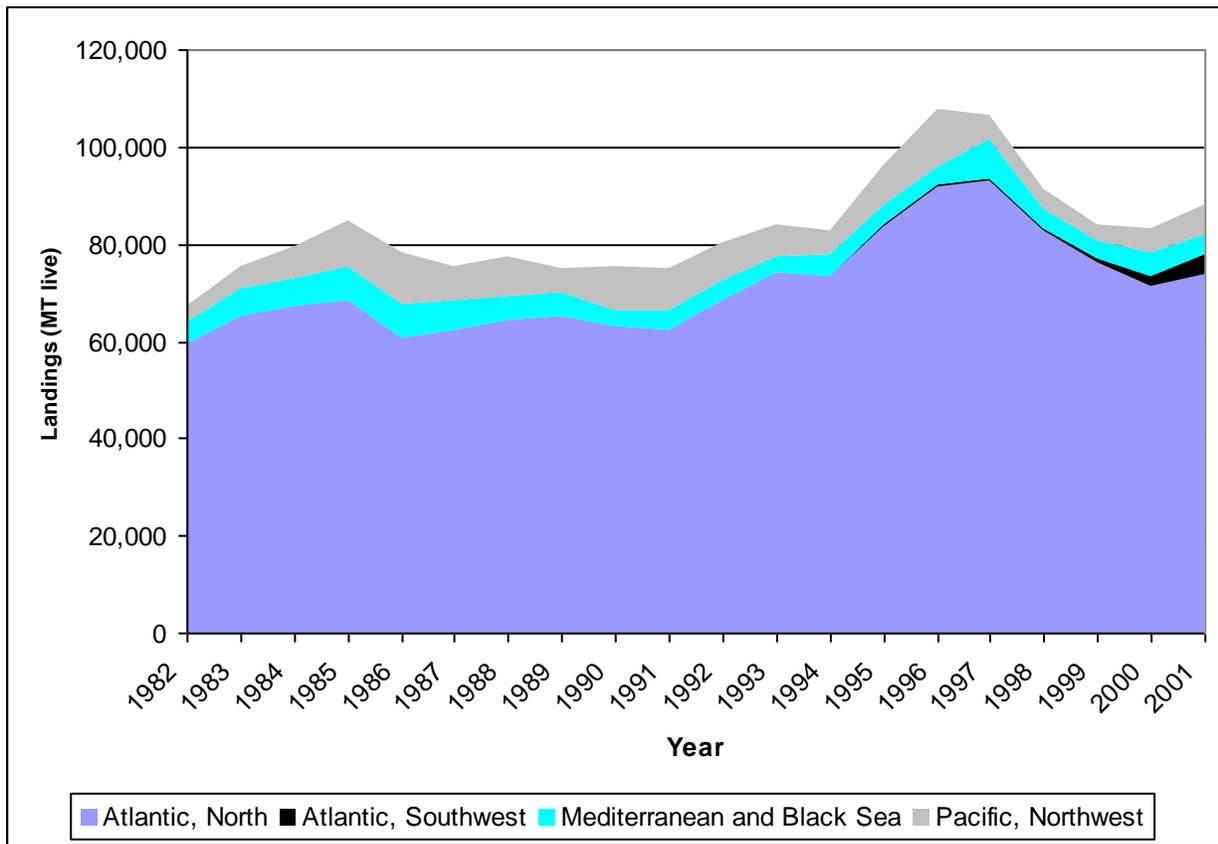


Figure 59 Regional sources of global market supply of monkfish (FAO)

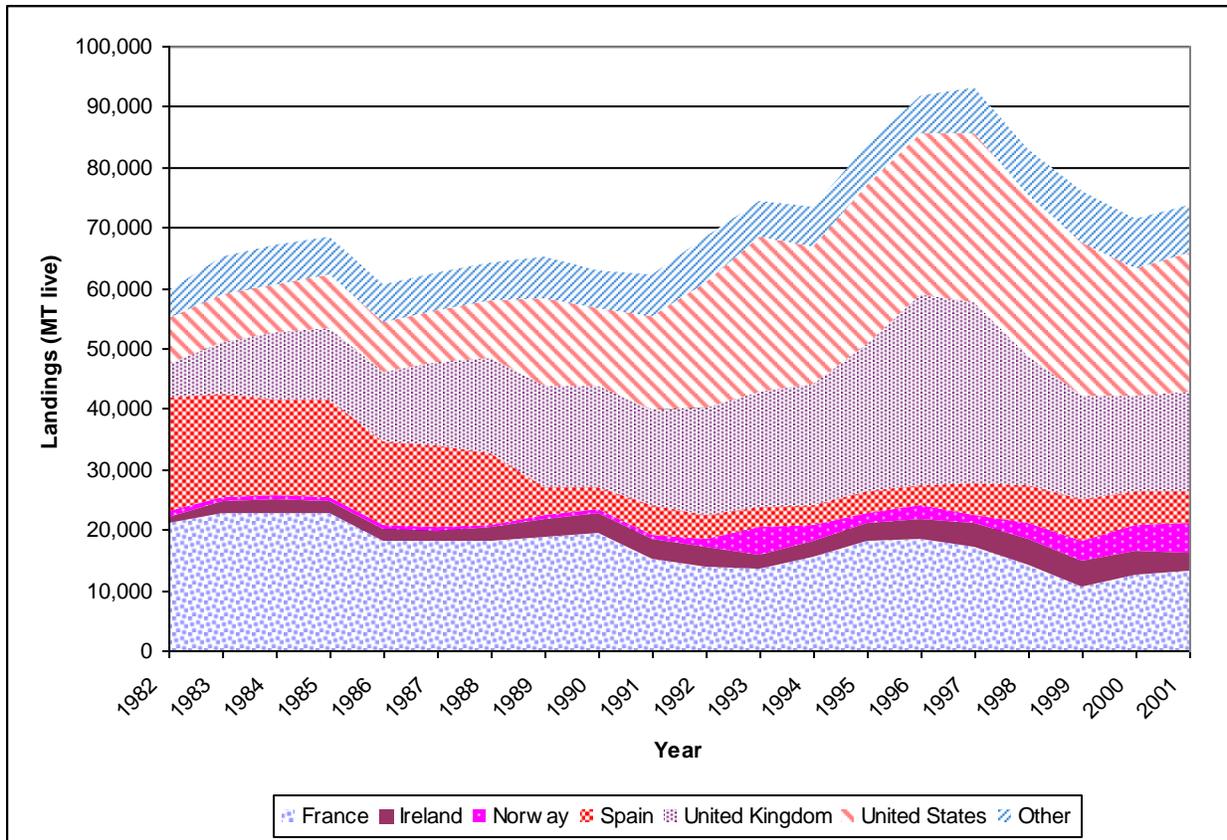


Figure 60 Northeast and Northwest Atlantic monkfish production by country, 1982-2002.

The United States exports monkfish products primarily to Europe and Asia as whole fish, tails, and filets. In addition, the livers are sold, primarily into Asian markets. Existing trade data is only available on a detailed species basis since 1995. These data may also omit trade volume for seafood that is not identified and include only fresh or frozen fish. This means that livers may not be included which would understate the value of trade particularly with Asian countries as most monkfish shipped to Europe is in the form of tails.

Whole fish are almost exclusively exported to South Korea and other Asian markets. Small tails, either whole or processed into filets, are shipped fresh or frozen, primarily to European markets. Large tails are sold domestically or exported to Europe (fresh or frozen, sometimes processed into filets), depending on the season. In general, the exporters of monkfish deal exclusively with one or the other region (Europe or Asia).

In 1995 the value of monkfish exports was over \$14 million, of which, the majority (\$12 million) was shipped to Europe (Figure 61). Export value increased to \$22 million in 1996 but fell in both 1997 and 1998. Since 1999, however, the value of U.S. exports of monkfish has risen steadily and was approximately \$41 million in 2002.

Since 1998 the quantity of monkfish going to Asian markets has increased while European exports have fallen to less than 20% of total value. Monkfish exports to Asia go almost exclusively to Japan and South Korea with the latter accounting for nearly 90% of total export

value in each of the past three years (Figure 62). European exports go mainly to France (50 to 60% of export value) with lesser quantities going to Portugal, Germany, the United Kingdom, the Netherlands, and Belgium (Figure 63).

The following tables (Table 74 and Table 75) show weights (in kilos) and value (nominal dollars) of monkfish exports by country and product form (fresh or frozen) for fishing years 1999 – 2002, as compiled by the U.S. Census Bureau and reported by NMFS Office of Science and Technology. **NOTE:** Since the reported weights are the actual weight of product being exported, and since product form (in terms of whole fish, tails, filets, livers) is not identified, the figures are not comparable to the landings figures reported in other sections of the document.

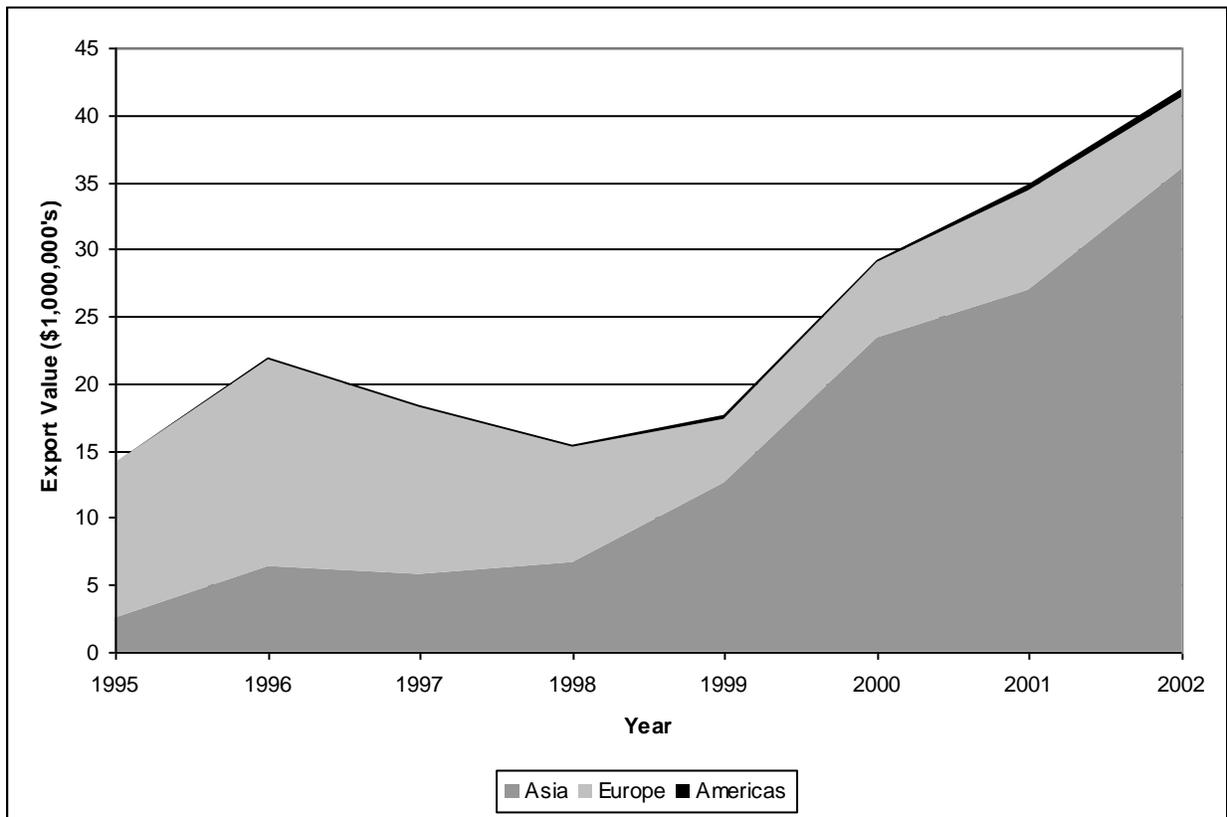


Figure 61 Monkfish exports by region, 1995-2002.

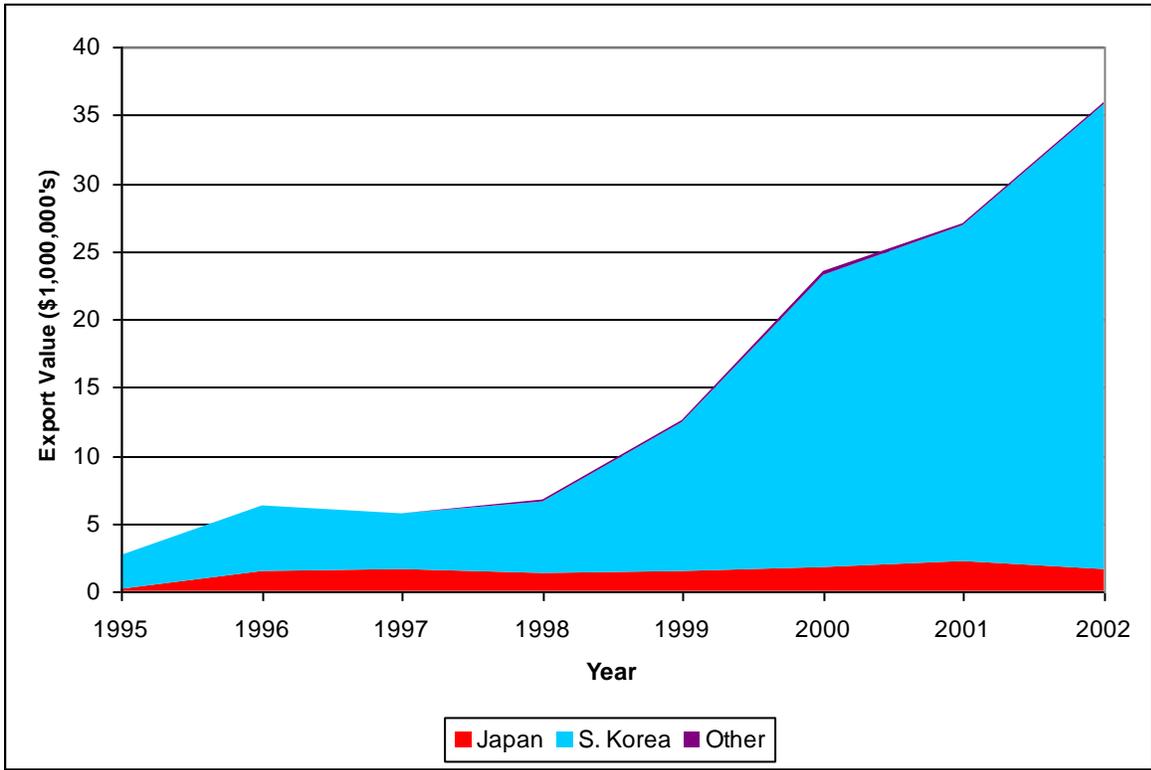


Figure 62 Monkfish exports to Asia, by country, 1995-2002

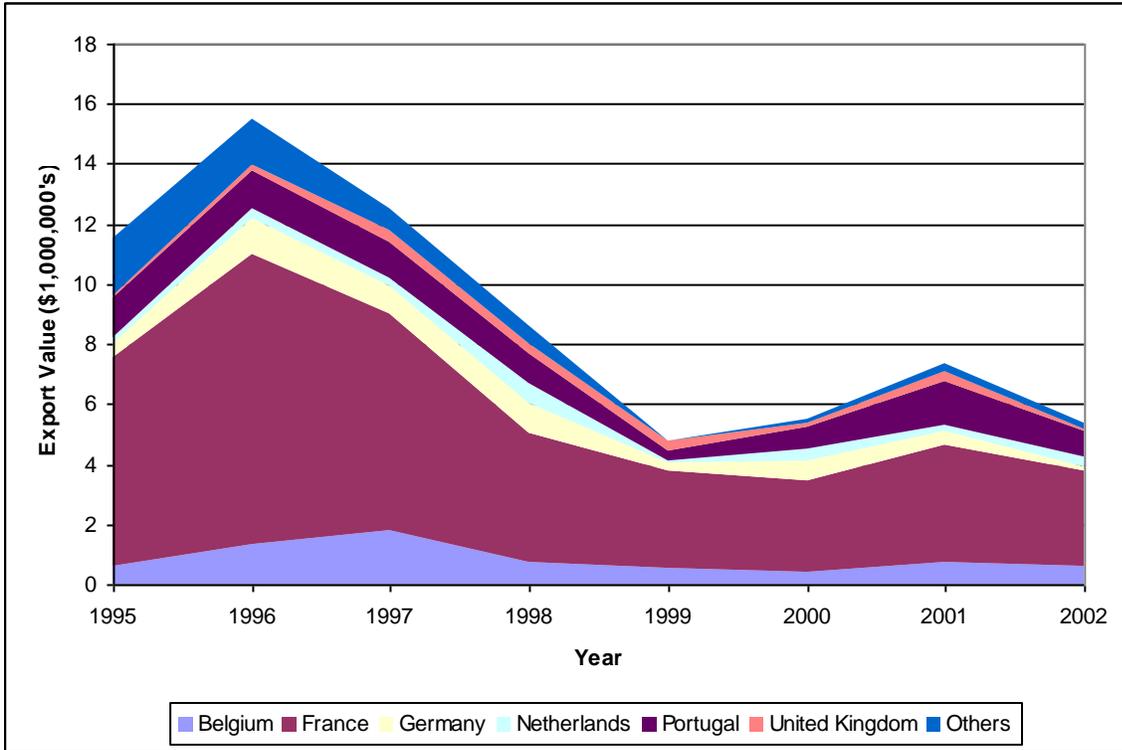


Figure 63 Monkfish exports to Europe, by country, 1995-2002

FY1999

Sum of KILOS COUNTRY	PRODUCT		Grand Total
	MONKFISH FRESH	MONKFISH FROZEN	
BELGIUM	37,386	81,772	119,158
CANADA	28,543		28,543
CHINA	1,807		1,807
CHINA - HONG KONG	5,174		5,174
CHINA - TAIPEI	2,569	26,815	29,384
FINLAND	642		642
FRANCE	99,586	530,054	629,640
GERMANY		145,409	145,409
GREECE	1,926		1,926
ITALY	1,400		1,400
JAPAN	281,184		281,184
MALAYSIA	7,095		7,095
MEXICO	6,963	2,497	9,460
PHILIPPINES	2,180		2,180
PORTUGAL		119,312	119,312
SINGAPORE	629	21,109	21,738
SOUTH KOREA	1,278,947	2,761,085	4,040,032
SWEDEN	644		644
UNITED KINGDOM		30,483	30,483
Grand Total	1,756,675	3,718,536	5,475,211

FY2000

Sum of KILOS COUNTRY	PRODUCT		Grand Total
	MONKFISH FRESH	MONKFISH FROZEN	
BELGIUM		86,502	86,502
CANADA	48,852	827	49,679
CHINA - HONG KONG	386		386
CHINA - TAIPEI	728		728
COSTA RICA	1,401		1,401
FRANCE	99,305	632,597	731,902
GERMANY	12,995	107,373	120,368
ITALY		103,788	103,788
JAPAN	247,520	6,914	254,434
NETHERLANDS	40,235		40,235
PANAMA	7,128		7,128
PHILIPPINES		35,899	35,899
PORTUGAL	13,610	218,007	231,617
SINGAPORE		37,210	37,210
SOUTH KOREA	1,836,666	2,924,933	4,761,599
SPAIN		10,108	10,108
SWEDEN	1,111		1,111
UNITED KINGDOM		128,853	128,853
VENEZUELA	5,721		5,721
Grand Total	2,315,658	4,293,011	6,608,669

Table 74 Weight (kilos) of monkfish exports by Country and Product form (fresh/frozen)

FY2001

Sum of KILOS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	28,964	83,051	112,015
CANADA	118,563		118,563
CHINA		3,181	3,181
CHINA - HONG KONG	1,036		1,036
FRANCE	294,145	505,670	799,815
GERMANY		131,083	131,083
INDONESIA		12,524	12,524
ITALY	4,203		4,203
JAPAN	240,380	176,444	416,824
MALTA	21,828	12,000	33,828
NETHERLANDS	3,430	20,000	23,430
PORTUGAL	22,004	213,770	235,774
SOUTH KOREA	1,802,825	5,853,082	7,655,907
UNITED KINGDOM	12,636	32,023	44,659
Grand Total	2,550,014	7,042,828	9,592,842

FY2002

Sum of KILOS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	1,983	75,432	77,415
CANADA	105,054		105,054
CAYMAN IS.	2,631		2,631
CHINA		102,840	102,840
CHINA - TAIPEI	147		147
FALKLAND IS.	840		840
FRANCE	565,462	345,788	911,250
GERMANY		64,818	64,818
ITALY	11,937	27,900	39,837
JAPAN	146,592	210,695	357,287
KENYA	1,357		1,357
NETHERLANDS	105,250		105,250
PORTUGAL	150,034	114,280	264,314
SOUTH KOREA	1,201,680	6,783,493	7,985,173
SPAIN	1,170		1,170
UNITED KINGDOM	516	11,110	11,626
Grand Total	2,294,653	7,736,356	10,031,009

Table 74 Weight (kilos) of monkfish exports by Country and Product form (fresh/frozen)

FY1999

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	\$266,015	\$429,556	\$695,571
CANADA	\$155,439		\$155,439
CHINA	\$8,870		\$8,870
CHINA - HONG KONG	\$32,396		\$32,396
CHINA - TAIPEI	\$10,271	\$56,750	\$67,021
FINLAND	\$2,930		\$2,930
FRANCE	\$758,134	\$1,997,199	\$2,755,333
GERMANY		\$519,142	\$519,142
GREECE	\$10,615		\$10,615
ITALY	\$13,700		\$13,700
JAPAN	\$1,759,835		\$1,759,835
MALAYSIA	\$48,531		\$48,531
MEXICO	\$22,303	\$21,686	\$43,989
PHILIPPINES	\$19,400		\$19,400
PORTUGAL		\$357,231	\$357,231
SINGAPORE	\$3,326	\$71,400	\$74,726
SOUTH KOREA	\$5,481,306	\$9,974,549	\$15,455,855
SWEDEN	\$3,548		\$3,548
UNITED KINGDOM		\$100,616	\$100,616
Grand Total	\$8,596,619	\$13,528,129	\$22,124,748

FY2000

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM		\$711,082	\$711,082
CANADA	\$292,696	\$2,683	\$295,379
CHINA - HONG KONG	\$5,156		\$5,156
CHINA - TAIPEI	\$6,022		\$6,022
COSTA RICA	\$9,849		\$9,849
FRANCE	\$955,328	\$2,907,548	\$3,862,876
GERMANY	\$132,415	\$336,682	\$469,097
ITALY		\$373,229	\$373,229
JAPAN	\$1,794,718	\$26,018	\$1,820,736
NETHERLANDS	\$412,686		\$412,686
PANAMA	\$14,252		\$14,252
PHILIPPINES		\$75,975	\$75,975
PORTUGAL	\$100,310	\$1,232,020	\$1,332,330
SINGAPORE		\$29,768	\$29,768
SOUTH KOREA	\$7,590,832	\$12,842,760	\$20,433,592
SPAIN		\$21,392	\$21,392
SWEDEN	\$7,075		\$7,075
UNITED KINGDOM		\$339,299	\$339,299
VENEZUELA	\$14,318		\$14,318
Grand Total	\$11,335,657	\$18,898,456	\$30,234,113

Table 75 Nominal value of monkfish exports by country and product form (fresh/frozen)

FY2001

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	\$310,880	\$333,133	\$644,013
CANADA	\$597,933		\$597,933
CHINA		\$6,731	\$6,731
CHINA - HONG KONG	\$6,104		\$6,104
FRANCE	\$1,517,641	\$1,697,407	\$3,215,048
GERMANY		\$351,990	\$351,990
INDONESIA		\$82,233	\$82,233
ITALY	\$31,333		\$31,333
JAPAN	\$1,639,942	\$373,422	\$2,013,364
MALTA	\$82,954	\$15,000	\$97,954
NETHERLANDS	\$28,024	\$173,000	\$201,024
PORTUGAL	\$179,491	\$966,731	\$1,146,222
SOUTH KOREA	\$7,007,352	\$23,990,124	\$30,997,476
UNITED KINGDOM	\$29,706	\$72,944	\$102,650
Grand Total	\$11,431,360	\$28,062,715	\$39,494,075

FY2002

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	\$18,808	\$295,576	\$314,384
CANADA	\$548,715		\$548,715
CAYMAN IS.	\$17,996		\$17,996
CHINA		\$222,522	\$222,522
CHINA - TAIPEI	\$3,549		\$3,549
FALKLAND IS.	\$5,000		\$5,000
FRANCE	\$3,346,713	\$1,089,530	\$4,436,243
GERMANY		\$225,008	\$225,008
ITALY	\$72,416	\$112,647	\$185,063
JAPAN	\$958,392	\$448,676	\$1,407,068
KENYA	\$10,500		\$10,500
NETHERLANDS	\$652,547		\$652,547
PORTUGAL	\$300,000	\$556,098	\$856,098
SOUTH KOREA	\$4,564,873	\$26,776,716	\$31,341,589
SPAIN	\$11,227		\$11,227
UNITED KINGDOM	\$3,519	\$44,075	\$47,594
Grand Total	\$10,514,255	\$29,770,848	\$40,285,103

Table 75 Nominal value of monkfish exports by country and product form (fresh/frozen)

5.3.5 Bycatch

Monkfish is caught and landed both as the result of directed effort and as incidental catch in a number of other fisheries, particularly those using trawls, gillnets and scallop dredges. As noted in Section 5.3.1.1, monkfish limited access permit holders also hold permits in a number of other fisheries, and the number of trips landing monkfish as a component of a mixed catch far exceed the number of trips where monkfish is the dominant species. In general about 80 percent of the trips landing monkfish only account for about 20 percent of the total landings. In the NFMA, monkfish is primarily integrated with the multispecies fishery, while in the SFMA vessels fishing for scallops, dogfish, summer flounder, skates, squid, scup as well as multispecies, all land some amount of monkfish.

Monkfish landings and revenues as a percentage of total landings and revenues on vessels with a monkfish permit (limited and open access) are discussed in Section 5.3.2.2.3. The data presented there, particularly in Table 53 and Table 54, show the relative importance of monkfish and other species on vessels landing monkfish, and illustrate the wide variety of species with which monkfish is associated in the commercial catch. As a result of this intermixing of species and fisheries, the bycatch discussion is divided into three sections: bycatch of monkfish in directed monkfish fisheries, bycatch of other species in directed monkfish fisheries, and bycatch of monkfish in fisheries not targeting monkfish.

Information on bycatch is derived from VTR data and the observer program. Generally, VTR data, which is supplied by the vessel operator, is considered unreliable because of widely varying levels of compliance, non-standard methods for estimating discards, and other sources of error. The observer database, while providing precise estimates for those trips that are covered, does not comprise sufficiently large samples of trips across fisheries, gears, areas and seasons to make reliable estimates of discards fishery-wide. Nevertheless, the observer data does provide some insight into the types of discards occurring and the reasons for those discards (as the vessel operator tells the observer).

5.3.5.1 Bycatch of monkfish in directed monkfish fisheries

The degree of monkfish discards in the directed fishery, and the reasons for those discards vary with gear and area. For the purpose of this discussion, all trips that landed more than 400 lbs./DAS (landed weights) of monkfish are considered because the observer database does not specify whether landings are in tails or whole fish. There is no regulatory basis for designating a trip as “directed”, and there is no other objective criterion for selecting a specific threshold for “directed” trips given the wide range of vessel sizes and landings. Consequently, the results give a relative snapshot, not the absolute amount of bycatch in “directed” fisheries. Some scallop dredge trips are included under the “directed” fishery, even though they are operating under a 300 lb./DAS (tails) incidental catch limit. On a percentage basis, the scallop dredge fishery has the highest discard ratio, primarily due to the minimum size regulations (Table 76 and Table 77). The gillnet fishery has a low occurrence of monkfish discards while the trawl fishery has a moderate but highly variable occurrence, again with the primary reason being “too small”. SAW 34 also noted that the major reason for discarding was quality (gillnet) and size (both for market and regulations in the other fisheries). Since incidental catch limits, or trip limits are not a major

reason for monkfish discards, it is valid to group observations in both management areas in this discussion.

	Gear	# trips	Monk Caught Lbs.	Monk Discarded Lbs.	Monk Discard as % of Monkfish Catch	Monk Discarded Too Small Lbs.	Monk Discarded too small as % of Monkfish Discards
North							
2001	Gillnet > 10 "	20	17,583	1,661	9%	20	1%
	Gillnet < 10 "	11	1,341	24	2%	24	100%
	Trawl	13	57,867	11,208	19%	11,098	99%
	Scallop	<3	108	66	61%	59	89%
2002	Gillnet > 10 "	87	117,900	2,699	2%	50	2%
	Gillnet < 10 "	43	18,026	524	3%	369	70%
	Trawl	103	604,614	66,450	11%	47,007	71%
	Scallop	7	10,213	3,862	38%	3,684	95%
South							
2001	Gillnet > 10 "	16	27,068	1,029	4%	69	7%
	Gillnet < 10 "	<3	0	0	0%	0	0%
	Trawl	0	-	-	NA	-	NA
	Scallop	5	10,146	3,481	34%	2,178	63%
2002	Gillnet > 10 "	67	161,728	772	0%	0	0%
	Gillnet < 10 "	0	-	-	NA	-	NA
	Trawl	14	8,929	2,699	30%	1,975	73%
	Scallop	6	22,400	8,053	36%	5,463	68%

Table 76 Monkfish discards on trips landing >400 lbs. of monkfish, observer data 2001 and 2002, showing the impact of the minimum size regulation or market cull.

North				South			
Dredge	Kept (mt)	Discard (mt)	Disc Ratio	Dredge	Kept (mt)	Discard (mt)	Disc Ratio
1996	4.46	1.43	0.32	1996	36.51	8.50	0.23
1997	9.64	1.51	0.16	1997	32.92	8.51	0.26
1998	6.40	0.36	0.06	1998	26.45	1.45	0.05
1999	0.63	0.07	0.11	1999	10.24	2.70	0.26
2000	0.19	0.03	0.15	2000	18.23	4.48	0.25
2001	0.05	0.03	0.61	2001	4.60	1.58	0.34
2002	4.63	1.75	0.38	2002	10.16	3.65	0.36
Average	3.71	0.74	0.25	Average	19.87	4.41	0.25
Gillnet	Kept (mt)	Discard (mt)	Disc Ratio	Gillnet	Kept (mt)	Discard (mt)	Disc Ratio
1996	4.06	0.55	0.14	1996	45.98	3.15	0.07
1997	3.20	0.35	0.11	1997	111.34	6.40	0.06
1998	5.91	0.24	0.04	1998	83.01	6.56	0.08
1999	7.06	0.16	0.02	1999	14.69	0.77	0.05
2000	19.01	1.35	0.07	2000	19.70	1.60	0.08
2001	8.58	0.76	0.09	2001	12.28	0.47	0.04
2002	61	1.00	0.02	2002	73.35	0.35	0.00
Average	15.52	0.63	0.07	Average	51.48	2.76	0.05
Trawl	Kept (mt)	Discard (mt)	Disc Ratio	Trawl	Kept (mt)	Discard (mt)	Disc Ratio
1996	41.88	8.02	0.19	1996	14.75	1.87	0.13
1997	35.20	3.28	0.09	1997	80.40	3.52	0.04
1998	6.81	0.78	0.11	1998	7.25	0.56	0.08
1999	16.73	1.18	0.07	1999	18.56	1.74	0.09
2000	114.10	9.13	0.08	2000	14.41	3.76	0.26
2001	26.24	5.08	0.19	2001	0.00	0.00	0.00
2002	274.20	30.14	0.11	2002	4.05	1.22	0.30
Average	73.60	8.23	0.12	Average	19.92	1.81	0.13

Table 77 SAW 34 observer data summary of discards (from tables C7 and C8) for 1996-2000, updated with observer data from 2001 and 2002 on trips landing >400 lbs of monkfish.

5.3.5.2 Bycatch of other species in the directed monkfish fishery

The bycatch of other species on monkfish trips landing more than 400 pounds of monkfish in 2001 and 2002 is shown in Table 78. Note that the number of trips observed is relatively small and variable by gear and area, although increased coverage in 2002 is evident, and, therefore, these results cannot be quantitatively expanded to describe the entire monkfish fishery. Nevertheless, a few obvious conclusions can be made, particularly that the overall rate of discards appears to be highest in trawl gear and lowest in large mesh gillnet fisheries. Winter skates and dogfish are the predominant species discarded in the NFMA, and winter and thorny skates, as well as dogfish are discarded in the SFMA.

In both trawl and gillnet fisheries, the reasons for discards (as the operator informed the observer) is “no market, reason not specified”, at 65 and 56 percent, respectively. In the trawl fishery, the next most apparent reason is “too small”, either due to no market or minimum size regulation. Regulations prohibiting retention, either outright or due to quota, comprise the next most significant reason. In the gillnet fishery, quota restrictions are the second most important reason, followed by “poor quality, sand flea damage” and “too small”.

North											
2001											
Gear	# trips	Total Catch	Total Discards	Total Discard %	Percent of discards						
					MONKFISH	SKATE, WINTER	SKATE, THORNY	DOGFISH	LOBSTER	COD	CRAB, JONAH
Gillnet > 10 "	20	38,155	8,393	22	20	29	6	21	4	2	2
Gillnet < 10 "	11	18,994	4,262	22	1	1	2	60	3	12	2
Trawl	13	253,364	62,820	25	18	11	0	10	6	1	19
Scallop	<3	10,485	2,703	26	2	2	-	-	-	-	-
2002											
Gillnet > 10 "	87	204,908	16,989	8	8	55	3	9	3	3	6
Gillnet < 10 "	43	75,692	9,965	13	5	3	2	49	4	10	1
Trawl	103	4,182,331	1,340,904	32	5	19	4	10	2	1	3
Scallop	4	457,300	32,905	7	12	16	-	-	-	-	-
South											
2001											
Gear	# trips	Total Catch	Total Discards	Total Discard %	Percent of discards						
					MONKFISH	SKATE, WINTER	SKATE, THORNY	DOGFISH	BASS, STRIPED	WEAK-FISH	
Gillnet > 10 "	16	34,916	3,376	10	30	18	14	11	-	-	-
Gillnet < 10 "	<3	944	365	39	-	-	8	-	68	-	8
Trawl	0	-	-	-	-	-	-	-	-	-	-
Scallop	5	351,342	54,970	16	6	32	3	0	-	-	-
2002											
Gillnet > 10 "	67	182,061	2,969	2	26	3	4	7	-	-	-
Gillnet < 10 "	0	-	-	-	-	-	-	-	-	-	-
Trawl	14	194,097	89,614	46	3	5	16	17	-	-	-
Scallop	6	674,142	81,762	12	10	11	25	-	-	-	-

Table 78 Observed bycatch of other species on trips landing >400 lbs. of monkfish in 2001 and 2002. Only species exceeding 1 percent of discards are shown (do not = 100%).

	%
Trawl	
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	1.04
OTHER, DISCARDED	2.12
NO MARKET, QUOTA FILLED	2.31
REGULATIONS PROHIBIT ANY RETENTION.	2.42
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	4.72
REGULATIONS PROHIBIT RETENTION, TOO SMALL	5.86
NO MARKET, TOO SMALL	14.27
NO MARKET, REASON NOT SPECIFIED.	64.96
Gillnet	
RETAINING ONLY CERTAIN SIZE BETTER PRICE TRIP QUOTA IN EFFECT.	1.09
POOR QUALITY, SHARK DAMAGE	1.11
OTHER, DISCARDED	1.46
REGULATIONS PROHIBIT RETENTION , WITH EGGS.	1.83
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	2.21
REGULATIONS PROHIBIT RETENTION, TOO SMALL	2.93
POOR QUALITY, REASON NOT SPECIFIED	3.81
NO MARKET, TOO SMALL	4.17
POOR QUALITY, SANDFLEA DAMAGE	5.13
REGULATIONS PROHIBIT RETENTION, NO QUOTA IN AREA.	6.24
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	12.40
NO MARKET, REASON NOT SPECIFIED.	55.56

Table 79 Reasons given to observers for discards of other species in trips landing >400 lbs. of monkfish.

5.3.5.2.1 Bycatch of red crab in directed monkfish fisheries

While red crab bycatch is a potential issue in deepwater monkfish fisheries due to their apparent co-location, observer data and commercial catch data do not show any bycatch, however, this

may be due to lack of coverage or reporting. The Red crab FMP identified the bycatch of red crabs in the offshore monkfish fishery as a potential concern. Based on data from the 1974 NMFS bottom trawl survey (the survey used for the red crab assessment), 33 tows caught 1,436 red crabs (630 females and 806 males). The average water depth of the tows that caught red crabs from the NMFS bottom trawl survey was approximately 565 meters. Figure 64 shows the locations where red crabs were caught in the survey. Monkfish otter trawl effort from the vessel trip report database has been added to the figure to show where there is potential overlap. While it would be more appropriate to compare effort and location of red crab from the same year, there is no effort data available from 1974, and there is no red crab location data available for 1999.

There is one source of more recent data from the F/V Mary K, which was involved in a cooperative NMFS/ industry monkfish survey in the Spring of 2001. In that survey, approximately 6,900 red crabs were caught in 24 tows (about 1800 females, and 5100 males) out of 53 tows at depths ranging from 115 m to 700 m (See Figure 65). The average water depth of the tows that caught red crabs was approximately 400 meters.

Some anecdotal reports suggest that bycatch levels of red crab may be quite high occasionally, and that the mortality of red crabs caught may be high as well. In order to determine this for sure, we need more information on the level of bycatch from this fishery, the mortality of red crab bycatch, and the sex and size distributions of the red crab bycatch.

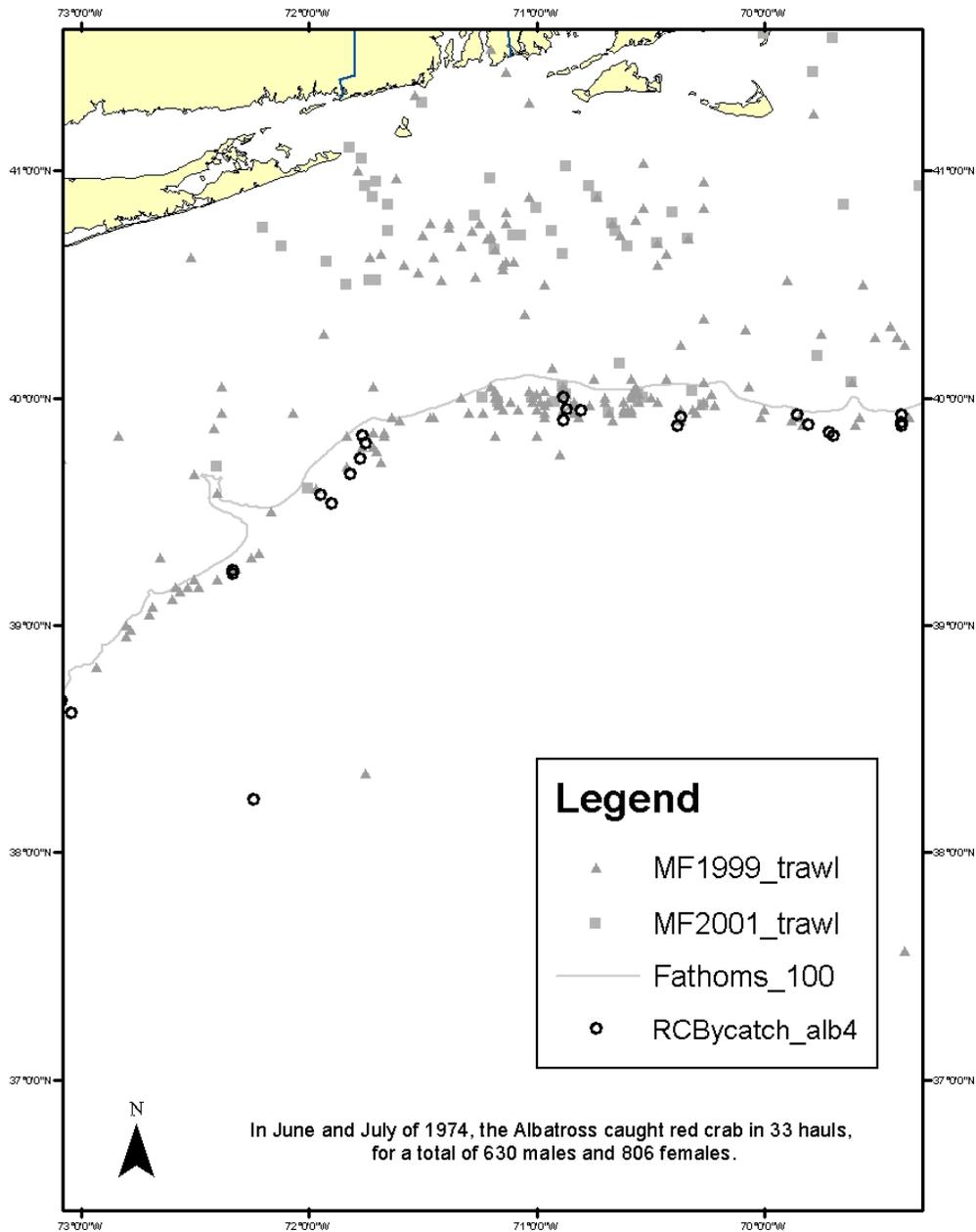


Figure 64 Display of where red crab was caught in 1974 on the Albatross survey as well as directed offshore monkfish trawl effort from fishing years 1999 and 2001

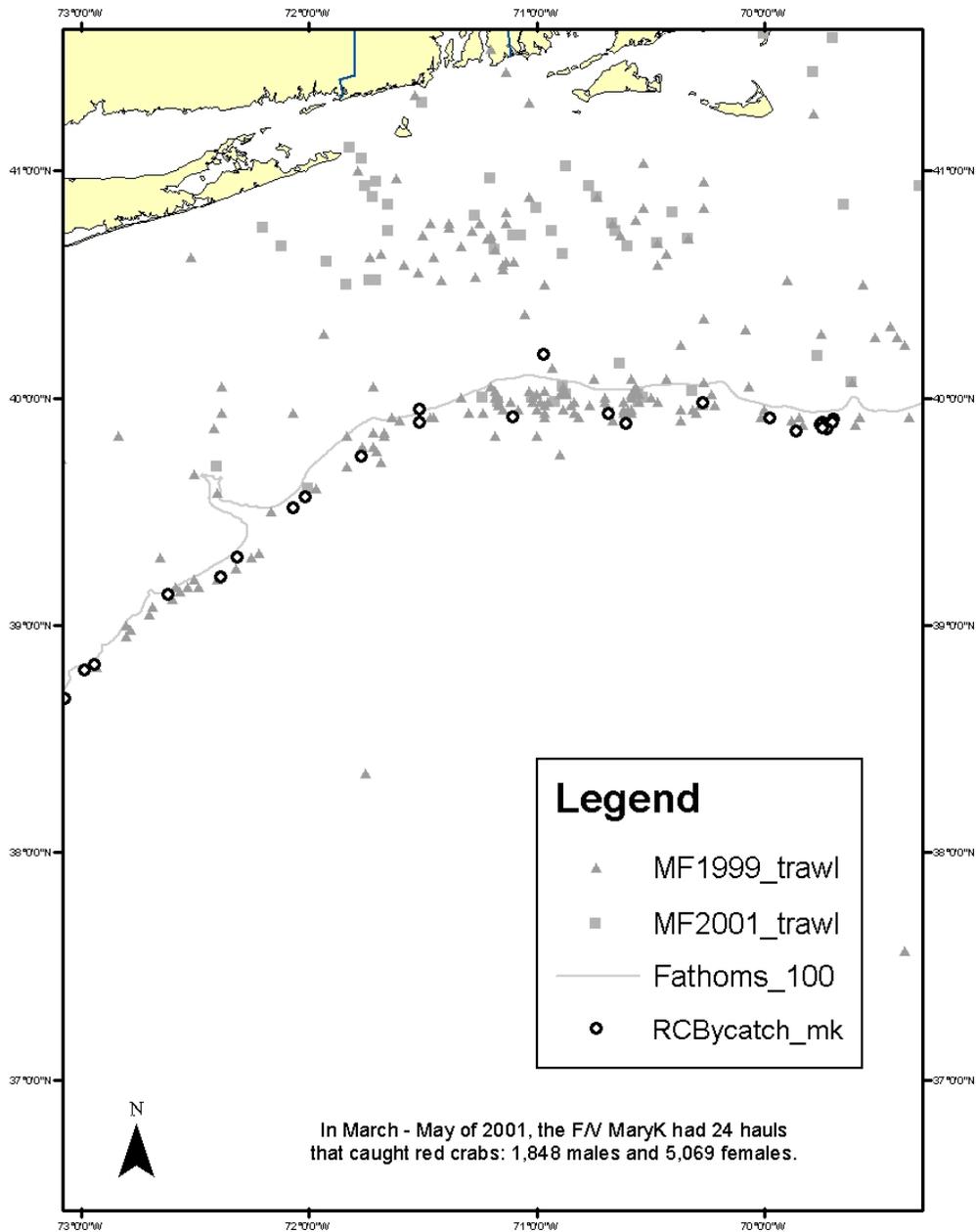


Figure 65 Display of where red crab was caught in the 2001 cooperative survey (F/V MaryK), as well as directed offshore monkfish trawl effort from fishing years 1999 and 2001

5.3.5.3 Bycatch of monkfish on non-directed trips

For this discussion, non-directed trips are those landing monkfish using scallop dredge or landing less than 400 lbs. of monkfish in 2002. As shown in Table 80, observer coverage was more extensive in the NFMA than the SFMA and on gillnet trips using mesh less than 10 inches and trawl trips. Based on these observations, in both areas, the percent of monkfish discarded is greatest on trawl and dredge trips, and insignificant on gillnet trips. On all three gears, the primary reason for monkfish discards is “too small”, mostly due to the minimum size regulation but also to “no market” (Table 81). On gillnet trips, operators also attributed about the same amount of discards to “poor quality”, including damage by hagfish, sand fleas and gear.

North	# trips	Monk Landed lbs.	Monk Discards	Monk total	Total Monk/trip	Landed Monk / Trip	Discards as % of Total monkfish
Gear							
Gillnet > 10 "	34	5,392	106	5,498	162	159	2%
Gillnet < 10 "	233	14,535	170	14,705	63	62	1%
Trawl	200	19,389	14,585	33,974	170	97	43%
Scallop	9	7,960	4,378	12,337	1,371	884	35%
South							
Gillnet > 10 "	<3	219	0	219	NA	NA	0%
Gillnet < 10 "	13	540	0	540	42	42	0%
Trawl	42	4,195	1,542	5,737	137	100	27%
Scallop	20	12,709	5,069	17,778	889	635	29%

Table 80 Observed bycatch of monkfish on non-directed trips (scallop dredge and those landing <400 lbs. of monkfish in 2002.

Trawl	%
NO MARKET, REASON NOT SPECIFIED.	1.74
NO MARKET, TOO SMALL	7.03
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	7.47
REGULATIONS PROHIBIT RETENTION, TOO SMALL	83.69
Gillnet	
NO MARKET, TOO SMALL	1.45
NO MARKET, REASON NOT SPECIFIED.	3.62
POOR QUALITY, SANDFLEA DAMAGE	3.99
POOR QUALITY, GEAR DAMAGE	14.50
POOR QUALITY, HAGFISH DAMAGE	14.50
POOR QUALITY, REASON NOT SPECIFIED	22.83
REGULATIONS PROHIBIT RETENTION, TOO SMALL	39.11
Scallop Dredge	
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	1.06
NO MARKET, TOO SMALL	15.35
NO MARKET, REASON NOT SPECIFIED.	24.79
REGULATIONS PROHIBIT RETENTION, TOO SMALL	56.69

Table 81 Reasons given to observers for discards of monkfish in non-directed trips (using scallop dredge or landing >400 lbs. of monkfish).

5.4 Habitat Considerations

5.4.1 Adverse Impacts Determination

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 was followed in the preparation of this section of Amendment 13. 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 monkfish fishery on monkfish EFH and EFH of other species. It also includes information on the effects of other federally managed fishing activities on monkfish EFH, and identifies gears used in state-managed fisheries that could affect monkfish EFH. Most of the information needed to complete this determination is provided in more detail in Appendix II.

The EFH Final Rule also stipulates that “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 are adversely affected by the monkfish fishery are listed in Appendix II. These species and life stages were ranked according to the vulnerability of their EFH to the effects of mobile, bottom-tending gear. EFH for those ranked as moderately or highly vulnerable were included in this adverse impacts evaluation.

For this determination, fishing activities are interpreted to mean fishing gears, since there is not enough information available to support a more detailed determination based on different fishing practices used with each gear type. Adverse impacts associated with each gear type are assessed for specific habitat types. Only benthic habitats are considered, since the gears used to catch monkfish are bottom-tending gears. Habitat type is based on type of substrate, and, to some extent, depth and degree of exposure to natural disturbance. These simplifications were made in order to allow maximum use of the information available and to provide an evaluation that encompasses as broad a range of the relevant fisheries and affected habitats as possible.

5.4.1.1 Structure of the EFH Adverse Impacts Determination

Section 1.2 of Appendix II 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. Most of this information is derived from the NMFS, NEFMC and MAFMC-sponsored Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast region on mud, sand, and gravel habitats (NREFHSC 2002) and from an extensive review of relevant gear effects studies (Stevenson et al. 2003). Additional sources of information include work done by the NEFMC Habitat Technical Team and NEFMC and NMFS staff, and a National Research Council report on the Effects of Trawling and Dredging on Seafloor Habitat (NRC 2002). 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 1.5 of Appendix II 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 3.0 of Appendix II summarizes the results and findings of this section, identifying the potential adverse impacts of the 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.

Section 5.4.2 of this EIS addresses non MAGNUSON-STEVENSON Act fishing activities, and **Section 5.4.3** addresses non-fishing related activities, that may adversely affect essential fish habitat.

5.4.1.2 Description of Monkfish EFH Designations

The EFH text descriptions and map designations for the various life stages of Monkfish were defined in the Habitat Omnibus Amendment (1998). The following paragraphs and maps describe the environmental needs and natural distribution of Monkfish. For more information on Monkfish EFH refer the Habitat Omnibus Amendment (1998).

*Essential Fish Habitat Description
Monkfish (*Lophius americanus*)*

In its Report to Congress: Status of the Fisheries of the United States (September 1997), NMFS determined monkfish is currently overfished. This determination is based on an assessment of stock size. Essential Fish Habitat for monkfish is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 4.1 - 4.4 and meet the following conditions:

Eggs: *Surface waters of the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.1. Generally, the following conditions exist where monkfish egg veils are found: sea surface temperatures below 18° C and water depths from 15 - 1000 meters. Monkfish egg veils are most often observed during the months from March to September.*

Larvae: *Pelagic waters of the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.2. Generally, the following conditions exist where monkfish larvae are found: water temperatures 15° C and water depths from 25 - 1000 meters. Monkfish larvae are most often observed during the months from March to September.*

Juveniles: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, and all areas of the Gulf of Maine as depicted in Figure 4.3. Generally, the following conditions exist where monkfish juveniles are found: water temperatures below 13° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰.*

Adults: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, along the outer perimeter of Georges Bank and all areas of the Gulf of Maine as depicted in Figure 4.4. Generally, the following conditions exist where monkfish adults are found: water temperatures below 15° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰.*

Spawning Adults: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, along the outer perimeter of Georges Bank and all areas of the Gulf of Maine as depicted in Figure 4.4. Generally, the following conditions exist where spawning monkfish adults are found: water temperatures below 13° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰. Monkfish are observed spawning most often during the months from February to August.*

The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

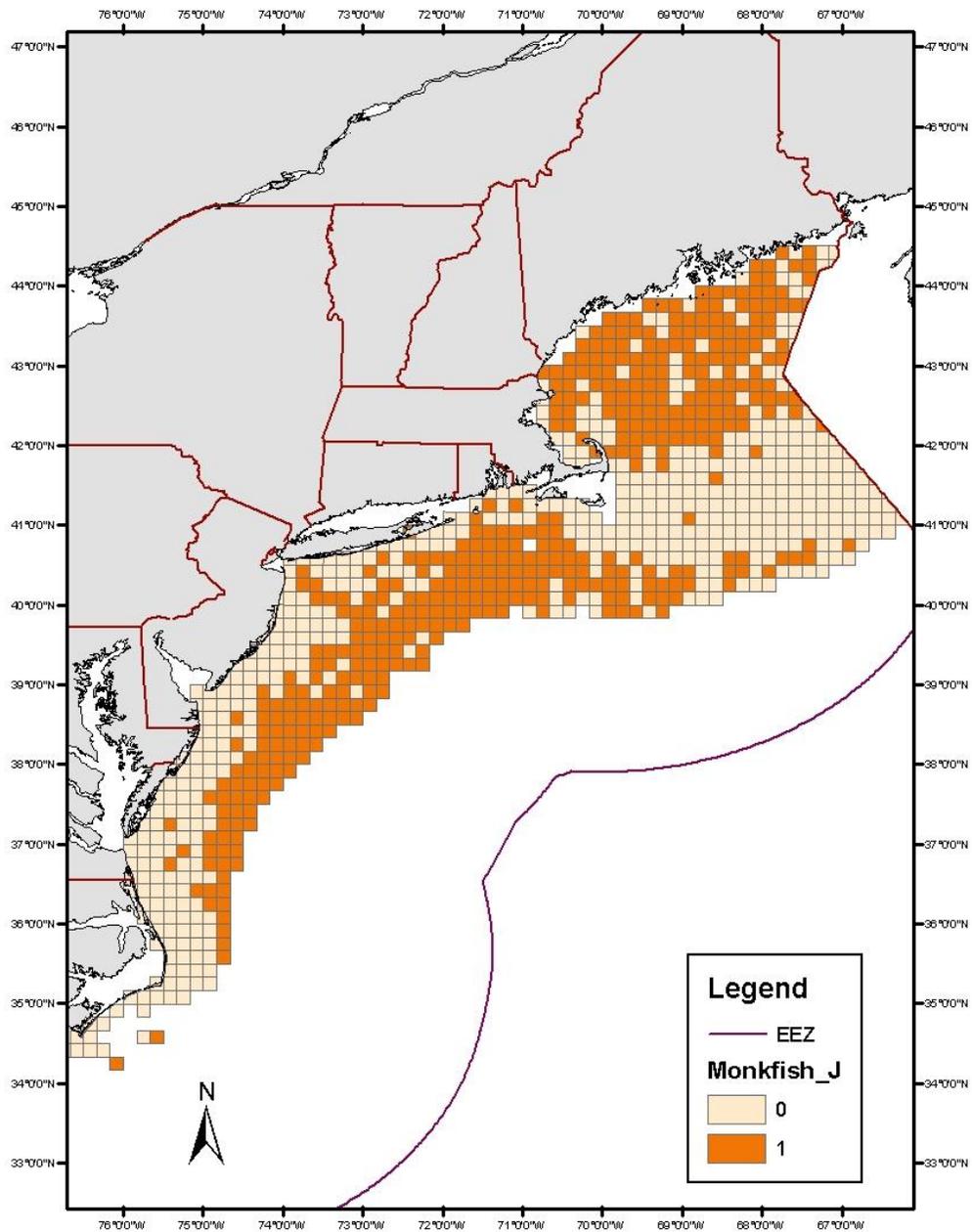


Figure 66 – EFH Designation for Juvenile Monkfish is highlighted in the shaded ten-minute squares

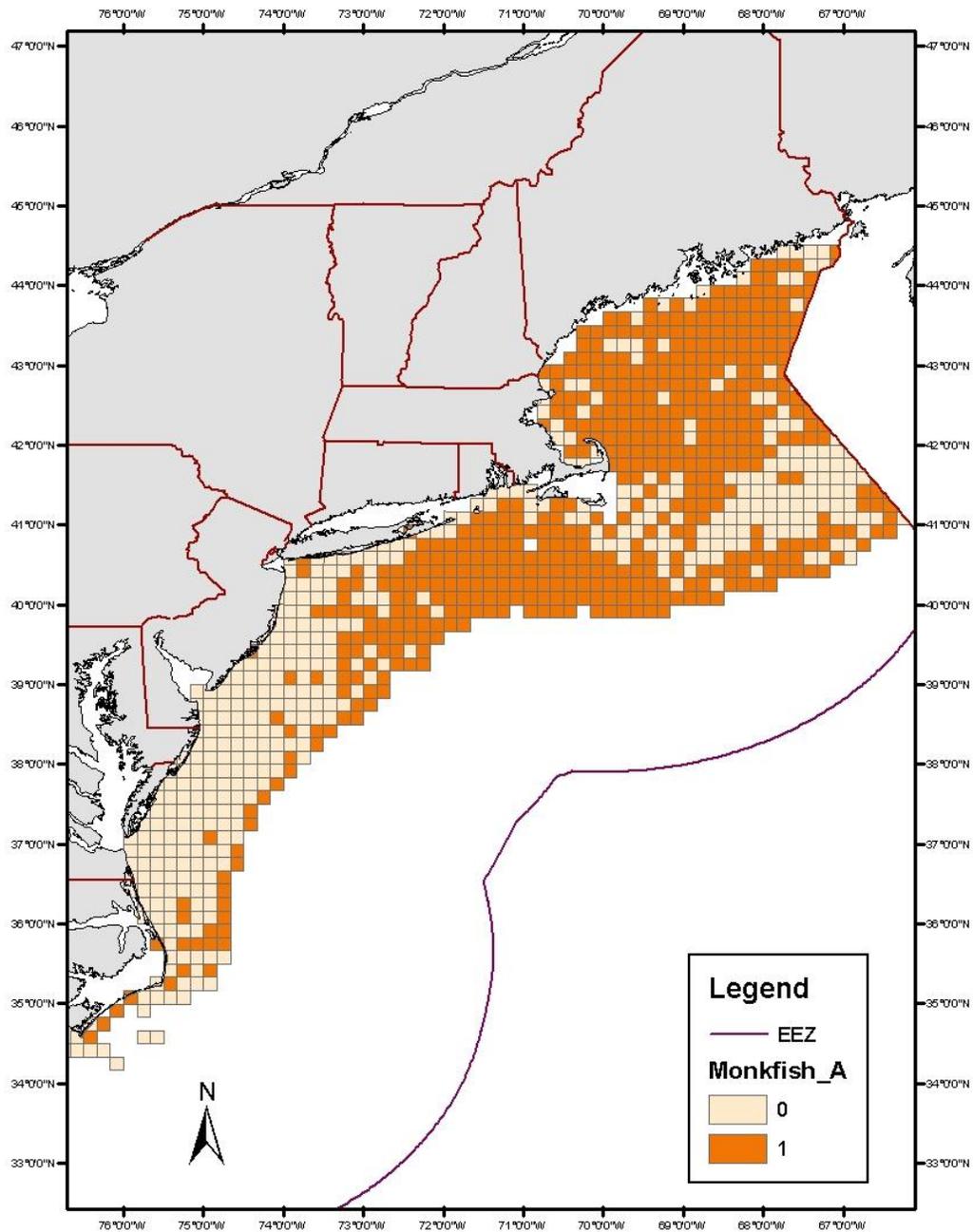


Figure 67 – EFH Designations for Adult Monkfish is highlighted in the shaded ten-minute squares

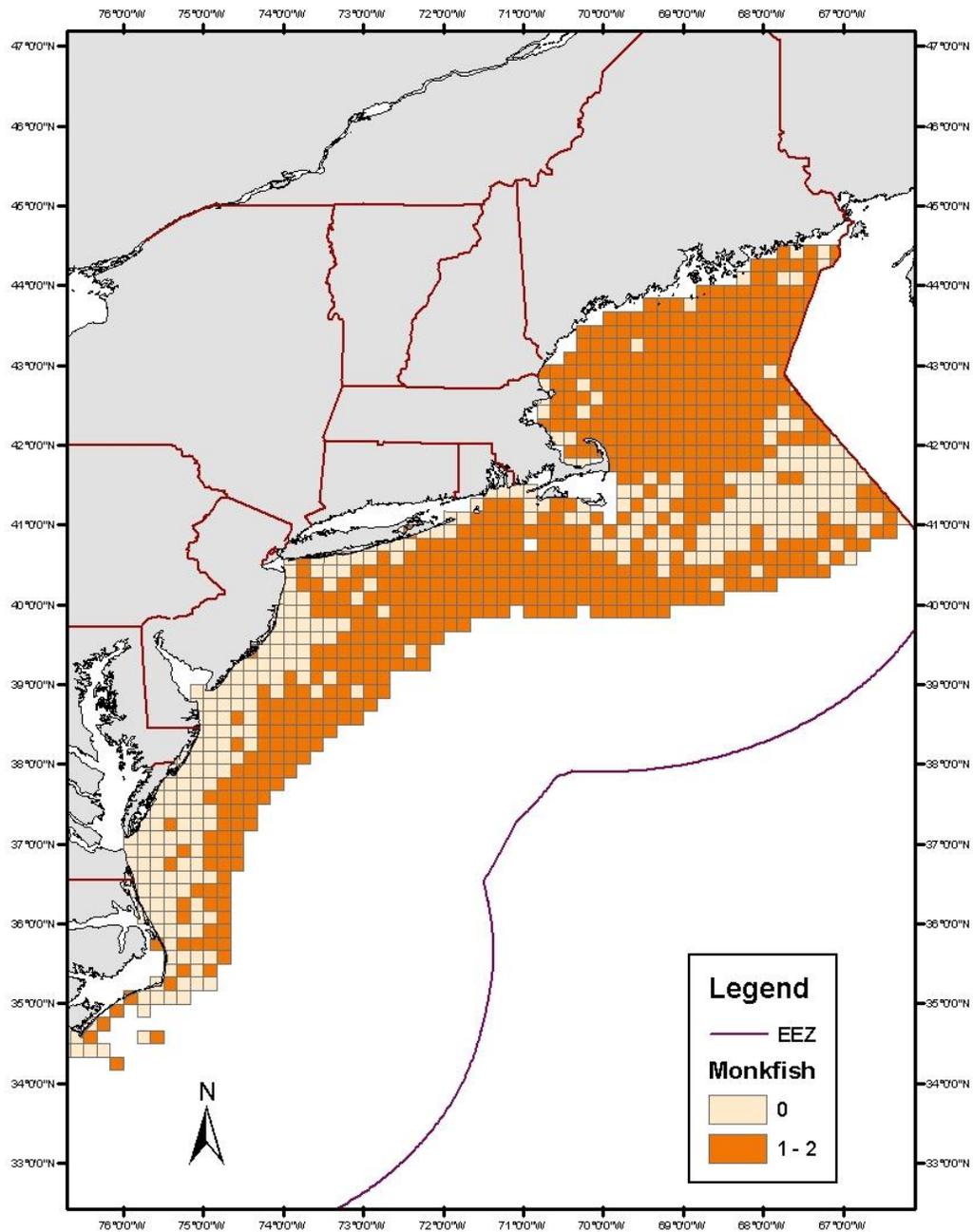


Figure 68 – EFH Designation for both Juvenile and Adult Monkfish combined is highlighted in the shaded ten-minute squares

Monkfish EFH has been determined to only be minimally vulnerable to bottom-tending mobile gear (bottom trawls and dredges) and bottom gillnets (see Appendix II). Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. However, the impacts of the monkfish fishery on the EFH of other species in the region with EFH that has been determined to be moderately or highly vulnerable to these gears must be assessed.

5.4.1.3 EFH of other Northeast Species

A list of species and life stages with EFH that has been determined to be adversely impacted by the Monkfish fishery are included in Table 82. Overall, there are 23 species with at least one life stage with EFH that is adversely impacted by bottom trawl gear. Thirteen of them have EFH designated in depths greater than 200 meters, and 5 of them occupy hard substrates in depths >200 m.

Species with EFH vulnerable to otter trawl gear:

American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), ocean pout (E, L, J, A), pollock (A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Species with vulnerable EFH designated in waters deeper than 200 meters are:

Atlantic halibut (A), Pollock (A), Redfish (J, A), Silver hake (J), Witch flounder (J, A), Tilefish (J, A), Barndoor skate (J, A), Clearnose skate (J, A), Rosette skate (J, A), Smooth skate (J, A), Thorny skate (J, A), Winter skate (J, A), and White hake (J).

Species with vulnerable EFH including waters deeper than 200 meters and containing hard substrate: Pollock (A), redfish (J, A), whiting (silver hake) (J), clearnose skate (J, A) and tilefish (J, A).

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOME, GB	100 - 700		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 - 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Goosefish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Goosefish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	juvenile	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170 - 350		Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380		Bottom habitats
Pollock	juvenile	GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 – 250		Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 – 365		Hard bottom habitats including artificial reefs
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOME, southern edge of GB	25 - 400		Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOME, southern edge of GB	50 - 350		Bottom habitats with a substrate of silt, mud, or hard bottom
White hake	adult	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 325		Bottom habitats with substrate of mud or fine grained sand
Silver hake	juvenile	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 – 270		Bottom habitats of all substrate types
Silver hake	adult	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30 – 325		Bottom habitats of all substrate types
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	juvenile	GOME, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500		Bottom habitats with fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300		Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscoot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscoot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Red crab	juvenile	Southern flank of GB and south the Cape Hatteras, NC	700 - 1800		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Red crab	adult	Southern flank of GB and south the Cape Hatteras, NC	200 - 1300		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred
Ocean quahog	juvenile	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245		Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Ocean quahog	adult	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Spawn May to December with several peaks	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 -185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Spiny dogfish	juvenile	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 390		Continental shelf waters and estuaries
Spiny dogfish	adult	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 450		Continental shelf waters and estuaries
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Golden crab	juvenile	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

Table 82 – EFH definitions for all federally-managed species. Species with EFH vulnerable to bottom tending gear are shaded, and species with EFH deeper than 200meters are in boldface.

5.4.1.4 Gear Descriptions

Commercial fishing gear types that contact the bottom and are defined for data-reporting purposes are listed in Table 88. Some of them are federally-regulated and others that are only used in state waters are not.

Federally regulated gears that contact the bottom can be divided into two types, mobile and stationary (or fixed) gears. Mobile, bottom-tending gears fall into two major groups, trawls and dredges. Types of trawls used in the Northeast region include otter trawls for fish, scallops, and shrimp, and Scottish and Danish seines. Federally-managed dredges include scallop and clam dredges. Bottom-tending fixed gears include sink and stake gill nets, long lines, pots and traps used to catch lobsters, crabs, and fish, and floating traps. Descriptions of these gears, and other gears used in the Northeast Region, are provided in Appendix II. The descriptions for trawls and dredges include some information on individual components that contact the bottom and some details about fishing practices (types of bottom fished, towing speeds, etc.). Bottom otter trawls are described as a single category, with some information on differences in gear design and configuration for trawls used to target particular resources (fish, scallops, or shrimp) or habitat types (smooth vs. rocky bottom). Of all the bottom-tending gears that have the potential to adversely affect benthic EFH in the NE region, bottom otter trawls are the most diverse group.

5.4.1.5 Distribution of Fishing Activity

The two gears used to harvest monkfish directly are bottom otter trawls and bottom gill nets. Monkfish are caught incidentally with other targeted species with both of these gears as well as scallop dredges. Information on the spatial distribution of fishing activity for these three gear types during 1995-2001 is provided in this section, the next section focuses on directed monkfish activity for FY1999 and FY2001. It is important to keep in mind that while dredge activity is reported in this document, dredge gear is not permitted to target Monkfish under the FMP while fishing on a Monkfish DAS. The geographic distributions of the ten minute squares (TMS) of latitude and longitude that accounted for most of the trips or days absent from port reported in the NMFS vessel trip database for these five gears are as follows:

Bottom gill net trips during 1995-2001 were made primarily in the Gulf of Maine (GOM). 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 side of the Great South Channel, in Rhode Island coastal waters, along the south shore of Long Island, and off New Jersey, the DelMarVa Peninsula, and North Carolina. A few trips were also made in three TMS along the 100 fathom contour at the shelf break in southern New England and (apparently) in a single TMS in even deeper water southeast of Hudson Canyon. Gill net trips made in federal waters were about five times more numerous during 1995-2001 than bottom longline trips.

Bottom trawling in federal waters in the Northeast region during 1995-2001 accounted for 150% more days absent from port as 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.

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 (see map of sub-regions).

Scallop dredging in federal waters in the Northeast region during 1995-2001 accounted for less than half as many days absent as bottom trawling, but nearly ten times more time at sea than was spent dredging with hydraulic clam dredges. Scallop dredging during 1995-2001 was reported in TMS along the eastern Maine coast, in the extreme southwestern “corner” of the GOM north of Cape Cod, along the western side of the Great South Channel, along the northern edge of GB and on its southeastern flank, and in a very large continuous area reaching from the eastern end of Long Island south across the shelf that included outer shelf waters as far south as the North Carolina border. Large expanses of bottom area in the outer GOM, in the central part of GB, in SNE, and in inner shelf waters of the MA did not support any notable amount of scallop dredging. Unlike bottom trawling, scallop dredging was almost completely confined to depths shallower than 50 fathoms. Analysis of VTR data by sub-region showed that about half of the reported scallop dredging days at sea were in the MA sub-region, about 30% in the GB sub-region (the same proportion as for trawls), 10% in SNE, and 5% or less in the GOM.

5.4.1.6 Distribution of Monkfish Fishing Activity and overlap with Vulnerable EFH and Substrate Type

The Monkfish fishery is described in more detail in Section 5.3. The fishery in the South is primarily a directed fishery, while Monkfish is more of a component fishery in the North. Figure 69 through Figure 71 depict the “directed” monkfish trips spatially by gear type for fishing years 1999 and 2001. A directed trip is defined in the analysis as any trip where total landings are made up of more than 50% monkfish, however the FMP only allows vessels using trawls or gillnets, but not dredges, to be fishing on a monkfish DAS. It is important to note that the Monkfish Plan does not permit directed effort by dredge gear. Therefore the very small number of trips that came up with more than 50% monkfish landings for dredge vessels are probably scallop trips that happened to land a significant portion of monkfish relative to the weight of scallops landed. Since dredge gears is not permitted to direct on Monkfish, it is more appropriate to manage this gear type for EFH impacts under a different FMP, such as the Sea Scallop FMP. Therefore, for the remainder of the adverse impacts determination, only bottom trawl effort will be considered, since gillnets have not been found to have adverse impacts on EFH. It is important to note that there is a significant amount of Monkfish landed as a component catch, particularly in the North. Since these vessels are targeting other species, and catching Monkfish incidentally, then it may be more appropriate to manage the impacts of these gears on EFH through other FMPs such as the Multispecies and Sea Scallop FMP. Fishing year 1999 was selected to show what fishing looked like just prior to the implementation of the FMP, and

fishing year 2001 is the most recent year available to show current fishing effort (FY2002 data was not available). In general, most directed effort is by gillnet vessels, which have not been determined to have adverse impacts on EFH.

	1999		2001	
	Number of Trips	MF Landings (lbs)	Number of Trips	MF Landings (lbs)
Otter Trawl	817	5,941,012	640	6,358,009
Gillnet	3,991	10,409,092	5,451	12,547,883
Dredge	20	73,900	27	210,980
TOTAL	4,828	16,424,003	6,118	19,116,873

Table 83 – Number of trips and pounds of monkfish landed from “directed” Monkfish trips in 1999 and 2001

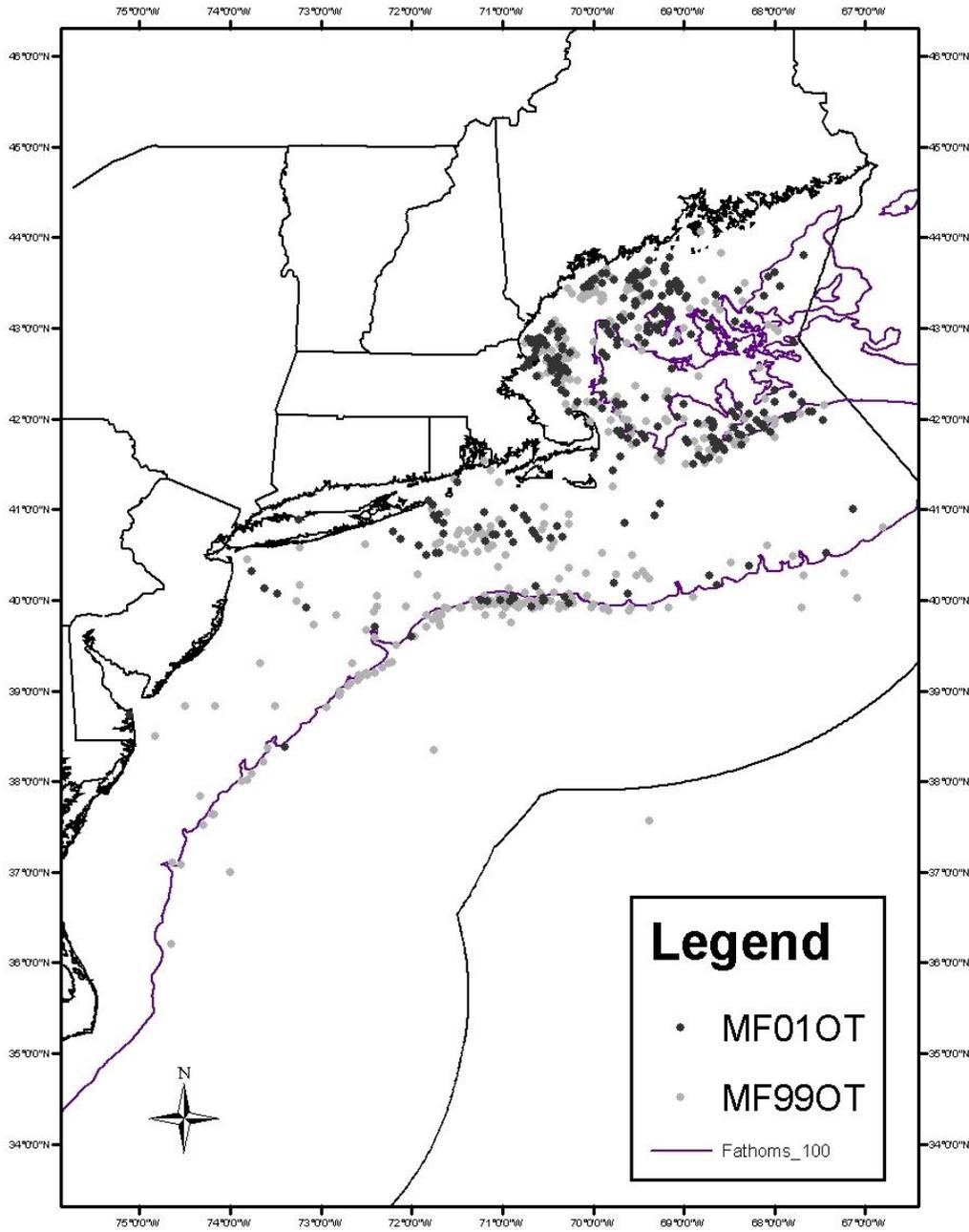


Figure 69 – Distribution of Directed Monkfish Otter Trawl Effort (from 1999 and 2001 VTR reports).

A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition.

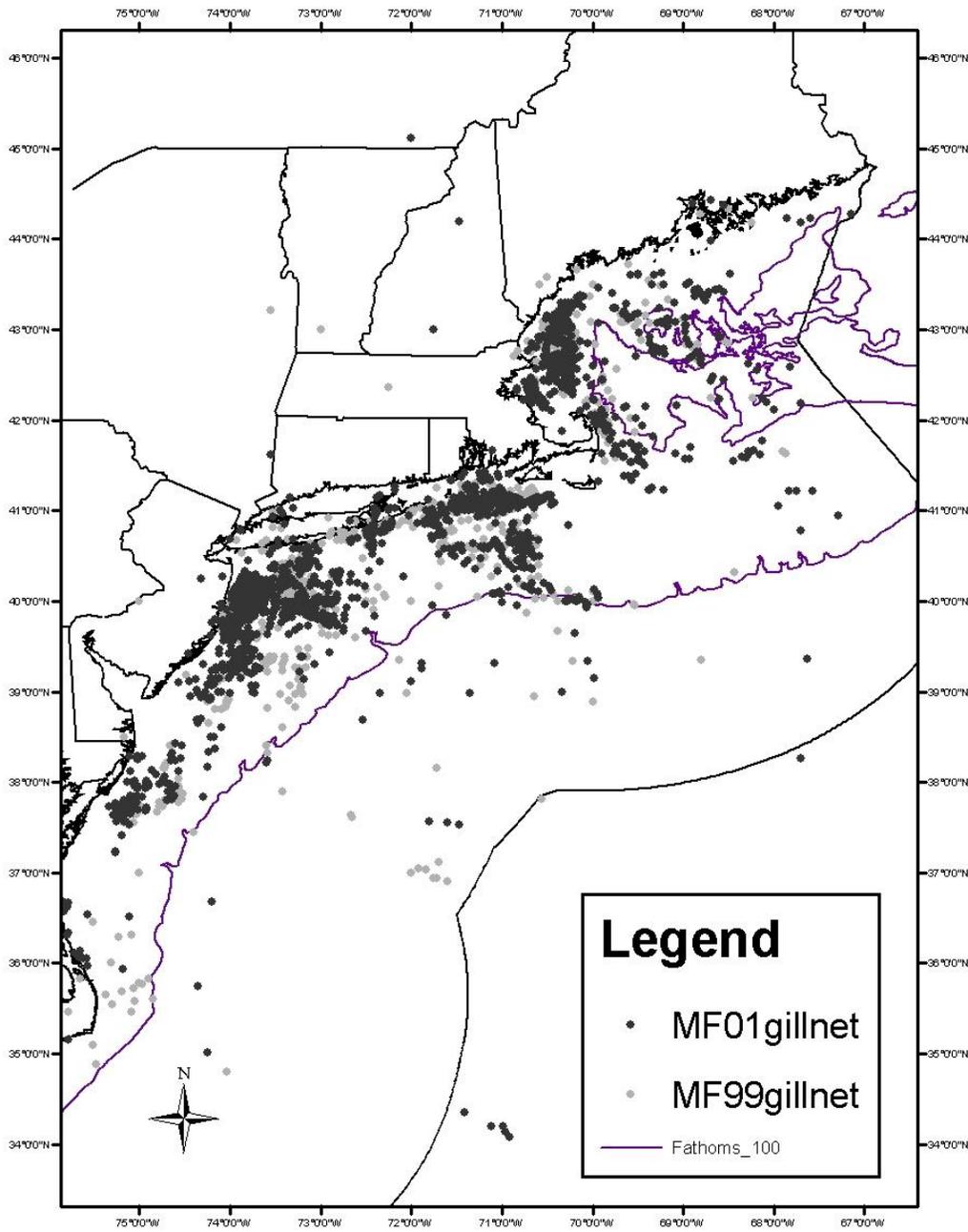


Figure 70 – Distribution of Directed Monkfish Gillnet Effort (from 1999 and 2001 VTR reports).

A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition. Note that many of the 1999 values are covered up by 2001 data points that are right over or near to the same point.

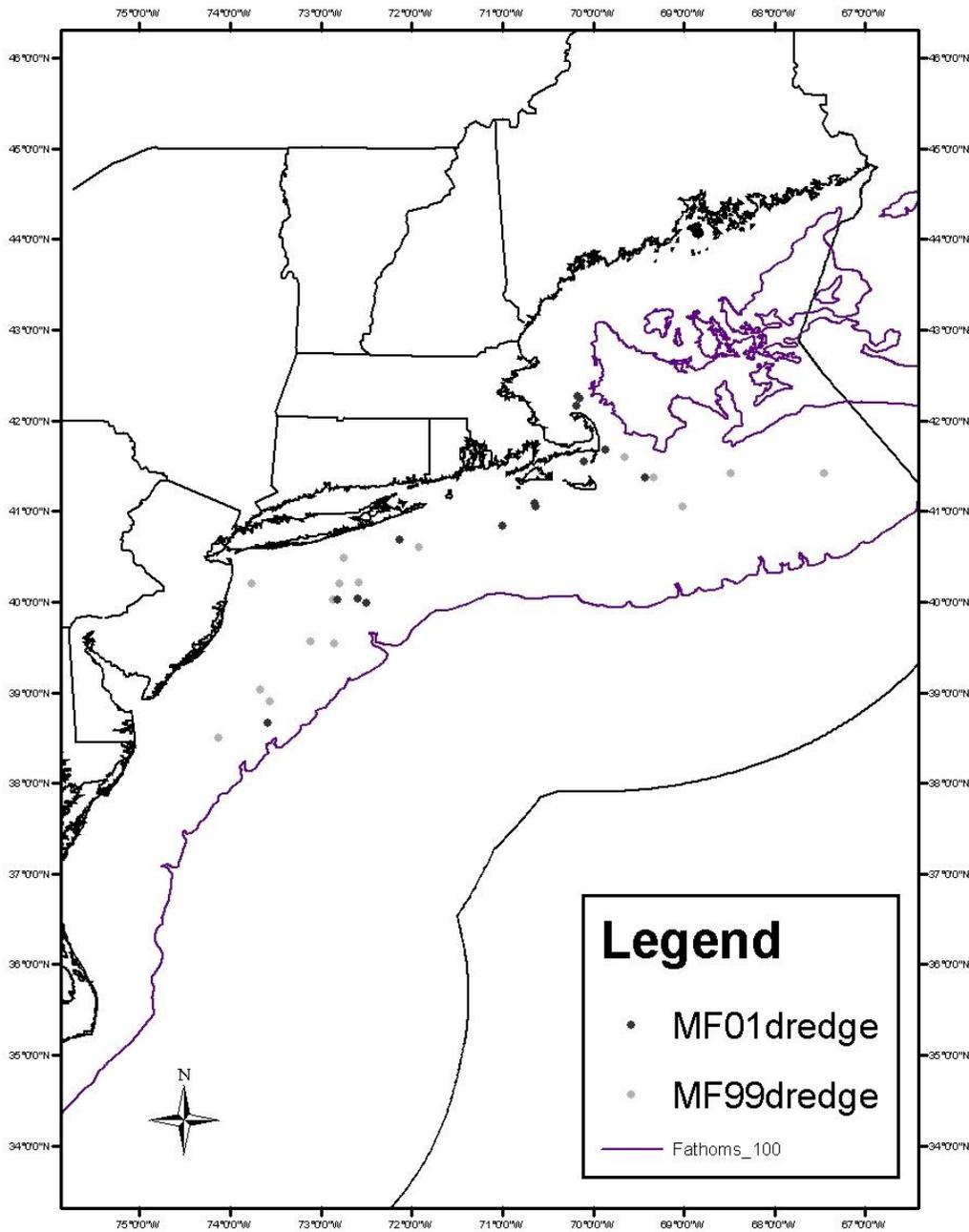


Figure 71 – Distribution of Directed Monkfish Dredge Effort (from 1999 and 2001 VTR reports).

A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition.

The directed Monkfish effort in the region was then combined with EFH and sediment data to give a better description of the impacts of the monkfish fishery on EFH. The percent of directed effort that took place over vulnerable EFH was calculated, as well as the percent of total Monkfish landings that were harvested in those areas. This analysis focuses on the overlap of monkfish effort and EFH for species with EFH vulnerable to bottom tending gear, not all species in the region. Table 63 in Appendix II lists the species and life stages that are moderately or highly vulnerable to bottom tending gear, according to the vulnerability determination described in Section 1.5 of Appendix II. Table 84, Table 85, and Table 86 of this document describe the degree and extent to which the monkfish fishery prosecutes in areas with a.) Moderately and highly vulnerable EFH, b.) Highly vulnerable EFH, and c.) Monkfish EFH, respectively. Additionally, the percent of directed Monkfish effort that takes place over areas of Monkfish EFH has been determined for description purposes, even though Monkfish EFH has been determined to have low vulnerability to bottom tending gears.

		Species with Moderate and Highly Vulnerable EFH			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	612	3,632,412	610	3,590,875
	Gillnet	2686	6459651	2671	6446721
	Dredge	17	71242	17	71242
	TOTAL	3315	10163305	3298	10108839
2001	Trawl	378	3094208	378	3094208
	Gillnet	4504	9981007	4475	9948045
	Dredge	15	50941	15	50941
	TOTAL	4897	13126156	4868	13093194

Table 84 – Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with EFH of species with moderate and highly vulnerable EFH

		Species with Highly Vulnerable EFH Only			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	567	3092864	509	2366928
	Gillnet	2485	5982315	2516	6047137
	Dredge	17	71242	15	69762
	TOTAL	3066	9146421	3040	8483827
2001	Trawl	373	3076974	367	2979559
	Gillnet	4141	9378245	4212	9522653
	Dredge	14	50821	14	50821
	TOTAL	4528	12506041	4593	12553033

Table 85 - Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with EFH of species highly vulnerable EFH only

		Monkfish EFH Only			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	452	2089557	539	3,269,939
	Gillnet	1151	3398101	1357	3829541
	Dredge	8	13119	9	25721
	TOTAL	1611	5500777	1905	7125201
2001	Trawl	251	1715305	328	2830824
	Gillnet	1719	4878346	2163	5942522
	Dredge	7	38020	13	25821
	TOTAL	1977	6631671	2504	8799167

Table 86 - Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with Monkfish EFH

The percent of directed effort and percent of monkfish landings from those trips was also compared with each sediment type found in the region. For description purposes it is helpful to evaluate what sediment type the majority of effort is taking place. The sediment data is based on the Poppe et al database. Table 87 and Table 88 describe where directed monkfish effort took place in 1999 and 2001, in terms of sediment type. The dredge effort is insignificant because according to the Monkfish FMP dredge gear cannot be used to direct on Monkfish. Furthermore, it is interesting to evaluate where the gillnet effort is taking place in terms of sediment type, but this gear does not adversely impact EFH. Therefore, it is most pertinent to determine on what sediment types the directed trawl effort is taking place and according to the tables below, the majority of directed monkfish trawl effort is over mud and sand.

		1999			
		Trawl	Gillnet	Dredge	1999 Total
% over Bedrock	# of Trips	0	0	0	0
	MF landings	0	0	0	0
% over Gravel	# of Trips	1(<1%)	30(1%)	0	31(<1%)
	MF landings	350(<1%)	35117(<1%)	0	35467(<1%)
% over Gravely-Sand	# of Trips	15(2%)	371(14%)	2(12%)	388(11%)
	MF landings	42466(1%)	638495(10%)	22(<1%)	698092(7%)
% over Sand	# of Trips	156(25%)	1783(65%)	14(82%)	1953(58%)
	MF landings	1338251(34%)	4538125(69%)	17132(24%)	5930464(56%)
% over Muddy Sand	# of Trips	146(23%)	165(6%)	1(6%)	312(9%)
	MF landings	1456814(37%)	531806(8%)	54088(76%)	1988643(19%)
% over Mud	# of Trips	309(49%)	389(14%)	0	698(21%)
	MF landings	1068845(27%)	872078(13%)	0	1940924(18%)
TOTAL	# of Trips	627	2738	17	3382
	MF landings	3906727	6615622	71242	10593590

Table 87 - Percent of directed Monkfish trips and total monkfish landings from FY 1999, versus the sediment type associated with each trip.

(Poppe sediment data overlapped with the location of each directed monkfish trip from the VTR database).

		2001			
		Trawl	Gillnet	Dredge	2001 TOTAL
% over Bedrock	# of Trips	0	10(0.2%)	0	10(<1%)
	MF landings	0	7217 (<1%)	0	7217 (<1%)
% over Gravel	# of Trips	1(0.3%)	133(3%)	0	134(3%)
	MF landings	7779 (<1%)	172254 (2%)	0	180033 (1%)
% over Gravely-Sand	# of Trips	11(3%)	768(17%)	1(6%)	780(16%)
	MF landings	87297 (3%)	1345725 (13%)	600 (1%)	1433622 (11%)
% over Sand	# of Trips	105(27%)	2630(58%)	15(94%)	2750(56%)
	MF landings	1077714 (34%)	5599117 (55%)	50353 (99%)	6727184 (51%)
% over Muddy Sand	# of Trips	34(9%)	369(8%)	0	403(8%)
	MF landings	361071 (11%)	1242637 (12%)	0	1603708 (12%)
% over Mud	# of Trips	233(61%)	635(14%)	0	868(18%)
	MF landings	1619018 (51%)	1732769 (17%)	0	3351787 (25%)
TOTAL	# of Trips	384	4545	16	4945
	MF landings	3152880	6615622	50953	10593591

Table 88 - Percent of directed Monkfish trips and total monkfish landings from FY 2001, versus the sediment type associated with each trip

(Poppe sediment data overlapped with the location of each directed monkfish trip from the VTR database).

5.4.1.7 Gears Used In Monkfish Fishery that Adversely Affect EFH

Of the two directed gear types (bottom otter trawls and bottom gillnets) used to harvest monkfish that are managed under the NEFMC Monkfish FMP or which are used in other federally-managed fisheries, only bottom otter trawls have been determined to adversely affect benthic EFH. This conclusion is based on two recent reports. The first of these (NREFHSC 2002) is the report of a workshop held in October 2001 that examined the habitat effects of gears used in the Northeast region on three substrate types (gravel, sand, and mud). A panel of experts concluded that otter trawls is one of two gears with the highest priority in terms of impacts, with minimal impacts for clam dredges, nets and lines, and pots and traps. While scallop dredge gear does land monkfish, this is not a gear type that is permitted to direct on monkfish under a Monkfish DAS, therefore the adverse impacts of this gear type on vulnerable EFH are managed under the Scallop FMP.

The second report (Morgan and Chuenpagdee 2003) evaluated the effects of ten different commercial fishing gears on marine ecosystems in U.S. waters. It differentiated between habitat impacts and by-catch issues and listed the effects of each gear type in more detail than the first report. (It also relied on input from a larger group of experts and used more scientifically based methods for collecting and analyzing the information). The report concluded that bottom trawls and dredges have very high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. Individual types of trawls and dredges were not evaluated. The impacts of bottom gill nets, traps, and longlines were limited to warm

or shallow-water environments with rooted aquatic vegetation or “live bottom” environments (e.g., coral reefs).

5.4.2 Non Magnuson-Stevens Act Fishing Activities

There are a number of fishing activities that may adversely affect EFH that are not necessarily managed under the Magnuson-Stevens Act. For example, state fisheries, some recreational fisheries, subsistence fishing, and even research projects. When these activities are added together, they may have the potential to cumulatively impact habitat. It is difficult to keep track of every non-Magnuson fishing activity and measure all of these activities occurring along the coast, but the EFH Regional Steering Committee has gathered information about the various fishing gears used in the Northeastern United States and their potential effects on EFH. Table 89 describes the fishing gears used in estuaries and bays, coastal waters, and offshore waters of the EEZ from Maine to North Carolina. Notice the variety of gears used in state waters for non-Magnuson related fishing activities, and whether these gears come in contact with the bottom or not.

GEAR	Estuary or Bay	Coastal 0-3 Miles	Offshore 3-200 Miles	Contacts Bottom	Federally Regulated
Bag Nets	X	X	X		X
Beam Trawls	X	X	X	X	X
By Hand	X	X			X
Cast Nets	X	X	X		
Clam Kicking	X			X	
Diving Outfits	X	X	X		
Dredge Clam	X	X	X	X	X
Dredge Conch	X			X	
Dredge Crab	X	X		X	
Dredge Mussel	X	X		X	
Dredge Oyster, Common	X			X	
Dredge Scallop, Bay	X			X	
Dredge Scallop, Sea		X	X	X	X
Dredge Urchin, Sea		X	X	X	
Floating Traps (Shallow)	X	X		X	X
Fyke And Hoop Nets, Fish	X	X		X	
Gill Nets, Drift, Other			X		X
Gill Nets, Drift, Runaround			X		X
Gill Nets, Sink/Anchor, Other	X	X	X	X	X
Gill Nets, Stake			X	X	X
Haul Seines, Beach	X	X		X	
Haul Seines, Long	X	X		X	
Haul Seines, Long(Danish)		X	X	X	X
Hoes	X			X	
Lines Hand, Other	X	X	X		X
Lines Long Set With Hooks		X	X	X	X
Lines Long, Reef Fish		X	X	X	X
Lines Long, Shark		X	X		X
Lines Troll, Other		X	X		X
Lines Trot With Baits		X	X		X
Otter Trawl Bottom, Crab	X	X	X	X	
Otter Trawl Bottom, Fish	X	X	X	X	X

Otter Trawl Bottom, Scallop		X	X	X	X
Otter Trawl Bottom, Shrimp	X	X	X	X	X
Otter Trawl Midwater		X	X		X
Pots And Traps, Conch	X	X		X	
Pots and Traps, Crab, Blue Peeler	X	X		X	
Pots And Traps, Crab, Blue	X	X		X	
Pots And Traps, Crab, Other	X	X	X	X	X
Pots And Traps, Eel	X	X		X	
Pots and Traps, Lobster Inshore	X	X		X	
Pots and Traps, Lobster Offshore			X	X	X
Pots and Traps, Fish	X	X	X	X	X
Pound Nets, Crab	X	X		X	
Pound Nets, Fish	X	X		X	
Purse Seines, Herring		X	X		X
Purse Seines, Menhaden		X	X		
Rakes	X			X	
Reel, Electric or Hydraulic		X	X		X
Rod and Reel	X	X	X		X
Scottish Seine		X	X	X	X
Scrapes	X			X	
Spears	X	X	X		
Stop Seines	X			X	
Tongs and Grabs, Oyster	X			X	
Tongs Patent, Clam Other	X			X	
Tongs Patent, Oyster	X			X	
Trawl Midwater, Paired		X	X		X
Weirs	X			X	

Table 89- Fishing gears used in estuaries and bays, coastal waters, and offshore waters of the EEZ, from Maine to North Carolina.

Includes all gear responsible for 1% or greater of any state's total landings and all gear that harvested any amount of federally managed species.

Entries in bold type are gears that are federally managed and contact the bottom

Based upon 1999 NMFS landings data and 2000 ASMFC Gear Report

The New England Council has initiated Amendment 3 to the Monkfish FMP, which is part of a larger Omnibus EFH Amendment that will review and revise the EFH components of all the Council's FMPs. In this review, the Non-Magnuson Act fishing activities that may adversely affect EFH will be updated. The estimated completion date for this action is year-end 2007.

5.4.3 Non-Fishing Related Activities

The Omnibus Habitat Amendment (1998), Amendment 1 to the Monkfish FMP, identified numerous potential non-fishing threats to essential fish habitat. The chemical, biological, and physical threats to riverine, inshore, and offshore habitats are extensively discussed in Section 5.2 of the Omnibus document. Overall, the major threats to marine and aquatic habitats are a result of increasing human population and coastal development, which is contributing to an increase of human generated pollutants. These pollutants are being discharged directly into riverine and inshore habitats by way of both *point* and *non-point* sources of pollution. Point sources of pollution include industrial discharge, power plants, sewage treatment plants, disposal of dredged materials, energy and mineral exploration, marine transportation, coastal and port development, and erosion. Non-point sources include run-off, wildlife feces, industrial shipping,

recreational boating, septic systems, and contaminated groundwater and sediments. Table 90 summarizes the Non-Fishing Related Threats to EFH. Refer to Amendment 11 to the Northeast Multispecies FMP (1998) for a more complete discussion of these potential threats.

The New England Council has initiated Amendment 3 to the Monkfish FMP, which is part of a larger Omnibus EFH Amendment that will review and revise the EFH components of all the Council's FMPs. In this review, the non-fishing activities that may adversely affect EFH will be updated. The estimated completion date for this action is year-end 2007.

THREATS	Chemical											Biological			Physical																							
	oil	heavy metals	nutrients	pesticides	herbicides / fungicide	acid	chlorine	thermal	metabolic / food wastes	suspended particles	radioactive wastes	greenhouse gases	exotic / reared organisms	nuisance / toxic algae	pathogens	channel dredge	dredge and fill	marina/dock construction	vessel activity	bulkheads	seawalls	jetties	groins	tidal restriction	dam	water withdrawal	irrigation	deforestation	gravel / mineral mining	oil / gas mining	peat mining	debris	artificial reefs	dredged material				
ACTIVITIES & SOURCES ("2°" = secondary source)																																						
non-point sources																																						
municipal run-off	X	X	X	X	X	X			X	X	X		X	X																					X			
agricultural run-off	X	X	X	X	X	X			X	X			X	X																								
atmospheric deposition		X	X	X	X	X				X	X	X																										
wildlife feces			X					X					X	X																								
septic systems			X				X	X					X	X																								
industrial shipping	X	X	X							X			X	X	X	X	X	X	X											X	X	X	X	X		X		
recreational boating	X	X	X							X			X	X		X	X	X																X		X		
contaminated groundwater		X	X	X	X	X	X						X																									
contaminated sediments	X	X	X	X									X																								X	
nuisance / toxic algae (2°)			X						X					X																								
point sources																																						
industrial discharge		X	X			X	X	X	X	X	X		X																									
power plants	X	X					X	X			X															X												
sewage treatment plants			X			X	X		X				X	X																								
ocean disposal of dredged	X	X	X	X						X				X																								
aquariums			X									X		X																								
biotechnology labs												X		X																								
silviculture			X						X	X			X																X									
water diversion			X	X	X				X				X	X											X	X	X	X										
decaying shoreline																	X	X																	X			
energy and mineral	X		X							X			X																	X	X	X						X
marine transportation	X	X								X						X	X	X																				X
coastal development			X	X	X											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	
port / harbor development																X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					X		X	
erosion control										X										X	X	X	X	X	X													

Table 90- Non-Fishing Related Threats to EFH and Activities and Sources Contributing the Threats

Source: *Habitat Omnibus Amendment (1998)*

5.4.4 Conservation and Enhancement

The Magnuson-Stevens Fishery Conservation and Management Act requires all fishery management plans (FMPs) to identify actions to promote the conservation and management of fishery resources. Prior to the concept of essential fish habitat (EFH), conservation primarily involved management measures to reduce overfishing and rebuild overfished stocks. The Habitat Omnibus Amendment (1998) strengthened the role of the New England Fishery Management Council to further conserve and enhance EFH and related fishery resources. Section 6.0 of the EFH Amendment describes options to avoid, minimize, or compensate for the adverse effects of activities identifies as non-fishing threats to essential fish habitat.

The conservation and enhancement options promoted by the Council include, as directed in the Interim Final Rule: the enhancement of rivers, streams, and coastal areas; improving water quality and quantity; watershed analysis and planning; and habitat creation. The Habitat Omnibus Amendment detailed recommendations to address fishing threats including chemical, biological, and physical threats. Furthermore, the state, non-profit, and other federal agencies that are working with the Council to develop programs to monitor and research habitat are highlighted in that document as well.

5.4.5 Prey Species

In addition to the monkfish-specific information contained in Section 5.1.5, Appendix A of the Habitat Omnibus Amendment (1998) describes the life history and habitat characteristics of all Council-managed species. The abundance of major prey items in the diet of these managed species are listed within the Appendix, which are based on the NEFSC bottom trawl survey data. This information is important to consider when analyzing prey species and essential fish habitat, however existing law does not require the Council to define prey species as EFH. Technical guidance from NOAA general counsel encouraged the Councils to identify the prey species for the species managed under the FMP and describe the habitat of those significant prey species to aid in the determination of adverse effects to their habitat. This information should be included in the “adverse effects” section of the EFH FMP, rather than the description and identification section. Therefore, the Habitat Omnibus Amendment is sufficient to date, and the EFH Source Documents should be referred to when evaluating adverse effects of EFH (Appendix A of EFH Amendment).

5.4.6 Research and Information Needs

The regulatory text of the EFH Final Rule directs the Council to include in the EFH amendment recommendations, preferably in priority order, for research efforts that the Council and NMFS view as necessary for carrying out their EFH management mandate. The need for additional research is to make available sufficient information to support a higher level of description and identification of EFH. Additional research may also be necessary to identify and evaluate actual and potential adverse effects on EFH including, but not limited to, direct physical alteration, impaired habitat quality/functions, cumulative impacts from fishing, or indirect adverse effects such as sea level rise, global warming and climate shifts, and non-equipment related fishery impacts. The need for additional research on the effects of fishing equipment on EFH is also included. The

research needed to quantify and mitigate adverse effects on EFH is identified in this amendment as well.

The Council hopes to coordinate with NMFS in identifying research priorities for EFH; therefore, the Council supports the recent work compiled by the Northeast Region EFH Steering Committee (2000). Table 91 describes the habitat research needs as identified by EFH Steering Committee. Five major research categories were identified: habitat characterization needs, gear impacts, specific habitat studies, data collection needs, and anthropogenic impacts. Research priority is given when appropriate, and potential funding sources are identified as well. The Habitat Technical Team recognizes that all research priorities are important, but the cost and length of a project are critical factors in determining its overall priority. The length of recovery for a specific habitat type may be a realistic goal for short-term research, but until a determination is made on how fish are linked to these habitats, management will not benefit from these projects. The Council's EFH Technical Team identified high-resolution mapping of the ocean floor as the research need with the highest benefit to EFH research, but is also the most expensive. It is important for the Council to assist the research community to identify what habitat research is currently taking place, so future research can be directed to complete these projects into one integrated EFH dataset for the Northwest Atlantic.

Research Category	Research Need	Priority	Potential Funding Source	Council/ASMFC Interest
Habitat Characterization Needs	Provide high resolution benthic/sediment mapping of mid-Atlantic and New England areas	HIGH	Examples - NOAA (Habitat Characterization Initiative?), NMFS, Sea Grant, Councils NE Cooperative Research Funds	All
	# Identify and describe biogenic structure and biological communities associated with different physical habitat types	HIGH		All
	# Develop mechanism for fishing industry-supported, high resolution sediment mapping in the Gulf of Maine and Georges Bank. Use Canadian sea scallop industry mapping effort as an example to establish process for similar mapping efforts in U.S. waters	HIGH		NEFMC
	Identify nursery and overwintering habitats for black sea bass	HIGH	MAFMC-TAC	MAFMC ASMFC
	Identify nursery and overwintering habitats for scup	Med.	MAFMC-TAC	MAFMC ASMFC
	Identify Loligo squid spawning areas	Med.	MAFMC-TAC	MAFMC
	Identify dogfish pupping areas	Med.	MAFMC-TAC	All
	Identify Atlantic herring spawning areas	Med.		NEFMC ASMFC
	Identify spring spawning bluefish areas in South Atlantic Bight	Low		MAFMC ASMFC
Refine identification of summer flounder nursery habitat	Low		MAFMC ASMFC	
Gear Impacts	Assess effects of specific mobile bottom gear types along a gradient of effort, on specific habitat types	HIGH	NOAA, MAFMC, NEFMC	All
	# Effects on tilefish burrows	HIGH		MAFMC
	# Effects on Loligo egg mops	HIGH		MAFMC
	# Effects on soft muddy bottom communities	HIGH		NEFMC
	# Identify and compare/contrast impacts to a variety of habitat types (mud, sand, gravel, cobble, rock, boulder) associated with the various fishing gear types used in New England and Mid-Atlantic fisheries	HIGH		All
# Explore options for the development of new otter trawl, scallop and clam dredge, and other fishing gear designs that have less contact and impact on the benthos than current fishing gear designs	Med.	All		
Effects on ecosystems as compared to other anthropogenic impacts and natural perturbations	HIGH	Cooperative Research Funding	NEFMC MAFMC	
# Identify and establish baseline sites throughout the New England and Mid-Atlantic regions where fishing effort has been minimal	HIGH		All	
Determine recovery rates for various habitat types	HIGH		All	

Table 91- Essential Fish Habitat Research Needs (Identified by the EFH Steering Committee)

Research Category	Research Need	Priority	Potential Funding Source	Council/ASMFC Interest
Gear Impacts (cont.)	Identify fishing grounds and SAV distributions to locate where the two overlap and identify the changes in beds over time	Med.		MAFMC ASMFC
	Effects of dredging for surf clams and ocean quahogs	Med.		NEFMC MAFMC
	Effects of ghost fishing gear	Low		MAFMC ASMFC
Specific Habitat Studies	Determine the functional value of various habitat types	HIGH		All
	# Distribution and value of relic shoal habitat along the mid-Atlantic coast	HIGH		MAFMC
	# Investigate the conditions and benthos that contribute to groundfish settlement and recruitment. Identify the areas where this happens with some regularity	HIGH		NEFMC MAFMC
	# Relationship between SAV and environmental quality of fish habitat and relative importance of SAV to other habitat types	Med.		All
	# Role of artificial fish habitats, both intentional and accidental, in the health of fishery species	Med.		All
	# Importance of "open sand bottoms" in shallow areas for various fish	Low		MAFMC ASMFC
# Tagging/in situ observations to estimate habitat home range of species at critical life stages	Low		All	
Data Collection Needs	Develop a reporting system and/or expand vessel tracking system to collect high resolution data on the distribution of fishing effort	HIGH	NMFS	All
Anthropogenic Impacts (non-fishing)	Effects on fish communities due to alterations to mud flat habitats	Med.		All
	Identify impediments to anadromous and catadromous fish passage on rivers and assess their impacts	Med.		All
	Effects of power plants on fish populations due to habitat change, entrainment and impingement	Low		All

Table 91 (continued) **Essential Fish Habitat Research Needs (Identified by the EFH Steering Committee)**

5.4.7 Identification of HAPCs

This review will take place during the next Habitat Omnibus Amendment scheduled to be completed in 2004. The process for considering new HAPC proposals is outlined in the Council's Habitat Annual Review and Report of 2000. This process will be followed during the next Omnibus Amendment.

5.4.8 Review and Revision of EFH Components of FMPs

The Council conducts a review of EFH designations at least once every five years, and this will take place during the upcoming Habitat Omnibus Amendment 2.

6.0 ENVIRONMENTAL CONSEQUENCES (IMPACTS) OF THE PROPOSED ACTION AND ALTERNATIVES

6.1 Introduction to Analysis of impacts

This section contains the analysis of impacts of the proposed action and alternatives, including no action, which are also summarized in Appendix I. Section 6.6 contains a discussion of the cumulative effects of the proposed action, compared to taking no action, and other past, present and reasonably foreseeable future actions, including other fishery and non-fishery actions that geographically overlap the monkfish fishery.

6.2 Biological Impacts

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following sections (Sections 6.2.1- 6.2.3) contain a discussion of the biological impacts of the alternatives on monkfish, other managed fisheries, and protected species, respectively.

6.2.1 Biological Impacts of the proposed action

This section describes the impact of proposed action items in comparison to taking no action.

6.2.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.2.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

The proposed action will not have a biological impact on either monkfish or other species since there will not likely be any redirection of effort. The measure does not increase the incidental catch allowed on a one-day trip compared to the no action alternative, and, therefore, does not provide any incentive for vessels to target monkfish. Only certain small-mesh fisheries, namely squid and whiting, have vessels that engage in multi-day trips. These are high volume fisheries, and the allowance of 50 lbs. per day of monkfish is not a sufficient incentive for these vessels to target monkfish, but will simply allow for the conversion of discards to landings (minimize bycatch). By allowing vessels to land the incidentally caught monkfish, catch data will improve, allowing for better stock assessment and management. Furthermore, the incidental catch from all vessels not on a monkfish DAS is accounted for in the annual calculation of the trip limits and DAS allocated to the directed fishery.

6.2.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels.

For the same reasons given in the previous proposal, the Councils do not expect that the proposed action will have a biological impact on either monkfish or other species. The Councils do not expect that the allowed level of retention will result in any new effort on monkfish, but only that it will allow for the conversion of discards to landings.

6.2.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

While there is limited evidence about discards of monkfish in this area during the past year when the current rule was in effect (the no action alternative), the proposed action restores the incidental limit that was in place under the original FMP. As a result, the Councils do not expect this action to have an impact on monkfish or other species in the area, except that it will allow for the conversion of some monkfish discards to landings in the fluke fishery. As with the previous two proposals, any incidental catch in this fishery will be accounted for in the annual calculation of trip limits and DAS allocated to the directed fishery, therefore no overall increase in effort is anticipated.

6.2.1.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA, Section 4.1.2).

If the proposed action results in some vessels targeting smaller monkfish than under the no action alternative, the yield-per-recruit of monkfish could decline to a minor degree. The Councils do not expect that this 3-inch reduction in the tail size will cause such a redirection of effort. If, on the other hand, this change simply allows vessels to land monkfish that they otherwise were required to discard under the previous minimum size, then there would be no effect on yield per recruit. Allowing those vessels to land monkfish that otherwise would have to be discarded will also improve the catch data used in the stock assessment and management process.

6.2.1.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies (see Section 4.1.3).

The PDT and Industry Advisors commented that the no action alternative has no biological benefit because requiring vessels to take 20 days out of the fishery during a 90-day period, when vessels only have 40 DAS allocated is completely ineffective (they can still take their entire allocation during the same 90-day period), particularly when vessels not on a monkfish DAS can retain their incidental catch of monkfish. Therefore, eliminating the seasonal closure will not have an impact on monkfish or on other species.

6.2.1.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

The proposed action may cause a shift in effort from inshore areas to offshore, but with a reduction in overall effort resulting from the pro-rating of DAS compared to taking no action. If vessels enroll in the program that are not already active in the monkfish fishery, there could be some overall increase in fishing effort compared to no action, but the amount of new effort cannot be predicted. Overall, however, the Councils do not expect this to be a significant source of new effort, since the number of vessels that can participate in the fishery is limited by technical and logistical factors (for example, depth and distance from shore). Furthermore, any increases in overall effort resulting from the proposed action will be mitigated in subsequent years by automatic adjustments to the trip limits and DAS allocations under the stock rebuilding plan.

To the extent that vessels shift from inshore to offshore areas, the proposed action could have a positive effect on other fisheries, particularly multispecies. The catch of multispecies in the offshore fishery is insignificant, which is further minimized by the large-mesh requirement on vessels enrolled in this program. In addition, participating vessels with Category C and D permits who also hold multispecies permits will be using multispecies DAS when fishing in this offshore area, and, therefore, will have fewer multispecies DAS available to target groundfish in other areas. Since the level of participation by such vessels in this proposed program is unknown, the magnitude of this impact cannot be predicted.

6.2.1.5 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

The analysis of this proposal indicates that five vessels would qualify for a permit under this proposal. These vessels fished for monkfish in the EEZ prior to 1999 when the FMP took effect. Subsequently, these vessels fished for monkfish either in state waters or in the EEZ under an experimental fishery permit. The experimental fishery was discontinued, and sea turtle closures further limited the ability of these vessels to fish for monkfish in the past two years. The proposed action, therefore, may result in some shift

in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest increase in overall monkfish effort if these vessels are currently not active in the fishery. Overall, however, the biological impact on monkfish and other species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20'N) and the sea turtle closures. Any increase in monkfish effort as a result of this proposal, however, would be mitigated in subsequent years by the automatic adjustment of trip limits and DAS allocations as needed by the stock rebuilding program.

6.2.1.6 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct biological impacts of the following three measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents.

6.2.1.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

The proposed action will have no direct impact on domestic monkfish stocks, or other species, since it merely defines process for vessels to fish outside the EEZ while exempting them from domestic monkfish regulations. Although a similar exemption provision exists in the Multispecies FMP, and about 40 High Seas Compliance Permits have been issued, no vessel has undertaken to fish in the NAFO Regulated Area. It is unlikely in the reasonably foreseeable future that any monkfish vessels will make the trip. For that reason, the proposed action is not likely to have any biological impact.

6.2.1.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.2.1.8.1 Southern Area trawl disc restriction

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This action has no immediate biological impact compared to taking no action, since vessels targeting monkfish in the SFMA already use gear that meets this requirement. The proposal will, however, limit monkfish vessels from expanding their effort into areas of complex bottom habitat, particularly offshore areas, and as a result has an indirect positive biological impact on monkfish and other managed species found in the SFMA. The magnitude of this impact cannot be determined, however, since it is primarily preventative and the amount of future potential effort that is affected is unknown.

6.2.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals and their habitat.

As with the previous measure, this action has no immediate biological impact compared to taking no action, since vessels currently targeting monkfish in the SFMA are not fishing in the canyon areas that would be protected under this action. The proposal will, however, protect those areas that are known to have deep sea corals and sponges, among other species, from expanding monkfish fishing effort, particularly under the proposed offshore fishery program. Thus, the biological impact on monkfish and other managed species found in the canyons is preventative and, therefore, positive, but its magnitude cannot be determined, since the amount of future potential effort that is affected is unknown.

6.2.1.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined in Section 4.1.9.

The proposed cooperative research programs will not have a direct biological impact on monkfish or other species, since they are principally administrative in function. The pool of DAS is taken from existing allocations, and, therefore, does not result in a net increase in overall effort. Indirectly, the programs could have a positive biological impact, to the extent that the research undertaken under these programs results in reduced bycatch, minimizing fishery impacts on protected species or EFH, or improves the scientific understanding of monkfish biology and population dynamics.

6.2.1.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

This action is an administrative change that does not result in any increase in fishing effort or direct change to the fishery, and, therefore, has no biological impact.

6.2.1.11 Biological impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.2.1.11.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. Each vessel must weigh the opportunity cost of using a monkfish DAS to target monkfish against the value of using a scallop or multispecies DAS to target one of those fisheries. According to the data in Table 38, Category C and D vessels used less than 50 percent of the allocated monkfish DAS, and no scallop/monkfish DAS were used. Due to the linkage with those other FMPs, those effort control programs, which are as restrictive, or more restrictive than in the recent past, are likely to continue contributing to the monkfish rebuilding program in both management areas.

6.2.1.11.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. This minimum mesh size, which is the largest mesh size required in all northeast fisheries, minimizes the bycatch of sublegal monkfish and non-target species. Since this mesh is only required on monkfish-only DAS, or monkfish/scallop DAS, and since nearly all monkfish trawl effort is on monkfish/multispecies DAS, the impact of no action is likely to be insignificant. If the Councils had decided to separate DAS usage requirements, this alternative would have had a greater impact, since more vessels would likely have operated under monkfish-only DAS.

6.2.1.11.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. In fact, vessels are already conducting the specified research without formal establishment of an experimental fishery by the FMP. The no action alternative does not modify this ability, and, therefore, does not have a biological impact.

6.2.1.11.4 Impact of fishing year no action alternative

The alternatives under consideration to change the fishing year, including the no action alternative, are administrative and do not result in any biological impact.

6.2.2 Biological Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in the

previous section, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.2.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform (“fleet”) allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

In the DSEIS, the analysis of this alternative concluded that separating DAS usage requirements would provide for more control over the directed monkfish fishery, and that the associated trawl gear proposals (for vessels on a monkfish DAS) would reduce bycatch and discards, and increase yield-per-recruit, and minimize impacts on EFH. These effects could indirectly, and in a positive way, enhance the stock-rebuilding program. At the same time, the DSEIS noted that separating DAS usage requirements for Category C and D permits could result in increased directed fishing effort, compared to taking no action, as a result of monkfish DAS being “freed up”. In other words, as the opportunity cost of using a monkfish DAS declines (that is, would not cost a vessel a multispecies or scallop DAS), vessels may elect to use more of their monkfish DAS than in the past. Simultaneously, multispecies Category C and D vessels, and to a far lesser extent scallop C and D vessels, could direct more of their effort on multispecies or scallops stocks, since they would have monkfish only DAS to target monkfish, and their “freed up” multispecies (or scallop) DAS to target multispecies (or scallops).

The degree to which individual vessels would actually avail themselves of this opportunity cannot be predicted, but if additional monkfish DAS are used, the DSEIS analysis suggested that the program established in Framework 2 provides for annual adjustment of trip limits to ensure that target catch levels designed to achieve annual biomass rebuilding goals are not exceeded. Under that program, the TAC for the directed fishery is calculated by subtracting the expected incidental catch from the overall TAC. The residual amount is then distributed among the DAS vessels under a formula that calculates the expected catch per DAS and DAS usage (by permit category) using the

most recent full year for which landings data is available (that is, the previous fishing year). Thus, if either the catch per DAS or total DAS usage rates were to change significantly in any year (such as in response to the separation of DAS usage requirements), the current management program has an immediate and automatic response mechanism built in. This program functions as a backstop that protects the stock rebuilding program from sudden increases in monkfish effort. During the public comment period, however, the Councils recognized that effort levels could be unacceptably high during the two-year lag time in implementing these reactive adjustments (using previous year data to set following year TACs).

Also during the public comment period, the Framework 40a to the Multispecies FMP was implemented (see Section 2.9.2). This action created, among other things, a one-year Pilot Program for using B Regular DAS that potentially has an impact on the monkfish fishing effort. If the pilot program is successful, it will be a model for a future B Regular DAS management program that will enable multispecies vessels to target monkfish and healthy groundfish stocks, provided the quarterly TACs for the multispecies stocks of concern are not caught. Even though the total number of DAS on which multispecies vessels could target monkfish is less under this program, overall monkfish effort could increase under this program since vessels that did not direct on monkfish in past years could choose now choose to do so, since it is one of only a few stocks that would be available for targeting under a B DAS. The Councils, in response to public comment, were concerned that this program, combined with the potential effort increase under decoupled DAS usage requirements, could result in monkfish effort rising to unacceptable and unsustainable levels, jeopardizing the stock-rebuilding program.

Thus, while some biological benefits could have been realized with the adoption of separated DAS usage under this alternative, the overall negative impact of increased effort on monkfish stocks, as well as other managed stocks (multispecies and skates, in particular) outweighs any positive impact (see Skate Baseline Review, following below).

6.2.2.2 Skate Baseline Review

The Skate FMP identified and characterized a baseline of management measures in other fisheries that control the mortality of species in the Northeast skate complex. 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 (discard and fishing mortality) for a species of skate in a formal rebuilding program, then the Skate FMP requires a baseline review.

A baseline review process is initiated if one or more of seven categories of management measures are changed which have been identified as providing beneficial protections 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 Amendment 2 is considering decoupling Monkfish-Only DAS from Multispecies and Scallop DAS, overall allocated Monkfish-Only DAS may increase, although it is very difficult to predict whether actual effort will increase, decrease, or stay the same.

Since overall effort levels may increase, the Skate PDT must evaluate the potential impacts of this change over and above that which has been accounted for in the baseline before the Councils make final decisions on management measures for Amendment 2. In general, this section will evaluate whether decoupling DAS will have a greater impact on overall skate mortality as compared to the baseline and additional potential benefits may be afforded to skates from the other measures implemented by this action, as well as recently implemented actions under the Multispecies and Scallop FMPs (Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP).

A 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 evaluate the impacts of this Amendment on the mortality rates of these two species. Furthermore, the Skate FMP is very specific in identifying only seven categories of management measures that would trigger a baseline review. Therefore, while there may be other measures in this Amendment that could indirectly increase or decrease skate mortality, the baseline review is only required to assess whether the proposed action would implement a change to one or more of the seven identified measures.

DAS is one of the primary mechanisms used for controlling effort and reducing fishing mortality in the monkfish fishery. Monitoring monkfish effort is complicated because the program currently has four permit categories (A, B, C and D) and two of those categories, C and D, are linked to DAS allocations in other fisheries. All four vessel categories have been awarded 40 “Monkfish-Only” DAS, but Category C and D monkfish vessels are charged a Multispecies or Scallop DAS each day that vessel targets monkfish. Therefore, if a Category C or D vessel decides to target monkfish, they are charged one Monkfish-Only DAS and one Multispecies or Scallop DAS for every day that vessel is at sea. On the other hand, Category A and B monkfish vessels are vessels that qualified for a monkfish limited access permit, but did not have a multispecies or scallop permit; therefore, they have been allocated 40 Monkfish-Only DAS. The only difference between Category A and B is that one category has a higher possession limit.

If DAS are decoupled, then vessels with Category C or D permits may direct on monkfish without being charged a Multispecies or Scallop DAS. This may result in an increased use of allocated Monkfish-Only DAS. The overall impact to skate mortality is difficult to evaluate when you consider the alterations to DAS programs under recent amendments to the Multispecies and Scallop FMPs. Both Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP have altered the total allocated DAS, and in both cases, DAS usage is more restrictive. For example, the conditions of DAS use in exchange for participation in special area access programs. These changes to DAS programs took place after implementation of the Skate FMP and baseline assessment of DAS. Therefore, it is appropriate to consider whether these changes in DAS use effectuate positive controls on skate mortality in light of the alternative under consideration in Amendment 2 that would decouple DAS.

Multispecies DAS

The Skate FMP's baseline of management measures with respect to groundfish DAS was established according to the effort level prescribed in the interim action (about 62,000 DAS available to the entire fleet). Amendment 13 to the Multispecies FMP categorized DAS into A, B (regular and reserve), and C DAS. This change in designating DAS into several different categories is an important shift in management, especially when you consider the restrictions on their use. For example, Amendment 13 allocated about 43,000 Category A DAS, which are DAS that can be fished anywhere in open areas. Amendment 13 also allocated a specific number of Category B DAS that can only be used to target healthy stocks through programs like special access programs (SAPs). Amendment 13 allocated about 14,500 Category B regular and about 14,500 Category B reserve DAS. Amendment 13 also allocated Category C DAS, which do not represent actual effort because these DAS were established according to the level of latent effort that existed during the qualifying time frame; therefore, they are unavailable for use at this time.

The Council recently approved Framework 40a to the Multispecies FMP, which implements several Special Access Programs (SAPs), and allows for the use of category B DAS in these SAPs. A skate baseline assessment was completed for that action in Section 8.1.3 of Framework 40a and the Skate PDT concluded that there will not be 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 FMP baseline. Overall, the impacts of Framework 40a on skate mortality are expected to be minimal.

Scallop DAS

The baseline of scallop effort described in the Skate FMP is 34,000 DAS, and is based on the total number of allocated DAS from the fishing years 1999-2002. Since implementation of the Skate FMP, scallop management has evolved to a rotational area management scheme. In particular, Amendment 10 recently (June 2004) implemented a rotational area management strategy, which allocates a certain number of DAS to vessels for use inside specific rotational access areas, and a separate number of DAS that can be used outside identified access areas. Prior to Amendment 10, allocated DAS could be used in any area- fishermen were not given the opportunity to use days in certain areas in exchange for a DAS tradeoff (i.e., some portion of the used DAS is credited back to them). Furthermore, Amendment 10 implements additional restrictions associated with DAS use in the scallop access areas, such as gear requirements (e.g., minimum twine top mesh size), scallop possession limits, broken trip provisions, and trip allocations/DAS tradeoffs, which further limit harvest levels and may reduce the levels of skate bycatch that would normally be encountered in the scallop fishery.

On the heels of Amendment 10, the Council approved a joint Multispecies/Scallop framework action (Framework 16/39). Although it has not yet been implemented, it would provide controlled access into portions of the groundfish closed areas. A complete skate baseline review was prepared for that action (See Section 7.1.4 of Framework 16/39 for details). Framework 16/39 proposes that full-time limited access vessels receive 42

DAS to fish anywhere in open areas, 48 DAS for fishing exclusively in the Hudson Canyon Area, and 36 DAS for access to designated areas within the groundfish mortality closed areas during the 2004 fishing year. These three DAS allocations for full-time vessels totals 126 DAS, six more days than the 120 DAS assessed in the Skate FMP baseline. However, if they choose not to participate in one or more of the access areas, then they forfeit that entire amount of DAS, which would not be available to use in other areas, as would have been the case under previous scallop actions.

When you break down the DAS allocations according to permit category and compare these to the baseline in the Skate FMP, the FY2004 allocations are slightly higher for two of the three limited access vessel categories: 6 more DAS for full time vessels, 2 more DAS for part time, and the same DAS allocation for occasional vessels. After FY2004, the DAS allocations are reduced to levels significantly below the Skate FMP baseline (i.e., 34,000 DAS available for use by all limited access permit categories). In FY2005, the DAS allocated to the limited access fleet would be 100 DAS for each full-time vessel (20 DAS less per vessel than the Skate FMP baseline), 40 DAS for each part-time vessel (10 DAS less per vessel than the Skate FMP baseline), and 8 DAS for each occasional vessel (2 DAS less per vessel than the Skate FMP baseline).

After implementation of Amendment 10 and Framework 16/39, total allocated DAS are expected to increase to approximately 35,800 DAS in 2004; however, in the long term total allocated DAS is expected to be around 27,000 DAS under rotational area management. The projected amount of DAS used remains significantly below the level used in the baseline 2002 fishing year (about 30,065 DAS). Therefore, while total allocated Scallop DAS is expected to increase slightly above the baseline in 2004, allocated DAS will decrease after the first year of the program. In addition, due to the new stipulations on DAS in Amendment 10 and Framework 16/39, DAS use is more restricted compared with the scallop effort that was attributed to controlling skate mortality under the Skate FMP baseline.

Monkfish Only DAS

There is overlap between the monkfish and skate fisheries, and monkfish vessels often land some skates that they catch incidentally while monkfish fishing (mostly skate wings as opposed to skate sold for bait). The Skate FMP baseline related to monkfish effort is 4,500 Monkfish-Only DAS (including permit categories C and D). This value is based on the approximate 4,240 Monkfish-Only DAS that were allocated in 2002. Approximately 2,100 of those DAS were from Category A and B vessels, and the remaining DAS were additional Monkfish-Only DAS that were awarded to multispecies vessels under the groundfish interim action implemented as a result of CLF v. Daley (Framework 33 lawsuit). That ruling allowed groundfish vessels that were allocated fewer than 40 Multispecies DAS to fish the remainder as Monkfish-Only DAS. As a result, approximately 2,200 DAS were shifted from coupled Multispecies/Monkfish DAS to Monkfish-Only DAS.

Decoupling DAS under Amendment 2

If DAS are decoupled in this Amendment, overall available Monkfish-Only DAS may increase and use of these DAS will be dependent on how profitable (catch per unit effort) it will be to fish for monkfish exclusively. Due to the nuances between the various

permit categories and how monkfish effort is coupled with other management plans, in order to assess the overall impact of decoupling DAS on skate mortality, the changes in Multispecies, Scallop and Monkfish DAS must be considered. Table 92 compares the allocated DAS in each fishery used in the skate baseline versus the maximum allocated DAS under present management programs if Monkfish DAS are decoupled from Scallop and Multispecies DAS. The Skate FMP identifies the baseline of Multispecies DAS to be 62,000 DAS. After implementation of Amendment 13 the total Category A DAS available to the multispecies fleet is approximately 43,000, with another approximately 14,500 B-regular DAS and 14,500 B-reserve DAS (for a total of 72,000 DAS) available to the fleet. Category C DAS are not considered because these DAS allocations are not based on actual effort and cannot be used at this time. Multispecies A and B DAS are not the same and should not be combined to evaluate the total amount of allocated effort because B DAS are more restrictive in terms of how and where they can be used.

The Monkfish Amendment 2 skate baseline evaluation simply recognizes that if DAS are decoupled, there would be more Multispecies and Scallop DAS available to vessels with C and D monkfish permits, because there would no longer be a need to use a Scallop or Multispecies DAS when targeting monkfish under a Monkfish-Only DAS. However, it should be noted that if DAS are decoupled in this Amendment, vessels will still have the option to keep their DAS coupled on a trip-by-trip basis. It should also be noted that according to Table 38, all of the Monkfish Category C and D vessels that used a Monkfish-Only DAS to target monkfish, were called in by multispecies permit owners, not scallop permit owners. However, only about 40-50% of the total DAS for Multispecies vessels with monkfish Category C or D permits were used in FY2001 and FY2002.

The Skate FMP baseline related to scallop fishing effort is 34,000 DAS available for use by all limited access permit categories. After implementation of Amendment 10 and in the future, Framework 16/39, the total DAS available to the scallop fleet is projected to be approximately 35,000 DAS, a net increase above the baseline described in the Skate FMP. Similar to Multispecies DAS, a Scallop DAS is more restrictive after implementation of Amendment 10 than a DAS assessed under the skate baseline. The limited access scallop fleet will now be charged a minimum amount of DAS to enter into scallop access areas, with various other restrictions, including possession limits and gear requirements. Therefore, the DAS are not completely comparable pre- and post-Amendment 10, for purposes of evaluating changes to the Skate FMP baseline. Furthermore, the total Scallop DAS allocations are expected to decrease to a level around 27,000 DAS a year after implementing the rotational area management program, which is about 6,000 total DAS lower than the Skate FMP baseline.

The Skate FMP identifies the baseline of Monkfish-Only DAS to be 4,500 DAS (about 2,200 DAS for Category A and B vessels, and the rest for multispecies vessels that did not receive 40 DAS in 2001). Under the preferred alternative, this Amendment proposes to decouple Monkfish DAS from Multispecies/Scallop DAS, and to allocate 40 DAS to all limited access monkfish vessels. Under this scenario, the total maximum DAS that would be available today to direct on monkfish for Category A and B vessels is 2,200 (based on 15 Category A vessels and 40 Category B vessels). In addition, approximately 26,520 additional Monkfish-Only DAS would potentially be available for Category C and

D vessels (based on 328 Category C vessels and 335 Category D vessels). It is not likely that all Multispecies and Scallop vessels that are allocated Monkfish-Only DAS will choose to target monkfish. In fact, according to Table 92, no scallop vessels with Category C or D permits landed monkfish on a Monkfish-Only DAS in 2002, and about 40-50% of the Monkfish-Only DAS allocated to multispecies vessels were used. Whether or not these trends would continue under the preferred Amendment 2 decoupling alternative, depends on the areas where vessels would chose to fish, if they had the option to do so, and if it would be cost effective to target monkfish under the applicable trip limits. However, if DAS are decoupled, Category A, B, C, and D monkfish vessels are expected to be allocated approximately 28,720 Monkfish-Only DAS (600 DAS for Category A vessels, 1,600 for Category B vessels, 13,120 for Category C vessels, and 13,400 for Category D vessels).

Conclusion

Although the potential impacts of decoupling DAS according to the preferred alternative in this amendment appears to increase effort beyond that considered in the Skate FMP baseline, vessels will still have the option to keep their DAS coupled on a trip-by-trip basis. While the number of DAS available seems to be very high as compared to the DAS assessed under the Skate FMP baseline, these estimates are maximum values, and there are many unknowns that make this evaluation uncertain. For example, it is impossible to predict how many allocated Monkfish-Only DAS under the preferred decoupling alternative will be used to target monkfish exclusively. Furthermore, it is unknown where this effort will be used. While in fact, some non-preferred alternatives describe an area-based decoupling scheme; it is unclear whether or not this would translate into more or less impacts on skate mortality. If more effort shifts to the south, then impacts on thorny and barndoor skate mortality would be reduced, but if effort shifts to the north, it is possible that there would be greater impacts on thorny and barndoor skate mortality.

In addition to the overall preferred alternative to decouple DAS in this action, there are several alternatives under consideration that would implement decoupling DAS differently, for example, by area, transferability, and leasing of DAS. Depending on which alternatives are selected, the various options could have different impacts on skate mortality. For example, DAS Alternative 1A would only allow decoupled DAS to be used in the southern fishery management area. If effort increased as a result of decoupling DAS, it would only impact skate species that are found in the south. Of the two species included in the skate baseline assessment only part of the barndoor distribution is found in the SFMA. Thorny skates are primarily found in the Gulf of Maine, thus a potential increase of effort in the SFMA would not impact thorny skate mortality. On the other hand, DAS Alternative 1b would allow decoupled DAS to be used in both areas; therefore if effort increases in the north as a result of decoupling DAS, then both species could be impacted. In terms of transferability, Transferable DAS Alternative 2 and 3 could result in the activation of latent effort. While there is potential for effort to increase as a result of activation of latent effort, direct impacts on skate mortality are uncertain.

If DAS are decoupled, and the Councils require specific gear to be used on directed monkfish trips, preliminary research shows that the proposed monkfish trawl gear may be

effective at reducing skate bycatch. This gear requirement could be considered a mitigating measure to offset the potential increase in skate mortality as a result of the increase in allocated DAS available to target monkfish. (In order to fully evaluate the effectiveness of this gear for avoiding skate bycatch the research results from this experiment would need to be peer reviewed and fostered through the management process, e.g., Research Steering Committee). Overall, this measure is expected to have fairly low impacts to skate mortality as compared to that which was assessed under the Skate FMP baseline, particularly because of the gear selectivity measure. Furthermore, both the Multispecies and Scallop fisheries have made adjustments to their DAS programs, and the added restrictions on DAS use are expected to result in fewer impacts on skate mortality overall, especially when you consider these changes in DAS use relative to the effort controlling measures in effect at the time the Skate FMP implemented its baseline.

	Under Skate Baseline	2004	2005	2006 and beyond
Multispecies DAS	62,000	A DAS 43,000	A DAS 43,000	A DAS 39,600
		B DAS 29,000	B DAS 29,000	B DAS 32,400
		Total 72,000	Total 72,000	Total 72,000
Scallop DAS	34,000	35,000	27,800	25,300
Monkfish-Only DAS	4,500	IF DAS ARE DECOUPLED Assuming 718 total Monkfish Permits (A, B, C, and D)		
		29,000 (718 X 40 DAS)	29,000	29,000
Total DAS Available	100,500	136,000	128,800	126,300

Table 92 – Allocated Multispecies, Scallop and Monkfish-Only DAS under the Skate FMP baseline as compared to maximum allocated DAS under present management programs if Monkfish-Only DAS are decoupled.

Note: These DAS are allocated DAS, not necessarily the expected usage. For the scallop and multispecies fisheries usage is affected by the conditions of participation in area access programs.

6.2.2.3 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs.

The DSEIS analysis concluded that the proposed adjustments to the incidental catch limit, including this non-preferred alternative, will not affect fishing effort on monkfish and the stock-rebuilding program. One of the fundamental elements of the management plan is that the directed fishery TAC is calculated after accounting for the incidental catch of monkfish in other fisheries. Thus, if monkfish catches increase as a result of any

adjustment to the incidental catch limit, the amount of the overall TAC available to the directed fishery will be reduced proportionally. Nevertheless, the proposed adjustments are not expected to result in increased catches of monkfish in those non-directed fisheries affected by the proposed changes. Those increases will convert some discards to landings, especially as monkfish stocks increase, resulting in better catch data, but they are not large enough to create a directed fishery under a nominal incidental catch fishery. Thus, this alternative would not likely have a significant biological impact compared to no action.

6.2.2.4 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

According to the analysis in the DSEIS, supported by public comment, in the case of monkfish, the selectivity characteristics of 10-inch or larger trawl and gillnet mesh are not well understood, but generally the fishery already uses (by both fishermen's choice and regulation) the largest meshes of any fishery in the region. Alternatives that increase minimum mesh size are likely to result in some increase in yield-per-recruit for monkfish, but these effects cannot be quantified. Also, qualitatively speaking, larger mesh sizes also reduce the incidental catch of other species, but the actual difference between no action (10-inch square mesh on trawl vessels) and the non-preferred alternatives (12-inch square mesh) is not likely to be significant since most of the incidental catch is already released under the current mesh size, according to public comment.

6.2.2.5 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

The DSEIS noted that decreasing or eliminating the minimum fish size could have a negative effect on yield-per-recruit, but would not likely have a significant effect on the monkfish stock rebuilding program which is based on trip limits and DAS. The DSEIS pointed out, however, that alternatives that reduce or eliminate the minimum fish size do not necessarily translate into reduced yield-per-recruit if those fish that could be landed under the new rule were simply fish that otherwise would be caught and discarded. According to the analysis of bycatch in that document, the primary reason given to observers for monkfish discards in directed fisheries is “too small” either due to regulation or market cull, and, therefore, those measures are not likely to have a significant effect on reducing yield per recruit since they would likely simply convert discards to landings. If directed effort shifts to targeting smaller fish in response to the reduced or eliminated minimum size, however, there could be negative impacts on stock rebuilding (more numbers of fish killed for a given TAC).

6.2.2.6 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

The Councils considered PDT comments in the DSEIS that a 20-day block over a 90-day period, when vessels are only allocated 40 DAS, is totally ineffective. Furthermore, even if the period were extended to 40 days, the benefits to spawning, which are the basis for the closed season, are unknown, and the effectiveness of the longer closed season is reduced by the fact that vessels in other fisheries could still land monkfish under the various incidental catch limits during the period when vessels are not active in the directed fishery.

6.2.2.7 Offshore SFMA Fishery

The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

Area Option 2 differs from the proposed action by restricting the offshore fishery program from fishing along the southern flank of Georges Bank. This alternative, however, has no significant biological impact compared to proposed action, since vessels not enrolled in the program can target monkfish in that zone. In fact, since those vessels could fish with multispecies regulated mesh when on a multispecies/monkfish DAS, Option 2 could have a greater impact on regulated species and small monkfish than the proposed Option 1, under which those vessels would be required to use 10-inch mesh in that area if they are enrolled in the offshore program.

Since both DAS/Trip Limits options represent different methods for calculating the trip limits and DAS allocated to participating vessels, based on the same overall annual allocation, the two options are equivalent from a biological perspective.

6.2.2.8 Modification of permit qualification for south of 38°00’N

The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°00’N.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
Alternative 3	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 93 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

The biological impact of the non-preferred Alternatives 1, 2 and 4 are not significantly different than Alternative 3, compared to no action. The basis for this conclusion is that the number of affected vessels ranges from 3 to 7, with 5 expected to qualify under the proposed action, Alternative 3. As noted in the discussion of impacts of Alternative 3, the proposed action may result in some shift in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest increase in overall monkfish effort if these vessels are currently not active in the fishery. Overall, however, the biological impact on monkfish and other species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20’N) and the sea turtle closures. Any increase in monkfish effort as a result of this proposal, however, would be mitigated in subsequent years by the automatic adjustment of trip limits and DAS allocations as needed by the stock rebuilding program.

6.2.2.9 EFH Alternative 4 Option 2 (Monkfish trawl configuration)

The Councils considered an alternative trawl configuration specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. The Councils considered adopting individual elements from the following options, and sought public comment on the specific components. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species.

The Councils considered this alternative trawl configuration as a means to minimizing the impact of the directed monkfish fishery on EFH of other species, particularly groundfish, and to reducing incidental catch of small monkfish, multispecies and skates. However, the gear is unproven, and based on public comment, may not be any more effective in keeping effort off complex bottom areas than the 10-inch minimum mesh size and the 6-inch roller restriction in the southern area, since groundfish catches are likely to be minimal. The impact of this gear, while potentially beneficial to monkfish and other managed species, is highly uncertain, and may be no more effective than the no action alternative (10-inch square mesh) if DAS are not separated, since the number of vessels that would be required to use it (i.e. trawl vessels on a monkfish only DAS) is minimal.

6.2.2.10 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB. Non-preferred Alternative 5C proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line.

As with proposed action (EFH Alternative 5AB, closure of Oceanographer and Lydonia Canyons), this alternative has no immediate biological impact compared to taking no action, since vessels currently targeting monkfish in the SFMA are not fishing in the canyon areas that would be protected under this action. This alternative would, however, protect those areas that are known to have deep sea corals and sponges, among other species, from expanding monkfish fishing effort, particularly under the proposed offshore fishery program. Thus, the biological impact on monkfish and other managed species found in the canyons is preventative and, therefore, positive, but cannot be quantified, since the amount of future potential effort that is affected, as well as the number and distribution of affected species (fish as well as corals and sponges) in these areas is unknown.

6.2.2.11 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

The proposed experimental fishery would not have a direct biological impact on either monkfish or other managed species, compared to no action, since vessels can conduct such experimental fisheries without the Councils adopting this alternative, and, in fact, such an experiment is currently being done. The DSEIS noted, however, that indirectly the trawl experimental fishery could reduce the monkfish fishery's impact on the multispecies fishery, if successful and followed-up with establishment of a trawl exempted fishery. The goal of the experiment is to determine if and under what circumstances a monkfish trawl exempted fishery can be established that meets the maximum bycatch tolerance of the multispecies regulations. If successful, the fishery will provide an alternative fishery for multispecies vessels facing increasing restrictions under Amendment 13, with minimal incidental catch of groundfish. Since an experimental

fishery is already being conducted, these benefits could be realized without the Councils taking further action.

6.2.2.12 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but rejected three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

This is an administrative action and, therefore, these alternatives do not have any biological impact compared to taking no action.

6.2.2.13 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. Since the Councils took no action to change the fishing year, these administrative alternatives are irrelevant.

6.2.3 Impacts on Marine Mammals and Protected Species

6.2.3.1 General Considerations

Background information on the fishery relative to interactions with threatened and endangered species is included below to lend context to the discussion on impacts of the management alternatives under consideration in Section 6.2.3.2. It is excerpted from the Biological Opinion dated April 14, 2003 and prepared by NOAA Fisheries, Northeast Region. While a number of the species discussed have no known takes in the directed monkfish fishery, many have either had documented takes in multispecies sink gillnet gear which is used in the monkfish fishery or their distribution is known to overlap with the fishery. For example, in the case of sei whales, takes in fishing gear have not been documented and their distribution is generally offshore, but Waring et al. (2002) reports that reduced prey availability in certain years has resulted in more inshore movements of this species in locations such as Great South Channel and Stellwagen Bank. The following discussion, therefore, is based on potential risks based on the overlap of the monkfish fishery and the distribution of the species, or takes in gear that is consistent with that used in the directed monkfish fishery.

The location of the monkfish fishery in relation to the distribution of ESA-listed species is a factor influencing the likelihood that a gear entanglement will occur. All of the species considered in this Opinion occur in the action area where monkfish gillnet gear is set. Overlap of monkfish gillnet gear with right and humpback whales occurs during the fall and spring when right and humpback whales travel between northern foraging grounds and southern calving areas as well as when these species are on the foraging grounds in the Gulf of Maine.

Overlap of the fishery with humpback whales can also occur in the winter off of Virginia where juvenile humpback whales have been observed feeding.

Fin whales are more ubiquitous in their distribution, and less is known about their winter distribution than for right and humpback whales. In the North Atlantic, the single most important area for this species appears to be from Great South Channel, along the 50m isobath past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffrey's Ledge (Hain et al. 1992).

Within the action area, the sei whale is most common on Georges Bank and into the Gulf of Maine/Bay of Fundy region during spring and summer, primarily in deeper waters. Individuals may range as far south as North Carolina. Blue whales are still considered to occur more regularly in Canadian waters as compared to U.S. waters, but blue whales have been observed in the Gulf of Maine including three sightings in the summer and early fall 2002. In the U.S. EEZ, sperm whales are distributed in a distinct seasonal cycle; concentrated east-northeast of Cape Hatteras in winter and shifting northward in spring when whales are found throughout the Mid-Atlantic Bight. Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 1999). Given the distribution of these species, all occur in areas where monkfish gillnet gear is set, although blue whales and sperm whales are expected to have the least extent of overlap with monkfish gillnet gear given the depths at which these species typically occur.

Sea turtles also occur through all or most of the area in which monkfish gillnet gear is set. Of the turtle species considered, loggerheads are the most abundant in the action area. Loggerhead turtle abundance is relatively high from Cape Hatteras to Long Island throughout continental shelf waters (NOAA Fisheries 1994). Loggerhead, green and Kemp's ridley turtles are also sighted in inshore waters of the Mid-Atlantic area (NOAA Fisheries 1994).

While leatherbacks are most often sighted offshore, they may follow jellyfish into nearshore waters (NOAA Fisheries 1994). Turtles occurring in the inshore waters of Virginia tend to stay from May through November, and turtles generally occur in New York inshore waters from June until October (NOAA Fisheries 1994). Coincidentally, peak monkfish landings by gillnet gear occur in the SFMA in May-June and November-December (Monkfish SAFE Report 2001). Of particular concern is the early spring monkfish gillnet fishery that occurs off of North Carolina and Virginia in March through May. It has been previously shown that the narrowness of the continental shelf and the influence of the Gulf Stream on nearshore regions serves to concentrate sea turtles emigrating from nearshore waters in the Mid-Atlantic Bight and Pamlico and Core Sounds in the late fall and early winter (Epperly et al. 1995b). As water temperatures warm in the spring, these turtles begin to move north and disperse to summer foraging grounds. Although monkfish fishing effort in EEZ waters off of North Carolina and Virginia is far less than elsewhere in the action area, the high concentration

of turtles in the area means there is a risk of a high level of interaction with the fishery.

As described above, monkfish trawl gear is used more often in New England waters and in deeper waters throughout the action area where sea turtles are less likely to occur. Therefore, the risk of entanglement for sea turtles in this gear type is expected to be less than for gillnet gear. However, based on take of sea turtles in trawl gear used in other fisheries, sea turtle takes in monkfish gear are possible when the distribution of sea turtles and operation of this gear in the monkfish fishery overlap.

Another factor influencing the likelihood that a gear entanglement will occur is the configuration of the fishing gear. Baleen whales, including right, humpback, fin, sei and blue whales, skim and gulp for prey and filter vast quantities of water through rows of baleen plates suspended from the upper jaw on the inside of their large mouths. Line suspended in the water column such as from buoy lines may become caught in the baleen if the whale incidentally encounters the line when feeding. Whales may also be more likely to become incidentally entangled in gillnets when distracted by feeding or social behavior.

Leatherback sea turtles may actually be attracted to buoys used on trawl and gillnet gear which could appear to be jellyfish, or they may be attracted to the organisms which colonize ropes and buoys. Tie-downs used on monkfish gillnet gear in the Mid-Atlantic may also contribute to sea turtle entanglements in such gear. While tie-downs reduce the vertical profile of the net which can help to reduce interactions with harbor porpoise, the tie-down also creates a pocket of netting which can increase the likelihood of entanglement for species that occur at or near the bottom. Using tie-downs is a common practice in portions of the monkfish fishery in order to increase the catch rate of monkfish (a bottom dwelling fish species). Given that hard-shelled sea turtles such as loggerheads, greens, and Kemp's ridleys forage at or near the bottom in benthic habitats, the use of tie-downs for gillnets set in the same areas may increase the likelihood that turtles will be caught in the net. The long soak time of monkfish gillnets, particularly in the Mid-Atlantic, also increases the risk of sea turtle entanglements by increasing the length of time (i.e., the opportunity for incidental capture) that the net is in the water. Soak times for monkfish gillnets, in general, are greater than the submergence tolerance of sea turtles. Therefore, sea turtles are almost certainly expected to die as a result of capture in a monkfish gillnet unless the animal is caught in the net close to the surface and has the ability to breathe, or is caught immediately prior to hauling of the net.

While the implications of potential shifts, as well as increases and decreases in fishing effort, are discussed in detail below, in Section 6.2.3.2, the overall impacts of the amendment remain unclear at this writing. In a number of cases they are dependent on the behavior of fishermen responding to actions proposed for the Northeast multispecies and sea scallop fisheries. It is known, however, that right, fin, humpback, fin and sei whales and loggerhead, green, Kemp's ridley and leatherback turtles become entangled in both trawl and sink gillnet gear that is identical or similar to that used in the monkfish fishery.

Although they could occur, the April 2003 NMFS Biological Opinion prepared for the monkfish fishery notes that there have been no reported or observed incidental takes of sea turtles specifically in the monkfish otter trawl fishery during any time of the year. Similarly, ESA-listed whales are rarely caught in trawl gear.

Sea turtles, however, occur throughout the area in which monkfish gillnet gear is set, but particularly in the SFMA. Takes of turtles that have been attributed to monkfish gear are expected to be reduced by the Large-Mesh Gillnet Final Rule in effect for federal waters off North Carolina and north to Chincoteague by limiting effort to times when sea turtles are not expected to be present in large or significant numbers.

Loggerhead turtles are most affected by potential increases in gillnet effort and benefit from the Large Mesh Final Rule, although green and Kemp's ridley turtles are also found inshore in the Mid-Atlantic area. Right and humpback whales may also experience reduced risks of entanglement as a result of the turtle measures.

Other actions affecting sink gillnet gear include the Harbor Porpoise Take Reduction Plan which prohibits setting gillnets in southern Mid-Atlantic waters for selected time periods. The plan should benefit any cetacean moving from southern nursery areas to northern feeding areas during these periods as well as sea turtles that are present in the areas during the closure period. Rules included in the Atlantic Large Whale Take Reduction Plan require modifications to gillnet gear to reduce the risk of entanglement as well as the severity of entanglements for large whales.

6.2.3.2 Impacts of Amendment 2 Measures on Protected and Endangered Species

This section contains analysis and discussion of proposed measures as well as those considered in the DSEIS but not adopted by the Councils. Proposed and non-preferred alternatives are identified within each subsection.

6.2.3.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. The Councils did not adopt these alternatives.

Under both alternatives (Alternative 1a and 1b) and under the no action alternative (Alternative 2), all monkfish limited access permit holders would be allocated 40 monkfish DAS. Options are also provided under Alternative 1 that would allocate individual DAS based on past performance in the monkfish fishery. DAS could be reduced, under the management program implemented in Framework 2, if the SFMA TAC is set below 8,000 mt. In that case, the trip limits would remain fixed at 550 lbs. and 450 lbs. (tails/DAS) for Category A and C, and B and D, respectively.

The two alternatives for de-coupling monkfish DAS from multispecies and scallop DAS usage requirements would allow vessels the choice, both annually and on a trip-by-trip basis, to use separated DAS or combined DAS. Whether or not a vessel would fish its

monkfish DAS separately depends on the particular circumstances of the vessel, namely, area and gear fished, number of DAS or opportunities available in other fisheries, and possibly other considerations.

The combined, or cumulative effect of de-coupling DAS usage requirements and the B Day measures adopted in the Multispecies FMP would be a far greater increase in monkfish effort than under the proposed, no action alternative. This would occur to a large degree in the NFMA, where the availability of alternative fisheries to those impacting the groundfish species of concern is more limited. Vessels that could have, but did not target monkfish in the past, would now target monkfish on their B days, as well as on their de-coupled monkfish DAS, had that alternative been adopted.

The requirement to use a specific net (proposed monkfish trawl or large-mesh gillnet) while on a monkfish DAS is an additional factor that each vessel owner would have to consider in making the decision whether to de-couple DAS, had this alternative been adopted. Protected species interactions would likely not change from current levels under this scenario. It should be noted that until a monkfish trawl exempted fishery is established in the NFMA (following experimental fishing shown to minimize bycatch of regulated species to below the 5 percent standard), trawl vessels must be on a multispecies DAS to land more than the incidental catch limit, therefore, in the near term the option to increase effort by separating DAS in the NFMA does not exist for trawl vessels, although effort may increase as a result of the Multispecies B day program.

In the SFMA, where vessels can direct effort on monkfish and multispecies with far less overlap than in the NFMA, Category C and D could increase overall effort under DAS Alternative 1 compared to no action because they would have monkfish DAS *in addition* to their multispecies or scallop DAS, not *in combination with* their other DAS. If effort increases, there could be negative effect on protected species due to the increased possibility of encounter. Under Multispecies Amendment 13, groundfishing effort has been substantially reduced, although the B day program adopted in Framework 40A may result in monkfish fishing effort actually increasing, although the total change in effort due to the combination of DAS alternatives in this amendment and changes in Amendment 13 and Framework Adjustment 40a cannot be quantified at this time.

While the number of vessels that would use the opportunity presented by Alternative 1 cannot be determined, it is most likely that some scallop vessels will increase overall fishing time if DAS are decoupled. Under Alternative 1, those vessels could fish their entire scallop allocation on a full-time basis and then fish their monkfish DAS allocation. Under this alternative the potential for interactions with protected species in the SFMA is likely to increase compared to no action. One limiting factor is that vessels will have to weigh the opportunity costs and the cost of re-rigging to use the monkfish trawl against the expected revenues.

If a significant number of scallop vessels targeted monkfish, overall effort levels would increase (unless, of course, scallop DAS were reduced under scallop management actions). These vessels generally operate in the SFMA, and as a consequence, the impacts to protected species of increased trawl fishing effort will increase accordingly and could potentially affect sea turtles where overlap with the scallop fishery occurs.

Although not adopted in this amendment, except as an action that could be taken under the framework adjustment process, DAS transfer options could result in the activation of latent effort, or unused DAS by monkfish vessels, and the impact of the fishery on protected species could increase even further. Provisions to maintain conservation neutrality would mitigate this effect.

6.2.3.2.2 Trip Limits for Monkfish Incidental Catch

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs. The proposed increase is intended to reduce discards of monkfish by allowing specified vessels, including general category scallop and clam dredge boats (under a proposal adopted in this amendment), to retain rather than discard small amounts monkfish caught incidentally.

Given the very low trip limits proposed, these measures, as well as the No Action alternative, are not likely to have an impact on any protected species in the action area. At such low levels, especially when compared to value of the target species of these vessels, the poundage under consideration is not significant and should not appreciably affect monkfish effort or shifts in effort. Consequently it is not likely to change interactions with protected species beyond what currently exists in the identified fisheries. No action could result in the continued discarding of monkfish by the vessels in these fisheries and would continue the status quo with respect to protected species.

The proposed action to restore the incidental catch limit west of 72°30' to what was in place prior to the Multispecies interim rule in 2001 (See Section 4.1.1.3) will not have a measurable effect on effort. Affected vessels fishing in this area under the monkfish incidental catch limit are targeting summer flounder and did not alter their fishing pattern subsequent to, or as a consequence of the reduced monkfish incidental catch limit. They simply discarded monkfish over the 50 lb. limit, according to reports by fishermen. Therefore, the impact of Alternative 2, the proposed action, on protected species is no different than Alternative 1 (no action).

6.2.3.2.3 Minimum Mesh Size on Directed Monkfish DAS

The Councils considered three alternatives, including the No Action alternative, for the minimum mesh size on trawl vessels on a monkfish only DAS. The Councils propose taking no action, but under the alternatives not adopted (Alternatives 2 and 3), Category A and B vessels on a monkfish DAS, as well as limited access scallop vessels on a monkfish DAS, would be required to use mesh larger than the current minimum size.

The Councils' intent is to minimize the bycatch of small monkfish and of other species on monkfish trawl vessels. Gillnet vessels currently are required to fish with 10-inch minimum mesh, but do not experience the same finfish bycatch problems as monkfish trawl gear. In fact, many participants in the gillnet fishery claim to already use mesh sizes larger than the current required minimum size. Potentially, the increased mesh size could reduce fishing effort in areas with a bycatch of multispecies, and cause effort to shift to

areas where protected species are either more or less abundant than in the current fishery. As such, the outcome for any of the alternatives is unclear, but the changes in fishing patterns would affect the trawl sector only. As has been mentioned, takes of protected species are known to occur in bottom trawl fisheries, but based on current data, the risk of entanglement is lower than in the gillnet fishery. Since the Councils propose taking no action, no effort shifts can be attributed to this measure and it should not affect monkfish fishery interactions with protected species.

6.2.3.2.4 Minimum Fish Size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. Because none of the alternatives, including no action, would change catch targets or DAS/trip limit allocations, they would have little or no impact on the magnitude or distribution of effort, and, therefore, are expected to have a negligible impact on any protected species. If vessels do not high-grade their catch (discard smaller animals in favor of larger ones that may get a higher price per pound), it is possible they may reach their trip limit more quickly under these scenarios, resulting in trips that are shorter in duration. Gear in the water for shorter periods than under No Action alternative could benefit protected species because of the potential reduced risk of entanglement. Under the proposed action, the reduction in tail minimum size by three inches in only the SFMA is not expected to have an effect on the duration of trips.

6.2.3.2.5 Closed Season or Time Out of the Fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. This requirement affects all limited access monkfish vessels, except category C and D vessels with a scallop limited access permit.

In general, gear out of the water equates to fewer impacts to protected species. It could be inferred here that the alternative which doubles the time that gear must be removed from the water would have the most benefit to protected species. To the extent that benefits are realized, species most likely affected by a reduction in gear during the spring (under Alternative 3) period include right and humpback whales traveling from southern calving areas to northern foraging grounds, sperm whales shifting northward to the Mid-Atlantic Bight, sea turtles traveling to the Mid-Atlantic from wintering grounds in the south and harbor seals moving northward within the Gulf of Maine.

Conversely, the proposed action to eliminate of the requirement could be expected to have negative impacts to those protected species. The effects, however, are not so straightforward because individual vessels may elect to take their block out at any point

during the March 1 –May 31 period with ample time left to use their 40 DAS allocation within the 90-day window. Therefore, varying amounts of gear will still be in the water even if the gear removal time were doubled.

6.2.3.2.6 Offshore SFMA Fishery Program

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2 (Area Option 1) (see Section 4.1.4). Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (DAS/Trip Limits Option 2). Within Alternative 2, however, the Councils considered, but non-preferred options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

Area Option 2 differs from the proposed action by restricting the offshore fishery program from operating along the southern flank of Georges Bank. Since both DAS/Trip Limits options represent different methods for calculating the trip limits and DAS allocated to participating vessels, based on the same overall annual allocation, the two options are equivalent from a biological perspective. Under the No Action alternative, fishing would occur in either area under the current rules.

Under the proposed action, the increased trip limits associated with the programs provide vessels with an incentive to shift effort from inshore areas to offshore, but overall effort would be reduced since DAS will be used at a higher rate as a requirement of participation, ensuring that fishing gear will be in the water less, compared to no action. Another mitigating factor for protected species, including sea turtles, is that they are less present in the area during the October through April season of the offshore fishery. Further, vessels must enroll annually in the program and carry a VMS, thereby enhancing monitoring of the portion of the fleet that chooses to participate, and potentially providing more information that could contribute to a better understanding of protected species and their overlap or interactions with the monkfish fleet, to the extent such interactions occur.

6.2.3.2.7 Modification of permit qualification for south of 38°00'N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

The Councils considered four alternatives to revise the limited entry qualification period for vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The impact on protected species of the non-preferred Alternatives 1, 2 and 4 are not significantly different than Alternative 3, compared to no action, since the number of affected vessels ranges from 3 to 7, with 5 expected to qualify under the proposed action, Alternative 3. These qualifying vessels fished for monkfish with large-mesh gillnets in the EEZ prior to 1999 when the FMP took effect.

Large mesh gillnets are subject to a series of closures in federal waters off North Carolina and north to Chincoteague by the Final Rule for Large Mesh Gillnet Fisheries, except in late winter and very early spring when turtles are less likely to be found. Following FMP implementation, these vessels fished for monkfish either in state waters or in the EEZ under an experimental fishery permit. The experimental fishery was discontinued, and the sea turtle closures further limited the ability of these vessels to fish for monkfish in the past two years. The proposed action, therefore, may result in some shift in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest, but not significant increase in overall monkfish effort if these vessels are currently not active in the fishery.

Overall, however, the impact on protected species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20'N) and the sea turtle closures.

6.2.3.2.8 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct biological impacts of the following three measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents. Because this alternative will enable the Councils to take timely action to implement measures to address protected species issues within the context of the FMP through framework adjustment, this measure indirectly benefits the protected species that are likely to interact with monkfish gear in the EEZ. Measures include, but are not limited to gear-specific seasonal/area closures or gear modifications.

6.2.3.2.9 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7). Few vessels are able (because of the size required to fish on the Grand Banks) or likely to take advantage of this measure. Encounters with deep water cetacean species such as sperm whales could occur in the area, but impacts are not likely to increase appreciably beyond that now occurring in the multispecies fishery which has had a similar exemption for a number of years. Although no vessels have availed themselves of this opportunity, even if some do, it is likely to be a small number and they will not likely affect the potential for encounters with protected species in an appreciable way.

6.2.3.2.10 Measures to Minimize the Fishery Impacts on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8). The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA (EFH Alternative 4, Option 3), and propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals and their habitat (EFH Alternative 5AB). The Councils considered but rejected an alternative trawl configuration specifically designed to minimize the impact of the monkfish fishery on EFH for groundfish species if DAS usage requirements were separated (EFH Alternative 4, Option 2). The Councils also considered a second closure option to minimize the impacts of the directed monkfish fishery on deepwater corals (EFH Alternative 5C), which proposed to close up to 12 large canyons from Norfolk Canyon to the Hague Line.

EFH Alternative 1, no action, has been assessed with regard to impacts on protected species in the Monkfish FMP and subsequent framework adjustments as well as in the Biological Opinions prepared by NMFS for ESA Section 7 consultations. In the DSEIS, EFH Alternative 2 considered the effect of other Amendment 2 measures in protecting EFH, and is discussed in this document under the respective action items and alternatives. EFH Alternative 3 considered the effect of actions taken under Amendment 13 to the Multispecies Plan and Sea Scallop Amendment 10 on EFH as they affect monkfish vessels, and have been determined to have varying impacts that are not expected to appreciably increase the potential risks to protected species, although impacts vary by species. While adverse effects can and do occur under all of these management programs, none are considered by NMFS to jeopardize the continued existence of ESA-listed species, except for right whales. In that case, a Reasonable and Prudent Alternative has been implemented through the ALWTRP.

The option for a monkfish trawl configuration (Alternative 4, Option 2) considered but not adopted by the Councils may have benefits to protected species, if the ability of the net to “herd” fish is reduced and other effects have the potential to reduce the likelihood of sea turtle interactions. This conclusion, however, is speculative given that actual gear trials have not yet occurred. Further, although bottom trawls have documented takes of sea turtles, there are none documented in monkfish trawl gear. This is possibly an artifact of low observer coverage. More comprehensive monitoring of this component of the fishery should lead to a better evaluation of this potential.

The proposed action, Option 3, setting a 6-inch maximum roller disc diameter on monkfish trawls in the SFMA is not likely to be different than the no action alternative with regards to impacts on protected species, since that is the maximum size currently used by vessels in that area. The roller restriction will, however, serve to prevent those vessels from expanding their effort into complex bottom areas along the continental margin and offshore canyons.

Protection of deepwater corals (EFH Alternatives 5AB and 5C) through area closures could afford some level of protection to sperm whales and possibly other offshore species such as beaked whales, dwarf sperm whales, Risso’s dolphins, pilot whales and common dolphins to the extent that their distribution overlaps with the fishery. The selected option

that includes all vessels on a monkfish DAS will afford greater protection than the non-preferred option that would have applied just to trawl vessels.

6.2.3.2.11 Cooperative Research Program Funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP. One is based on a DAS set-aside, and the other on providing a limited exemption from DAS for vessels engaged in research. Both are expected to have neutral effects to protected species compared to no action in that they do not, in and of themselves result in any changes in effort. Projects undertaken within either program will be evaluated on a case-by-case basis as to their impacts on protected species, as the Experimental Fishery Program currently operates. The exemption or set-aside alternatives simply obviate the need for individual researchers to apply for DAS exemptions and conduct the required impact analysis with respect to the effects on monkfish fishing mortality.

Since Alternative 1 sets aside DAS from the existing pool of allocated DAS, effort is not likely to increase as a result of adopting this approach. Under Alternative 2, which provides an exemption from DAS, effort is also not likely to increase because the amount of DAS available under the exemption program is limited to the residual of the pool of DAS not distributed to vessels under the set-aside. In other words, the DAS being set aside under Alternative 1 are from the same currently unused portion of allocated DAS that would be used under the exemption program in Alternative 2. In either case, the proportion of DAS available under both alternatives is a small fraction of the total DAS used, and, therefore, likely to be insignificant.

6.2.3.2.12 Clarification of Vessel Baseline History

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

This action is an administrative change that does not result in any increase in fishing effort or direct change to the fishery, and, therefore, will not likely affect the fishery interaction with protected species.

6.2.3.2.13 NFMA Monkfish Trawl Experimental Fishery

The Councils considered but rejected a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. The Councils rejected the proposal because vessels can already conduct such an experiment under current regulations, and, in fact, are. A two year trial would not affect protected species except to allow an adequate evaluation of its effects on listed and other protected species. Impacts at this time are unknown.

Taking no action would not affect protected species.

6.2.3.2.14 Change Fishing Year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but did not adopt three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

This is an administrative action and, therefore, these alternatives do not have any impact on protected species compared to taking no action.

6.3 Impacts on EFH

6.3.1 Habitat Assessment of alternatives designed to minimize impacts on EFH

This Amendment and FSEIS include a no action EFH alternative (Alternative 1, combined measures of DSEIS EFH Alternative 1 and EFH Alternative 3, due to FSEIS timing relative to implementation of Amendment 10 to the Scallop FMP and Amendment 13 to the Multispecies FMP). EFH Alternative 2 relies on the incidental habitat benefits of management measures considered in the DSEIS to have substantial benefits, other than those specifically designed to minimize EFH impacts. EFH Alternative 4, in the DSEIS, included options that focus on the direct adverse impacts of bottom trawls for 23 species with life stages with EFH that is potentially vulnerable to bottom trawls and dredges by regulating the configuration (Option 2) or roller gear (Option 3, adopted) of monkfish trawls. EFH Alternatives 5AB (proposed action) and EFH Alternative 5C (not adopted) focus on the impacts of the monkfish fishery on EFH for managed species and life stages found in deep-sea canyon communities. EFH Alternative 5, specifically, was intended to protect the deep-sea coral communities that occur in submarine canyon environments on the outer continental shelf. The monkfish fishery is one of the few fisheries that operate in deep water, and these alternatives are intended to minimize the potential interactions of monkfish gear with deepwater corals to avoid the impacts to the hard bottom that is EFH for many species in these areas. EFH Alternative 5AB, was originally considered as two separate alternatives, but combined by the NEFMC prior to completion of the DSEIS.

6.3.1.1 EFH Alternative 1 (No Action)

This option is the baseline EFH alternative, that is, the measures that would have been in effect if the Councils had taken no action on measures proposed in this Amendment, as well as under other amendments that would have an effect on EFH, such as Multispecies Amendment 13 and Scallop Amendment 10. Both Amendment 10 and Amendment 13 have been approved since the Councils completed development and analysis of this no-action alternative in the DEIS; therefore, this alternative includes measures implemented by Amendment 13 and Amendment 10. In the DSEIS Amendments 10 and 13 measures were identified as a separate alternative, EFH Alternative 3, but since they have been adopted, Alternative 3 is incorporated into this no action alternative. The following Table 94 describes the habitat impact of the no action alternative.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Authorized fishery programs	Monkfish	3. Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. 4. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N.	3. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. 4. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect.	0
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. 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 EFH. Rare kelp beds are found in that area.	+
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	+
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravely sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	+
EFFORT REDUCTION MEASURES				
Monkfish DAS	Monkfish	Retain current requirement for vessels to	This alternative relies on the scallop and multispecies	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
usage by limited access permit holders in scallops and multispecies fisheries		use both monkfish DAS and scallop or multispecies DAS simultaneously	management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	
Trip limits for incidental catch	Monkfish	<p>4. 50 lbs. (tails) per trip.</p> <p>5. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish.</p> <p>6. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00' went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip</p>	<p>4. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries.</p> <p>5. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries.</p> <p>6. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery.</p>	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	<p>Mix of adaptive and phased effort reduction strategies.</p> <p>A days (60% of effective effort)</p> <p>B days (40% of effective effort)</p> <p>C days (FY01 allocation).</p> <p>Provides opportunity to fish on stocks that do not need rebuilding.</p>	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
			provision cannot be sold.	
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: NFMA: 11 inches (tail) or 17 inches (whole) SFMA: 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent.	+
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	0
OTHER MEASURES				
Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	Uncertain
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	+
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	+

Table 94– Habitat Evaluation of the No Action alternative in Amendment 2 to the Monkfish FMP

6.3.1.2 EFH Alternative 2 (Benefits of other Amendment 2 measures)

This section summarizes the habitat impacts of the non-habitat measures considered in the Amendment 2 DSEIS, which, although not adopted by the Councils, could have had substantial benefits to EFH. Applying the benefits of these measures to achieve the habitat objectives of the Magnuson-Stevens Act would incur no additional regulatory burden on the fishing community or enforcement/monitoring agencies, since they are being adopted for other reasons. However, these measures may not minimize the adverse effects of fishing on EFH as effectively as the proposed habitat protection alternatives. Table 95 summarizes the non-habitat measures considered, but not adopted in Amendment 2 that could have had substantial positive impacts on EFH had they been adopted.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	Without the associated trawl gear requirement, separated DAS would allow for increased overall effort with no habitat benefit. However, if the proposed trawl gear configuration is adopted as part of the separated DAS alternative, separating DAS may actually reduce impacts to vulnerable EFH for several reasons.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	Expected to improve bottom habitat conditions by reducing bycatch and mortality of benthic organisms. May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 95- Potential habitat benefits of non-habitat Amendment 2 management alternatives

The three management measures identified in the table above are distinguished from the other measures considered in Amendment 2 because they were expected to have substantial positive impacts on EFH. It should be noted that other management measures that were considered in the Amendment 2 DSEIS could have some positive, negative, or no impact on EFH. The habitat impact of each non-habitat measure proposed in this Amendment is summarized in Section 6.3.2.

6.3.1.3 EFH Alternative 3 (Benefits of actions in other FMPs)

Alternative 3, which intended to use the habitat benefits of measures implemented in Amendment 10 to the Atlantic scallop FMP and Amendment 13 to the Northeast Multispecies FMP, has been absorbed into the No Action Alternative (EFH Alternative 1).

At the time of the preparation of the Amendment 2 DSEIS, the New England Council was considering significant measures to mitigate adverse impacts (via gear modifications, effort reductions and habitat closed areas) of fishing with trawls, scallop dredges and hydraulic clam dredges on EFH in Amendment 10 and Amendment 13. Because the timing of the Councils' deliberation on alternatives to include in the Monkfish Amendment 2 DSEIS occurred simultaneously with the final decisions by the New England Council on these other two major FMP amendments, the decision was made to include Alternative 3 in the DSEIS. This decision was made with the understanding that if Amendment 10 and 13 were implemented prior to the submission of Council decisions on Amendment 2, then the measures outlined in Alternative 3 would become part of the No Action alternative as the implemented measures are considered part of the Status Quo. As such, all status quo measures that may have a habitat impact have been outlined in Alternative 1. See Table 94 for a description of the No Action Alternative for EFH and the estimated habitat impacts.

6.3.1.4 EFH Alternative 4 (Monkfish trawl configuration)

This alternative includes trawl configuration options that are specifically designed to minimize the impact of the monkfish fishery on EFH by both reducing the ability to use monkfish trawls on hard bottom and reducing the ability (incentive) of the gear to catch groundfish that are managed under the Multispecies FMP.

6.3.1.4.1 Option 2 (not adopted)

The Councils considered requiring specific trawl gear when a vessel is on a monkfish DAS (not a combined DAS), either as a complete package or individual elements from the following proposal based on public comment.

1. Max disc diameter on sweep

Option A: 12-inches both areas

Option B: 6-inches SFMA only

Option C: 16-inch North only, configured so discs can roll (with only one wire or chain)

2. Maximum ratio of headrope to footrope length of 1:1.1 to eliminate overhang

3. No ground cable, or maximum distance between doors and wings cannot be greater than 1/2 the length of the vessel

4. Upper and lower legs must be even

5. Minimum mesh size

Option A: (no action) 10" sq or 12" dia. (codend only), Multispecies mesh in the body

Option B: 10" sq or 12" dia. (entire net)

Option C: 12" sq. (codend), 12" dia. (body and wings)

Option D: 12" sq. (codend only), Multispecies mesh in body

6. Two-seam net construction requirement

6.3.1.4.2 Option 3 (proposed action)

The Councils propose to restrict the roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS in the SFMA.

Discussion/Rationale for Options 2 and 3

Relationship between monkfish behavior and the configuration of trawls:

Observations of monkfish behavior in the vicinity of a trawl show that herding is not a factor, minimizing the need for the gear to create a dust cloud, but increasing the importance of the wings of the net, which are often extended on monkfish trawls. Further, monkfish do not attempt to escape upwards, as do roundfish, allowing for a lower headrope than is needed on a groundfish trawl.

Sediments: The primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more consistent over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface.

Gear Used: These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

Fishing Behavior: Furthermore, since most vessels are required to use a multispecies DAS while fishing for monkfish, they currently fish in areas where they can target both groundfish and monkfish. A directed, monkfish-only trawl fishery could occur if vessels fished solely on muddy bottoms. If retention of groundfish were prohibited, vessels would have no incentive to fish on the more complex bottom types where those species would be caught in combination with monkfish.

Summary: A trawl net configuration was developed with the goal of increasing fishing efficiency for targeted monkfishing, taking into account fish behavior and bottom types, while reducing the incentive and ability to fish in more complex bottom areas which are essential fish habitat for many groundfish species. Increased efficiency would reduce the time gear would be in contact with the bottom for a given target catch or trip limit. By removing the incentive and ability to fish in hard bottom, the strategy would effectively eliminate the impact of the monkfish trawl fishery on essential fish habitat for many groundfish species that depend on those areas during most life history stages.

The Councils did not adopt Option 2 because they do not feel the trawl design has been scientifically demonstrated to achieve the objectives. Furthermore, since they are not separating DAS usage requirements, trawl vessels in the NFMA would not be fishing on monkfish-only DAS and most of the affected vessels would be in the SFMA. The Councils expect that the mesh

size and roller restriction (Option 3) applicable to those vessels would achieve the same result in the SFMA as Option 2 was intended to in the NFMA.

6.3.1.5 EFH Alternative 5 (protection of deep-sea canyon communities)

The EFH Final Rule states that FMPs must minimize the adverse effects of fishing on EFH, to the extent practicable (600.815(a)(2)(ii)). Adverse effects are defined to mean “any impact that reduces the quality and/or quantity of EFH” and 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 site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions” (600.810(a)). The scope of the regulations is rather broad and provides a basis for closed area management alternatives that address the potential indirect habitat or ecosystem impacts of fishing on EFH, as well as the direct impacts on EFH, in offshore canyon habitats. Impacts to offshore canyon habitats, which include deep-water coral species, has a direct adverse impacts on EFH that is more than minimal and less than temporary in nature; therefore, the Councils are considering alternatives to minimize those impacts.

Since this Amendment considered and approved the expansion of the offshore directed monkfish trawl fishery in the southern fishery management area, the Councils considered two options to minimize the potential impacts of that fishery on deep-sea canyon habitats (See Section 4.1.4 for a description of the measures and Section 6.3.2.6 for an evaluation of the habitat effects of these measures). Within these hard-bottom habitats, a variety of species of deep-sea corals have been found which are known to provide structured habitat and shelter for some species of demersal fish and invertebrates (see Section 5.1.6).

The directed monkfish fishery is conducted with bottom trawls and bottom gillnets, primarily in coastal and offshore waters of the Gulf of Maine, on the northern edge of Georges Bank, and in coastal and continental shelf waters of southern New England (Figure 69 and Figure 70), including offshore waters on the edge of the continental shelf, near the heads of several deepwater canyons (Figure 76). One of the proposed fishery management measures that has been approved by the Councils (see Section 4.1.4) would increase the probability that the offshore fishery for monkfish will expand in the future, within the area shown in Figure 2. Deep-sea corals are known to exist in some of the submarine canyons in this area (Figure 72). Furthermore, EFH for some federally-managed species extends beyond the edge of the continental shelf and includes portions of some of the canyons (see Section 6.3.1.5.3). Therefore, the possible expansion of the directed offshore monkfish fishery – either spatially into new areas or in terms of increased fishing intensity in existing areas - increases the probability of adverse impacts to EFH, canyon habitats, and deep-sea corals. Alternative 5 is intended as a precautionary measure to prevent any potential direct or indirect impacts of an expanded offshore monkfish fishery on EFH and offshore canyon habitats.

Following the NMFS guidance entitled *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002), as step-by-step evaluation of habitat impact evaluation was conducted by the PDT. First, a description of the

gears used in this fishery and an evaluation of the spatial distribution of their use in the Northeast region was conducted. Next, the results of scientific studies of the habitat impacts of these gears on different habitat types were summarized and an evaluation was made of the species and life stages of federally-managed species in the region with EFH that was determined to be vulnerable to the effects of different types of fishing gear. This information is presented in Appendix II to this FSEIS.

A summary of EFH and substrates contained in deep-sea canyons in the region based on the best available science was prepared (Section 6.3.1.5.3 and Section 6.3.1.5.4). This section of the FSEIS also included an assessment of additional information about the presence of managed species within the two canyons included in the proposed action (Alternative 5AB), including available data from submersibles, underwater camera surveys, NMFS trawl surveys (Section 6.3.1.5.5), and preliminary results from a recent NMFS deepwater biodiversity cruise (Section 6.3.1.5.6). Although the data are limited, these analyses confirm that there are federally-managed species within the Alternative 5AB proposed closure areas, and that some of these species have EFH defined as hard substrates in depths greater than 200 meters. Furthermore, the EFH designations for juvenile and/or adult life stages of six of these species overlap with the two areas proposed for closure under this alternative. Some type of hard substrate is included in the EFH description for all six of these species. EFH for all six of these species has been determined to be moderately or highly vulnerable to the effects of bottom trawls and minimally vulnerable to bottom gill nets. Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epi-benthic fauna that provide relief and shelter, and are known to be particularly vulnerable to damage or loss by bottom trawls and bottom gillnets (Section 5.1.6 and Section 5.4.1.7).

Protection of deep-sea corals is a relatively new concept in this region and the Councils asserted that there may be several statutory and regulatory authorities that support the Councils' initiative to protect deep-sea coral habitats, whether or not corals have been specifically identified as EFH for managed species. These authorities include the EFH Final Rule, discretionary provisions of the Magnuson-Steven Act, as well as bycatch provisions of the Magnuson-Stevens Act. National Standard 9 of the Magnuson-Stevens Act requires that management plans minimize bycatch to the extent practicable. NOAA fisheries consider bycatch to include finfish, shellfish, invertebrate species, and all other forms of marine animal and plant life. In the Response to Comments on the National Standard One Guidelines, the specifics of what constitutes as bycatch was examined. Based on the Response to Comment #4, NOAA Fisheries interprets bycatch to include a wide variety of marine species, with or without commercial value. Therefore, there may be regulatory justification to consider alternatives to reduce the impacts of the offshore monkfish fishery on deep-sea coral habitats.

6.3.1.5.1 Overlap of directed monkfish effort and location of known deep-sea corals

The degree of spatial overlap of monkfish fishing and deep-sea corals was evaluated. The data used are described in more detail in the paragraphs below. In summary, the degree of overlap is very small based on the data used, in terms of fishing activity within the submarine canyons. However, since there may be potential for expansion of the offshore fishery, the Councils developed two alternatives to protect canyon habitats that include deep-sea corals (Alternative 5AB and Alternative 5C).

Monkfish Effort Data: The monkfish fishery is described in more detail in Section 5.3. The fishery in the southern fishery management area (SFMA) is primarily a directed fishery, while monkfish is more often caught incidentally to other groundfish species in the northern fishery management area (NFMA). Figure 69 through Figure 71 depict the “directed” monkfish trips spatially by gear type for fishing years 1999 and 2001. A directed trip is defined in the analysis as any trip where total landings are made up of more than 50% monkfish (whole fish weight).

Coral Location Data: Available coral presence data were compiled during the development of these alternatives. Two primary databases were used: Theroux and Wigley data (TW) from the NMFS Benthic Invertebrate Database compiled in 1998 (see Theroux and Wigley 1998, Wigley and Theroux 1981), and Watling and Auster data (WA) compiled in 2003 from a variety of sources (Watling and Auster, in press; Watling et al. 2003). The WA database includes records from several sources including museum collections, submarine observations, and underwater camera tows. The TW database contains about 550 records (about 400 of “hard corals” and about 150 of “soft corals”). For this document, “hard corals” include several species within the subclass Hexacorallia (Zoantharia). “Soft corals” include species that are within the subclass Octocorallia, which include both soft coral species (order Alcyonacea) and gorgonians (order Gorgonacea), or sea fans. Note that sea pens have *not* been included in the “soft coral” classification for either database. There was some overlap between the two databases; roughly 26 of the records in the WA database were taken from the TW database. In all, the WA database (which is still being developed) includes 761 geo-referenced records for 25 species in 10 taxonomic families. Distribution maps based on these data show presence only, i.e., they only describe where corals that could be identified were observed or collected. There are no data that show where deepwater explorations have occurred and not encountered coral. For this reason, the distributions of deepwater corals are somewhat unknown, since all areas have not been surveyed and since some specimens were not identified. However, the combination of these two databases represents the best available data on the presence of deepwater corals in this region.

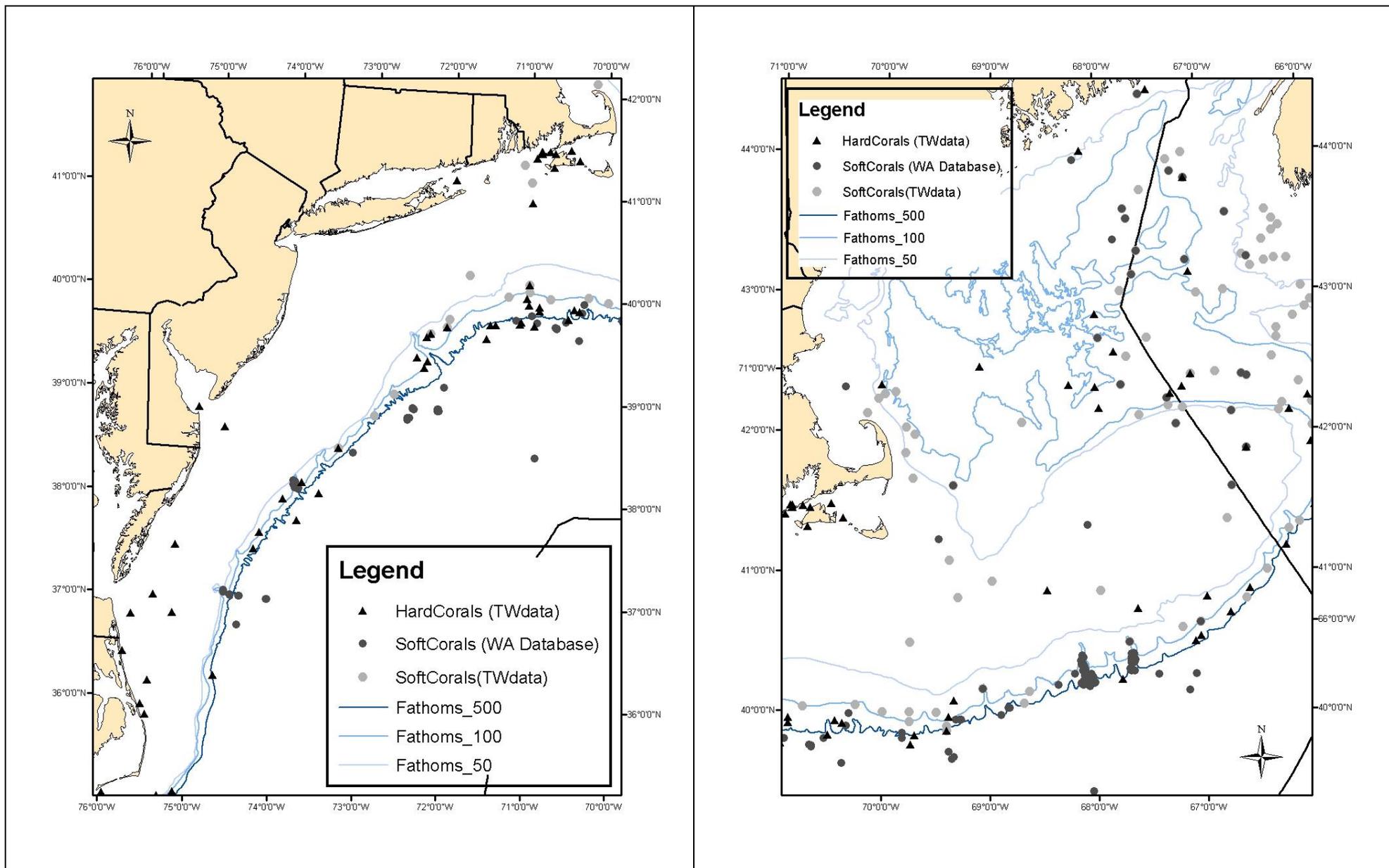


Figure 72: Presence of both hard and soft coral in the Northeast region (*Two primary sources: Watling et al., 2003 and Theroux and Wigley, 1998*).

6.3.1.5.2 Development of alternatives to protect deep-sea coral habitats

Three strategies were developed and used to identify a range of closed area alternatives to protect deepwater corals in the region.

Strategy One: Close areas deeper than a specific depth

Strategy Two: Close areas in canyons that are known to contain concentrations of coral,

Strategy Three: Close areas where directed monkfish effort overlaps with areas where concentrations of deepwater corals are present

The Habitat Committee considered the alternatives developed to meet these three strategies, but chose to forward a subset to the Council for consideration. For each of the options below there are two sub-options that specify which gears will be prohibited from these areas. Note that the Monkfish FMP does not permit dredge gear to direct on monkfish; therefore the potentially adverse impacts by this gear type should be managed under other FMPs, such as the Sea Scallop FMP. Although directed monkfish effort does not currently take place in all areas where coral have been found, there is a possibility that effort may increase into deeper waters and the distribution patterns of gears used in the fishery may change, particularly if the Monkfish and Multispecies DAS are separated. However, the proposed action does not include the separation or de-coupling of DAS at this time. However, the proposed action does not include the separation or de-coupling of DAS at this time.

6.3.1.5.2.1 EFH Alternative 5AB (Oceanographer and Lydonia Canyons Closure) (proposed action)

This alternative was initially developed as two separate alternatives, but combined by the NEFMC prior to submission of the DSEIS. The original intent of this alternative was to close Oceanographer Canyon and Lydonia Canyon to trawling in waters deeper than 500 meters because that is the depth that has been identified as a reasonable depth that would protect most of the deepwater species without closing waters throughout the entire range of all deepwater corals. However, using depth contours in areas of high relief would be very difficult to interpret and enforce. Therefore, a similar alternative was developed that closes the Canyons in a form that is more easily enforceable and that does not close waters shallower than 200 meters. See Figure 73 and coordinates are provided in Table 97.

Alternative 5AB -Option 1: Closed to trawl gear only (on a monkfish DAS)

Alternative 5AB -Option 2 (proposed action): Closed to all gears on a monkfish DAS (trawl and gillnets)

6.3.1.5.2.2 EFH Alternative 5C (up to 12 large, steep-walled canyons closures) (not adopted)

This option proposed to close waters above up to 12 large canyons, based on the premise that many deepwater corals need hard substrate and are predominately found on hard substrate within canyons, not on the slope. Although research has not been conducted in every large canyon in

the region, the canyons with hard substrate and steep walls are likely to have corals, since other canyons with similar characteristics do. See Figure 74 and coordinates are provided in Table 98.

EFH Alternative 5C -Option 1: Closed to trawl gear only (on a monkfish DAS)

EFH Alternative 5C -Option 2: Closed to all gears on a monkfish DAS (trawl and gillnets)

Alternative	AREA (nm2)
5 AB (Proposed Action)	116
5 C	508

Table 96 – Area in square nautical miles of both coral protection alternatives

	Latitude		Longitude	
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38

Table 97 - Coordinates of Habitat Alternative 5AB (Proposed action)

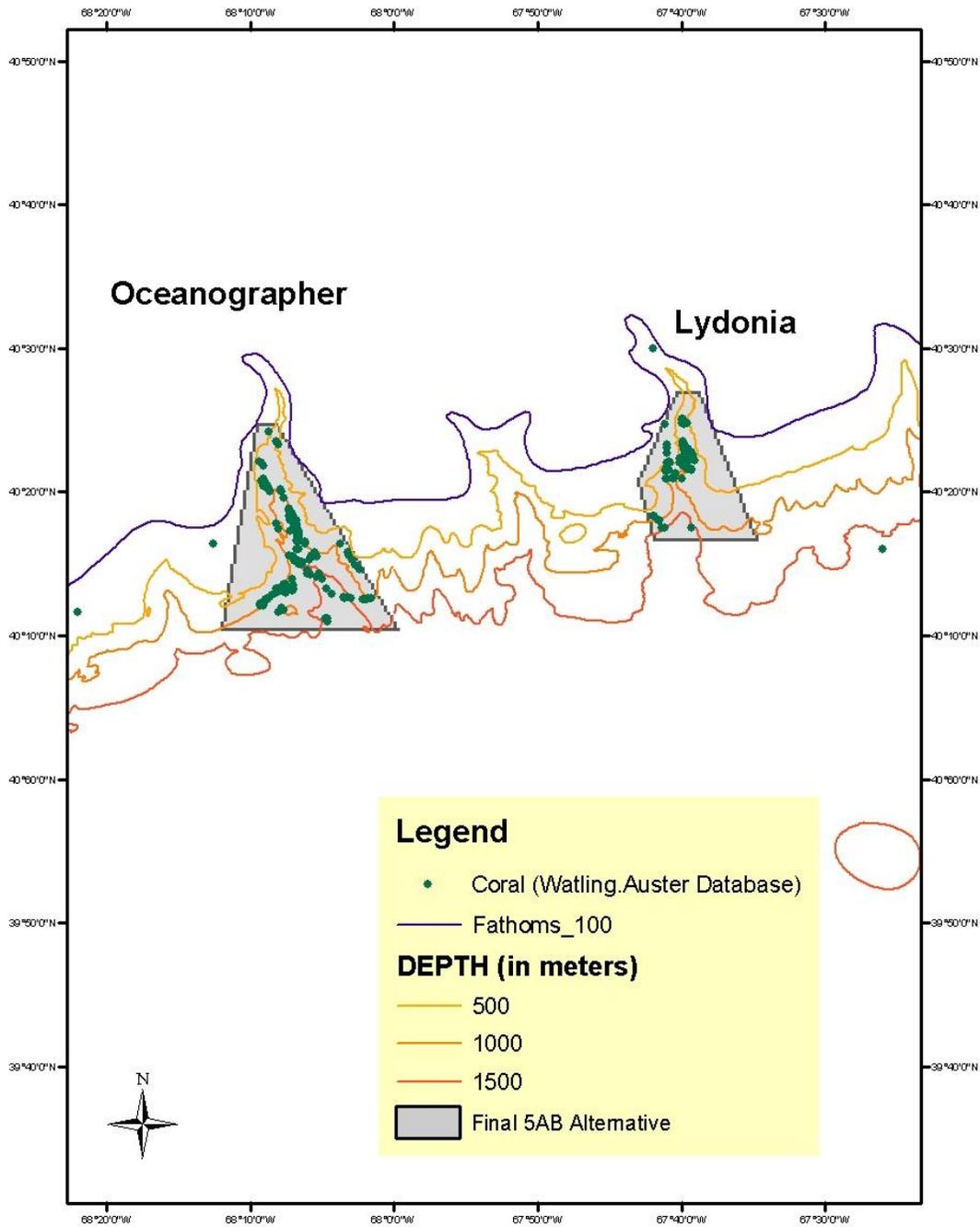


Figure 73 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon) (Proposed action)

Note that location of known soft coral is mapped as well (Watling and Auster).

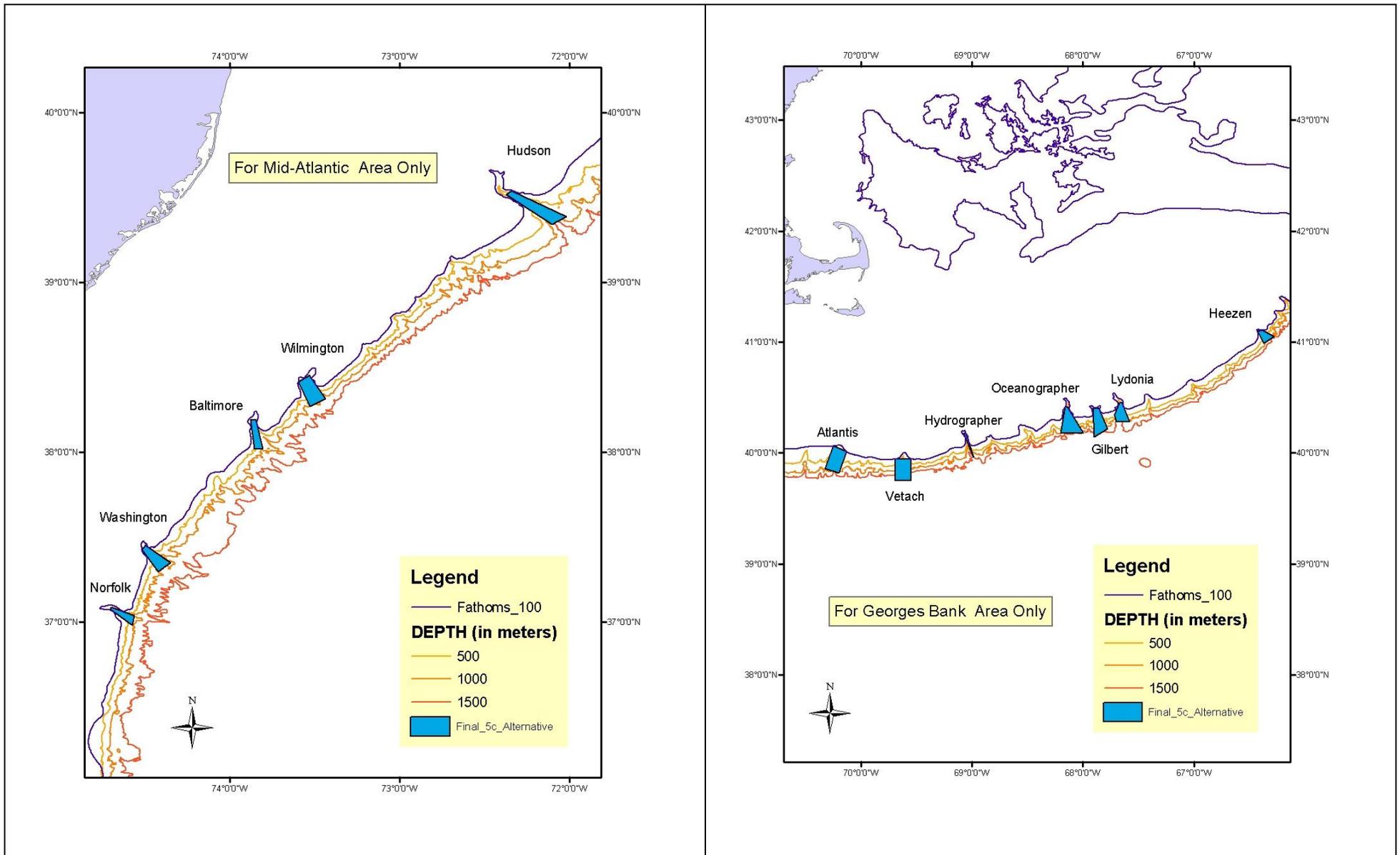


Figure 74 – Habitat Alternative 5 C –

Note that two maps are provided so the areas can be seen more clearly, but this alternative contains areas in up to 12 deep-water canyons

	Latitude		Longitude	
Norfolk	36	58	74	34
	37	4	74	41
	37	5	74	41
	37	2	74	33
Washington	37	17	74	25
	37	25	74	30
	37	27	74	29
	37	21	74	20
Baltimore	38	1	73	51
	38	11	73	52
	38	11	73	50
	38	0	73	48
Wilmington	38	16	73	31
	38	24	73	35
	38	27	73	31
	38	18	73	26
Hudson	39	20	72	6
	39	31	72	22
	39	32	72	20
	39	23	72	1
Atlantis	39	51	70	19
	40	3	70	14
	40	0	70	7
	39	49	70	12

	Latitude		Longitude	
Veatch	39	45	69	41
	39	56	69	41
	39	56	69	32
	39	45	69	32
Hydrographer	39	57	68	59
	40	10	69	4
	40	10	69	3
	39	57	68	58
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Gilbert	40	8	67	53
	40	23	67	54
	40	24	67	51
	40	13	67	46
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
Heezen	40	27	67	38
	40	59	66	22
	41	5	66	25
	41	6	66	23
	41	2	66	16

Table 98 - Coordinates for Habitat Alternative 5C

Overlap of Directed Monkfish Fishery and Alternative 5AB

VTR data from 1999 and 2001 suggests that there is no overlap between the proposed closure and the directed monkfish fishery (Figure 75). There are only 5 trips (3 in 1999 and 2 in 2001) that are displayed in the figure below, and none of them are within the boundaries of this alternative.

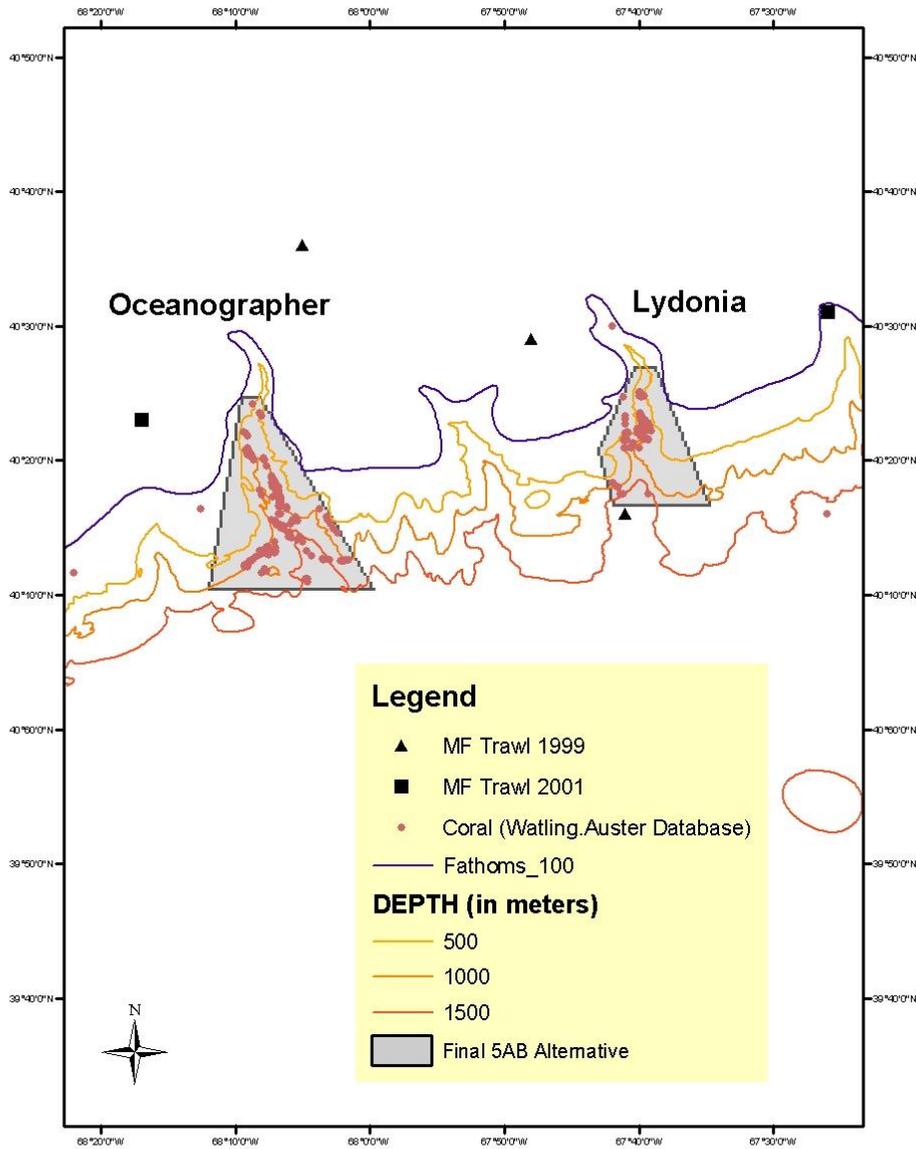


Figure 75– 1999 and 2001 directed monkfish otter trawl trips near Alternative 5AB (source: 2001 VTR).

Note: no directed gillnet trips were reported in this vicinity.

Overlap of Directed Monkfish Fishery with Alternative 5C

The primary area of overlap with the directed monkfish fishery is in the vicinity of Atlantis Canyon (due south of Nantucket) (Figure 76). Directed monkfish trips were also present in and around some of the other deep-water canyons, such as Vetach and Heezen canyons. Overall, nine directed monkfish trawl trips were reported within Alternative 5C in 1999 and less than 3 were reported in 2001. In 1999, no directed monkfish gillnet trips were reported within areas contained by Alternative 5C, and in 2001 21 trips were reported in these areas (in Atlantis and Heezen canyons). The number of reported trips overlapping with this alternative is very small.

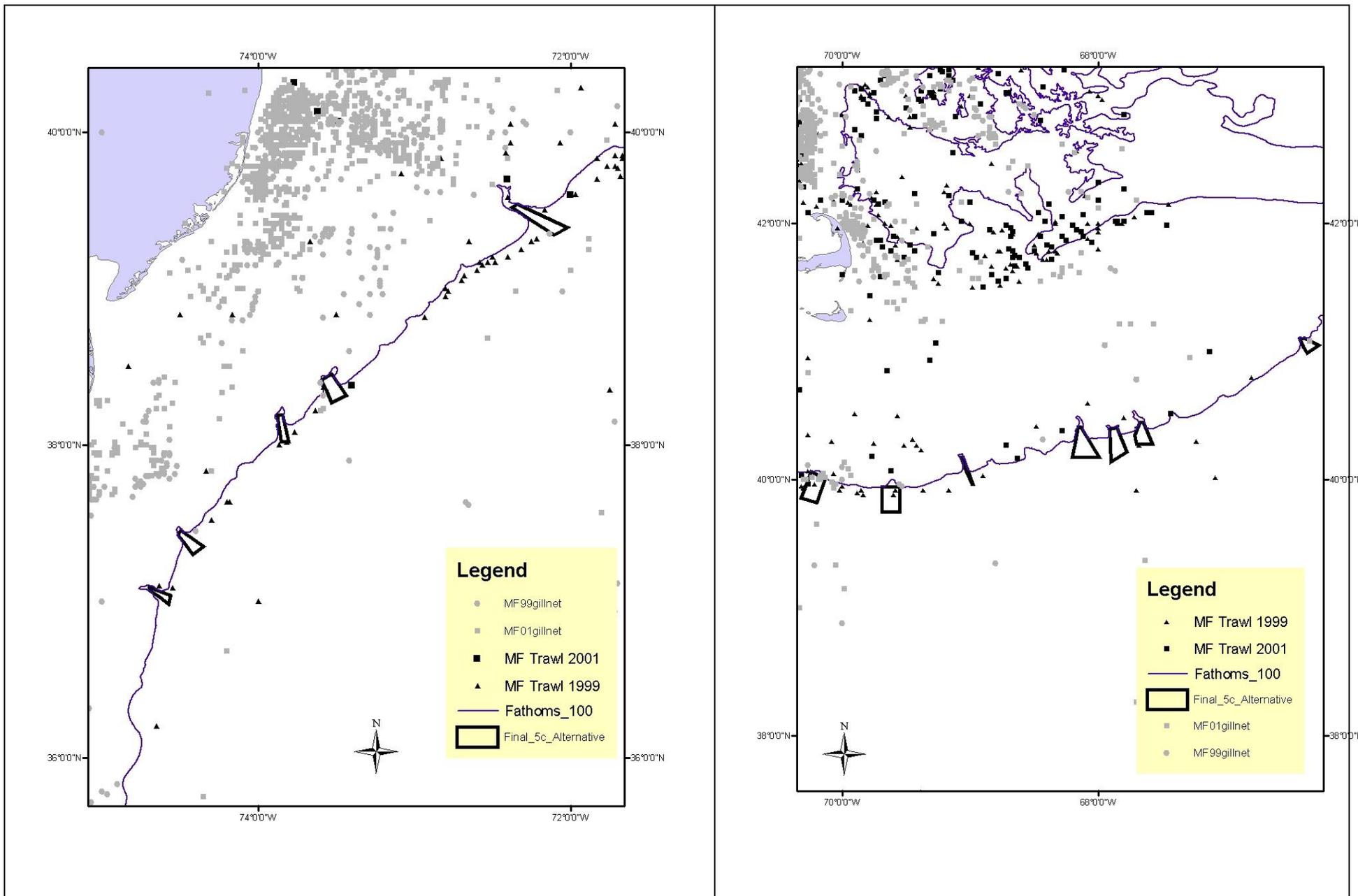


Figure 76 – 1999 and 2001 directed monkfish trips by trawl and gillnet gears in the vicinity of Alternative 5C (source: VTR database).

6.3.1.5.3 EFH within the deep-sea canyon closed area

The Habitat PDT then evaluated the EFH contained within the proposed deep-sea canyon closed areas based on the best available science. The data used in this analysis are described in more detail in the paragraphs below.

EFH Data: Essential Fish Habitat (EFH) has been designated for life stages of 39 species in the region by the New England and Mid-Atlantic Fishery Management Councils. Each species and life stage has a written, legally binding definition of EFH and the EFH area of most species has been delineated based on their abundance from annual stock assessment surveys in the region. For most species in New England and the Mid-Atlantic, EFH has been mapped for each species and life stage by individual ten-minute squares (TMS) of latitude and longitude. This information was used to identify the species and life stages with EFH within the two proposed Alternative 5 closed areas.

Table 99 describes the EFH for the benthic life stages of all federally-managed species in this region. It includes the geographic area, depth range, seasonal occurrence, and EFH description (i.e., substrates) for each species and life stage. Species with EFH that has been determined to be moderately or highly vulnerable to the effects of otter trawl gear are shaded, and species with EFH defined in waters deeper than 200 meters are in boldface. Appendix II describes in detail the gear effects evaluation, which determined which species have EFH which is vulnerable to various fishing gear types. Adverse EFH impacts of bottom gillnets were attributed to a number of species, but they were minimal. Therefore, the direct effects analysis is limited to bottom trawl impacts. Indirect effects include the potential impacts of bottom trawls and bottom gill nets, since both gears can cause the damage or loss of attached benthic organisms such as corals that are part of canyon ecosystems.

Species and life stages that could potentially benefit from the habitat protection provided by closed areas in the canyons are those with benthic EFH that is more than minimally vulnerable to bottom trawls, extends to depths greater than 200 meters, and includes some type of hard substrate (gravel, rocks, pebbles, etc.). These species and life stages are listed below.

Species and life stages with EFH more than minimally vulnerable to otter trawl gear (42):
American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), pollock (A), ocean pout (E, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Species and life stages with EFH more than minimally vulnerable to otter trawl gear and designated in waters deeper than 200 meters (22):
Atlantic halibut (A), Pollock (A), Redfish (J, A), Silver hake (J), Witch flounder (J, A), Tilefish (J, A), Barndoor skate (J, A), Clearnose skate (J, A), Rosette skate (J, A), Smooth skate (J, A), Thorny skate (J, A), Winter skate (J, A), and White hake (J).

Species and life stages with EFH more than minimally vulnerable to otter trawl gear and designated in waters deeper than 200 meters and hard bottom (17):

Pollock (A), Halibut (A), Redfish (A, J), Silver hake (J), Tilefish (J, A), Clearnose skate (J, A), Barndoor skate (J, A), Smooth skate (J, A), Thorny skate (J, A), and Winter skate (J, A).

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOME, GB	100 - 700		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 - 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Goosefish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Goosefish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	juvenile	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170 - 350		Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380		Bottom habitats
Pollock	juvenile	GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 - 250		Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 - 365		Hard bottom habitats including artificial reefs

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOME, southern edge of GB	25 - 400		Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOME, southern edge of GB	50 - 350		Bottom habitats with a substrate of silt, mud, or hard bottom
White hake	adult	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 325		Bottom habitats with substrate of mud or fine grained sand
Silver hake	juvenile	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 - 270		Bottom habitats of all substrate types
Silver hake	adult	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30 - 325		Bottom habitats of all substrate types
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 - 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	juvenile	GOME, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500		Bottom habitats with fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300		Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Red crab	juvenile	Southern flank of GB and south the Cape Hatteras, NC	700 - 1800		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Red crab	adult	Southern flank of GB and south the Cape Hatteras, NC	200 - 1300		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Ocean quahog	juvenile	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245		Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Ocean quahog	adult	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Spawn May to December with several peaks	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 - 185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Spiny dogfish	juvenile	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 390		Continental shelf waters and estuaries
Spiny dogfish	adult	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 450		Continental shelf waters and estuaries

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Golden crab	juvenile	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

Table 99 – EFH designations for managed species in the Northeast region. Species with EFH vulnerable to bottom tending gear are shaded, and species with a portion of their EFH designated in waters deeper than 200 meters are in boldface.

EFH Composition of Alternative 5AB and 5C

Monkfish inhabit deep water, but their EFH is not considered to be vulnerable to mobile, bottom-tending gear because juvenile and adult monkfish are distributed over a wide geographic range and depth range, and inhabit a variety of bottom substrates (see Section 5.4.1.2). Thus, the direct EFH benefits of the proposed habitat closed areas are assessed in terms of the degree to which they contain EFH for any of the species with vulnerable EFH in depths greater than 200m. Indirect EFH benefits are assessed in terms of the protection afforded to deep-water corals and other types of epifauna that grow on hard substrates within the proposed closures, and are highly vulnerable to bottom trawling (see Appendix II).

Direct effects of bottom trawling on the quality and/or quantity of EFH within Alternative 5AB or 5C would be limited to any of the species and life stages listed in Table 99 with EFH that overlaps spatially with the proposed closures. For Alternative 5AB, there are six species and eight life stages with EFH that is vulnerable to bottom tending gear that is designated within a portion of one or both of the 5AB closures (Table 100). These are redfish (A and J), barndoor, smooth, thorny, and winter skate (all juvenile life stage), and tilefish (A and J). The locations of partial ten-minute squares within Alternative 5AB are shown in Table 101 and Figure 77. Overall, not many of the ten-minute squares within Alternative 5AB contain many of the species with vulnerable EFH deeper than 200 meters. This is largely due to the fact that the EFH designated ten-minute squares are based on trawl survey data that were collected primarily in depths <200 meters. Thus, the small number of EFH-designated species in these two canyons is largely an artifact of the EFH designation methodology that was used.

There are many more (49) ten-minute squares (TMS) that overlap to some degree with the 12 Alternative 5C closures (Figure 78), but only one additional species (clearnose skate A and J) is added to the list of species that might benefit from these closures (Table 101). Also added to the list are the adult stages of the other four skate species. Ten of these TMS include five or more of the 14 species and life stages listed for this alternative, all of which are located in the five eastern-most canyons on the southern edge of Georges Bank (Figure 78).

Of the EFH-designated species and life stages that might benefit from habitat closures that prohibit the use of monkfish bottom trawls or gill nets in the canyons, all are known to inhabit substrates that include hard bottom which supports the growth of corals and other types of attached epifauna that are susceptible to damage or removal by these two gears (Table 99). Redfish is probably the most important species given its known association with structure-forming benthic organisms (Auster, in press). Redfish is a more northern species and is designated in a number of TMS in deep water on the southern edge of Georges Bank.

Species	Ten Minute Square Number									SUM
	1	2	3	4	5	6	7	8	9	
Redfish A	Yes	N	Yes	N	N	Yes	N	Yes	Yes	5
Redfish J	Yes	N	Yes	N	N	N	Yes	Yes	Yes	5
Skate Barndoor J	N	N	Yes	N	N	Yes	Yes	Yes	Yes	5
Skate Smooth J	N	N	N	N	N	N	N	Yes	Yes	2
Skate Thorny J	N	Yes	Yes	N	N	Yes	N	Yes	N	4
Skate Winter J	N	Yes	Yes	N	N	Yes	N	N	Yes	4
Tilefish A	N	N	N	N	N	Yes	N	N	N	1
Tilefish J	N	N	Yes	N	N	N	N	N	N	1
SUM	2	2	6	0	0	5	2	5	5	

Table 100 – Species with vulnerable EFH designations for ten-minute squares within Alternative 5AB. (Presence = Yes and Absence = N)

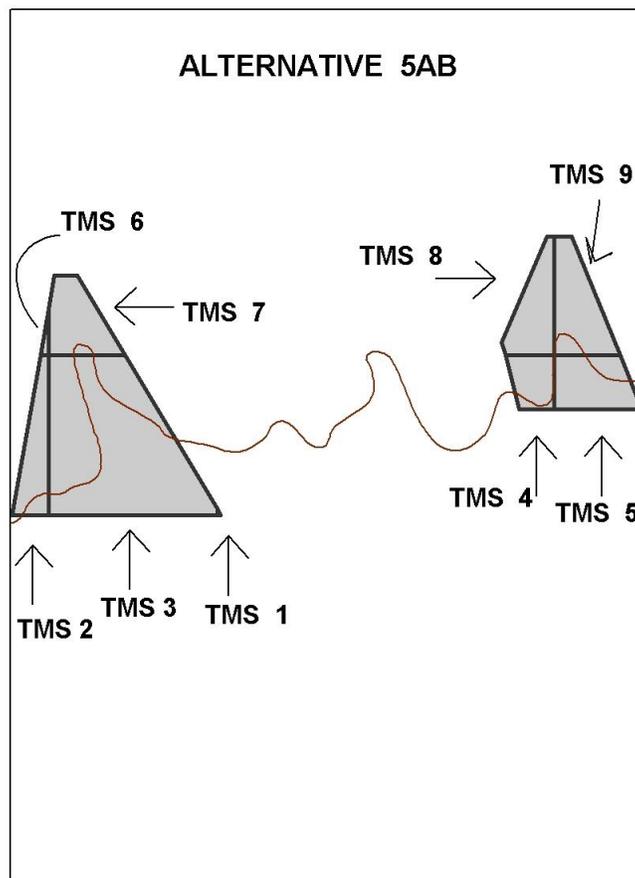


Figure 77 – Location of ten-minute squares (TMS) with EFH designations for Alternative 5AB (compare to Table 100)

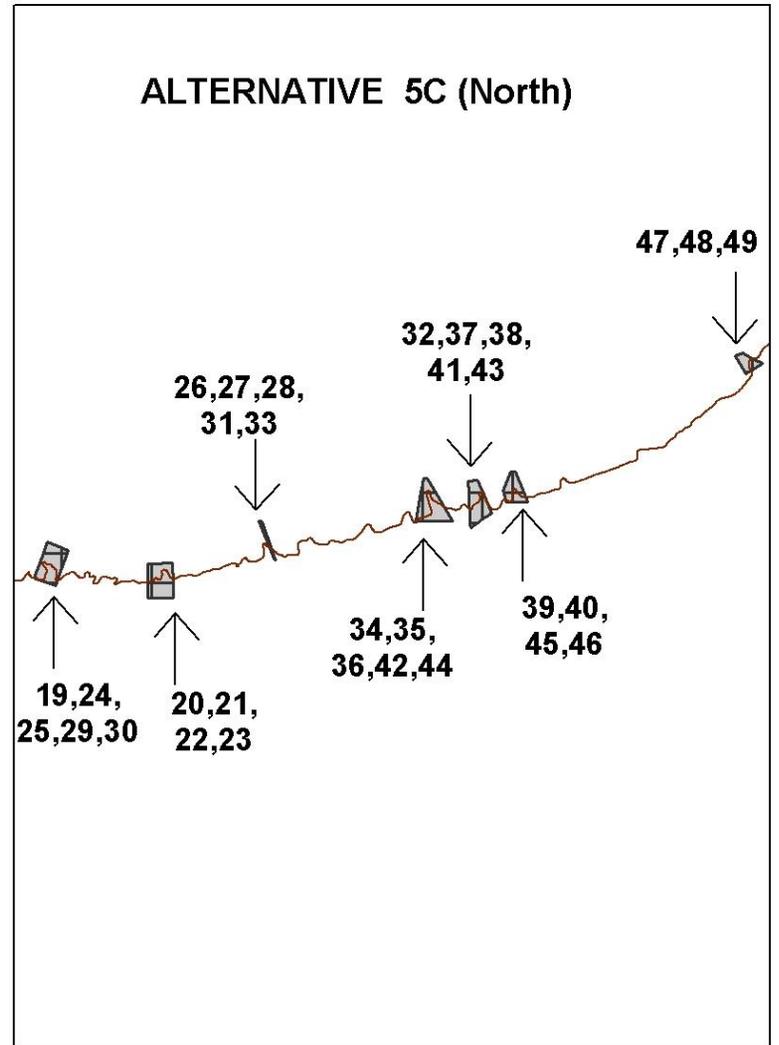
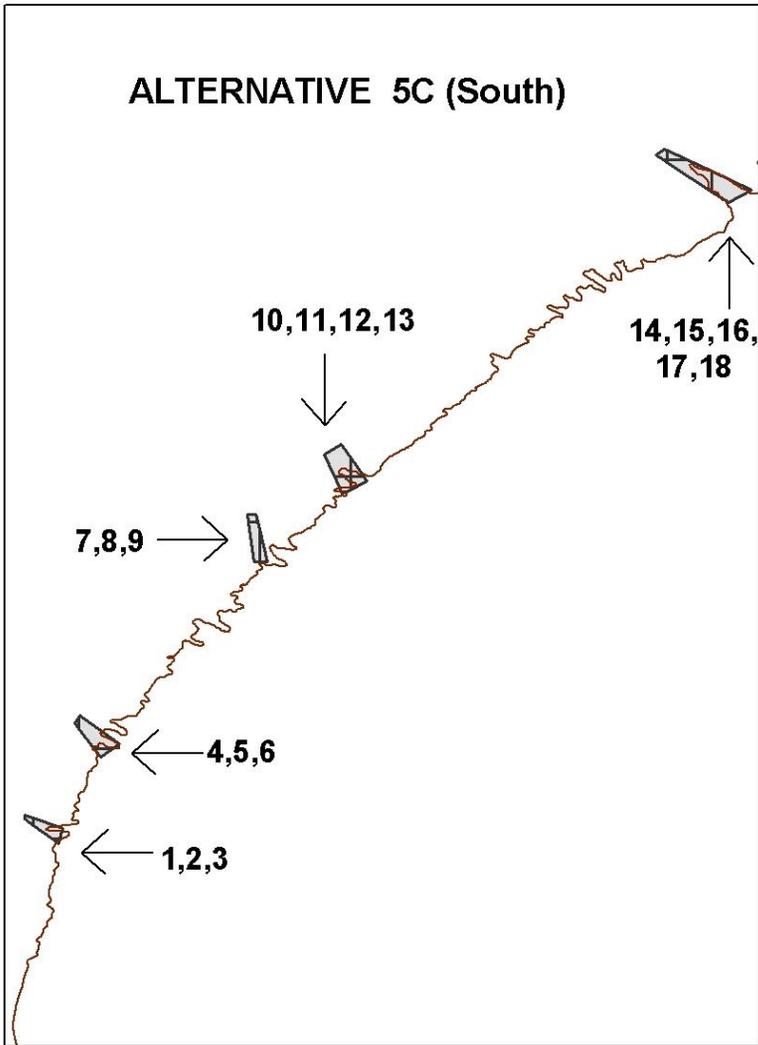


Figure 78 – Location of ten-minute squares with EFH designations for Alternative 5C (compare to Error! Reference source not found.)

6.3.1.5.4 Substrate within the deep-sea canyon areas

Substrate types within the deep-sea canyons were also evaluated. Section 5.1.6 describes the sediments in Oceanographer and Lydonia based on a variety of sampling techniques. Both Oceanographer and Lydonia Canyons have a mosaic of substrate types that are dependent on depth, currents, geology, relief, and biological activity. Corals are more abundant in Oceanographer Canyon than in Lydonia Canyon and substrates are more variable. In Oceanographer, shelf sediments are transported over the eastern rim of the canyon by the southwest drift and storm currents. Tidal currents and internal waves move sediments downcanyon along the axis and walls. The extensive exposure of outcrops (clay and boulders) indicates modern day erosional activities. The outcrops of clay and boulders are present on the canyon walls. Rippled, unconsolidated silt and sand are found along the canyon walls and in the axis. Large erratic boulders are present on the gently sloping upper canyon walls. Gravel up to cobble size forms a pavement throughout the northern part of the canyon and isolated patches are also found on the canyon walls and along the axis. The fauna within the heavily graveled area is sparse but diverse and is dominated by epibenthic invertebrates and fish

In Lydonia canyon, silty sediments are found on the walls and flanks of Lydonia Canyon and there are also sporadic rock outcrops. Rock outcrops are more common along the axis. There are rippled silty sediments in the axis of the canyon along most of its length. There are clay and rock outcrops on the west wall and flank of the canyon. Cobbles, pebbles, and shell hash are found above 400m on the east wall and flank. There is a good deal of erosion of sediments particularly along the axis. Most of the corals found in Lydonia Canyon are restricted to hard surfaces; the coral fauna is diverse and abundant.

Based on the information provided above, these two canyons contain some harder bottom types (rock and boulder outcrops, gravel and cobble, large boulders). The only spatial substrate data available for the entire Northwest Atlantic region are sediment data digitized by Poppe et al. These data were used to describe and compare the substrates believed to be found within the canyons. It is important to keep in mind that this digitized map is based on very few data points, and should be used in conjunction with the more descriptive information provided above from various sources, which have explored Oceanographer and Lydonia Canyon, primarily in the 1960s and 1970s.

Substrate Data: Sediment data analyzed here were derived from digitized maps of sediment coverage (CONMAP) originally developed by Poppe et al. (1989, 1994) and made available on a CD-ROM by the U.S. Geological Survey (USGS 2000). Sediment coverages were inferred from point sample data based on depth changes. Very few samples were collected in offshore areas, especially in the canyons. This is the only comprehensive sediment database that is available for the entire Northeast region. Sediment types were originally classified into nine distinct grain size categories ranging from clay to bedrock. For simplicity, these nine sediment categories were condensed into six (based on a recommendation from the Habitat Technical Team). The six categories used for analysis are: bedrock, gravel, gravelly sand, sand, muddy sand, and mud. The substrate compositions of both closed area alternatives were determined.

Sediment Composition of Alternative 5AB and 5C

The sediment composition of both Alternative 5AB and 5C is depicted in Table 102. Alternative 5AB, the proposed action, is primarily muddy sand bottom (90%). Sand is reported in the shallower portions of the Lydonia Canyon closed area, while muddy sand is found in most of the Oceanographer Canyon closed area and in deeper waters of the Lydonia closed area (Figure 79). The division between muddy sand and sand is demarcated by the 100 fathom isobath (in most places). These data suggest that the majority of all the deep-sea canyons are comprised primarily of muddy sand, mud, and sand. The twelve closures in Alternative 5C contain 64% muddy sand and 31% mud (Table 102). Figure 80 depicts the substrate types in and around Alternative 5C (both maps). Substrate types contained within the deep-sea canyons based on the best available science were also evaluated. The data used are described in more detail in the paragraph below. In summary, the majority of the deep-sea canyons contain muddy sand, mud and sand, according to the data available. Section 5.1.6 describes the sediments found in Oceanographer and Lydonia in more detail and includes some harder bottom types.

Alternative	AREA (nm2)	Gravelly Sand	Sand	Muddy Sand	Mud
5 AB (Proposed Action)	116	1%	7%	90%	2%
5 C	508	0%	5%	64%	31%

Table 102 – Sediment composition of Alternative 5AB and 5C (source: Poppe et al. 1989).

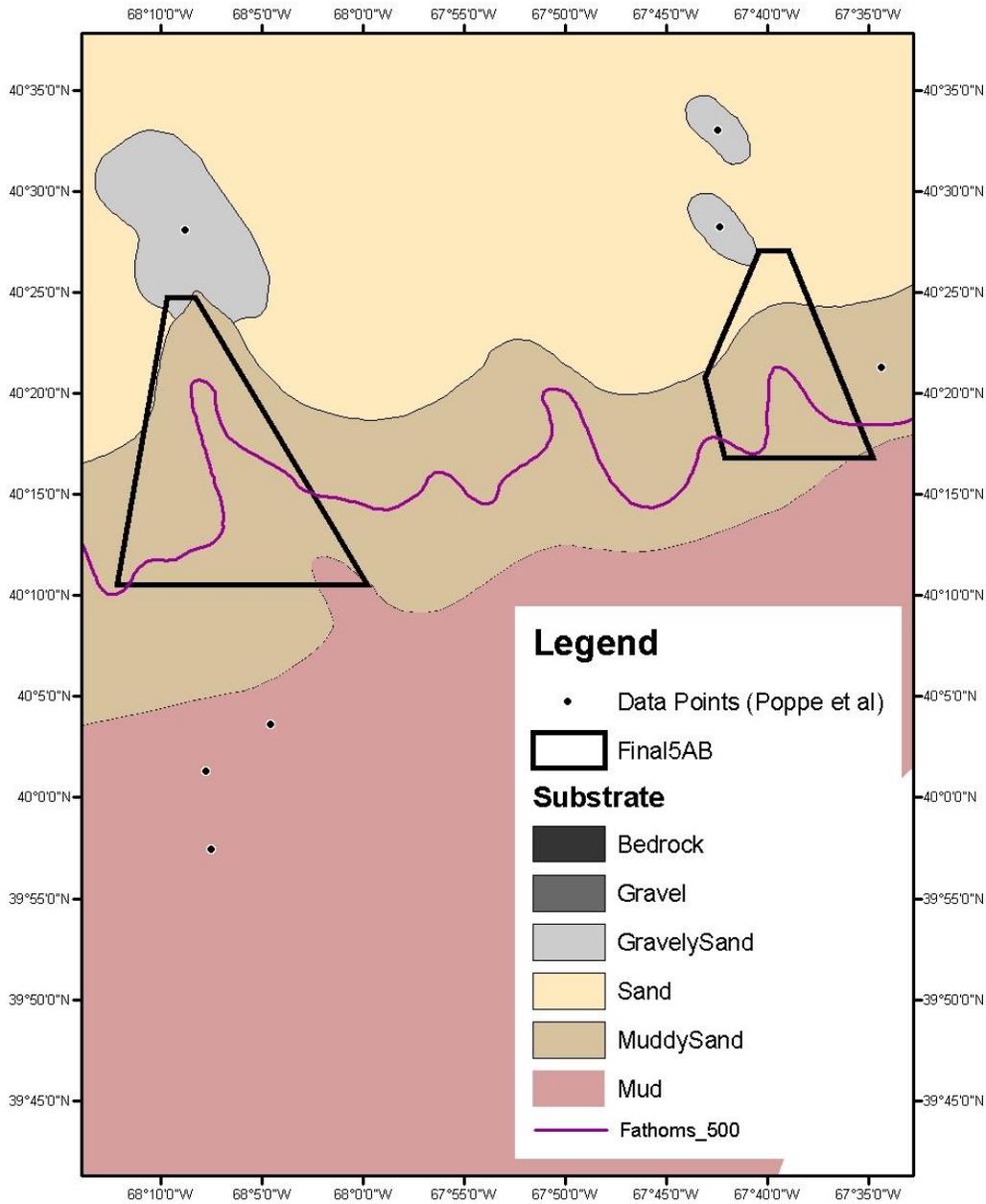


Figure 79 – Overlay of substrate type and Alternative 5AB (Proposed Action) (source Poppe et al 1989).

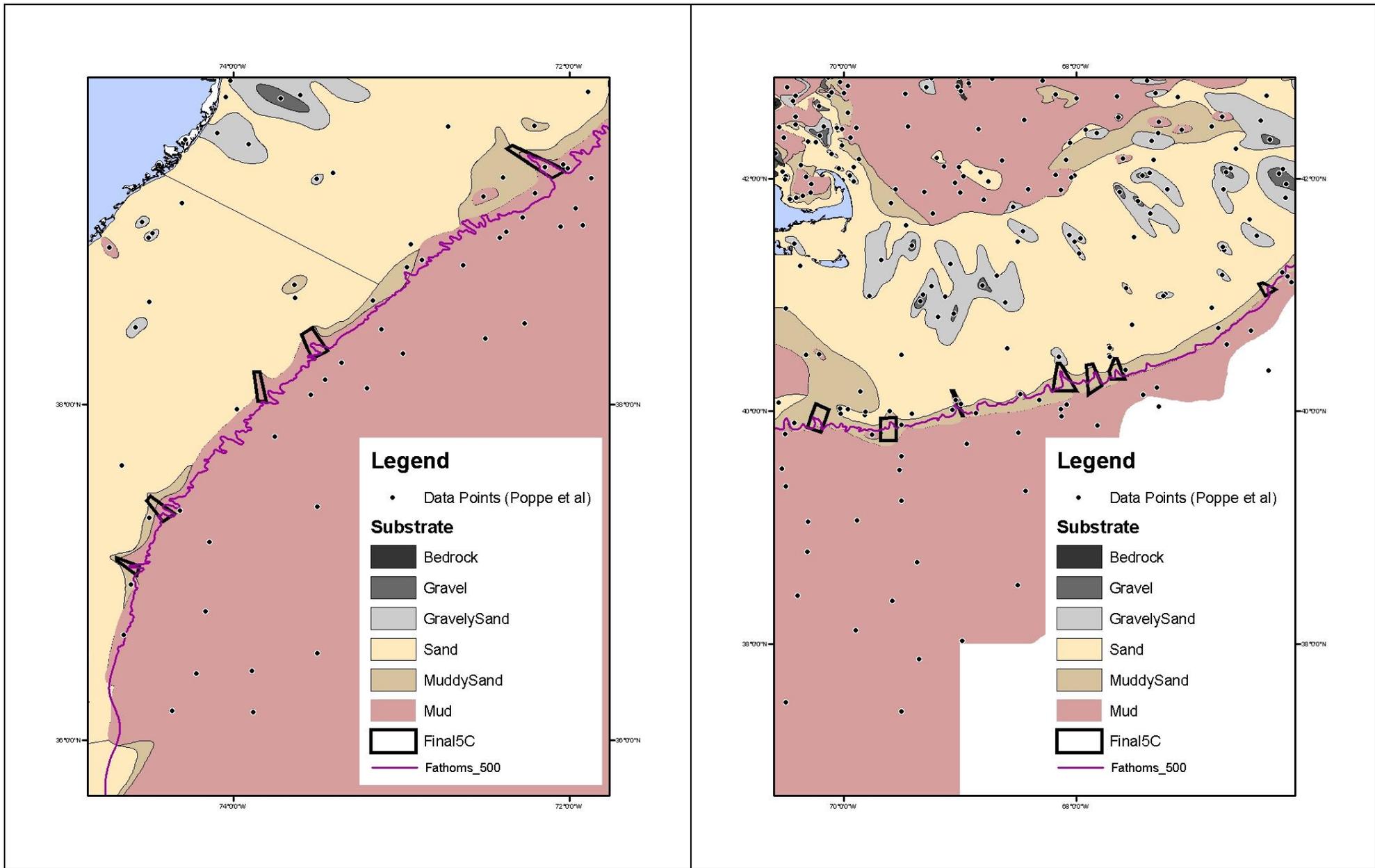


Figure 80 – Overlap of substrate type and Alternative 5C (based on Poppe et al 1989)

6.3.1.5.5 Presence of federally-managed species within the proposed Alternative 5AB closure

An analysis was conducted in order to determine which federally managed species and life stages occupy the proposed closed areas. A variety of sources were used in this analysis including submersible survey data, NMFS trawl survey data, data from a benthic sample database, and several key literature sources. Most of this analysis relies on reports and published studies using submersibles (Hecker et al. 1980, Valentine et al. 1980, Hecker et al. 1983, Cooper et al. 1987). Some of the submersible survey data, especially for schooling species, are based on occurrences (i. e., presence/absence rather than abundance estimates). The EFH source documents were also extensively used for information about the species in found within the proposed closure areas. See Reid et al. (1999) for the methods used to generate data presented in the EFH source documents.

The NMFS trawl survey database and the Wigley and Theroux benthic database (see Wigley and Theroux [1998] for methods) were queried for data within the closure coordinates. Trawl and benthic grab data from these areas were very limited, in part due to the difficulty of obtaining quantitative samples within the canyons. Obstructions to sampling in the canyons include fishing gear, steep walls, boulders, and great depths. The trawl survey database contained only one station (in Oceanographer Canyon, in 1968) within the closure coordinates and with a mean trawling depth >200m. Another five stations had trawls at least partly within the closure coordinates, and mean depths slightly <200m. In the Wigley and Theroux benthic database, there was only one record for areas within the closure coordinates.

Table 103 lists the federally managed species that were confirmed to occur at depths >200m in the Lydonia canyon closure, confirmed by data from submersibles and/or NMFS trawl survey data. There were four trawl stations within the Lydonia canyon closure from 1966-2001. Table 104 lists the federally managed species that were confirmed to occur at depths >200m within the Oceanographer canyon closure. Only two tows were within the boundaries of the Oceanographer canyon closure, one conducted in 1968 and one in 1997. While this data set is very limited, it is the best available data on the presence of federally-managed species within the proposed canyon closures.

Information about predator-prey interactions was limited due to the lack of specific data from the canyons. However, several prey species of the federally managed species found within the canyon closure areas were documented in the submersible data; specifically, quill worm, a prey species of red crab, and sea anemones, a prey species of tilefish.

Species	Observed in Submersible data	References	Observed in NMFS Trawl Data (Number and Biomass)	
Acadian redfish	Yes	Valentine et al 1980, Hecker et al. 1983, Shepard et al. 1986 Pikanowski et al. 1999	2	0.00
American plaice	No		2	0.50
Atlantic cod	No		1	7.70
Butterfish	No		8	0.70
Haddock	No		7	4.10
Little skate	No		2	1.30
Longfin inshore squid	No		91	7.40
N. shortfin squid	No		10	1.00
Ocean pout	No		66	28.10
Offshore hake	No		3	0.60
Pollock	Yes	Cooper et al. 1987, Cargnelli et al. 1999	5	2.70
Red crab	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 2001	No	
Red hake	Yes	Hecker et al. 1983, Cooper et al, 1987, Steimle et al. 1999	27	10.00
Silver hake	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999	183	15.00
Spiny dogfish	No		1	1.80
Tilefish	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999	No	
White hake	No		17	24.90
Winter skate	No		1	2.40
Witch flounder	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Cargnelli et at. 1999	3	1.20

Table 103 – Presence of federally-managed species in Lydonia Canyon (submersible and trawl data)

Species	Observed in Submersible data	References	Observed in NMFS Trawl Data (Number and Biomass)	
Acadian redfish	Yes	Valentine et al 1980, Hecker et al. 1983, Shepard et al. 1986, Pikanowski et al. 1999	No	
Barndoor skate	No		1	3.30
Butterfish	No		8	0.50
Little skate	No		2	0.50
Longfin squid	No		12	1.00
Offshore hake	No		1	0.50
Pollock	Yes	Cooper et al. 1987, Cargnelli et al. 1999	1	1.50
Red crab	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 2001. Valentine et al, 1980	No	
Red hake	Yes	Hecker et al. 1983, Cooper et al. 1987, Valentine et al. 1980, Steimel et al, 1999	18	4.20
Silver hake	Yes	Hecker, et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Valentine et al. 1980, Lock and Packer, 2004	35	4.80
Spiny dogfish	No		1	0.30
Thorny skate	No		1	0.00
Tilefish	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999, Valentine et al. 1980	No	
Witch flounder	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Cargnelli et at. 1999, Valentine et al. 1980	No	

Table 104 – Presence of federally-managed species within Oceanographer canyon (submersible and trawl data)

This analysis shows that a number of federally-managed species occupy these areas. Benthic habitats for five of them (redfish, tilefish, barndoor skate, little skate, and winter skate) are designated as EFH within the two proposed closed areas. To some extent, redfish and tilefish inhabit hard bottom substrates that support coral and other types of attached epifauna (Table 85). Redfish aggregate in the vicinity of corals and other attached epifauna, utilizing them for shelter and perhaps preying on small organisms that are also associated with them (see Section XX). Damage or removal of corals and other species of attached epifauna by bottom trawls or gill nets would reduce the quality and/or quantity of EFH and therefore constitute an adverse impact.

6.3.1.5.6 Additional information about the proposed action to protect deep-sea canyon habitats

Additional information about the Lydonia and Oceanographer canyon closure areas is available based on preliminary research from a deepwater biodiversity cruise conducted by the Northeast Fisheries Science Center in May 2004. The cruise was taken in slope waters off Georges Bank, between Oceanographer and Munson canyons and in adjacent water depths of 400-1200m. The study utilized midwater and bottom trawls, hydroacoustics, and camera systems to assess biodiversity of fish and invertebrate assemblages in relation to habitat type. These data are preliminary and have not yet been audited; however, there is useful qualitative information that can be used in the meantime.

The midwater trawl used on the survey was an International Young Gadoid Pelagic Trawl (IYGPT). A standardized, roller rigged No. 36 Yankee bottom trawl with standard codend was also used. In addition to data for the primary organisms (fish) caught in the nets, catch data were also collected for invertebrate specimens.

Over 25 stations were sampled, and a handful of the stations were located within and around the proposed canyon closed areas. Figure 81 depicts the start location of all the tows from the survey, and Figure 82 depicts the start and end locations of all the tows that were within the proposed closed areas. These tows were very deep, so it is impossible to predict exactly when the tow reached the bottom, and where it actually began fishing.

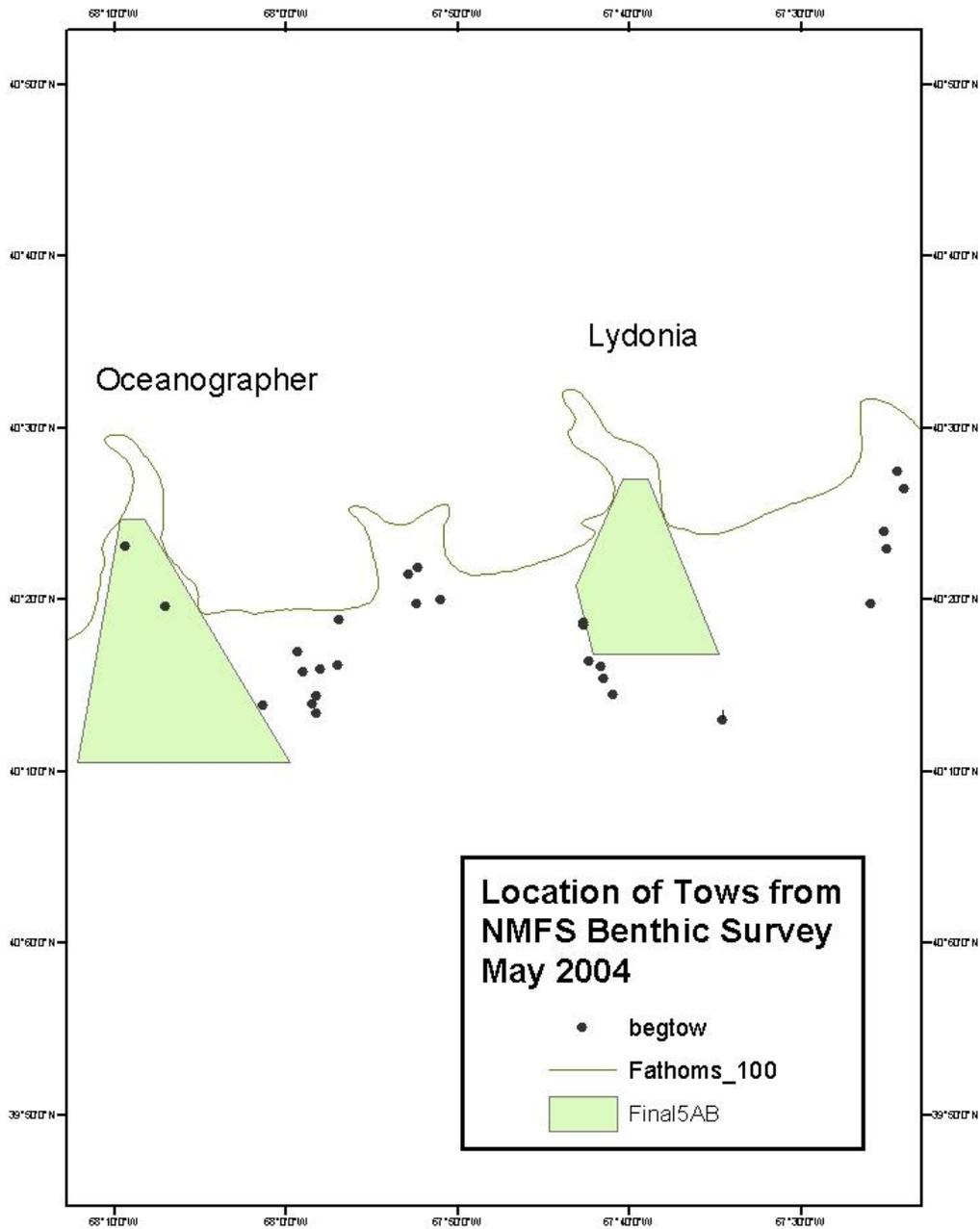


Figure 81 – Start location of survey stations from the May 2004 NEFCS Benthic Biodiversity Cruise (Conducted on the Delaware II May 17-28).

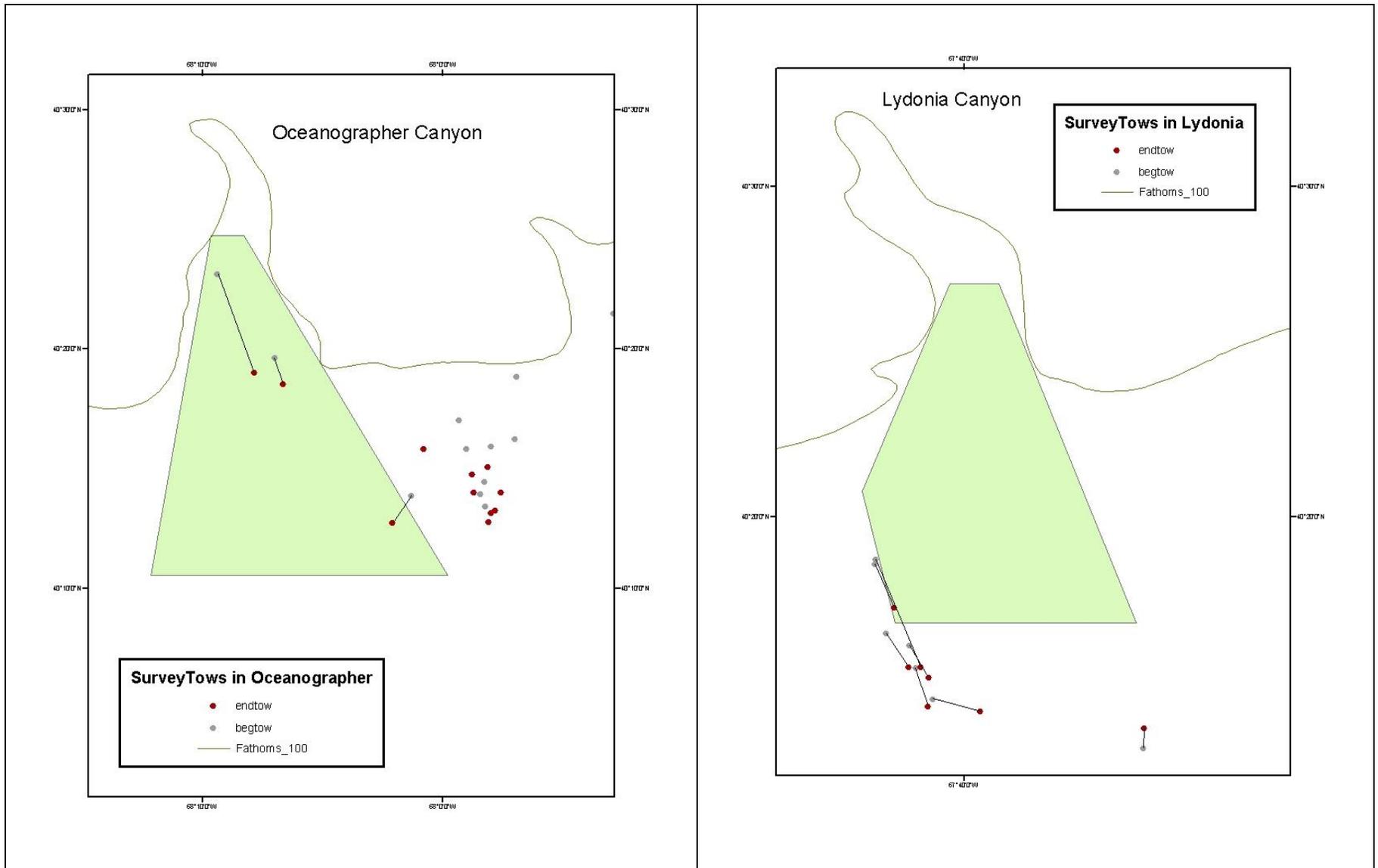


Figure 82 – Start and end locations of survey stations within the proposed canyon closure areas (Alternative 5AB) from the NEFSC Benthic Biodiversity cruise, May 2004.

On the three tows within Oceanographer Canyon, monkfish, witch flounder, and white hake were captured. Additional information was included related to other species found on these tows, specifically jellyfish, ctenophores (comb jellies), soft corals, and sea stars. The depth range for these three tows was 446 – 1053 meters. In Lydonia Canyon, two tows were made within the closed area, and several more in the areas around the closure. From the two tows within the canyon, a substantial number of monkfish, offshore hake, and thorny skates were caught, as well as other species. Based on the preliminary data from this survey, there is evidence that two more federally- managed species (monkfish and thorny skate) inhabit the proposed closed areas. EFH is designated for juvenile thorny skates within the closure (Table 100). According to the gear effects evaluation (Appendix 2 of this FSEIS), 4 of the 23 species with EFH considered to be vulnerable to bottom tending gears were found within the canyon closures based on these survey tows (witch flounder, white hake, thorny skate, and silver hake).

In summary, the data provided by the earlier trawl and submersible surveys and the 2004 offshore benthic survey support the conclusion that there are a number (24) of federally-managed fish species that occupy the closed areas that have been identified in the proposed action. Six of them have EFH that has been designated within these closures and is vulnerable to bottom tending gear. Benthic EFH for all six of them has been determined to be moderately or highly vulnerable to the effects of bottom trawling. One of them (juvenile redfish) is highly vulnerable due largely to the use of bottom structure (including corals) for shelter. Any reduction in the quality or quantity of EFH for these species within these two canyons would constitute a direct adverse habitat impact that would be prevented by the proposed action.

In general, the vulnerability of shallow-water habitats to the effects of bottom gill net fishing is low, but large corals in deep-water can easily be entangled by the nets and are thus highly vulnerable (see Section 5.4.1.7). Therefore, the habitat benefits that would result from the proposed action apply to bottom gill nets as well as bottom trawls.

Several of the other species that are found in the closed areas utilize deep-water gravel and other hard bottom habitats that support the growth of corals and other species of attached epifauna. Damage or loss of these organisms caused by monkfish trawls or gill nets would constitute an indirect adverse impact to benthic habitats that will be avoided by the implementation of the proposed closures. Protecting deep-water corals from damage or loss is especially critical given their very slow recovery rates (see Section 5.1.6).

Oceanographer (3 tows)		Lydonia (2 tows)	
Species	Number of individuals	Species	Number of individuals
Monkfish	6	Thorny skate	38
Witch flounder	4	Monkfish	10
White hake	1	Offshore hake	9
		Silver hake	8
		White hake	2
		Witch flounder	1

Table 105 – Summary of the number of species recorded on each survey tow within the two proposed canyon closure areas.

6.3.2 Other Alternatives considered in Amendment 2

6.3.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives for de-coupling the DAS usage requirement, as described in Section 4.2.2.1. Based on public comment and concerns about increased fishing effort on monkfish and multispecies, the Councils rejected the proposals, and are taking no action. Under the no action alternative, Category C and D limited access vessels when on a monkfish DAS must also use either a multispecies or scallop DAS, depending on which other limited access permit the vessel holds.

Habitat Impacts

The two alternatives for de-coupling monkfish DAS from multispecies and scallop DAS usage requirements would allow vessels the choice, both annually and on a trip by trip basis, whether to use separated DAS or combined DAS. Whether or not a vessel would fish its monkfish DAS separately depends on the particular circumstances of the vessel, namely, area and gear fished, number of DAS or opportunity available in other fisheries, and other considerations. Vessels fishing in the NFMA, for example, whose multispecies DAS exceed its monkfish DAS, may find it more profitable to fish the multispecies DAS (with no monkfish trip limit) than to fish the monkfish DAS with no monkfish trip limit and the multispecies DAS with a monkfish incidental catch limit, even though the total number of DAS available to the vessel would be greater if the DAS were separated. As a result, there would be no increased effort under the DAS Alternative 1, and in fact effort may decline due to restrictions forthcoming in Amendment 13. The requirement to use a specific net while on a monkfish DAS, if adopted, is an additional factor that each vessel owner would have to consider in making the decision whether to de-couple DAS.

In the SFMA, where vessels can direct effort on monkfish and multispecies with far less overlap than in the NFMA, Category C and D may increase overall effort over the bottom compared to the status quo because they would have monkfish DAS *in addition* to their multispecies or scallop DAS, not *in combination with* their other DAS. Even if some NFMA vessels may elect to fish their monkfish only DAS in the SFMA, resulting in an increase in effort in that area, the habitat impacts would be minimal because the substrate type in the SFMA is primarily sandy bottom and less vulnerable to fishing impacts. While it is difficult to predict how many vessels would use the opportunity presented by Alternative 1, it is most likely that some scallop vessels will increase overall fishing time if DAS are decoupled. Under Alternative 1, those vessels could fish their entire scallop allocation on a full-time basis and then fish their monkfish DAS allocation. One limiting factor is that vessels will have to weigh the opportunity costs and the cost of re-rigging to use the monkfish trawl against the expected revenues.

If a significant number of scallop vessels targeted monkfish, overall effort levels would increase (unless, of course, scallop DAS were reduced under scallop management actions). These vessels

generally operate in the SFMA, and as a consequence, the impacts to habitat of increased fishing effort will be less severe than in the NFMA due to the lower frequency of complex habitat types in the SFMA. Hence, whether this alternative would affect total bottom trawling time in the monkfish and/or groundfish fisheries is not clear.

If DAS transfer options result in the activation of latent effort, or unused DAS by trawl vessels, the impact of the fishery on EFH could be increased, depending on where and with what type of net the increased effort is used. Provisions to maintain conservation neutrality would mitigate this effect, however, as would trawl gear that is designed to minimize the effect of the fishery on EFH for some species.

Generally, 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 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 (see section 9.3.2). 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 and 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.

6.3.2.2 Trip limits for incidental catch

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs. The proposed increase is intended to reduce discards of monkfish by allowing specified vessels, including general category scallop and clam dredge boats (under a proposal adopted in this amendment), to retain rather than discard small amounts monkfish caught incidentally.

Habitat Impacts

Trip and possession limits may alter fishing effort on particular stocks and, consequently, in particular geographic areas or areas of specific bottom sediments. The impact of increasing trip

or possession limits on fishing behavior, however, depends in large part on the magnitude of the limit relative to other species caught, particularly target species. In the case of the proposed alternatives, which address low incidental catch allowances, the amount of monkfish that vessels can retain under any of the alternatives is insignificant in comparison to the quantity and value of the target species, and are unlikely to affect the distribution or magnitude of fishing effort and its effect on EFH.

6.3.2.3 Minimum mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

Habitat Impacts

Use of a larger mesh in the codend of monkfish trawls will reduce bycatch and allow for the escape and survival of some benthic organisms that would otherwise be brought aboard the vessel and die. This is expected to improve bottom habitat conditions in trawled areas by increasing the abundance and diversity of benthic communities. In addition, increasing mesh size may reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species. To the extent that the increased mesh allows escapement of legal sized or marketable monkfish, vessels may increase the amount of time the gear is on the bottom necessary to catch an equivalent amount of monkfish. Selectivity data on 12-inch mesh for monkfish, however, is not available, and it is unknown how much catches of marketable monkfish would be reduced.

6.3.2.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 11-inch or 10-inch minimum tail size (Alternative 2, Options 1 and 2, adopted Option 1), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

Habitat Impacts

A reduction in, or the elimination of a minimum size requirement, will result in vessels reaching their trip limits sooner because they could keep more fish brought up in the nets, and, therefore,

will reduce trip time on directed monkfish trips. Total bottom time, however, may not be affected if vessels make more trips. An increase in minimum size (Alternative 4), along with the increased minimum mesh size could result in vessels fishing longer to catch the same total weight of monkfish. In general, it is unlikely that changes to the minimum fish size will have a significant effect on total fishing effort by bottom trawl vessels in the directed monkfish and groundfish fisheries.

6.3.2.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

Habitat Impacts

Requiring a vessel take 20 or 40 days out of the fishery would reduce trawling effects on benthic habitats for such a short period of time that it is not likely to have any measurable effect. For the same reason, eliminating the requirement (proposed action) will not have any effect on habitat.

6.3.2.6 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

Habitat Impacts

This program could affect deep-sea benthic habitats on the edge of the continental shelf by enabling vessels to return to areas where they have not been able to fish profitably since the implementation of the FMP. However, it must be noted that the offshore fishery program also requires the use of 6" inch roller gear, which may reduce the disturbance level of complex or high relief bottom habitats, and limits the ability of trawl vessels to fish in those areas. Additionally, because the DAS allocated to participating vessels will be pro-rated to account for the increased trip limit, the overall effort of the fishery might be reduced. However, data and models to accurately predict the mitigating effects of these requirements are unavailable.

Historically, fishing for monkfish with trawls and gillnets took place in offshore waters on the edge of the continental slope, near the heads of several deepwater canyons. Deep-sea corals are known to exist in the submarine canyons in this region and provide hard structure that in turn provides ecological services to many of the Councils' managed species. Therefore, the re-establishment of an offshore directed monkfish trawl fishery may increase the probability of fishing effort near these deepwater canyons, which could increase interactions with deep-sea

corals. The monkfish fishery is one of the few fisheries that operate in deepwater, and this offshore fleet is more equipped to explore these areas. Damage to these areas may indirectly and adversely impact the EFH. Managed species with EFH including waters deeper than 200 meters and containing hard substrate include pollock, redfish, whiting (silver hake), clearnose skate and tilefish. A number of habitat management alternatives in this amendment are designed to protect these deep-sea canyon communities from the adverse effects of fishing (see Section 4.1.8)

According to the Red Crab FMP, red crabs are patchily distributed along the continental shelf between 200 and 1800 meters. The EFH of red crab (all life stages) is depicted in Figure 83, along with directed monkfish trawl effort. There is some overlap, especially in the shallower portion of overall red crab EFH, which begins around 200 meters. However, due to red crab opportunistic feeding habits, the vulnerability of adult and juvenile red crab EFH to otter trawls was characterized as “low”. Red crab larvae are pelagic, and red crab eggs live within the female carapace, thus the vulnerability to otter trawling is not applicable for these life stages. Therefore, adverse impacts to red crab EFH at any life stage by the monkfish fishery are not occurring because a “moderate” or “high” vulnerability ranking is needed to meet the threshold (see Appendix II).

The proposed offshore monkfish trawl fishery will most likely be prosecuted in waters near or within areas designated as tilefish EFH. The tilefish HAPC was designated as an area important for tilefish in 2001. In fishing year 1999, approximately 19% of the directed monkfish trawl fleet fished within the boundaries of the tilefish HAPC according to locations provided by fishermen in the vessel trip report database (See Figure 84). There are several pieces of information that may or may not conclude that bottom-tending mobile gear has an adverse impact to tilefish EFH that is more than minimal and temporary in nature. The Gear Effects workshop (NREFHSC, 2002) indicated that tilefish EFH, particularly the pueblo village structures, is vulnerable to bottom-trawling. A MAFMC funded report (Able and Muzeni) concludes, based upon a limited review of video tapes of submersible dives, that there is no evidence that otter trawls adversely impact tilefish burrows through sedimentation. Lastly, the NEFMCs gear effects evaluation ranks tilefish EFH as vulnerable to otter trawling based upon the potential adverse impacts to habitat components other than structure such as impacts to food sources, impacts to reproduction, and impacts to non-burrow structures. In fishing year 2001, only 3% of all directed monkfish trawl trips were taken within the tilefish HAPC (See Figure 84).

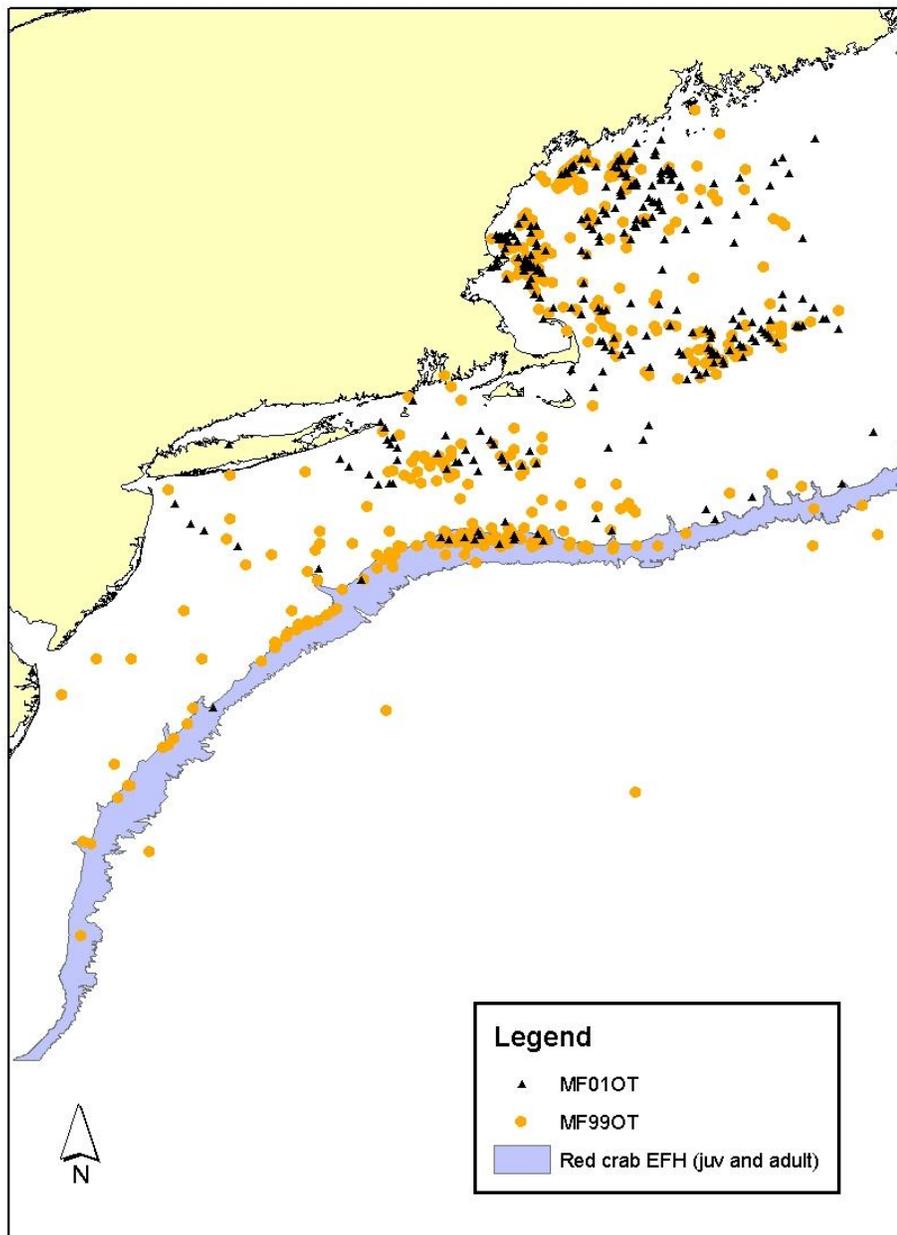


Figure 83 EFH for all life stages of Red crab with directed monkfish trawl effort from fishing years 1999 and 2001

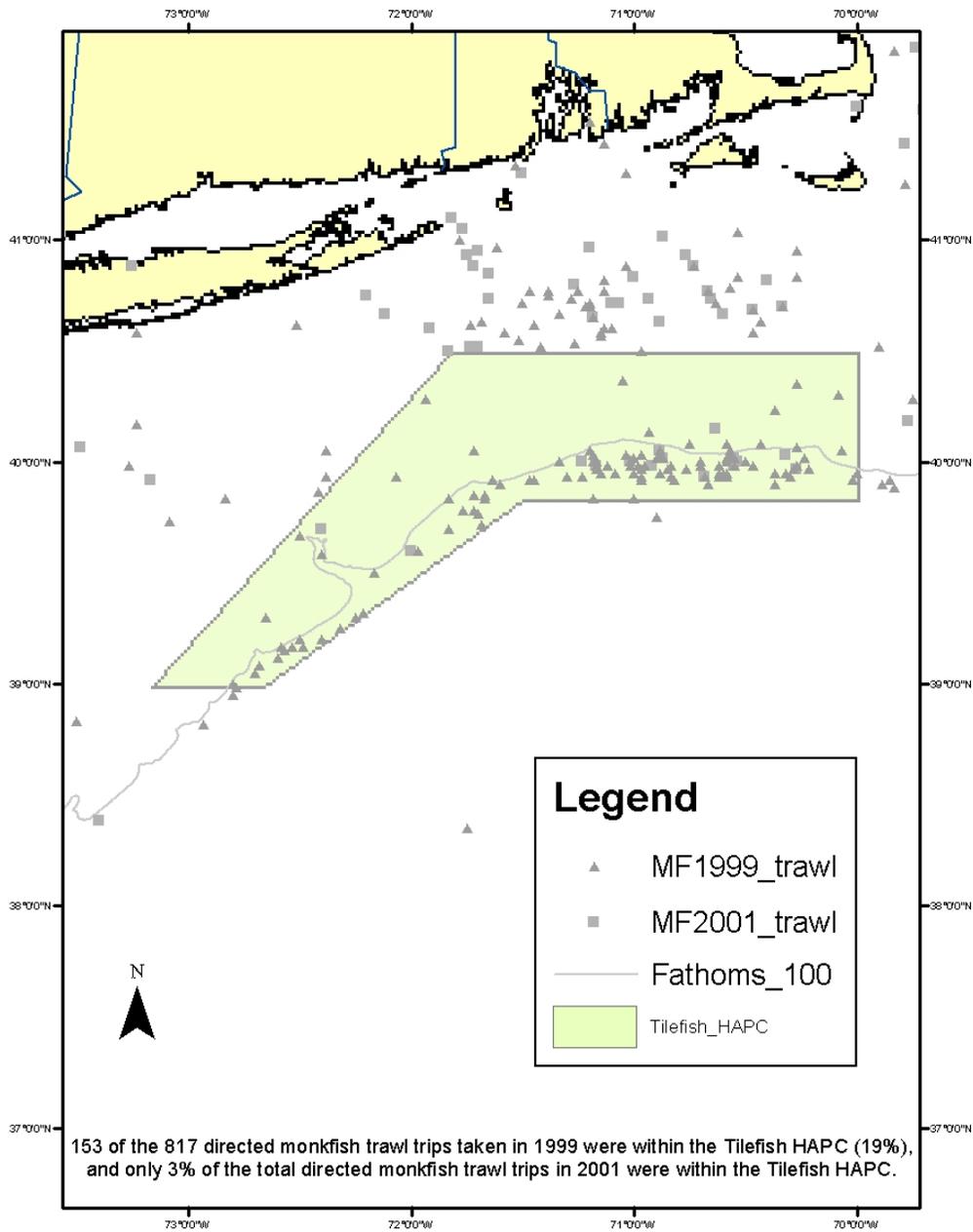


Figure 84 Distribution of directed monkfish trawl effort within the tilefish HAPC for fishing years 1999 and 2001.

6.3.2.7 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

Habitat Impacts

The proposal to modify the permit qualification criteria for vessels fishing south of 38°00'N could result in up to 5 new vessels entering the fishery, pending any appeals. The monkfish fishery in that area, however, is a large-mesh gillnet fishery that has minimal impact on bottom habitats. Even if some of those vessels were to convert to trawl gear, the number of new vessels, compared to the total number of monkfish permits is small, and the impact on sandy bottom habitat in the area would be insignificant.

6.3.2.8 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Habitat Impacts

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct habitat impacts of the proposed measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents.

6.3.2.9 Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

Habitat Impacts

None of the proposed measures are expected to affect EFH.

6.3.2.10 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research. Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application or respond to a NMFS Request for Proposals.

The research that could be conducted under either of these programs includes, but is not limited to: research to minimize bycatch; research to minimize impacts of the fishery on EFH or other sensitive habitats; research or experimental fisheries for the purposes of establishing a trawl exempted fishery under the multispecies FMP in the NFMA; research on the biology or population structure and dynamics of monkfish; cooperative surveys; and gear efficiency.

Habitat Impacts

These alternatives, to the extent that they are focused on research to minimize impacts of the fishery on EFH or other sensitive habitats, will result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Both are expected to have neutral direct effects on habitat because they do not result in increased effort. Because the maximum number of DAS available under these programs would not exceed 500, and since those DAS would be subtracted from the overall allocation to vessels, the potential impact to habitat is minimal.

6.3.2.11 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

Habitat Impacts

While increases in vessel size and horsepower could affect the vessel's impact on EFH by enabling it to fish in more areas, to fish in deeper water, and on more hard bottom, this proposal will not likely impact EFH because the upgrading provision will only equalize two existing baselines, not increase the overall baseline.

6.3.2.12 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

Habitat Impacts

The proposed experimental fishery would not have a direct impact on habitat, compared to no action, since vessels can conduct such experimental fisheries without the Councils adopting this alternative, and, in fact, such an experiment is currently being done. Indirectly, however, the

trawl experimental fishery could reduce the monkfish fishery's impact on habitat, if the resulting experiments were successful and followed-up with establishment of appropriate gear requirements. As noted, however, such experiments can take place without the adoption of this alternative.

6.3.2.13 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but rejected three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

Habitat Impacts

This is an administrative action and, therefore, these alternatives do not have any habitat impact compared to taking no action.

6.3.3 Practicability analysis

The legal EFH provisions state that each FMP shall identify and “minimize to the extent practicable adverse effects on such habitat caused by fishing.” In this context “practicable” was interpreted to mean “reasonable and capable of being done in light of available technology and economic considerations.”

The EFH regulations at 50 CFR 600.815(a)(2)(iii) provide guidance on evaluating the practicability of management measures:

“In evaluating the practicability of the identified habitat management measures, Council should consider the nature and extent of the adverse effect on EFH and the long and short-term costs and benefits of potential management measures to EFH, associated fisheries and the nation consistent with national standard 7. In determining whether management measures are practicable, Councils are not required to perform a formal cost/benefit analysis.”

A practicability analysis of EFH measures in a fisheries management plan is supposed to weigh the economic and social costs (and benefits) against the benefits to habitat of EFH protections. However, the ecological costs and benefits (of taking or not taking action) are substantially harder to evaluate. In essence, the benefits of specific actions to protect or restore habitat are not all readily quantifiable in the same units as the costs (dollars). It is therefore very difficult to make direct quantitative comparisons and hence give specific quantified answers to questions of practicability. This is in part due to uncertainty in the direct effects of fishing gears on habitat function and the lack of information on the relationships between habitat function and the productivity of managed and non-managed species. This uncertainty and lack of information is both a consequence of and exacerbated by the complexities of the ecological relationships and processes involved.

This practicability analysis follows concepts and text provided in the Gulf of Mexico Fishery

Management Council’s Generic Essential Fish Habitat EIS (2003).

6.3.3.1 Assessing Practicability with Limited Information – Approach

NMFS has not identified a preferred methodology for conducting the practicability analysis. Therefore, a strawman approach, combining habitat, economic, and social analysis of the habitat alternatives to determine their overall practicability, is presented here. The habitat alternatives are primarily analyzed in a qualitative manner. This analysis synthesizes some of the conclusions from the habitat analysis, the socio-economic impact analysis, the biological and ecological impacts, as well as issues such as compliance with National Standards or MSA in general that are described in other parts of the document.

Four primary components have been extracted from the full analysis to help determine the practicability of the alternatives. Each component is briefly described in the sections below (see Table 106).

This FSEIS uses specific practicability factors relevant to the EFH Final rule requirements to evaluate if the action is reasonable and capable of being done in light of available technology and economic considerations, and will not impose unreasonable burden on the fishery. The practicability factors used are qualitatively discussed in the relevant consequence sections as follows and summarized in the Summary of Practicability section.

Practicability Factor	Relevance to 50 CFR 600.815(a)(2)(iii)	Description
Net economic change to fishery	The long and short-term costs and benefits of potential management measures to: associated fisheries the nation	Industry-level impacts to groundfish, scallop, monkfish and other fisheries
Equity of potential costs among communities	The long and short-term costs and benefits of potential management measures to: fishing communities	Short-term impacts on coastal subregions
Differences in EFH Value	The nature and extent of the adverse impact on EFH and the long and short-term costs and benefits of potential management measures to: EFH (direct impacts)	Directionality of change in amount and type of area, vulnerable or adversely impacted EFH and complex sediment types
Population effects and ecosystem changes	The long and short-term costs and benefits of potential management measures to: EFH (indirect impacts)	Directionality of change in amount and type of important species guilds and species assemblages as indicated by analysis

Table 106 Description of factors used in the EFH practicability analysis

According to information included and evaluated in this FSEIS (see Gear Effects Evaluation, Vulnerability of EFH to Bottom-Tending Fishing Gears, and Adverse Impact Determination Sections), there is some understanding in the Northeast U.S. that a relationship exists between

fishing gear and effort and effects on habitat. For some species, there is also some understanding of the links between exploited populations and habitat in terms of ecological functions. However, there is little or no understanding of these links in terms of productivity and the specific effects of habitat degradation, past, present and future, on the productivity of managed species. According to a provisional framework outlined in Auster (2001), it would seem that the types of management measures needed for preventing, mitigating, or minimizing adverse effects of fishing on EFH are a mixture of preventative/corrective and the precautionary approach. The types of actions the author suggests under these categories are as follows:

Preventative approach: restrict effort or gear or use no-take marine protected areas (MPAs) to minimize effects of particular gear types on particular habitats.

Corrective approach: Adjust boundaries or change management measures on the basis of data on habitat recovery and links to population dynamics.

Precautionary approach: Designate no-take MPAs to protect long-lived and sensitive species in areas that do or potentially contain such taxa.

The New England Fishery Management Council will be considering similar issues and approaches in the upcoming Omnibus Habitat Amendment #2.

6.3.3.1.1 Net economic change to fishery

A summary on a fishery-by-fishery basis is not possible, in part, because the impacts are negligible and because the analysis applies only to directed monkfish trips. As such, the impact will be limited to monkfish fisheries. Scallop fisheries are unaffected because the closures apply only to vessels on a monkfish DAS which cannot be used in combination with a scallop DAS.

6.3.3.1.2 Equity of potential costs among communities

See Social Impact Assessment of Alternatives to Minimize Adverse Effects of Fishing on EFH Section for a more detailed look at the impacts to ports and vessel characteristic classes (Section 6.5.5.8).

6.3.3.1.3 Differences in EFH Value Between Alternatives / Population effects and ecosystem values

The “preventative approach” of restricting effort or gear is utilized to minimize effects of the directed monkfish fishery on vulnerable habitats.

6.3.3.2 Assessing Practicability with Limited Information – Results

6.3.3.3 Alternative 1

Net economic change to fishery / Equity of potential costs among communities – Taking No Action would impose no immediate term economic impacts on fishery participants. The longer term impact is not known as quantifiable links between habitat and productivity of the monkfish resource has not been established. Should these links prove to be significant, then taking no action would have a longer term deleterious impact on the net value of the monkfish fishery.

Differences in EFH Value / Population effects and ecosystem changes- This alternative does not contain any specific measures to minimize adverse effects on EFH. However, it should be noted that the status quo groundfish closed areas will remain intact and will provide substantial habitat protection for vulnerable habitat types. However, the primary mitigation tool employed to minimize the adverse effects of EFH that are more than minimal and less than temporary in nature are the network of Habitat Closed Areas. With that said, there are net benefits to habitat under the current management measures that have been implemented by the monkfish, groundfish and scallop fishery management plans. Refer to Table 107 for a list of management measures that are part of the Status Quo for fisheries management of the stocks in the Northeastern U.S. as well as a brief description of their habitat impacts.

Overall, this alternative is practicable.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Authorized fishery programs	Monkfish	5. Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. 6. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N.	5. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. 6. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect.	0
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. 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 EFH. Rare kelp beds are found in that area.	+
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	+
EFFORT REDUCTION MEASURES				
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Monkfish	Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously	This alternative relies on the scallop and multispecies management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	+
Trip limits for incidental catch	Monkfish	<p>7. 50 lbs. (tails) per trip.</p> <p>8. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish.</p> <p>9. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00' went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip</p>	<p>7. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries.</p> <p>8. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries.</p> <p>9. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery.</p>	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	Mix of adaptive and phased effort reduction strategies. A days (60% of effective effort)	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
		B days (40% of effective effort) C days (FY01 allocation). Provides opportunity to fish on stocks that do not need rebuilding.		
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this provision cannot be sold.	+
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: NFMA: 11 inches (tail) or 17 inches (whole) SFMA: 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
			rates and increase bottom time in areas where medium-small sized scallops are prevalent.	
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	0
OTHER MEASURES				
Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	Uncertain
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	+
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	+

Table 107 Description of Status Quo measures that impact EFH that would be in effect under the EFH No Action Alternative (#1).

6.3.3.3.1 Alternative 2

Net economic change to fishery / Equity of potential costs among communities – Alternative 2 would impose no immediate term economic impact on fishery participants over and above the effort control measures contained in the Amendment. These measures do not include any specified area closures nor do they contain specific measures to reduce effort in the monkfish fishery that would clearly reduce habitat impacts. For the reasons noted above, the longer term economic impact of Alternative 2 is not known but could be negative if a significant link between habitat damage and monkfish resource productivity is established.

Differences in EFH Value/Population effects and ecosystem changes- described in Table 108.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	The trawl gear configuration developed by Monkfish PDT and EFH Plan Development Team may reduce impacts to EFH by reducing bottom contact time. Potentially, an increase in DAS usage by scallop and groundfish vessels could occur. However, this increase is unpredictable at this time.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	<ul style="list-style-type: none"> • Expected to improve bottom habitat conditions by reducing bycatch and mortality of benthic organisms. • May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 108- Potential habitat benefits of non-habitat Amendment 2 management alternatives

Because the Councils did not select any measures that provide additional habitat benefits, as identified in Table 108, there are no longer habitat benefits associated with this alternative. Therefore, it is no longer practicable alternative in terms of habitat protection.

6.3.3.3.2 Alternative 3

Alternative 3, which intended to use the habitat benefits of measures implemented in Amendment 10 to the Atlantic scallop FMP and Amendment 13 to the Northeast Multispecies FMP, has been absorbed into the No Action Alternative (EFH Alternative 1).

At the time of the preparation of the Amendment 2 DSEIS, the New England Council was considering significant measures to mitigate adverse impacts (via gear modifications, effort reductions and habitat closed areas) of fishing with trawls, scallop dredges and hydraulic clam dredges on EFH in Amendment 10 and Amendment 13. Because the timing of the Councils' deliberation on alternatives to include in the Monkfish Amendment 2 DSEIS occurred simultaneously with the final decisions by the New England Council on these other two major FMP amendments, the decision was made to include Alternative 3 in the DSEIS. This decision was made with the understanding that if Amendment 10 and 13 were implemented prior to the submission of Council decisions on Amendment 2, then the measures outlined in Alternative 3 would become part of the No Action alternative as the implemented measures are considered part of the Status Quo. As such, all status quo measures that may have a habitat impact have been outlined in Alternative 1. See Table 107 for a description of the No Action Alternative for EFH and the estimated habitat impacts.

Because the measures in Alternative 3 have been subsumed into the No Action Alternative, this alternative is no longer practicable.

6.3.3.3.3 Alternative 4

Net economic change to fishery / Equity of potential costs among communities - Alternative 4 may have some short term negative economic effects depending on which trawl configuration option is selected and in which management area the configuration requirements would apply. Option 2 would only impact trawl vessels that elect to fish on a monkfish-only DAS, and absent an exempted fishery status in the Northern Area, would only affect vessels that fish in the Southern area. Similarly, Option 3 would only affect vessels using trawl gear on a monkfish-only DAS in the SFMA.

Changing the trawl configuration would require vessels using non-conforming gear to bear the cost of making the necessary changes. Vessels may also find it impossible to fish in certain areas depending on which option is selected for the maximum disc diameter.

Differences in EFH Value / Population effects and ecosystem changes - This net was designed to be efficient at catching monkfish while reducing the incentive and ability to fish in more complex bottom. By developing a net that removes the incentive to fish on hard bottom, then the hard bottom that is EFH for other species will be protected. Therefore, this net is likely to change directed monkfish fishing behavior off complex bottom, and onto more muddy substrates.

Overall, this alternative is practicable.

6.3.3.3.4 Alternative 5AB and Alternative 5C

These alternatives contain measures to protect deep-sea canyon habitats. The economic effect of these closures was estimated by identifying all fishing activity that took place inside each of these proposed areas using position coordinates provided in VTR's for fishing years 1999 and 2001. The following summarizes the findings by closure area for Option 1 (closure to trawl gear on a monkfish DAS) and Option 2 (closed trawl and gillnet gears on a monkfish DAS). Note that since call-in records cannot be directly matched with logbooks any trip where monkfish was at least 50% of total weight of fish on board were assumed to be on a monkfish DAS.

The canyon habitat closed areas will benefit not only the EFH found in these areas, but also the other community components such as deep-sea corals. Alternative 5AB, and to a greater extent Alternative 5C, would also protect deep-sea canyon habitats from potential fishing activity targeting other deepwater species, to the extent that vessels fishing on a monkfish DAS become involved in exploring and developing those alternative fisheries. Installing protective measures before any such fisheries become established reduces the cost of such protections when compared to the cost of closing an established or burgeoning fishery in which vessels have already made capital investments. In Europe, a number of established deepwater fisheries have been displaced or shut down as coral protection closures were implemented in recent years. While such fisheries are not yet taking place in this region, it is likely that they will in the reasonably foreseeable future as the combination of technological advances and restrictions in other fisheries make such alternative fisheries attractive to large trawl vessels. These preventative and precautionary alternatives are practicable because they avoid costs of displacement or elimination of future fishing effort. The absence of any negative economic or social impact on the monkfish fishery (or on any other fishery that currently uses these areas, but will not be affected by the closures) also means that either closed area alternative is practicable despite the fact that EFH is only designated for a few managed species in portions of the closed areas.

Alternative 5A/B (Oceanographer and Lydonia Canyons)

Net economic change to fishery / Equity of potential costs among communities

No trips were identified as having taken place within the Oceanographer/Lydonia Canyon closure areas. Therefore, based on the criteria used for purposes of analysis, the economic effect of Alternative 5AB would be zero.

Differences in EFH value / Population effects and ecosystem changes

The EFH composition of Alternative 5AB is summarized in Section 6.3.1.5. Eight of the 22 species and life stages with benthic EFH that is moderately or highly vulnerable to bottom tending gear in waters deeper than 200 meters are contained in the two areas included in this closure. This alternative does contain almost all of the known coral recorded in Oceanographer and Lydonia canyons.

Overall, this alternative is practicable.

Alternative 5C (Large, Steep-Walled Canyon Closures)

Net economic change to fishery / Equity of potential costs among communities

Up to 12 canyon areas were identified under this closure alternative. Within these areas, there were about 34 directed trips identified from the 1999 and 2001 VTR database.

Assessment of all non-directed monkfish trips indicates that the majority were targeting squid or whiting while most other trips were associated with a directed summer flounder fishery. Under closure Option 1 a total of 9 trawl trips would be affected based on 1999 data and less than 3 trips would be affected based on 2001 data. Option 2 would affect an additional 21 gillnet trips based on 2001 data.

Differences in EFH Value / Population effects and ecosystem changes-

The EFH composition of Alternative 5C is summarized in Section 6.3.1.5. Fourteen of the 22 species and life stages with benthic EFH that is moderately or highly vulnerable to bottom tending gear in waters deeper than 200 meters are contained in the 12 closed areas included in this alternative. Canyons other than Oceanographer and Lydonia canyons are not as well represented in the soft coral database (see Section 6.3.1.5), but most of them have not been as thoroughly surveyed as Lydonia and Oceanographer canyons.

This alternative is not practicable for a number of reasons. Fishing effort data show that more social and economic impacts would be incurred by the closure of all 12 steep-walled canyons proposed in Alternative 5C as compared to Alternative 5AB, which proposes to close only Oceanographer and Lydonia canyons. Additionally, coral presence and absence data for the remaining 10 canyons not included in 5AB were not readily available. As such, the best available science supports only the closure of Alternative 5AB at this time. In other words protection of deep-sea corals in all 12 steep-walled canyons proposed in Alternative 5C would be less certain than in Alternative 5AB, until such time as additional surveys were conducted which documented the presence of corals in the other canyons included in this alternative.

6.3.3.4 Summary

Table 109 summarizes the practicability of the measures under consideration and the implementation of measures by the Council to minimize adverse effects of monkfish fishing on EFH in the Northeastern U.S.

Alternative	Practicable?	Implemented by Council?	Notes
Alt 1 <i>Status Quo/No Action</i>	Yes	No	Selected additional measures to protect habitat instead.
Alternative 2 <i>Complementary benefits of other Amendment 2 actions to EFH</i>	No	Yes	Measures with incidental positive benefits to EFH were not implemented.
Alternative 3* <i>Complementary benefits of other Amendment 13 (GF) and Amendment 10 (SC) actions to EFH</i>	Not assessed	Yes	Due to timing, this alternative was folded into Alternative 1.
Alternative 4 <i>Monkfish trawl gear modification</i>	Yes	Yes	Some measure options were dependent on de-coupling of DAS in FMP which was not implemented.
Alternative 5AB <i>Inclusion of habitat closed areas in Lydonia and Oceanographer canyons</i>	Yes	Yes	Lydonia and Oceanographer Canyons closed to fishing on a monkfish DAS – applies to both gillnet and trawl vessels.
Alternative 5C <i>Inclusion of all 12 steep-walled canyons in northeast as habitat closed areas</i>	No	No	Not enough scientific information on presence of corals in all 12 canyons at this time.

Table 109 Summary of practicability and implementation of measures to protect vulnerable EFH in Amendment 2

* Alternative 3 was folded into Alternative 1 as the implementation of both Amendment 13 to the Northeast Multispecies FMP and Amendment 10 to the Atlantic Sea Scallop FMP occurred between the publication of the Amendment 2 DSEIS and the Council's final decisions.

6.3.4 EFH Assessment

6.3.4.1 Description of the Action

For a full description of the proposed action, please refer to Section 4.1.

6.3.4.2 Assessing Potential Adverse Impacts

6.3.4.2.1 Experts Opinion

See Types of Gear Effects in Gear Effects Evaluation and Vulnerability of Benthic EFH to Bottom-Tending Fishing Gears in Appendix II. To summarize, positive and negative effects of otter trawls from 23 of these publications are listed by substrate type in Table 110 through Table 112, 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 just 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.

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 110 - 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 111 - 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	
<i>Biological Effects</i>	
Reduced abundance of attached organisms (sponges, anemones, soft corals)	
Damaged sponges, soft corals, brittle stars	12 months

Table 112 - 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.

The following conclusion can therefore be reached: Adverse and potentially adverse habitat impacts from bottom trawling occur throughout most of the NE region on a variety of substrates.

6.3.4.2.2 Determinations

Otter trawls will have a potential adverse effect on the EFH of species and benthic habitat types listed in Table 113. These species and life stages have been determined to be moderately or highly vulnerable to these gear types. In some cases the adverse effects may be significant (high vulnerability) and are denoted as well. For a detailed look at the full gear effects evaluation and adverse impacts determination, refer to Appendix II of the Amendment 2 FSEIS.

Species	Lifestage	Vulnerability to Otter Trawling	Depth in meters (EFH Designation)	Substrate (EFH Designation)
American Plaice	A	High	45-150	sand or gravel
American Plaice	J	Mod	45-175	sand or gravel
Atlantic Cod	A	Mod	25-75	cobble or gravel
Atlantic Cod	J	High	10-150	rocks, pebble, gravel
Atlantic Halibut	A	Mod	20-60	sand, gravel, clay
Atlantic Halibut	J	Mod	100-700	sand, gravel, clay
Barndoor Skate	A	Mod	0-750, mostly <150	mud, gravel, and sand
Barndoor Skate	J	Mod	0-750, mostly <150	mud, gravel, and sand
Black Sea Bass	A	High	20-50	structures, sand and shell
Black Sea Bass	J	High	1-38	rough bottom, shell and eelgrass beds, structures and offshore clam beds in winter
Clearence Skate	A	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Clearence Skate	J	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Haddock	A	High	35-100	pebble gravel
Haddock	J	High	40-150	broken ground, pebbles, smooth hard sand, smooth areas between rocky patches
Little Skate	A	Mod	0-137, mostly 73-91	sand or gravel or mud
Little Skate	J	Mod	0-137, mostly 73-91	sand or gravel or mud
Ocean Pout	A	High	<110	soft sediments
Ocean Pout	J	High	<80	smooth bottom near rocks or algae
Ocean Pout	L	High	<50	close to hard bottom nesting areas
Ocean Pout	E	High	<50	hard bottom, sheltered holes
Pollock	A	Mod	15-365	hard bottom, artificial reefs
Red Hake	A	Mod	10-130	sand and mud
Red Hake	J	High	<100	shell and live scallops
Redfish	A	Mod	50-350	silt, mud, or hard bottom
Redfish	J	High	25-400	silt, mud, or hard bottom
Rosette Skate	A	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Rosette Skate	J	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Scup	J	Mod	0-38	inshore sand, mud, mussel and eelgrass beds
Silver Hake	J	Mod	20-270	all substrate types
Smooth Skate	A	High	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles

Species	Lifestage	Vulnerability to Otter Trawling	Depth in meters (EFH Designation)	Substrate (EFH Designation)
Smooth Skate	J	Mod	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles
Thorny Skate	A	Mod	18-2000, mostly 111-366	sand gravel, broken shell, pebble, and soft mud
Thorny Skate	J	Mod	18-2000, mostly 111-366	sand gravel, broken shell, pebble, and soft mud
Tilefish	A	High	76-365	rough, sheltered bottom
Tilefish	J	High	76-365	rough, sheltered bottom
White Hake	J	Mod	5-225	pelagic during pelagic stage and mud or fine sand during demersal stage
Winter Flounder	A	Mod	1-100	estuaries with mud, gravel, or sand
Winter Skate	A	Mod	0-371, mostly <111	sand, gravel, or mud
Winter Skate	J	Mod	0-371, mostly <111	sand, gravel, or mud
Witch Flounder	A	Mod	25-300	fine-grained sediment
Witch Flounder	J	Mod	50-450	fine-grained sediment
Yellowtail Flounder	A	Mod	20-50	sand and mud
Yellowtail Flounder	J	Mod	20-50	sand and mud

Table 113 Species with EFH vulnerable to otter trawl gear.

6.3.4.3 Minimizing or Mitigating Adverse Impacts

In order to minimize and mitigate the adverse effects of the fishery on EFH the Council will implement Habitat Alternative 4 and Alternative 5AB.

In Amendment 13 to the Multispecies FMP and Framework 16 to the Scallop FMP, the New England Council implemented a range of measures to minimize the impacts of bottom trawling in the Gulf of Maine, George's Bank and Southern New England. In addition to the significant reductions in days-at-sea and some gear modifications, the Council closed 2,811 square nautical miles to bottom-tending mobile fishing gear (known as Habitat Closed Areas). Because the monkfish fishery overlaps significantly with the groundfish fishery in the northern fishery management area and the habitat closed areas extend into the southern fishery management area, measures to protect habitat in Amendment 10 and Amendment 13 assist in minimizing the effect of fishing on EFH in the monkfish fishery.

The alternatives selected for implementation in Amendment 2 focus on those areas (offshore/shelf slope/canyons) and gears modifications (trawl mesh) where the monkfish fishery operations do not overlap (spatially or gear use) with the groundfish or scallop fishery. This is depicted in the following Venn-diagram:

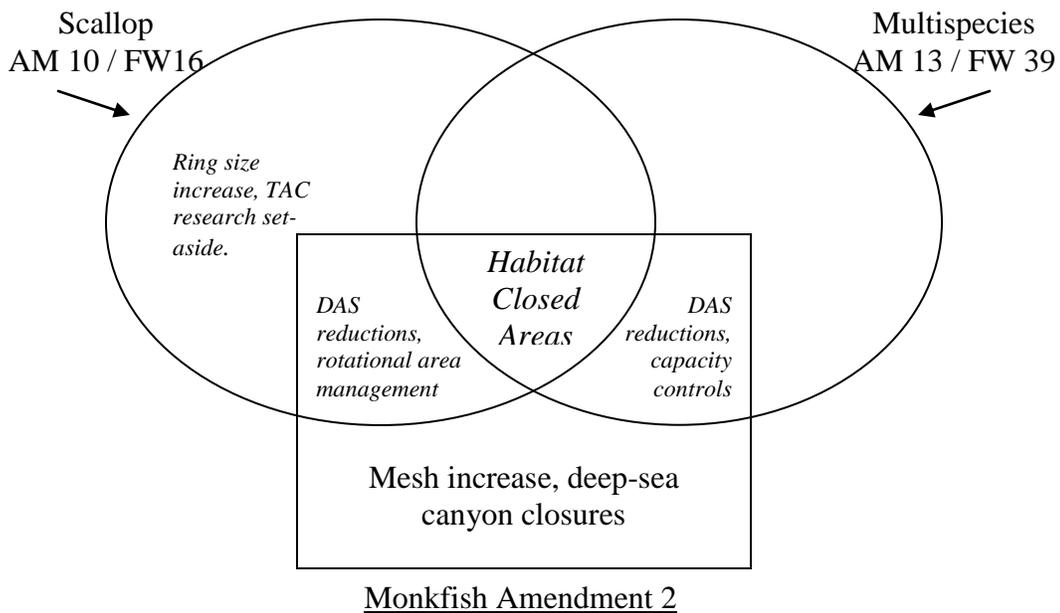


Figure 85 - Venn-diagram depicting intersections of measures in last major NEFMC amendments to minimize the adverse effects of fishing on EFH and additional measures that may have benefits to EFH.

6.3.4.3.1 Habitat Alternative 4

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This trawl gear measure was developed during a cooperative workshop involving trawl industry members and gear technology experts. Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. In the southern area the bottom characteristics are more consistent over large areas, while in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud. Under these conditions, southern area vessels can target monkfish successfully with smaller roller gear, and such a restriction would effectively ensure that such vessels do not fish in areas of more complex bottom characteristics, particularly in the offshore canyons.

6.3.4.3.2 Habitat Alternative 5AB

The Councils propose closing Oceanographer and Lydonia Canyons deeper than 200 meters, a total closure of 116 square nautical miles, to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater canyon, hard bottom communities.

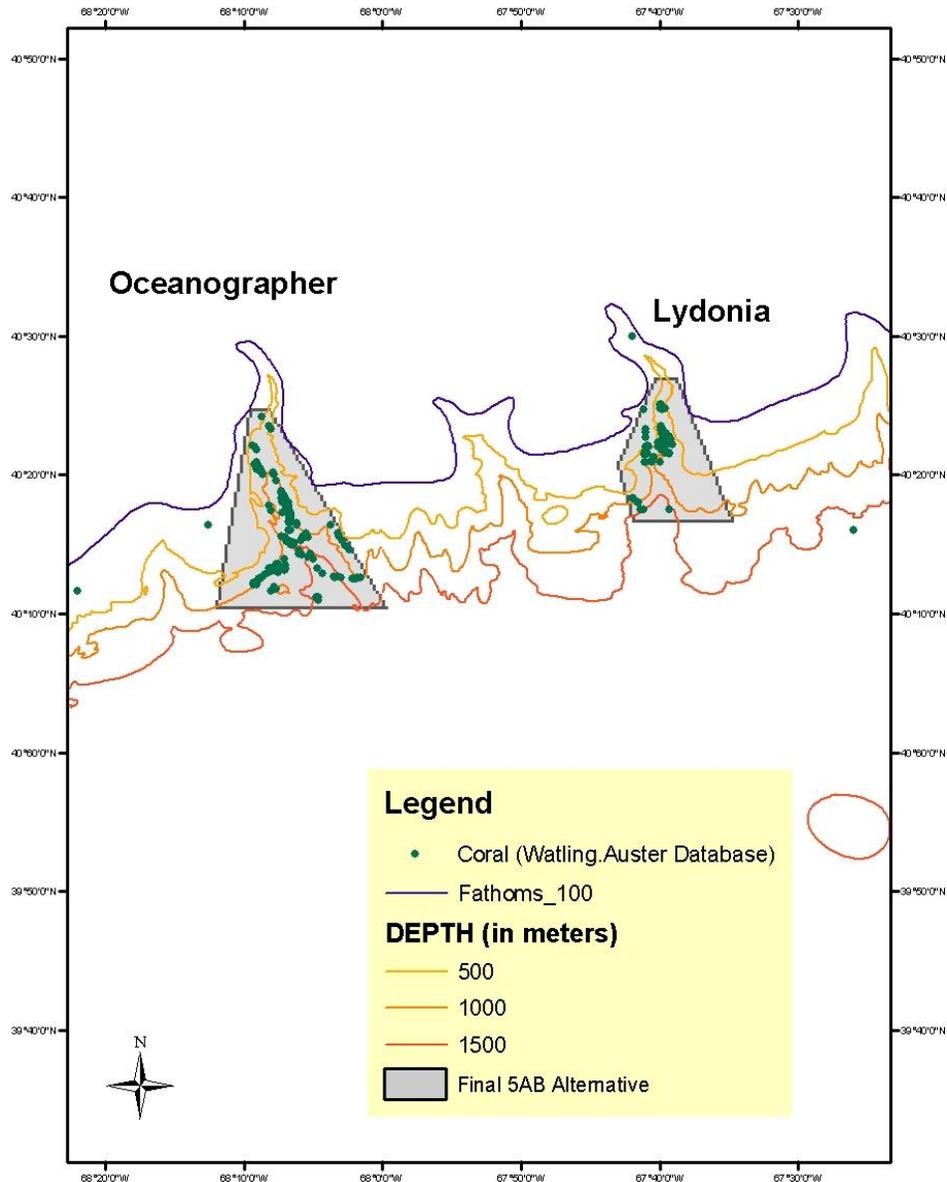


Figure 86 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon)

Note that location of known soft coral is mapped as well (Watling and Auster).

6.3.4.3.3 Analysis of Alternatives to Minimize Adverse Effects of Fishing on EFH

For a full analysis of the alternatives selected to minimize or mitigate adverse effects from fishing on EFH in Amendment 2 to the Monkfish FMP, see Section 6.3.

6.3.4.4 Impacts to EFH from non-EFH proposed measures in Amendment 2

Proposal	Habitat Impact	Feature	
Incidental Catch – 50 lbs./day, 150 max.	0 (neutral)	Applies on all vessels not on a DAS and fishing with small mesh, and handgear, includes multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.	Retention amount is insignificant in comparison to the quantity and value of the target species. Unlikely that those vessels will alter their behavior to target 50 lbs. of monkfish per day since the risks will likely outweigh benefits.
Minimum Fish Size	0 (neutral)	11" tail, 17" whole, both areas	Unlikely that changes to the minimum fish size will have a significant effect on total fishing effort by bottom trawl vessels in the directed monkfish and groundfish fisheries.
Closed Season	0 (neutral)	Eliminate April – June 20-day block out requirement on Category A and B vessels	Small blocks out of fishery will not reduce trawling effects to any measurable degree and eliminating the requirement will not have any effect on habitat.
Offshore SFMA Fishery Program	-/0 (negative)	Enrollment program; Oct. – April; 1,600 lbs. (tail) per DAS; pro – rated DAS allocations; VMS; Category A & B gear requirement; (see text for area and other details)	May affect deep water benthic habitats on the edge of the continental shelf by enabling vessels to return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels contribute to mitigate these potential effects.
Modification of Permit Qualification – South of 38°N	0 (neutral)	Vessels qualify for limited access permit with landings south of 38°N, during 3/15 – 6/15, 1994-1998; 50,000 lbs. (tail) for Category A or C permit; 7,500 lbs. for Category B or D; may only fish for monkfish south of 38°20'N	May result in up to 5 new vessels entering the fishery, however, vessels use large-mesh gillnet which have minimal impact on bottom habitats. If some of those vessels converted to trawl gear, impact will be small and likely occur on sandy bottom.
Modify the Framework Adjustment Procedure	0 (neutral)	Framework adjustments can be done to implement transferable MF DAS; measures to minimize impact on protected species; or bycatch reduction devices	Administrative.
NAFO Regulated Area Exemption Program	0 (neutral)	Vessels exempt from permit, mesh size, effort control and possession limit rules while fishing under High Seas Permit in NAFO Area; landings do not count against TAC	None of the proposed measures are expected to affect EFH.
Cooperative Research – DAS set aside	0/+ (neutral)	Vessels responding to cooperative research RFP may be allocated MF DAS; pool of 500 DAS deducted from total DAS allocation	May result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Expected to have neutral direct effects on habitat because does not result in increased effort.
Cooperative Research – DAS exemption	0/+ (neutral)	Vessels applying for MF cooperative research may obtain exemption from DAS usage requirements; available DAS limited to residual of DAS set-aside pool after RFP awards	May result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Expected to have neutral direct effects on habitat because does not result in increased effort.
Clarification of Vessel Baseline	0/+ (neutral)	Vessel length, tonnage and horsepower baseline to be set at those of first federal permit; only on request of vessel owner during first year after implementation	While increases in vessel size and horsepower could affect the vessel's impact on EFH by enabling it to fish in more areas, to fish in deeper water, and on more hard bottom, this proposal will not likely impact EFH because the upgrading provision will only equalize two existing baselines, not increase the overall baseline.

Table 114 - Impacts to EFH from non-EFH proposed measures in Amendment 2

Overall, the impacts to habitat from the non-habitat proposed measures will be slightly negative due to the potential expansion of the offshore fishery into deep-sea canyon communities. However, this impact is mitigated by the closure of Oceanographer and Lydonia canyons deeper than 200 meters to vessels fishing on a monkfish day-at-sea, the six-inch roller gear restriction in the SFMA, and the pro-rating of DAS allocated to vessels enrolled in the offshore fishery program.

6.3.4.5 Conclusion

The management measures, implemented through this action, minimize the adverse effects of fishing on EFH, to the extent practicable pursuant to Section 303(A)(7) of the MSA.

6.3.4.6 Proposed mitigation

None required.

6.4 Economic Impacts

The following section examines the expected economic impacts of the proposed action and of the alternatives considered in the DSEIS but not adopted by the Councils.

6.4.1 Economic Impacts of the proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.0 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following section contains a discussion and analysis of the economic impacts of the proposed action.

The proposed management changes contain a variety of measures that would have an impact on vessels that participate in monkfish fisheries. These measures include gear changes, minimum fish size, closed seasons, and provisions for a special access program in the SFMA, as well as qualification for fisheries south of 38° N. In addition, the Amendment contains provisions to address bycatch, Essential Fish Habitat, cooperative research, and exemptions for vessels fishing outside the U.S. EEZ. For the most part, the economic impact of these potential changes will include some monetary component, but this monetary impact is very difficult to quantify. For this reason, much of the following contains a qualitative assessment of how vessels will be affected relative to taking no action. Even though a quantitative assessment is not possible, in many cases the type of vessel that one may reasonably expect to be affected can be identified. Thus, wherever possible the number of vessels that may be affected is estimated.

6.4.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.4.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh or handgear would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, up to a maximum of 150 lbs. This trip limit would also apply on vessels holding a limited access multispecies permit that are 30 feet less in length. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

There are currently only 8 vessels permitted in limited access multispecies small vessel category, and these vessels likely fish single day trips due to their small size. Thus, the economic impact of this measure is not likely to be different than the no action alternative for those vessels. Secondly, because of the very small amount of reported monkfish

landings by vessels using handgear, the economic impact of this measure on such vessels should also be no different than the no action alternative.

Changes in incidental catch limits would provide small entities an opportunity to retain larger quantities of monkfish than under the no action alternative. Since the proposed change represents an increase over current trip limits, recent data cannot be used to quantify the potential economic impact of a higher trip limit. However, observed data may provide some insights into the number of trips and vessels that may benefit. Data from fishing year 2001 VTR records were used to identify the number of trips that may be affected. For these identified trips, distributions of trip duration, monkfish discards, and monkfish landings were constructed. These distributions provide an indication of the proportion of trips that may benefit from a higher trip limit. During FY2001, 12,000 trips were taken by monkfish permit holders that were identified as potentially subject to the 50 lb. incidental trip limit. Of these, 2,500 trips by 202 vessels reported landing monkfish. The proposed change would convert the 50 lb. trip limit to a daily 50 lb. limit up to a maximum of 150 lbs. This means that the trip limit change would only affect trips that are more than 24 hours in duration and that landed more than 50 lbs.

Approximately two-thirds of the trips landing monkfish landed less than 50 lbs., leaving 835 trips that may have been constrained by the 50 lb. incidental trip limit in FY2001. These trips either caught and landed no more than 50 lbs. of monkfish or caught more than 50 lbs. and discarded any overages. If these discards were reported, an estimate of the additional benefit of being able to retain more monkfish could be estimated. Unfortunately, over 90% of affected trips report no discards at all. Given the fact that fully one-third of affected trips are at exactly the trip limit it seems unlikely that available data would provide a reliable estimate of the economic benefit of increasing the incidental trip limit. Nevertheless, an upper bound estimate can be calculated by assuming that all trips would retain the maximum allowable limit.

As calculated from the logbooks, a total of 3,385 days absent were associated with the 835 trips that may benefit from the proposed action. Given the maximum limit of 150 lbs., trips that were more than 3 days (72 hours) would not be able to retain any more monkfish. This means that a maximum of 75,900 lbs. of monkfish could be retained under this option. The average monkfish price for 2001 was approximately \$2.53 per lb. so the maximum revenue gain would be \$192,000. Since 112 vessels had at least one trip that would benefit from Option 1, the average benefit would be \$1,700 in gross fishing revenue.

6.4.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels. Under current monkfish regulations, neither vessels fishing under a general category permit using scallop dredge gear nor vessels using clam dredges may retain any monkfish. The proposed action would change current restrictions to be equivalent to that of the incidental trip limit of 50 lbs. per day up to 150 lbs. maximum.

Based on FY2001 VTR data, 1,620 trips taken by 52 different vessels were determined to be consistent with either a clam or a general category scallop trip. None of these trips reported any monkfish discards so these data provide no information regarding potential catch rates on general category scallop or clam trips. Of these trips, over 90% were 24 hours or less and 99% of the trips were less than 48 hours. Given these trip durations, the maximum benefit from a 50 lb. trip limit would be 81,000 lbs. or \$204,000. This assumes that the catch on every trip is at least 50 lbs., which is unlikely since median landings on incidental trips were only 25 lbs. At this median level, revenue benefits on clam or general category scallop trips would be approximately \$102,000 or an average benefit of just under \$2,000 per vessel. The proposed incidental trip limit would provide only modest increases above this level since only 10% (162) of general category scallop or clam dredge trips are more than 24 hours in duration and the vast majority of these are no more than 48 hours. Assuming median landings, this leaves a maximum benefit of only \$10,250 over and above the 50 lb. incidental trip limit.

6.4.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

The proposed alternative would restore fishing opportunities for vessels involved in a summer flounder fishery in the affected areas. The economic impact of this change was estimated by using FY2001 VTR data for trips taken by vessels with a fluke permit using between 5.5" and 6" mesh and retaining fluke within statistical areas 612, 613, 615, 616, 622, 623, 627, 628, 633, 634, 636, and 637. Although these statistical areas do not correspond precisely to the regulated mesh area boundaries, they provide a rough approximation. Note also that the VTR reports only a single coordinate to represent an entire trip that may have taken place anywhere within a statistical area, so the statistical area may be a better proxy for trips that may be affected by the regulatory change than strict adherence to location data.

By adjusting these observed monkfish landings by the No Action incidental catch limit of 50 lbs. per trip, an estimate of the potential revenues that would be restored under the proposed alternative is obtained. Specifically, across the 114 vessels in the data set that landed monkfish the average annual restored landings would be 326 lbs. of monkfish. At an average price of \$2.53 per lb., this translates into \$825 per vessel. However, the impact varies considerably across vessels, ranging from no impact (i.e., no observed trip exceeded 50 lbs.) to almost \$10,000.

6.4.1.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA, Section 4.1.2).

The proposed action would implement a uniform minimum fish size in both management areas. The NFMA size limit would be unchanged but the SFMA size limit would be reduced to that of the NFMA (11-inch tail or 17- inches whole). This change would not have any economic impact on trips taken in the Northern area but would increase economic opportunities for vessels fishing for monkfish in the SFMA. A reduction in the size limit may also make fishing in the SFMA area more attractive since some vessels may have chosen to fish in the NFMA to take advantage of the smaller size limit. Without detailed information on the size distribution of the commercial catch in both areas, an accurate assessment of how much economic benefit will accrue to individual vessels is not possible. In addition to this economic benefit, there would be a concurrent reduction in the enforcement burden due to this change.

6.4.1.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as the multispecies fishery (see Section 4.1.3).

Current regulations require vessels (except Category C or D scallopers) to take a 20-day block out of the monkfish fishery during the spring. This requirement corresponds with the spawning season for monkfish. The proposed action would eliminate this requirement, thereby removing any associated regulatory burden. The extent of the regulatory relief provided by the removal of the 20-day block requirement is unknown. The 20-day block out of the fishery only means that vessels cannot call in a monkfish DAS. It does not mean that vessels cannot fish, nor does it mean that limited access permit holders cannot retain monkfish. Since the 20-day block may be taken at any time during the prescribed period, vessels may choose the specific block they expect to be most advantageous. Nevertheless, removing the requirement would provide vessels with greater flexibility in choosing when to fish for monkfish and when to fish for other species.

6.4.1.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with prorated DAS allocations (see Section 4.1.4).

The proposed offshore SFMA would permit enrolled vessels to increase in effect the amount of monkfish that could be retained per DAS. Over a fishing season the program would allow vessels to achieve higher profitability, because more monkfish could be retained using fewer overall inputs. Note that enrolled vessels would use up their DAS at a higher rate so no more fishing time would be used, but vessels would be able to use their available time more efficiently.

Participating vessels would be subject to VMS requirements, meaning vessels currently without VMS would have to bear the cost of installation. However, since participation would be voluntary, each individual would be able to weigh the benefits and costs of obtaining VMS before choosing to enroll. Given the proposed distance from shore, participation in the fishery would likely be limited to larger vessels.

6.4.1.5 Modification of permit qualification for south of 38°00’N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20’N.

The vessel level economic impact on affected vessels is likely to be positive, due to the increased opportunity to fish for monkfish in the EEZ, but the magnitude of this impact cannot be determined. These vessels already prosecute a monkfish fishery in state waters during the same limited season when they would be able to fish in the EEZ if they qualified for a federal permit. Secondly, it is unclear if the limitations on this fishery resulting from sea turtle closures would offset any immediate benefit these vessels might realize from obtaining a federal monkfish permit.

Preliminary estimates indicate that under the proposed action 5 vessels would qualify for a limited access permit (all in Categories B and D). Depending on these vessels’ level of effort (DAS used) and catch rates, the proposed action could therefore have an impact on the trip limits for other vessels fishing in the SFMA, since the TAC would now be distributed over an increased number of vessels.

In the five years prior to implementation of the FMP in 1999, the five vessels that are expected to qualify for a permit under the proposed action, depended on monkfish for about 25 percent of their total revenues (Table 115), averaging \$77,652 in monkfish revenues per vessel out of total average vessel revenues of \$480,023. (Note, these revenue figures are for the entire period, not annualized. Some of these vessels may have continued to rely on monkfish since FMP implementation by fishing in state waters and participating in experimental fisheries in 2000 and 2001.

	Revenues Jan 1, 1995 - Nov 7, 1999			
	Monkfish	Other spp	Total	Pct Monkfish
Sum	\$465,910	\$2,414,226	\$2,880,136	
Average	\$77,652	\$402,371	\$480,023	25.2%

Table 115 Pre-FMP vessel dependence on monkfish for five qualifying vessels under the proposed action.

An analysis done by the PDT that assumed the same average DAS usage rate and average catch per DAS as the rest of the fleet, concluded that Category A and C vessels’ trip limits would need to be reduced 13.6 lbs./DAS per vessel, while B and D trip limits

would have to be reduced 10.1 lbs./DAS per vessel. If 5 new permits were issued, the trip limits would be reduced by approximately 100 lbs./DAS (tail wt.) if the trip limits were originally at 1,200 lbs./DAS (roughly the FY2003 limits), and would be reduced by proportionally smaller amounts at lower trip limits. Comments by the public and the Monkfish Committee, however, suggest that these effects are unrealistically high due to the DAS usage and catch rate assumptions. For that reason, it is not possible to estimate with any degree of confidence what the economic impact would be on the rest of the fleet from the addition of 5 new permits. It should also be noted that if more than 5 permits were added, the impact on trip limits would be proportionally higher. Likewise, fewer additional permits would result in a smaller impact on trip limits.

6.4.1.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6).

Including these items in the list of frameworkable measures under the FMP is administrative in nature, and, therefore, will not result in any economic impacts at this time. The economic impacts associated with any DAS transfer, protected species, or bycatch reduction measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.4.1.6.1 Implement transferable MF-only DAS

Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action.

6.4.1.6.2 Implement measures to minimize fishery impact on protected species

The Councils propose to include measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises, in the FMP list of actions that can be taken under the framework adjustment process. The list of measures would include gear-specific seasonal/area closures or gear modification.

6.4.1.6.3 Implement requirements to use bycatch reduction devices

The Councils propose to add “bycatch reduction devices” to the list of measures that can be implemented under the framework adjustment process in the FMP.

6.4.1.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 would be exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions in some situations. They would be permitted to transit the EEZ with monkfish onboard the vessel or land in U.S. ports monkfish caught while fishing in the NAFO Regulatory Area, provided the vessel complied with certain administrative and gear stowage requirements (see Section 4.1.7).

The proposed action would exempt anyone fishing in the NAFO regulatory area from EEZ regulations. Vessels would be presumed to be compliant with appropriate NAFO

regulations and would be issued a High Seas Fishing Compliance permit. This alternative would relieve participating vessels from dual compliance with both EEZ and NAFO regulations and would provide vessels with greater flexibility compared to current regulations. The economic impact of such a change cannot be estimated with precision since it is not known to what extent current regulations inhibit domestic vessels from participating in the NAFO Regulatory Area. Nevertheless, the economic impact is at least likely to be positive since vessels fishing in international waters would be relieved of the more restrictive EEZ measures.

6.4.1.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.4.1.8.1 Southern Area trawl disc restriction

The Councils propose restricting the diameter of trawl roller gear to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This action may have some short-term negative economic effects on some of the vessels using trawl gear on a monkfish-only DAS in the SFMA. Vessels using non-conforming gear will be required to bear the cost of making the necessary change. However, this roller gear diameter is already used by most vessels in the SFMA, mitigating the potential impact. In addition, this requirement would effectively limit vessels to the locations they have already fished, and could therefore prevent exploratory fishing to find new productive areas.

6.4.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals.

The economic effect of the proposed closure was estimated by identifying all fishing activity taking place within the area using position coordinates provided in VTRs for calendar years 1999 and 2001. Since call-in records cannot be directly matched with logbooks, any trip where monkfish comprised at least 50% of the total weight of fish on board was assumed to be on a monkfish DAS. No trips were identified as having taken place within the Oceanographer and Lydonia Canyon Closure area. Therefore, based on the criteria used for the purpose of analysis, the economic effect of the proposed action would be zero.

6.4.1.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below (see Section 4.1.9).

Cooperative research has proven to be an important component of monitoring and assessment of the monkfish resource. By creating a DAS set-aside and DAS exemption program, the potential monkfish mortality effects of cooperative research can be accounted for upfront, streamlining the process for initiating and approving cooperative research.

6.4.1.9.1 Research DAS set-aside

A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. NMFS will distribute DAS from the pool to vessels responding to an annual cooperative research Request for Proposals (RFP).

This program would spread the set-aside equally across all monkfish vessels but would affect vessels unequally. Vessels that use their full allocation would lose monkfish fishing opportunities. However, if these vessels were also the ones engaged in a cooperative research program, lost DAS would be recouped and total fishing time on monkfish could actually increase. Vessels that do not use their full allocation of DAS would be unaffected by this change.

6.4.1.9.2 DAS Exemption

Under this proposal, DAS set aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. The total DAS available under this program would be the remainder of the DAS pool not distributed under the annual RFP process.

This program would exempt DAS used in a cooperative research project from counting against a vessel's allocation. Since the DAS exemption program draws from the 500 DAS set-aside, vessels would not see a further reduction in their DAS allocations, but those vessels using their full allocation and not participating in either program would lose monkfish fishing opportunities. However, like the set-aside, an exemption program would make it possible for some vessels to realize an increase in monkfish fishing opportunity through participation in cooperative research projects.

6.4.1.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

Clarification of vessel baseline would have no immediate economic impact on a vessel's ability to earn fishing income in the monkfish fishery as no proposed measures are specifically tied to any physical dimension of the vessel. A change in baseline could affect the value of a vessel depending on whether the baseline is higher or lower than the

current monkfish baseline. A change in baseline may also have some implications in the event a DAS leasing program is developed. The DAS leasing program for Amendment 13 of the Multispecies plan is based on a vessel's baseline. This leasing program makes it possible for smaller vessels to obtain DAS from larger vessels but leases from smaller to larger vessels would not be allowed. Within this setting, the smaller the baseline, the larger the pool of potential trading partners. However, since the adjustment under the proposed action can only be made at the request of the vessel owner, presumably only those who would benefit would make such a request.

6.4.1.11 Economic impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.4.1.11.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. Each vessel must weigh the opportunity cost of using a monkfish DAS to target monkfish against the value of using a scallop or multispecies DAS to target one of those fisheries. According to the data in Table 38, Category C and D vessels used less than 50 percent of the allocated monkfish DAS, and no scallop/monkfish DAS were used. The economic impact of the no action alternative are unchanged from that of the original FMP, except that the proposed offshore fishery program may provide some economic relief for vessels that were negatively impacted by the FMP.

6.4.1.11.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. Compared to the non-preferred alternatives, the cost to vessels would be minimized, since no new nets would have to be purchased. The smaller mesh size of the no action alternative also reduces the escapement of legal sized fish, therefore reduces the inefficiency that results from larger mesh requirements.

6.4.1.11.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. The no action alternative would not modify this ability, and, therefore, does not have an economic impact.

6.4.1.11.4 Impact of fishing year no action alternative

The alternatives under consideration to change the fishing year, including the no action alternative, are administrative and do not result in any economic impact, except that by

maintaining alignment with the multispecies fishing year, the permit application burden on vessels and the government is minimized.

6.4.2 Economic Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in the previous section, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.4.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform (“fleet”) allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

Since this measure would have only affected vessels having either groundfish or scallop DAS allocations, separation of DAS would have had no direct impact on the 55 Category A & B limited access or the 2,138 Category E open access vessels that held a monkfish permit in the 2002 fishing year, given that Fleet DAS would have remained at current levels. Since proposed individual DAS allocations are based on past performance, the impact would have been minimal even though some vessels would have seen an increase and others a decrease in allocation. Under individual DAS, the overall level of effort (cumulative of all vessels) would not have been reduced.

The economic impact of separating DAS on the 328 Category C and 334 Category D permit holders would have depended on whether the individuals held a groundfish or a scallop permit and whether they fished, or plan to fished, exclusively in one management area or both. Thus, for purpose of discussion the 662 C&D permit holders are sub-divided into four different groups; vessels that have a scallop permit; vessels that have a

groundfish permit that fish exclusively in the NFMA; vessels with a groundfish permit that fish exclusively in the SFMA; and vessels that have a groundfish permit that fish in both management areas. Note that multispecies combination permit holders (Category E) will be treated as a special case of a scallop vessel.

There were 176 scallop permit holders among the 662 C&D vessels, of which, 155 were Category C vessels. A total of 40 scallop permit holders also held a combination (Category E) multispecies permit. Under No Action a scallop vessel may choose to use a monkfish DAS but must forego the opportunity to use a scallop DAS to do so, since scallop vessels cannot direct on monkfish and scallops with a dredge or scallop net. With separation of DAS, scallop vessels could have chosen to fish a monkfish-only DAS without having to give up a scallop DAS. Given current allocations, full-time permit holders would have been able to use scallop gear for 120 DAS and then target monkfish using either large mesh trawl or gillnet gear for an additional 40 DAS. Given current resource conditions in the scallop fishery there is little economic incentive to use a monkfish-only DAS because the opportunity cost of losing a scallop DAS is too high. With separation of DAS, scallop vessels would have been able to diversify their business into a directed monkfish fishery without compromising scallop sales. Note that this does not necessarily mean that all scallop vessels would have taken advantage of the opportunity since it would have required installation of a net reel as well as the purchase of nets. In addition, vessels with little experience in a directed trawl or gillnet monkfish fishery may have been less inclined to take advantage of the separation of DAS. Note, however, scallop vessels that did decide to add directed monkfish activity to their overall business would have been competing with other limited access permit holders for a limited resource that could have resulted in a change in the distribution of monkfish revenues among vessels. If scallop vessels chose to fish with gillnets it may also have contributed to increased gear conflicts with other vessels as competition over limited bottom would have increased.

Even though separation of DAS would have offered scallop vessel owners an opportunity to expand their business, this opportunity would have been enhanced under Alternative 1B compared to Alternative 1A. Neither alternative would have had any affect on scallop activity but Alternative 1B would have made it possible for a scallop vessel to use monkfish-only DAS in either the NFMA or the SFMA, whereas, Alternative 1A would have meant that, if enrolled, the vessel could have only used a monkfish-only DAS in the SFMA.

While the general impact on scallop vessels is unambiguous, the impact of separation of DAS for limited access multispecies vessels is less clear largely because the regulations under which a vessel may participate in the monkfish fishery depend on the area fished, and absent an exempted trawl fishery in the NFMA, gear used. For this reason, multispecies vessels have been subdivided into three categories based on area fished.

Alternative 1A would have required an annual declaration to decouple DAS in the SFMA only. Such a declaration would have meant that the vessel could still declare on a trip-by-trip basis whether a monkfish-only or a combined DAS was being used, but could only

fish for monkfish in the SFMA. Vessels that did not declare for decoupled DAS would have fished for monkfish and multispecies under No Action regulations.

For vessels that fish for monkfish exclusively in the NFMA the economic effect of Alternative 1A would have been unchanged relative to the no action alternative since the trip-by-trip choices available to these vessels would have been unaltered. That is, assuming a 40 DAS monkfish allocation, a vessel with 50 groundfish DAS would still have been limited to fishing a maximum of 50 DAS for either monkfish or groundfish and would still have been able to fish up to 10 groundfish-only DAS without a monkfish trip limit. By contrast, if a vessel did declare into the SFMA it would have been possible to fish up to 50 groundfish-only and 40 monkfish-only DAS but would not have been able to use a monkfish-only or a combined DAS in the NFMA. Thus, while vessels that fish for monkfish only in the NFMA may have elected to have separation of monkfish DAS, doing so would have required a complete change in fishing location that could have required a change in homeport as well. Such a decision seems unlikely to make economic sense particularly when the majority of vessels that fish for monkfish only in the NFMA also fish for all other species exclusively in the NFMA.

Alternative 1B would have required an annual declaration to decouple DAS but would not have required an area designation. Vessels that elected to have separated DAS would still declare on a trip-by-trip basis whether they were fishing a groundfish-only, a monkfish-only or a combined DAS, but would have had to fish as Category E vessel in both management areas on a groundfish-only DAS. For vessels that fish exclusively in the NFMA this condition would have meant that the vessel would not be able to fish without a monkfish trip limit on a groundfish-only DAS. Vessels would have retained the option to fish without separated DAS, under No Action rules. Compared to the no action alternative, Alternative 1B would have provided greater flexibility to vessel owners and would have allowed them to choose whichever option would be most likely to improve economic performance.

At least until an exempted fishery has been established for a monkfish trawl fishery in the NFMA, trawl vessels that fish only in the Northern area may not be likely to declare for separated DAS since there would be nowhere to fish on a monkfish-only DAS in the North. This would have meant that potential gross revenue could have actually declined relative to No Action because the vessel would have been limited to fishing 40 combined DAS and 10 groundfish-only DAS with a 400 lb. per DAS trip limit. If the same vessel elected to fish under No Action it would be able to fish up to 50 groundfish DAS with no monkfish trip limit.

Depending on fishing patterns, gillnet vessels may have been better off with separation of DAS since an exempted fishery already exists in the NFMA. This means that gillnet vessels would have had an opportunity to increase total fishing days for monkfish and groundfish, although they may still not have elected to separate DAS if they still wanted to preserve the option to fish a groundfish-only DAS without a monkfish trip limit.

For vessels that fish exclusively in the SFMA Alternative 1A would have provided an opportunity to increase the total number of DAS that could be used in groundfish and monkfish fisheries combined. Unlike their northern counterparts, declaration into separated monkfish DAS would have been advantageous since they already fish monkfish only in the SFMA. Additionally, SFMA vessels would not have been giving up anything if they chose to fish a groundfish-only DAS since the monkfish trip limits would have been the same as No Action. The actual mix of groundfish-only, monkfish-only, or combined DAS that a vessel may have chosen cannot be predicted but Alternative 1A would have given vessel owners greater flexibility than they have now, enhancing their ability to operate a profitable business. Note that vessels that did not elect to have separated DAS would fish under No Action regulations, which would have left vessel owners no worse off than their current position.

Alternative 1B would have had the same economic impact on vessels that fish for monkfish exclusively in the SFMA. Vessels would still have been able to elect whether to have separated DAS, and would still have been able to declare into a monkfish-only, groundfish-only, or combined DAS on a trip-by-trip basis. Alternative 1B would have provided vessels with greater flexibility, however, because vessels would have been able to fish a monkfish or a combined DAS in the NFMA. Having this choice does not necessarily mean that vessels that fish only in the SFMA would actually have chosen to shift some effort to the Northern area since most of these vessels fish for all species only in the Southern area and many are based out of ports in Southern New England or the Mid-Atlantic states. Nevertheless, Alternative 1B would have provided vessels with greater flexibility and an opportunity to improve profitability compared to either No Action or Alternative 1A.

For vessels fishing in both management areas and not electing to have separated DAS, Alternative 1A would have had no economic impact relative to Alternative 2 since these vessels would have fished under No Action rules. Presumably, vessel owners that did declare into a separated DAS for the SFMA would have done so because they believed they could be more profitable. These vessel owners would have been able to continue to fish for monkfish in the SFMA but would have had to give up any directed monkfish trips that may have been taken in the NFMA and they would no longer have been able to take a groundfish-only trip in the NFMA and fish without a monkfish trip limit.

Alternative 1B would generally have had the same impact as Alternative 1A on these vessels, but would have provided vessel owners with more flexibility. Specifically, vessels owners would have been able to fish for monkfish on either a monkfish-only or a combined DAS instead of being limited to the SFMA-only for directed monkfish fishing.

Overall, separation of DAS would not have made any vessel worse off than they would be under No Action since all vessels would have had the choice to separate DAS or to fish under current regulations. In either case, vessels would have retained the ability to fish a groundfish or scallop-only DAS, a monkfish-only DAS, or a combined DAS. Therefore, the economic impact of either Alternative 1A or Alternative 1B was likely to have been positive, or at worst neutral, relative to No Action (Alternative 2).

It should be noted, however, that this analysis is based upon the assumption that overall effort level within the monkfish fishery would not have increased due to the DAS separation. If vessels that were previously not active in the monkfish fishery became so due to separated DAS, the trip limits and DAS allocated to currently active vessels would have had to be reduced proportionally to maintain the same overall level of effort that can be allowed for a given TAC. In this case, the economic opportunities of current participants in the fishery could have been reduced.

6.4.2.2 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs.

The No Action Alternative would have maintained the current incidental catch limit of 50 lbs./trip, regardless of trip length. While all vessels would continue to face their present economic opportunities, the 112 vessels in FY2001 with at least one trip potentially constrained by the current trip limit would have been required to continue discarding any overages, thus forgoing any economic benefit afforded by the proposed action.

The non-preferred alternative did not affect the total number of potential vessels that may benefit from a trip limit change, but did increase the maximum amount of monkfish that could be retained by extending the maximum trip duration to 10 days (240 hours) over which benefits may accrue. This means that the maximum benefit for the 112 affected vessels would increase to 127,000 lbs. or \$322,000, an average benefit of \$2,900 per vessel.

6.4.2.3 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

If any of the mesh alternatives had been adopted, at a minimum individual vessels would have been required to replace any nonconforming gear to the appropriate configuration. Since any of these alternatives would have applied only to trawl gear, the economic impact would be felt only by vessels using large mesh otter trawls. Unless, or until, a large mesh trawl exempted fishery is developed and approved in the NFMA, vessels that fish only in the NFMA would not be affected by the proposed mesh alternatives. However, vessels that fish in the SFMA with large mesh trawl gear may have been affected. Based on FY2001 VTR data the number of vessels using large mesh trawl was very low (12), and only 1 of these used large mesh of 10-inches or greater but less than 12-inches exclusively. VTR data do not provide sufficient information to evaluate net configurations (whether the mesh is diamond or square or what size mesh is in parts of the net), so there is no way to know whether other vessels using 12- inch or larger mesh are using square or diamond mesh.

6.4.2.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). Alternative 4, contingent upon the adoption of a monkfish-only DAS program, would have applied a different minimum size when a vessel was on a monkfish-only DAS. None of the alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

The No Action Alternative 1 would have maintained the current size limits of 11-inches (tail) or 17-inches (whole) in the NFMA, and 14-inches (tail) or 21-inches (whole) in the SFMA. While all vessels would continue to have the economic opportunities presently available to them, vessels fishing in the SFMA would have continued to face reduced economic opportunities relative to those fishing in the NFMA, since they would have been required to discard fish that would have been of legal size in the NFMA.

Option 2 of Alternative 2 would have implemented a uniform size limit in both management areas but would have reduced the minimum size to 10-inches (tail) or 15-inches (whole). This change would have increased economic opportunities for all vessels fishing for monkfish but would have probably had greater beneficial impact on vessels fishing in the SFMA.

Alternative 3 would have eliminated the minimum size limit and would have provided the greatest economic opportunity for vessels participating in the monkfish fishery. Alternative 3 would not necessarily have meant that all monkfish caught would be retained since there may be a limited market for monkfish below certain sizes. Nevertheless, elimination of the size limit would have provided some incentive to develop markets for smaller monkfish.

Alternative 4 would have adopted a minimum size limit that would be 14- inches (tail) or 21- inches (whole) while vessels are fishing on a monkfish-only DAS. Vessels that

typically fish in the SFMA would not have been affected by Alternative 4 since the size limit would be the same as the current regulation allows. Vessels fishing in the NFMA on a monkfish-only DAS might have experienced losses in economic opportunity, but this loss might have been negligible since the size limit would have applied on trips that would have been required to use large mesh anyway.

6.4.2.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

Alternative 3 would have doubled the current 20-day block to 40 days where vessels may choose to take the entire 40-days consecutively or may take two 20-day blocks. This change would have meant that out of a 90-day period vessels would have needed to identify 40 days in 20-day increments to take time out of a directed monkfish fishery. This would have placed a greater burden on trip scheduling and planning since the period (March to May for Category C and D groundfish and April to June for Category A and B vessels) corresponds to a time of year where weather can be quite variable. This could have left vessels with few opportunities to actually fish if weather conditions were poor during the time a vessel had declared into the fishery. As noted in the economic impacts of the proposed action, the economic impact of blocks out of the fishery are difficult to assess since vessels may still engage in other fisheries and may retain monkfish up to bycatch limits for the specified fishery. In a relative sense, however, Alternative 3 would have been more burdensome than Alternative 1 (No Action).

The No Action Alternative 1 would have preserved the current 20-day block out of the fishery requirement for limited access permit vessels. This requirement places a greater burden on trip scheduling and planning since the period (March to May for Category C and D groundfish and April to June for Category A and B vessels) corresponds to a time of year where weather can be quite variable. This can leave vessels with few opportunities to actually fish if weather conditions are poor during the time a vessel had declared into the fishery. As was noted in the economic impacts of the proposed action, the economic impact of blocks out of the fishery are difficult to assess since vessels may still engage in other fisheries and may retain monkfish up to bycatch limits for the specified fishery. While this would have been a continuation of the status quo in the fishery, there is some positive burden associated with the requirement that would be alleviated by the proposed action.

Alternative 3 would have doubled the current 20-day block to 40 days where vessels may choose to take the entire 40-days consecutively or may take two 20-day blocks. This change would have meant that out of a 90-day period vessels would have needed to

identify 40 days in 20-day increments to take time out of a directed monkfish fishery. This would have placed an even greater burden on trip scheduling and planning due to the variability of weather during the period, and could have left vessels with even fewer opportunities to actually fish than the No Action Alternative. As was previously noted, the economic impacts of blocks out of the fishery are difficult to assess, but Alternative 3 would have been more burdensome than Alternative 1 (No Action).

If monkfish DAS had been separated, scallop vessels would have also been required to take time out of the monkfish fishery. This would represent a change from the flexibility currently available to scallop vessels, but may not have had a substantial impact. Since implementation of the Monkfish FMP, scallop vessel landings of monkfish have fallen primarily because of improvements in the scallop resource itself. The scallop fishing year begins in March, which corresponds with the beginning of the proposed spawning closure period where a 20-day block (or two 20-day blocks) out of the directed monkfish would have been required. Most scallop vessels would more likely be engaged in a directed scallop fishery than a monkfish fishery even if monkfish DAS were separated from scallop DAS. Further, prior to FMP implementation monkfish landings by scallop vessels peaked during the fall and early winter months when monkfish prices (livers in particular) were peaking, and were lowest during spring. This suggests that if scallop vessels were to take advantage of separated monkfish DAS to take a monkfish-only trip, they would most likely use those days during a season other than spring. Therefore, the requirement to take time out of a directed monkfish fishery for 20 or 40 days during March to May would not likely have had a substantial adverse impact on scallop vessels.

6.4.2.6 Offshore SFMA Fishery

The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but non-preferred options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

The No Action Alternative would have continued to subject vessels fishing offshore to the same DAS, trip limits, and gear requirements applying to the same permit category inshore. As a result, the offshore fishery would continue to be unprofitable for most vessels due to the trip limits and, for some vessels, the requirement to use a multispecies or scallop DAS.

As was the case with the proposed action, the non-preferred alternative would have been subject to VMS requirements, so vessels without VMS currently installed would have to bear the cost of installation. However, since this would be a voluntary program, each vessel owner would have been able to weigh the benefits and costs of obtaining VMS. As the non-preferred area option is not significantly different from the proposed area, and given the proposed distance from shore, it is likely that participation in the fishery would be limited to larger vessels.

6.4.2.7 Modification of permit qualification for south of 38°N

The Councils took to public hearings four alternatives that would revise the limited entry qualification period for certain vessels that did not qualify for a permit under the original FMP, plus the no action alternative. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
Alternative 3	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 116 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

Analysis of the NMFS weighout and NCDMF data indicate that the number of vessels/owners that would qualify for monkfish limited access permits range from three under Options 2 and 4 to seven under Option 1. No vessels in the NMFS weighout database would qualify for a permit under options that only include landings south of 38° N (Options 1-4). NMFS NERO appeals records and permit file data indicate that the 2 vessels that applied for an appeal would qualify for permits under all four options considered.

The vessel level economic impact on affected vessels is likely to be positive, due to the increased opportunity to fish for monkfish in the EEZ, but the magnitude of this impact cannot be determined. These vessels already prosecute a monkfish fishery in state waters and during the same limited season when they would be able to fish in the EEZ if they qualified for a federal permit. Secondly, it is unclear how the limitations on this fishery resulting from the sea turtle closures would offset any immediate benefit these vessel might realize by obtaining a federal monkfish permit.

Depending on the number of vessels actually qualifying for a limited access permit under this program, their DAS used, and catch rates, the four alternatives allowing for new permits could have an impact on the trip limits for other vessels fishing in the SFMA, since the TAC would now be distributed over an increased number of vessels (3-7 vessels). An analysis done by the PDT that assumed the same average DAS usage rate and average catch per DAS as the rest of the fleet, concluded that Category A and C vessels’ trip limits would need to be reduced 13.6 lbs./DAS per vessel, while B and D trip limits would have to be reduced 10.1 lbs./DAS per vessel. If 5 new permits were issued, the trip limits would be reduced by approximately 100 lbs./DAS (tail wt.) if the trip limits were originally at 1,200 lbs./DAS (roughly the FY2003 limits), and would be reduced by proportionally less amounts at lower trip limits. Comments by the public and the

Monkfish Committee, however, suggest that these effects are unrealistically high due to the DAS usage and catch rate assumptions. For that reason, it is not possible to estimate with any degree of confidence what the economic impact would be on the rest of the fleet from the addition of 3-7 new permits.

Under the No Action Alternative, no additional permits would have been issued. Consequently, there would not be a potential change to the trip limits for vessels fishing in the SFMA due to this action. Therefore, there should be no economic impacts on those vessels currently participating in the fishery. However, those vessels that would have been denied permits under the No Action Alternative would have had reduced economic opportunities.

6.4.2.8 EFH Alternative 4 Options 1 and 2 (Monkfish trawl configuration)

The Councils considered 3 alternative trawl configurations, including no action, specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. Under Option 2, the Councils considered six individual elements, described in Section 4.2.2.9.3, that could be taken together or separately, and sought public comment on the specific components. However, this option would only be considered if DAS were de-coupled. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and to reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species. The Councils adopted Option 3, to establish a maximum disc diameter of 6-inches in the SFMA.

Option 1 of Alternative 4 was the No Action alternative, under which trawl vessels would not have been subject to any specific gear restrictions other than the minimum mesh size and gear/area-based restrictions that may apply because of other FMP regulations. Since this would not have necessitated any gear changes for vessels currently participating in the fishery, there would have been no economic effects.

Some short-term negative economic effects may have arisen from Option 2 of this alternative, depending on the specific trawl configuration selected and the management area to which the configuration requirements would have applied. Option 2 would have affected only trawl vessels electing to fish on a monkfish-only DAS and, absent an exempted fishery status in the Northern Area, would only have affected vessels fishing in the Southern area. Changing the trawl configuration would require vessels using non-conforming gear to bear the cost of making the necessary changes.

6.4.2.9 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB. Non-preferred Alternative 5C proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line.

Within these areas, 30 trips that would be affected by this alternative were identified from the 1999 and 2001 VTR database. Assessment of all non-directed monkfish trips

indicates that the majority were targeting squid or whiting while most other trips were associated with a directed summer flounder fishery. Under closure option 1, 9 trawl trips would have been affected based on 1999 data and less than 3 trips would have been affected based on 2001 data. Option 2 would have affected an additional 21 gillnet trips based on 2001 data.

6.4.2.10 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

Participating vessels would have been able to retain both their groundfish and monkfish catch while engaged in the experiment. Should the experiment have proven successful, an exempted trawl fishery could have been established allowing a larger number of vessels increased fishing opportunities under DAS separation. Without separated DAS, there would be little economic benefit for trawl vessels to use larger mesh since they would be better off by using groundfish gear and fishing with no trip limit in the NFMA.

6.4.2.11 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13, and considered three alternatives. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively.

Alternative 2 would have changed the fishing year to correspond to a calendar year. Current reliance on the fall survey index makes the change to a calendar year less of an issue since adequate time is available to make the survey data available, and still have adequate time to make annual adjustments. Alternative 2 would also have aligned the monkfish fishing year with the calendar year fishing years of several other Mid-Atlantic fisheries, potentially assisting vessel owners with annual planning of fishing activities. However, Alternative 2 would have meant that the fishing year would not be aligned with either multispecies or scallop fishing years, which would make the permit renewal process cumbersome, especially since the permit renewal cycle for most fisheries (with the exception of scallops and red crab) is based on the multispecies fishing year. Additionally, whether or not DAS had been separated, the allocation, monitoring, and enforcement of DAS allocations that become renewed at different times of the year would have been complicated. Note that this complication would also extend to vessel owners, as they would also have had to make annual planning decisions based on receiving different DAS allocations at different times of the year.

Alternative 3 would have changed the monkfish fishing year to October - September. This alternative would put monkfish at odds with the permit renewal schedule for every other FMP in the Northeast region and would have increased the cost of applying for and

administering these renewals. This alternative would also have introduced some of the same complications noted above both from an administrative and a fishing vessel perspective.

Alternative 4 would have changed the monkfish fishing year to July – June. This alternative offers no clear advantage over Alternative 1, especially since the multispecies fishing year did not change under the Amendment 13 preferred alternative. Given this fact, this alternative would have introduced the same administrative complications and would have complicated vessel business planning.

6.4.2.12 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. Since the Councils took no action to change the fishing year, these administrative alternatives are irrelevant.

6.5 Social and Community Impacts

6.5.1 Introduction

This Social Impact Assessment (SIA) characterizes the magnitude and extent of the social impacts likely to result from the proposed management action as well as from other alternatives considered by the Council during the development of Amendment 2 to the Monkfish Fishery Management Plan (FMP). This SIA will identify and describe all groups of participants and the communities involved in the monkfish fishery both in this section and by reference to the Affected Human Environment section of this document. It will build on information from social impact assessments within previous monkfish actions. A social impact assessment identifies the probable positive and negative impacts from a particular action on the “quality of life” of a community. In addition to the biological and economic impact analysis, this information is provided to help fishery managers make better decisions by clarifying the social and cultural effects of the proposed action.

The mandate to consider the social impacts from proposed federal actions comes from two major laws: the National Environmental Policy Act (NEPA) and the Sustainable Fisheries Act (SFA). NEPA regulations require federal agencies to assess the proposed action’s effects on the quality of the human environment, which includes the direct, indirect, and cumulative impacts on the economic and social aspects of the community (40 CFR 1508.14). In addition, SFA contains a National Standard that requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continued access to the fishery, within the constraints of the conservation objectives and condition of the resource.

National Standard 8 of the SFA states that:

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities (*16 USC § 1851(2)(8)*).

“Sustained participation” is interpreted as continued access to the fishery within the constraints of the condition of the resource. The definition of “fishing community” is not as clear, and has been interpreted in a variety of ways. SFA defines a fishing community as one that is “substantially dependent 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 a community” (16 UCS § 1802 (16)). However, at present it is not possible to fully access fishing communities¹ due to the dearth of appropriate data in some sectors. For example, crew members and processing plant workers are generally underrepresented in the U.S. Census. Representation of crew members in management plan analysis varies across the U.S. where permits are required in some areas though not for the northeast region. Additionally, state level data reflecting dependency on fishing, needed to determine National Standard Eight status, is not available across states limiting the analysis of fishing community dependency to federal fisheries data thus resulting in an, as yet, incomplete determination of fishing community status as defined by National Standard Eight. Given this determination, fishing communities will be referred to as communities that fish or port communities except when discussed in the context of National Standard Eight.

6.5.2 Background

There is minimal recreational effort on monkfish; therefore the major foci of this SIA are the commercial fishing businesses and families that depend on the monkfish fishery. For a complete description of the commercial monkfish fishery refer to the Monkfish FMP, Monkfish SAFE Reports for FY 2000, 2001, and the Affected Human Environment Section of this Amendment, which serves as the 2002 SAFE Report, particularly the Ports and Communities Section (Section 5.3.3). The Monkfish FMP was implemented on November 8, 1999 and contained a four-year phase in of management measures to reduce fishing effort and rebuild monkfish stocks within ten years or less. The primary management measures implemented were a limited access program with effort limitations (DAS), establishment of two management areas, target TACs, trip limits, bycatch allowances, minimum fish size, gear restrictions and spawning closures.

Year 4, starting May 1, 2002, of the FMP called for the elimination of the directed monkfish fishery and reduced bycatch trip limits, unless modified during the annual review and framework adjustment process. Framework 1 was proposed to delay the default management measures for one year, modify the management measures for Year 4 based on a review of scientific information, and to account for a Federal court order

¹Fishing community is a legally defined term in National Standard Eight Guidelines and therefore should only be applied to communities that fit the definition.

vacating differential trip limits for trawl and non-trawl gear. The New England and Mid-Atlantic Councils approved Framework 1, but NMFS disapproved the framework since it determined that it did not comply with the fishing mortality rate threshold specified in the original FMP. Instead, NMFS implemented an emergency interim rule (67 FR 35928, May 22, 2002) that revised the fishing mortality rate (F) criteria in the FMP to be consistent with the recommendations of SAW 34, and implemented the management measures contained in Framework 1 because, with the amendment to the F criteria in the FMP, NMFS determined that these measures were consistent with the best scientific information available.

Amendment 2 was initiated by the Council to implement any appropriate changes to the overfishing definitions and revisions to the management program by the start of Year 5, May 1, 2003. However, because NMFS could not guarantee that even if the Councils met their November 2002 target submission date, that the agency could not guarantee the measures would be implemented by the start of FY 2003. As a result, the Councils began work on Framework Adjustment 2 to the FMP. This framework was submitted by the Councils in January 2003, and was implemented on May 1, 2003 (68 FR 22325, April 28, 2003). This framework modified the overfishing reference points as recommended by SAW 34 and established an index and landings-based method for setting annual target TACs to achieve optimum yield and biomass rebuilding goals. This framework also eliminated the default management measures established in the FMP.

The goals and objectives of Amendment 2 are presented in Section 3.0 of this FSEIS. Some of the goals of this amendment are to address problems created by the implementation of the original FMP, comply with CEQ guidelines to update environmental documents, and address FMP deficiencies in meeting Magnuson-Stevens Act requirements.

The methods used to describe the social impacts of this action including comparative analysis of NMFS data and expert interviews. First, the impacts of specific measures such as trip limits, closures etc. will be discussed in general terms. Next, the distributional impacts of these measures in each monkfish dependent port will be discussed, broken down by different permit categories and gear types. The impacts of this action were measured using five general social factor categories:

- Size and demographic characteristics of the fishery-related work force residing in each area
- Cultural issues of attitudes, beliefs and values of fishermen, fishery-related workers, other stakeholders and their communities.
- Effects of proposed actions on social structure and organization
- Non-economic social aspects of the proposed action such as life-style, health, and safety.
- Historical dependence

In addition to evaluating the impacts on individuals primarily involved in the monkfish fishery, impact analysis evaluates the impact to the overall community; therefore

monkfish activity is expressed as a percentage of the overall community's direct fishing activity in federal waters. For the purposes of this SIA, the community groups identified in the next section will serve as the primary scale of measurement. These are the communities that fish of most interest in the Amendment.

6.5.3 National Standard 8 discussion

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 following social and demographic profiles of monkfish ports also draw on census data in the sections on environmental justice and port information provided in the Affected Human Environment and Social Impact Assessment sections. These discussions, when considered together, attempt to provide sufficient information to understand the impact of the proposed regulations. Of importance to this particular management plan is the general trend toward neutral or positive outcomes.

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. The distribution of primary monkfish ports by these indices sorted by the alternative occupation ratio summary is shown in Table 117. The indices themselves, though using different measurement metrics, show remarkable symmetry. Monkfish landings as a percentage of total landings are included as a point of reference to help ground the sub-regional indices at the port level. While the indices represent sub-regions within New England², rather than communities, they do provide a context within which

² Similar indices for the Mid-Atlantic have not yet been developed

port level dependence on fishing can be understood. Cape and Islands (Chatham) and Lower-Mid-Coast Maine (Portland) had the highest ratings for poor alternative employment options. This contrasts with Boston, which had the greatest occupational diversity.

	Homeport	4 YEAR AVE 99-02 (Monkfish Landings as a % of total Landings)	Sub-Region (Sub-NRR) (a)	% Related Occupations (a)	% of Total Employed (a)	Alternative Occupation Ratio Summary (a)
MA	CHATHAM	15	Cape and Islands	27	0.79	104
ME	PORTLAND	24	Lower-Midcoast ME	23	0.46	51
ME	PORT CLYDE	38	Midcoast ME	27	0.40	39
MA	WESTPORT	35	New Bedford/ South Shore	27	0.40	39
MA	FAIRHAVEN	11	New Bedford/ South Shore	27	0.40	39
MA	NEW BEDFORD	6	New Bedford/ South Shore	27	0.40	39
RI	LITTLE COMPTON	71	Rhode Island	24	0.31	31
RI	TIVERTON	64	Rhode Island	24	0.31	31
RI	NEWPORT	19	Rhode Island	24	0.31	31
RI	POINT JUDITH	11	Rhode Island	24	0.31	31
MA	GLOUCESTER	17	Gloucester/ North Shore	20	0.21	25
NH	PORTSMOUTH	28	New Hampshire Coast	8	0.09	9
MA	BOSTON	27	Boston	7	0.05	6
NJ	BARNEGAT LIGHT	30	na	na	na	na
NJ	POINT PLEASANT	7	na	na	na	na

Note: This table includes ports with monkfish weighout values averaging \$1,000,000 between 1999 and 2002. Weighout values are listed by registered homeport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. Na = not available. (a) Adapted from Hall-Arbor et al. 2001.

Table 117 Primary and Major Secondary Monkfish Ports by Alternative Occupation Ratio

The distribution of monkfish landings as a percent of total port landings is presented in Table 118. While this is an indicator of the port level importance of monkfish relative to all other federally regulated species, it does not represent over-all port fishing dependency in the National Standard Eight sense as state level contributions to the dependency equation do not yet exist. Nevertheless, based on the average percentage of monkfish landings, smaller primary ports appear more dependent (Little Compton, Tiverton, and Newport RI; Port Clyde, ME) while larger ports appear less dependent on monkfish (Gloucester, Chatham, Fairhaven, and New Bedford, MA; and Point Judith, RI).

	Homeport	4 YEAR AVE 99-02 (Monkfish Landings as a % of total Landings)	Sub-Region (Sub-NRR) (a)	% Related Occupations (a)	% of Total Employed (a)	Alternative Occupation Ratio Summary (a)
RI	LITTLE COMPTON	71	Rhode Island	24	0.31	31
RI	TIVERTON	64	Rhode Island	24	0.31	31
ME	PORT CLYDE	38	Midcoast ME	27	0.40	39
MA	WESTPORT	35	New Bedford/ South Shore	27	0.40	39
NJ	BARNEGAT LIGHT	30	na	na	na	na
NH	PORTSMOUTH	28	New Hampshire Coast	8	0.09	9
MA	BOSTON	27	Boston	7	0.05	6
ME	PORTLAND	24	Lower-Midcoast ME	23	0.46	51
RI	NEWPORT	19	Rhode Island	24	0.31	31
MA	GLOUCESTER	17	Gloucester/ North Shore	20	0.21	25
MA	CHATHAM	15	Cape and Islands	27	0.79	104
RI	POINT JUDITH	11	Rhode Island	24	0.31	31
MA	FAIRHAVEN	11	New Bedford/ South Shore	27	0.40	39
NJ	POINT PLEASANT	7	na	na	na	na
MA	NEW BEDFORD	6	New Bedford/ South Shore	27	0.40	39

Note: This table includes ports with monkfish weighout values averaging \$1,000,000 between 1999 and 2002. Weighout values are listed by registered homeport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. Na = not available. (a) Adapted from Hall-Arbor et al., 2001.

Table 118 Primary and Major Secondary Monkfish Ports as a % of Total Landings

When considering port level dependency on fishing it is also important to consider the extent to which the monkfish fishery is an adaptive versus a traditional fishery in New England and the Mid-Atlantic. This fishery has in recent years served to compensate for the loss of revenues in other fisheries (e.g., scallop fishery). As regulations impacting other fisheries become more stringent, it can be expected that port level reliance on monkfish may be on the rise.

6.5.4 Updated SIA Information

New social and community information has become available for use in assessing the social impacts of Amendment 2 alternatives. The research teams under Madeline Hall-Arber at MIT and Bonnie McCay at Rutgers University have completed updated port profiles and new ethnographic information for fishing ports in New England and for primary ports in the Mid-Atlantic (MARFIN Reports). Furthermore, several coastal states from Maine to North Carolina have provided updated information on Monkfish activity in both federal and state waters. Lastly, Council staff has collected qualitative information regarding potential impacts of measures and that input will be included when appropriate.

The majority of the social impact analysis for Amendment 2 builds on work from earlier Monkfish management plans such as the original FMP and Framework 1. The impact analysis for this SIA is qualitative in nature and is drawn from the analysis found in the Affected Human Environment section of this document. Data were compiled to describe the monkfish fleet and the distribution of the fishery across gear types, permit categories and port of landing. Primary and secondary community groups most substantially engaged in and dependent on monkfish were identified. Monkfish landings for homeports were examined for the time period 1999-2002 from the dealer weighout database. Primary community groups represent the most active ports in the monkfish fishery and were selected based on monkfish landings averaging \$1,000,000 or greater over the four year time period. Analysis found in the Affected Human Environment section included additional secondary ports based on nearness to the \$1,000,000 threshold, significant dependence on monkfish, and/or the presence of significant monkfish infrastructure. Secondary community groups consist of ports that yielded an average for the same time period of less than \$1,000,000 to \$50,000 (Table 119).

PRIMARY PORT COMMUNITIES

NEW BEDFORD	MA
BARNEGAT LIGHT	NJ
PORTLAND	ME
GLOUCESTER	MA
POINT JUDITH	RI
BOSTON	MA
PORTSMOUTH	NH
FAIRHAVEN	MA
NEWPORT	RI
WESTPORT	MA

SECONDARY PORTS COMMUNITIES

PORT CLYDE	ME	YORK HARBOR	ME
CHATHAM	MA	WAKEFIELD	RI
RYE	NH	CHINCOTEAGUE	VA
SCITUATE	MA	ROCKPORT	MA
TIVERTON	RI	CRISFIELD	MD
POINT PLEASANT	NJ	MANCHESTER	MA
CUNDYS HARBOR	ME	HATTERAS	NC
SHINNECOCK	NY	KITTERY	ME
PLYMOUTH	MA	OCEAN CITY	MD
SOUTH BRISTOL	ME	YORK	ME
WEST NEWBURY	MA	NEW LONDON	CT
WILMINGTON	DE	OWLS HEAD	ME
WARETOWN	NJ	DAVISVILLE	RI
CAPE MAY	NJ	SWAMPSCOTT	MA
NARRAGANSETT	RI	NEWPORT NEWS	VA
WOODS HOLE	MA	ISLIP	NY
HULL	MA	BARNEGAT	NJ
SAKONNET	RI	NEW HARBOR	ME
MONTAUK	NY	WANCHESE	NC
LITTLE COMPTON	RI	BAR HARBOR	ME
BLOCK ISLAND	RI	SOUTH DARTMOUTH	MA
FALL RIVER	MA	PROVIDENCE	RI
BARNSTABLE	MA	BELFAST	ME
ORRS ISLAND	ME	BATH	NC
		HARPSWELL	
HAMPTON FALLS	NH	CENTER	ME
HAMPTON	NH	BIDDEFORD	ME
NANTUCKET	MA	GREENBACKVILLE	VA
WESTBROOK	ME	BOOTHBAY HARBOR	ME
HAMPTON BAYS	NY		
KINGSTON	MA		
NORFOLK	VA		

*Based on dealer weighout data

Table 119 Primary and Secondary Port Communities

While the community groups above have been identified as communities of particular interest in this amendment, it is still important to consider the impacts of the measures in the amendment across all communities. Social impacts can be defined as the changes that a fisheries management action may create in people's way of life, cultural traditions, and the community (population's structure, cohesion, stability, and character). As such, social impacts may result from changes in flexibility, opportunity, stability, certainty, safety, and other factors that are not specific to any community, but oftentimes to any individual or entity experiencing changes resulting from a fishing regulation. An example of this in gross terms is the change in the distribution of primary and secondary ports between analysis in Table 45 of Amendment 1 which covered the period 1994-1997 and the present Table 119 which covered the period 1999-2002. While major ports such as New Bedford, Gloucester, and Boston MA; Barnegat Light, NJ; Portland, ME; and Point Judith, RI were considered the top five primary ports for Amendment 1 they again fall within the primary port category with the addition of Portsmouth, NH; Newport, RI; and Westport, MA. The additions to the primary port category are smaller ports where there tends to be a higher level of overall dependency on monkfish and less overall species diversity. While 13 ports were considered secondary ports for the first analysis, over 45 qualified as secondary ports in this analysis. This rise in port dependency, at least in part, can be contributed to the need of port communities to seek out alternative fisheries in response to ever more restrictive regulations.

Information concerning the number of vessels in each monkfish permit category, for the fishing years 1999 through 2003, in each of these primary and secondary port communities is presented in Table 120. This table also shows the percentage of monkfish vessels in each fishing port, by permit category, that were considered active in the monkfish fishery. The determination of whether or not a vessel was considered active during a given fishing year was based upon if that vessel landed at least 1 lb of monkfish during that fishing year.

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 than entering it. When the amount of fish harvested continues to decline by what ever means, cost cutting measures such as lapsed vessel insurance can be a strategy employed by vessel owners to reduce overhead even though the potential risking in doing so may be great. Fishery 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 full service working waterfront. Conversely, improved opportunities to fish may alleviate many of these less desirable impacts.

State	County	Port	Number of Permits							Percentage of Active Permits				
			Permit Type	99	00	01	02	03	Ave 99-03	99	00	01	02	Ave 99-02
MA	BARNSTABLE	CHATHAM	C	1	0	0	0	0	0.2	100%	0%	0%	0%	25.0%
			D	12	11	12	12	12	11.8	83%	91%	100%	92%	91.5%
			E	42	57	55	75	72	60.2	38%	37%	40%	32%	36.7%
	BRISTOL	FAIRHAVEN	C	13	16	10	9	7	11	100%	100%	90%	89%	94.7%
			D	3	4	3	3	3	3.2	67%	75%	67%	100%	77.1%
			E	9	18	19	22	18	17.2	56%	44%	37%	41%	44.4%
		NEW BEDFORD	A	0	1	0	0	0	0.2	0%	0%	0%	0%	0.0%
			C	105	105	112	107	110	108	98%	97%	96%	95%	96.7%
			D	39	38	42	42	39	40	92%	92%	90%	95%	92.5%
		WESTPORT	E	38	47	60	73	62	56	55%	55%	43%	37%	47.7%
			C	2	2	2	2	2	2	100%	100%	100%	100%	100.0%
			D	4	6	6	5	5	5.2	50%	50%	67%	80%	61.7%
	ESSEX	GLOUCESTER	E	8	14	17	16	16	14.2	0%	14%	0%	6%	5.1%
			B	1	0	0	0	0	0.2	0	0	0	0	0
			C	18	19	20	19	17	18.6	94%	95%	90%	95%	93.5%
D			33	38	38	35	38	36.4	91%	87%	92%	100%	92.5%	
SUFFOLK	BOSTON	E	89	107	121	150	130	119	42%	37%	34%	31%	36.0%	
		C	7	7	8	8	7	7.4	100%	100%	88%	100%	96.9%	
		D	2	3	5	5	5	4	100%	67%	80%	80%	81.7%	
ME	CUMBERLAND	PORTLAND	E	10	17	17	21	17	16.4	70%	47%	29%	19%	41.4%
			B	1	1	1	1	1	1	0%	0%	0%	0%	0.0%
			C	19	18	17	16	17	17.4	100%	89%	94%	94%	94.2%
			D	16	19	14	17	17	16.6	81%	84%	93%	82%	85.2%
KNOX	PORT CLYDE	E	17	23	25	24	25	22.8	41%	48%	44%	38%	42.6%	
		C	3	3	5	5	5	4.2	100%	100%	100%	100%	100.0%	
		D	7	7	7	7	7	7	100%	100%	100%	100%	100.0%	
NH	ROCKINGHAM	PORTSMOUTH	E	6	6	5	5	5	5.4	50%	33%	40%	40%	40.8%
			C	4	5	4	4	3	4	100%	100%	100%	100%	100.0%

			D	9	15	13	11	10	11.6	100%	87%	92%	82%	90.2%
			E	16	20	21	25	22	20.8	44%	65%	48%	32%	47.1%
NJ	OCEAN	BARNEGAT LIGHT	A	1	2	3	3	3	2.4	100%	100%	67%	100%	91.7%
			B	11	13	13	14	14	13	91%	85%	92%	93%	90.2%
			C	10	10	10	10	11	10.2	100%	100%	100%	100%	100.0%
			D	7	12	17	17	18	14.2	100%	100%	88%	94%	95.6%
			E	15	20	21	18	17	18.2	33%	40%	19%	11%	25.9%
		POINT PLEASANT	A	0	0	1	1	2	0.8	0%	0%	100%	100%	50.0%
			B	4	4	4	3	3	3.6	50%	75%	100%	100%	81.3%
			C	3	3	3	2	2	2.6	100%	100%	100%	100%	100.0%
			D	6	5	4	5	4	4.8	83%	80%	100%	60%	80.8%
			E	25	28	28	29	31	28.2	40%	32%	29%	24%	31.2%
RI	NEWPORT	LITTLE COMPTON	C	2	2	3	4	3	2.8	100%	100%	100%	100%	100.0%
			D	2	1	1	1	1	1.2	100%	100%	100%	100%	100.0%
			E	0	0	0	1	1	0.4	0%	0%	0%	0%	0.0%
		NEWPORT	B	0	0	1	1	1	0.6	0%	0%	100%	100%	50.0%
			C	7	4	5	6	6	5.6	100%	100%	100%	100%	100.0%
			D	5	5	5	7	7	5.8	100%	100%	80%	86%	91.4%
			E	8	16	18	14	10	13.2	38%	19%	28%	14%	24.6%
		TIVERTON	A	1	1	1	1	1	1	100%	100%	100%	100%	100.0%
			C	1	2	3	3	3	2.4	100%	100%	100%	100%	100.0%
			D	0	1	2	1	1	1	0%	100%	50%	100%	62.5%
			E	3	7	6	5	5	5.2	0%	14%	33%	20%	16.9%
	WASHINGTON	POINT JUDITH	A	2	2	2	2	3	2.2	100%	50%	50%	50%	62.5%
			C	25	25	24	24	25	24.6	100%	100%	100%	100%	100.0%
			D	18	18	21	20	20	19.4	83%	83%	90%	95%	88.0%
			E	36	43	40	42	40	40.2	42%	30%	33%	29%	33.2%

* Data source: Permit files and dealer weighout data for years 1999 through 2003 (year to date)

Table 120 Primary and Major Secondary Port Monkfish Permits and Percentage of Active Permits for 1999 – 2003 (year to date)

6.5.5 Social Impacts of the proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following section contains a discussion and analysis of the social impacts of the proposed action.

6.5.5.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.5.5.1.1 Incidental catch - 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh or handgear would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. This trip limit would also apply to vessels holding a limited access multispecies permit that are 30 feet or less in length that elect not to fish under the multispecies DAS. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

The proposed alternative represents a potential improvement in profitability for vessels fishing with small mesh in the SFMA due to increased trip limits for incidentally caught monkfish. Vessels most affected by this trip limit change would be vessels fishing for squid, Atlantic mackerel, butterfish, and scup. This may result in positive social outcomes (e.g., increased profit and decreased discards) for some small-mesh vessels that take trips longer than one day. According to the information contained in Table 35, during the 2002 fishing year, 29-percent of limited access monkfish vessels also held a limited access squid/mackerel/butterfish permit, and 42-percent of limited access monkfish vessels also held a limited access scup permit. Further, during the 2002 fishing year, 8-percent of vessels holding an incidental monkfish permit (2,142 vessels) held a limited access squid/mackerel/butterfish permit (177 vessels), and 21-percent of incidental monkfish vessels held a limited access scup permit (443 vessels).

Limited access multispecies vessels in the small vessel category could also be affected by this measure. However, there are currently only 8 vessels permitted in this multispecies permit category, and these vessels likely fish single day trips due to their small size. Thus, this measure is not likely to result in increased profitability for limited access multispecies vessels in the small vessel category. Further, because there are few reported landings of monkfish by means of handgear, vessels fishing with this gear type are not likely to receive any social benefits from this measure.

6.5.5.1.2 Incidental catch - General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels.

The alternative changes the incidental catch rate from zero to levels under consideration for vessels fishing with small-mesh gear. This improves the profitability for vessels equipped with scallop and clam dredge gear and decreases discarding, both of which have positive social impacts. According to the primary port analysis by vessel size class and gear type presented in Table 62, only vessels in the large (above 70 feet in length) and medium size classes (from 50 to 70 feet in length) would be affected by this action.

6.5.5.1.3 Incidental catch - Summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

This alternative would enable vessels involved in the summer flounder fishery that fish in the affected area to retain more incidentally caught monkfish than allowed under current regulations (50 lbs. per trip). This would result in improved profitability and thus positive economic and social outcomes. According to the information contained in Table 35, during the 2002 fishing year, 63-percent of limited access monkfish vessels also held a limited summer flounder permit and 20-percent of vessels holding an incidental monkfish permit (2,142 vessels) held a limited access summer flounder permit (433 vessels). Therefore, the proposed action could result in improved profitability for 883 vessels, or approximately 31-percent of the vessels holding either a limited access or incidental monkfish permits.

6.5.5.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA (Section 4.1.2).

This alternative would result in the same minimum fish size in both management areas. It would have no social impacts in the NFMA as the size would remain the same. However, economic opportunities in the SFMA would be increased by the reduction in minimum fish size in that area. Reducing fish size would also reduce discarding in the SFMA. The social impacts of the alternative are either neutral or positive.

6.5.5.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies (see Section 4.1.3).

This alternative would provide limited access Category A and B vessels with more opportunity to utilize their monkfish DAS. Thus, this alternative would provide these vessels with more flexibility to fish for monkfish when it is most economically beneficial, resulting in some social benefits to this sector of the directed monkfish fishery. This benefit may not be appears, however, since, under current rules, owners of limited access Category A and B vessels may choose the 20-day block that is most advantageous.

6.5.5.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

Vessels enrolled in this program would be able to increase the amount of monkfish harvested per DAS resulting in greater profitability. However, increased profits for some vessels may be tempered by the requisite cost of VMS installation. Vessels in the large size class (those greater than 70 feet in length) are more likely to benefit given the distance to fishing grounds. Furthermore, this alternative benefits large trawl vessels by allowing them to return to a level of participation in practice prior to the implementation of the FMP, having positive economic and social consequences for vessels in this size category (Table 62 and Table 63). Therefore, the social benefits for this alternative are likely to be positive for vessels in the large size class, in particular large trawl vessels.

6.5.5.5 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

This alternative is estimated to result in five new limited access monkfish permits. The economic analysis of this alternative (Table 115) shows that the five vessels that would qualify for limited access monkfish permits under this alternative were very dependant on the monkfish fishery prior to the implementation of the FMP. This alternative would provide these vessels with the opportunity to target monkfish in Federal waters, likely resulting in increased profitability. Therefore, the social benefits associated with alternative are likely to be positive for those affected.

6.5.5.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section). These three items are measures for transferable DAS, measures to protect sea turtles and other species protected under the Endangered Species and/or Marine Mammal Protection Act, and measures to implement bycatch reduction devices.

6.5.5.6.1 Implement transferable MF-only DAS

Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with transferable DAS measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.6.2 Implement measures to minimize fishery impact on protected species

The Councils propose to include in the FMP list of actions that can be taken under the framework adjustment process measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises. The list of measures would include gear-specific seasonal/area closures or gear modification. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with protected species measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.6.3 Implement requirements to use bycatch reduction devices

The Councils propose to add “bycatch reduction devices” to the list of measures that can be implemented under the framework adjustment process in the FMP. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with bycatch reduction measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

The preferred alternative for the NAFO regulated area exemption program would relieve vessels holding a High Seas Fishing Compliance Permit from the regulations governing the monkfish fishery within the U.S. EEZ. Under this program participating vessels must comply with NAFO regulations, and store their gear accordingly when transiting the U.S. EEZ. The preferred alternative will provide vessels with greater flexibility than the no action alternative. However, the social impacts of this program are uncertain since it is unknown how many vessels will participate in this program. The two factors that would affect a vessel’s participation in this program are: (1) the availability of the monkfish resource in the NAFO area, and (2) the size of the vessel.

6.5.5.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.5.5.8.1 Southern Area trawl disc restriction

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

While nearly all SFMA trawl vessels already use this gear, the proposed action could require some trawl vessels fishing under a monkfish DAS in the SFMA to purchase new trawl gear, or modify existing trawl gear, and affected vessel owners may consider this a hardship in a climate of shrinking profitability margins. Overall, however, this alternative has no social or community impact compared to no action.

6.5.5.8.2 Closure of Oceanographer and Lydonia Canyons

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals.

Based on 2001 VTR data only 3 trips were identified as having taken place within the Oceanographer Canyon Closure area, all reported using trawl gear, and were not directed trips. For the same year, only one non-directed trip was reported as having taken place within the Lydonia Canyon Closure area. The combined revenue from these trips was estimated to be \$68 thousand. Therefore, the social impacts resulting from the closure of these two areas are likely to be small in comparison to the no action alternative.

6.5.5.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below (see Section 4.1.9).

The DAS set-aside and DAS exemption alternatives would provide a means for streamlining the experimental fishing permit process for individuals interested in conducting monkfish related cooperative research activities outside the monkfish DAS program. Currently, researchers must provide information on the impacts of conducting their research activity outside the monkfish DAS program. However, the proposed DAS set-aside program and DAS exemption program would provide a means for analyzing the impacts associated with this additional monkfish effort up front, reducing the administrative burden on the researcher. Thus, because DAS set-aside and DAS exemption alternatives would reduce some of the administrative burden associated with conducting cooperative monkfish research activities, it could increase the incentive for individuals to conduct monkfish related research. The products of these research activities, such as bycatch reduction devices or improved information on the monkfish

resource, would likely improve the management of the monkfish fishery, resulting in some social benefits.

6.5.5.9.1 Research DAS set-aside

A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. NMFS will distribute DAS from the pool to vessels responding to an annual cooperative research Request for Proposals (RFP).

In terms of impacts on individual monkfish fishing effort, DAS set-aside alternative would spread the research set-aside across all limited access vessels, impacting all vessels equally. In fact, the proposed set-aside amounts of 500 DAS would result in limited access vessels giving up less than 1 monkfish DAS. Thus, the social impacts of a DAS set-aside related to reductions in fishing opportunity are expected to be negligible.

The vessels involved in the cooperative research activity would obtain social and economic benefits resulting from the additional fishing opportunities. In general, cooperative research programs funded by industry-based incentives have proven to be widely supported by fishing communities and have enhanced the relationship between industry and science sectors of the fishery. Recent cooperative research projects have fostered industry “buy-in” to the science used in support of management. Furthermore, the application for a DAS set-aside would be a competitive process similar to the research set-aside program (RSA) established for many fisheries managed by the Mid-Atlantic Fishery Management Council. Although this process may be more equitable than the DAS exemption procedures, it may add to the administrative burden of the NOAA Grants process.

6.5.5.9.2 DAS Exemption

Under this proposal, DAS set-aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. The total DAS available under this program would be the remainder of the DAS pool not distributed under the annual RFP process.

Since this measure would utilize the remaining set-aside DAS that were not distributed through the RFP process to provide additional research fishing opportunities, there would be no additional social impacts resulting from reductions in fishing opportunities. Similar to the DAS set-aside program, vessels participating in monkfish research activities under a DAS exemption would obtain both social and economic benefits resulting from the additional fishing opportunities. However, unlike the DAS set-aside program, the DAS exemption program would not be a competitive process. Requests for DAS exemptions would be reviewed and issued on a first come/first serve basis. Therefore, the DAS exemption process may be less equitable than the DAS set-aside procedures, especially for monkfish research activities that are scheduled to occur later in the fishing year.

6.5.5.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

The proposed action, to align the vessel baseline specifications for a vessel's limited access monkfish vessel with that vessel's first Federal limited access permit, would only impact those limited access monkfish vessels that have more than one baseline upon which an upgrade in size, tonnage, and horsepower can be based, and would only affect those vessels that request such a change be made.

As noted in Section 6.4.1.10, a change in a vessel's monkfish baseline could either reduce or increase the value of the vessel depending on when the monkfish baseline is smaller or larger than the first limited access permit held by the vessel, resulting in either positive or negative social impacts. However, since the adjustment under the proposed action can only be made at the request of the vessel owner, presumably only those who would benefit would make such a request. The no action alternative could also reduce the value of a limited access monkfish vessel if the vessel owner has to relinquish one of its limited access Federal permits (i.e., monkfish or multispecies) in order to upgrade the vessel within the established restrictions. Therefore, the proposed action is likely to have some positive social impact compared to no action.

The magnitude of these impacts is difficult to estimate since it is difficult to determine the number of vessels that are currently restricted by the existing vessel baseline provisions, and the number of vessels that may benefit from the proposed action. Furthermore, the preferred alternative only addresses multiple baselines with respect to the monkfish fishery. Although the preferred alternative would align a vessel's monkfish baseline with the baseline for its first Federal limited access permit, a vessel could have a baseline for another limited access fishery that is not affected by this action (i.e., summer flounder, tilefish, red crab, etc.). Thus, any positive impacts related to the proposed action would only be partially realized if the vessel has an additional baseline for another fishery not affected by this action.

6.5.5.11 Social Impacts of Combined Measures

The proposed action provides opportunities to vessel owners and crew members that would not be available if the no action alternative were chosen. 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. This assessment of impacts suggests that there will be general tendencies toward positive social outcomes from the proposed action as compared to the no action though in some cases the benefits are modest.

6.5.5.12 Social impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.5.5.12.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. The social impact of this requirement remain unchanged. As with the economic impact of this alternative, the social impacts result from the decision to use a monkfish or scallop DAS to target monkfish, which are not quantifiable because of the widely varying factors affecting each operator's decision.

6.5.5.12.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. This no action alternative would enable vessels to use existing gear and maintain current fishing strategies. As a result, the no action alternative is neutral in terms of the social impacts.

6.5.5.12.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. The no action alternative would not modify this ability, and, therefore, does not have a social impact.

6.5.5.12.4 Impact of fishing year no action alternative

The alternatives that were under consideration to change the fishing year, including the no action alternative, are administrative and have minimal social impact. By maintaining alignment with the multispecies fishing year, the permit application burden on vessels and the government is minimized. In comparison to the non-preferred alternatives, the no action alternative better enables the vessel owner to plan out fishing strategies for the upcoming year, especially if the vessel has multiple DAS permits. The allocation of DAS at different times of the year for different fisheries would not only be confusing to the vessel owner, it may impact how the vessel is able to use its monkfish DAS.

6.5.6 Social Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in Section 6.5.5, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.5.6.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives, including the no action, for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the action alternative (Alternative 1), Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): Separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform (“fleet”) allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

The Councils ultimately selected the no action alternative based on public comments received and other reasons, as discussed in Section 4.2.2.1.

6.5.6.1.1 Separation of DAS Alternative 1

The DSEIS concluded that the economic and hence social impacts of either Alternative 1a or 1b, in relation to the no action alternative, would likely be positive or neutral relative to the no action alternative depending on whether or not a vessel owner chose to fish under separated DAS. However, based on near-unanimous comments of current participants in the fishery, the impact of increased overall effort (mainly from scallop vessels) would outweigh any benefits of increased overall fishing opportunity resulting from separated DAS. This is because an increase in fishing effort would likely result in a reduction in trip limits and/or DAS for vessels fishing in the SFMA to prevent the target TAC for this management area from being overharvested. Therefore, an influx of new fishing effort from vessels that have historically not be very dependant upon the monkfish resource, resulting from the separation of DAS, could result in negative social impacts to vessels that are currently dependant on the fishery to varying degrees. Furthermore, because the reduction in trip limits and/or DAS would occur in the SFMA, the influx of new effort would mostly impact those vessels that fish exclusively in the SFMA, and to a lesser extent, those vessels that fish in both management areas.

6.5.6.1.2 Separation of DAS Alternative 1a (Area based)

A declaration to separate DAS usage requirements would be required annually for the SFMA only. For those fishing exclusively in the NFMA, alternative 1a would be the

same as the No Action alternative, which is the alternative being proposed in this amendment. This alternative provides an opportunity to increase the total number of DAS used in groundfish and monkfish fisheries combined. This is an advantage for the SFMA where Category C and D vessels currently target monkfish and have to use a multispecies DAS. This alternative would result in more options or flexibility that may enhance profitability. For vessels that fish exclusively in the NFMA, the economic and hence social impact effect of this alternative would be the same relative to the No Action. For vessels that fish in both areas, vessels that do not choose to have separated DAS would fish under existing management measures (no action measures) which would have no economic or social impact.

6.5.6.1.3 Separation of DAS Alternative 1b (Annual declaration)

As with Alternative 1a, impacts are largely positive in the SFMA where Category C and D vessels would be able to direct on monkfish without having to use a multispecies DAS. This alternative may similarly benefit gillnet vessels in the NFMA, where an exempted monkfish fishery is already established, but would require a trawl exempted fishery to be established for any benefit to accrue to monkfish trawl vessels in the NFMA. In both areas, vessels could elect to fish on combined DAS on a trip-by-trip basis. Because of the added flexibility, this alternative is likely to have positive social impacts for vessels fishing in either area. If the separation of DAS results in effort exceeding the maximum sustainable level under the rebuilding program, trip limits and allowable DAS could be reduced, resulting in some negative social effect on communities more dependent on the monkfish fishery, but whether this would occur cannot be predicted (especially since most vessels are not currently using more than half of their DAS allocations).

6.5.6.1.4 Fleet vs. Individual DAS allocations

If DAS are separated, monkfish DAS could be allocated as Fleet DAS (Alternative 1 Option 1a, equal number to all permit holders), or as Individual DAS (Alternative 1 Option 1b, based on past performance in the monkfish fishery). Vessels are currently allocated Fleet DAS, and this is the MAFMC's preferred alternative (the NEFMC did not identify a preferred alternative). Fleet DAS allocations inherently include some quantity of latent, or unused DAS (about half in the overall monkfish fishery) which could present an effort control problem if DAS leasing or transfer is allowed without appropriate controls to minimize the activation of such latent effort, especially during the stock-rebuilding period. On the other hand, Individual DAS allocations would minimize the amount of latent effort since the allocations would be based on actual vessel activity during the baseline period.

In terms of the social impact of the alternatives, Fleet DAS represent the least change from the current system, adjustments for DAS leasing/transfer notwithstanding, but also result in greater uncertainty about future allocations due to the potential for latent effort to be activated. In that sense, the impacts would be neutral to negative. On the other hand, latent effort represents a no-cost opportunity for vessels to increase monkfish effort as stocks rebuild to the point where some additional effort could be sustained. This provides the greatest opportunity for communities more dependent on the monkfish fishery.

Individual DAS, which are based on actual monkfish effort during a baseline period, would result in a minimal amount of latent effort being allocated to the vessels. Initial allocations, however, could be controversial, if the baseline period predates the FMP, prior to which some vessels were not required to report fishing effort or landings because they did not have federal fishing permits. While an individual DAS allocation system may favor communities where vessels were active in the fishery during the baseline period, it could be negative for those communities where vessels are permitted in the fishery but were not active during the period used to establish initial allocations.

Alternatives under consideration for transfer of DAS (by lease or sale) could have an effect on the choice between fleet or individual DAS programs. If an individual DAS program is adopted, the problems associated with leasing or transfer of latent effort are minimized since allocated effort would be similar in magnitude to actual effort used. The latent effort issue associated with fleet DAS, however, may also be mitigated by the conservation tax provisions of the transferability options.

6.5.6.1.5 Implement transferable monkfish only DAS in this amendment

The Councils considered two options for implementing a transferable monkfish-only DAS program. Alternative 1 Option 2a would implement transferable DAS (by lease or sale) as part of this amendment (effective May, 2005), while Option 2b would enable the Councils to implement such a program at a future date under the framework adjustment procedure. The Councils' selected Alternative 1 Option 2b as the proposed action.

Leasing and sale provisions would provide the most flexibility to vessels, enabling those who wanted to expand their participation in the fishery to do so, while providing some economic return to those vessels that want to reduce or eliminate their monkfishing activities. Under a leasing program, the leasing vessel would still retain the long-term rights (and DAS allocations), and these impacts are likely to be less pronounced than under a sale provision, where the transfer of DAS is permanent. While sale of DAS may provide an economic return to selling vessel owners, the impact of departure from the fishery on crew and other members of the community are uncertain.

6.5.6.1.6 On the other hand, having the ability to increase monkfishing activity through the purchase or leasing of DAS provides the acquiring vessel greater flexibility and opportunity to tailor its monkfishing activity to the level best suited to its needs. Thus, those communities where acquiring vessels operate (and crew on such vessels) would realize a positive effect of the transfer program. However, because such a program was only recently implemented under Amendment 13 to the Northeast Multispecies FMP, the actual impact cannot be accurately predicted, nor can the net social impact of crew and community benefits (of acquiring vessels) compared to losses (of selling vessels' crew and communities) be predicted. This uncertainty and other potential issues that have been raised about DAS transfer programs suggest that postponing the adoption of a leasing program until a future date (through a framework adjustment) would have less negative social impacts than if it were adopted upon implementation of this amendment. This rationale is also the basis for the Councils' preference to adopt transferability under a future framework adjustment procedure.

As discussed in the previous paragraphs, the Councils considered allowing vessels to lease or sell monkfish DAS either by framework adjustment at a future time, or upon implementation of this amendment. The DAS leasing and sale alternatives considered were modeled after similar programs proposed by the NEFMC in Amendment 13 to the Multispecies FMP. A quantitative analysis of the social impacts of these alternatives is not possible at this time, but a qualitative assessment based on the discussion in Amendment 13 is provided below.

The rationale for the DAS program in Amendment 13 is to provide flexibility for fishermen to adapt to the proposed DAS reductions that may make some vessels unprofitable. Similarly, the DAS sale provisions are designed to provide economic opportunity and flexibility while achieving some long-term reduction in fishing effort through the removal of active and inactive effort (via the conservation tax). While Amendment 2 does not contain either effort reduction proposals or the goal of long-term effort reduction that are integral to Amendment 13, the leasing and sale alternatives may still provide fishermen the opportunity and flexibility that those programs represent.

The Amendment 13 analysis concluded that “a leasing program offers an option for some vessels to temporarily increase the number of DAS they may fish by leasing the DAS from another vessel that chooses not to fish them. . . . If a particular community is home to a large number of vessels that can participate, this program may provide for the sustained participation of the community in the groundfish [or monkfish, in this case] fishery.” The analysis also noted that “the selection of a mechanism to ensure conservation-equivalency is important and may determine the extent to which some vessels are able to participate in the DAS leasing program.”

From Amendment 13:

The following gives some indication of the possible social impacts from leasing DAS. This analysis is based on part on the predicted outcomes from economic modeling . . . further aggregated by port, state, and vessel size to give an indication of the differential effects of DAS leasing within the groundfish industry. This analysis should be interpreted as an indication of the *direction* of pressures or trends, rather than a precise estimate of impacts. The economic model itself is highly stylized and makes a number of theoretical assumptions about perfect markets (such as the overall ability and willingness to trade and the full information to do so, and simultaneous execution of all trades) that are not reasonably expected to occur. There are also a number of reasons to expect, based on anthropological perspectives, that such trading will not take place as economic modeling may predict. Anthropological studies have demonstrated repeatedly that for many fishermen and fishing families, a commitment to fishing is based not solely on income or profit maximization but rather on fishing as a way of life. . . . Other studies have shown that many fishing businesses are family-run enterprises where income pooling and other forms of resource sharing mitigate against the more traditionally-capitalist assumptions about firms in economic analyses.

The economic modeling assumes that a vessel owner would only lease DAS if the income from leasing is more than the expected income from fishing those DAS; in other words, the impacts from such a leasing arrangement are expected to be positive, or at least no worse than status quo. Given the coupling of this alternative with other alternatives in order to meet conservation neutrality, leasing would at best mitigate the negative impacts from the overall reduction in fishing activity. However, since the income accrues to the owner of the vessel, crew members on vessels that lease DAS away may see a negative impact to income, depending on to what extent the vessel engages in alternative fishing activities (about which the model makes no predictions). Alternatively, crew on vessels that lease DAS in may see positive impacts from increased fishing activity. Changes in landing patterns that could occur with net outflows of DAS from particular ports (as indicated below) could have negative impacts on buyers and processors, depending again on to what extent vessels engage in other fishing activities. Moreover, the social impacts from policy changes extend beyond changes in income. Studies on the social ramifications of ITQ's (though fundamentally different from the policy proposed here since DAS are only leased and not permanently sold) have, for example, pointed to the significant impacts on social relations that stem from the modification of fishing activity. Moreover, such ITQ studies have pointed to the ramifications of changing market shares that enable the domination of particular segments of the industry over others without further protective legislation.

In terms of the distributional effects within the groundfish industry, the economic modeling indicates a movement of DAS from large/medium to small vessels.... For all size categories, there is a movement to vessels more dependent on groundfish income, though this is more pronounced for the larger vessels. At the state level ..., the influx of DAS is primarily to Massachusetts, which is also the state with the highest groundfish income from the vessels modeled. Maine, though with the second highest income and with income that comes from vessels dependent or highly dependent on groundfish, sees significant loss of DAS. Rhode Island also shows significant loss of DAS. It is therefore expected that the negative impacts (as detailed above) from DAS leasing would be felt most there. At the port level, ports such as New Bedford and Gloucester see a net gain of DAS while ports such as Portland, Point Judith, Newport, and Hampton might see a net loss. (*Amendment 13, Section 5.6.2.2.2*)

In the context of the monkfish fishery, therefore, DAS leasing is likely to result in the shift in distribution of DAS used in the fishery among communities and vessel classes, but the magnitude and direction cannot be predicted. Under a DAS sale program, similar changes would also likely occur, but on a more permanent basis.

6.5.6.2 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit; the no action alternative, a 50 lbs./day up to 150 lbs. maximum possession limit (Alternative

2), and a 50 lbs./day up to 500 lbs. maximum possession limit (Alternative 3). The Councils recommended Alternative 2 as the proposed action, rejecting both the no action alternative, and Alternative 3.

The no action alternative would have kept the present incidental allowance of 50 lbs. per trip in place, resulting in no social impacts with respect to the baseline. However, Alternative 3 would have enabled vessels to retain a higher amount of monkfish as incidental catch than the proposed action. Thus, Alternative 3 could result in greater positive social outcomes (e.g., increased profit and decreased discards) for some vessels, particularly squid freezer vessels that take trips of 3-10 days in duration, than the proposed action or the no action alternative.

6.5.6.3 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Alternative 2 proposed that limited access vessels fishing under a monkfish DAS would be required to use 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net. Alternative 3 proposed that limited access vessels fishing under a monkfish DAS would be required to use 12-inch square mesh in the codend only. Under these two action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section. Further, for mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

The proposed action would have no negative social impacts since it would not change minimum mesh size restrictions for vessels fishing under a monkfish DAS. Conversely, the implementation of an alternative that would increase the minimum trawl mesh size in the codend or entire net would require owners of monkfish trawl vessels with non-conforming gear to purchase and install trawl nets that comply with the new restrictions. While replacing an entire net may require a substantial initial expenditure, vessels routinely replace codends. The cost of gear may be offset by the benefits of increased fishing opportunity and increased yield per recruit associated with using larger mesh nets.

Vessels that fish only in the NFMA would likely not be impacted by a change in the minimum mesh size since there is currently monkfish trawl exemption area in the NFMA. As a result, these vessels would likely continue to fish for monkfish under a multispecies DAS, or under a combined multispecies/monkfish DAS, with minimum mesh regulated by the multispecies FMP. However, there is an option under the minimum mesh alternatives to require the increased minimum mesh size under combined DAS. If this

option is implemented, vessels that choose to fish under a combined DAS (to retain full monkfish allowance if DAS are separated) in the NFMA would also be required to purchase trawl mesh that conforms to the increased minimum monkfish mesh size.

In summary, the proposed action would result in no additional costs, and therefore, would likely not have any significant negative social impacts. However, an increase to the minimum mesh size (codend or entire net) would result in additional costs to vessels using non-conforming gear, resulting in some negative social impacts. However, there is insufficient data available on the mesh size being used by vessels targeting monkfish (from observer data and VTR data) to determine the extent of these impacts. Furthermore, the increased yield per recruit, reduced discards of small monkfish and other species, and the increased opportunity (associated with separated DAS) may actually result in positive social effects despite the short-term economic costs.

6.5.6.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform minimum tail size (Alternative 2) with two size limit options (Option 1 = 11-inch tail, Option 2 = 10-inch tail), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. The Councils are proposing that there be a uniform 11-inch minimum tail size (17-inch whole) for both management areas (Alternative 2, Option 1).

6.5.6.4.1 Minimum fish size Alternative 1 (no action)

The no action alternative would maintain the current minimum size limits of an 11-inch tail size in the NFMA, and a 14-inch tail size in the SFMA. Compared to the proposed action, vessels in the NFMA would continue to be subject to the same minimum fish size. However, vessels fishing in the SMFA would continue to have a more restrictive minimum fish size than vessels fishing in the NFMA under the No Action Alternative, potentially resulting in a higher discard rate for vessels fishing in the SFMA, and a greater loss in revenues due to the more restrictive minimum fish size. This could continue to foster feelings of inequity between vessels that fish exclusively in the SFMA, and those vessels that fish primarily in the NFMA.

6.5.6.4.2 Minimum fish size Alternative 3 (no minimum size)

None of the action alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. Alternative 3 would eliminate the minimum fish size limit resulting in the greatest potential economic flexibility and would eliminate regulatory discards due to minimum size restrictions. Thus, the social impacts of Alternative 3 are either neutral or positive.

6.5.6.4.3 Minimum fish size Alternative 4 (if DAS are separated, 14" tail/21" whole)

The 14-inch tail size limit proposed under Alternative 4 would be the same as current regulations for the SFMA. As a result, vessels fishing in the SFMA would not have to

adjust their current fishing practices. For the NFMA, this alternative would result in an increase to the current minimum fish size, requiring vessels to discard monkfish that they were previously allowed to land. Thus, the social impacts of this alternative would likely be neutral for the SFMA and negative for the NFMA.

6.5.6.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (two 20-day blocks).

Alternative 1 (no action) would retain the current requirement for limited access Category A and B vessels to take a 20-day block of time out of the monkfish fishery from April 1 through June 30 of each calendar year. Limited access Category C and D vessels are currently not required to take a monkfish spawning block since they are required to take a 20-day block out of the Northeast multispecies fishery from March 1 through May 31 of each calendar year, if they hold a limited access Northeast multispecies permit. This alternative would not incur any additional regulatory costs since it does not change the current monkfish spawning block requirements. As such, this alternative would likely not incur any additional social impacts.

Alternative 3 would increase the current 20-day spawning block to 40 days. Under this alternative, vessel owners may choose to take the entire 40-day block at one time, or split it into two 20-day blocks. This alternative would greatly impact monkfish trip scheduling and planning, leaving vessels with few opportunities to target monkfish during one of the peak monkfish fishing seasons. The social impacts of blocks of time out of the fishery are difficult to determine since vessels may engage in other fisheries while under a monkfish spawning block, and may retain monkfish within the bycatch limits established for fishery or gear type. However, because this alternative further restricts limited access monkfish vessels during one of the peak fishing seasons, Alternative 3 is expected to have greater social impacts than Alternative 1.

Under this management measure, there is an option to require all limited access monkfish vessels in the spawning season restrictions under either Alternative 1 or Alternative 3 if DAS are separated. Currently, limited access Category C and D vessels are not required to take a monkfish spawning block. Category C and D vessels with a limited access multispecies permit are required to take a 20-days out of the Northeast multispecies fishery, but Category C and D vessels with a limited access scallop permit are currently not required to take type of spring spawning block.

The option to include all limited access monkfish vessels in the spawning season restrictions may reduce social tensions between owners of Category A and B vessels and owners of Category C and D vessels resulting from feelings that Category C and D vessels have been given an unfair advantage. Scallop vessels are unlikely to target monkfish during the spring since this is the start of the scallop fishing year. As a result, the social impacts to limited access scallop/monkfish vessels resulting from Alternatives 1 or 3 would likely be minimal. Furthermore, limited access Category C and D vessels with a limited access multispecies permit are not expected to incur additional social costs under this option, since these vessels are currently not able to fish under a monkfish DAS during their 20-day multispecies spawning block.

6.5.6.6 Offshore SFMA Fishery

The Councils considered two alternatives for establishing an Offshore Fishery Program in the SFMA, including the no action alternative. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

The No Action alternative would continue to restrict the ability of vessels to prosecute a fishery in the offshore canyon areas; a fishery that previously occurred prior to the implementation of the FMP. Thus, the continued forgone opportunity to prosecute this offshore fishery under the no action alternative could result in some negative social impacts compared to the proposed action.

Area Option 2 would have established the boundary of the for the offshore fishery as a the area north of 38° N and offshore of the Loligo squid exemption line to its intersection with the northern boundary of the monkfish/skate trawl exemption area at 40°10' N, then eastward along the trawl exemption boundary. This area option would have excluded potentially productive deep water canyon areas from the Offshore Fishery Program, reducing the fishing opportunities available to vessels participating in this program. The Offshore Fishery Program as a whole is expected to result in positive social impacts. Therefore, one could expect that the social benefits of this Offshore Fishery Program under Area Option 2 would be less than under Area Option 1.

The DAS/Trip Limit Option 1 would have enabled participating vessels to chose a trip limit/DAS ratio of 1:2, 1:3 or 1:4, versus having a fixed trip limit of 1,600 lbs. tail weight (with DAS adjusted accordingly). This option would have provided participating vessel owners with the flexibility to choose the ratio that would maximize their profitability, potentially resulting in greater social benefits as compared to DAS/Trip Limit Option 1.

6.5.6.7 Modification of permit qualification for south of 38°N

The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action (Table 121). The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a

monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

	Qualification period – four years prior to:		Estimated qualifiers
Alternative 1	June 15, 1998	(full year)	7
Alternative 2	June 15, 1997	(full year)	3
Alternative 3	June 15, 1998	(March 15 – June 15)	5
Alternative 4	June 15, 1997	(March 15 – June 15)	3
Alternative 5 (no action)	February 27, 1995		N/A

Table 121. Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

The information contained in Table 121 shows the number of vessels estimated to qualify for new limited access permits under each alternative considered. For all of these alternatives, except the no action alternative, the social benefits for those affected would likely be positive. Alternative 1 would result in the greatest overall social benefit since it would provide positive benefits to a greater number of vessels than the other alternatives. Conversely, the no action alternative would continue to limit the fishing opportunities of vessels that would qualify for a limited access monkfish permit under the proposed action, or one of the other proposed action alternatives, with some potential negative social effects.

6.5.6.8 EFH Alternative 4 Options 1 and 2 (Monkfish trawl configuration)

The Councils considered 3 alternative trawl configurations, including the no action Option 1, specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. Under Option 2, the Councils considered six individual elements that could be taken together or separately, which are described in Section 4.2.2.9.3, and sought public comment on the specific components. However, this option would only be considered if DAS were decoupled. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species. The Councils adopted Option 3, to establish a maximum disc diameter of 6-inches in the SFMA.

Any change in gear requirements under Option 2 would require the purchase of new equipment for use during monkfish-only DAS trips. Although vessel owners are often required to purchase new gear for a variety reasons (wear, damage, etc.) some vessel owners may consider the purchase of new fishing gear a hardship in a climate of shrinking profitability margins. Conversely, under the No Action alternative, vessels would not be required to conform with new gear requirements. Thus, no social impacts would result from the No Action alternative.

6.5.6.9 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB, which consists of a closure of Oceanographer and Lyndonia Canyons. The Councils did not adopt Alternative 5C, which proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line. Alternative 5C would have closed a larger area to monkfish vessels than Alternative 5AB. Thus, the social impacts resulting from the closure of this area would likely be greater than the impacts resulting from Alternative 5AB, based on the affected area alone.

According to 2001 VTR data, only 116 trips were identified as having taken place within the Large, Steep-Walled Canyon Closures of which 5 were found to be directed trips. Conversely, only 3 trips were identified as having taken place within the Oceanographer Canyon Closure area, and only one trip was reported to have taken place within the Lydonia Canyon Closure area. None of the trips taken in either of these closure areas were directed trips. Thus, based on past effort in the offshore canyon areas, Alternative 5C would likely have greater social impacts than Alternative 5AB.

6.5.6.10 NFMA Monkfish trawl experimental fishery

The Councils considered two alternatives, including the no action alternative, for a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. However, the Councils determined that this alternative was no longer necessary for the reasons presented in Section 4.2.2.12.

This alternative would provide additional opportunity for vessels to fish for monkfish in the NFMA through participation in a cooperative research project. Further, information gathered from this research could be used to establish an experimental monkfish trawl fishery in the NFMA. Under current regulations, there is no exempted monkfish trawl fishery in the NFMA, and therefore, there is no opportunity for trawl vessels to use monkfish-only DAS in this area. Thus, because this alternative could lead to increased fishing opportunities, it would have some social benefits. However, because this alternative would utilize up to 300 of the 500 monkfish DAS set aside for monkfish research activities, it could prohibit other much needed monkfish research from being conducted, resulting in some social costs.

6.5.6.11 Change fishing year

The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13, and considered three alternatives. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively.

The three alternatives to change the fishing year would likely result in some level of social impacts since Amendment 13 to the Northeast Multispecies FMP made no changes to the multispecies fishing year, and the monkfish fishing year would no longer be

aligned with the multispecies fishing year, potentially making the permit renewal process more cumbersome. In addition, a change in the fishing year would impact a vessel owner's planning of fishing activities for the upcoming year, especially if a vessel is receiving different DAS allocations at different times of the year. These impacts would be more substantial if monkfish DAS are not separated from Northeast multispecies and scallop DAS. Furthermore, the social impacts associated with Alternative 2 may be slightly less than Alternatives 3 and 4 since Alternative 2 would align the monkfish fishing year with the fishing years of several other species managed by the Mid-Atlantic Fishery Management Council (i.e., summer flounder, scup, black sea bass, squid, etc.), making the planning of fishing activities slightly easier.

6.5.6.12 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. The only difference between the alternatives is that Alternative 2 provides for a longer transition period by extending the proration period into the 2006 fishing year. As a result, Alternative 2 may provide vessels with greater flexibility to maximize their economic opportunity. Therefore, Alternative 2 may have a slight advantage from a social impact perspective than Alternative 1 due to the increased flexibility. Since the Councils took no action to change the monkfish fishing year, these administrative alternatives are irrelevant.

6.6 Cumulative Effects

The purpose of this section is to summarize the incremental impact of the proposed action on the environment resulting when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes them.

6.6.1 Background

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 alternatives may have a cumulative effect. This analysis has taken into account, to the extent possible, the relationship between historical (both pre- and post-FMP) and present condition of the monkfish population and fishery, although significantly less is known about the population and the fishery prior to the implementation of the FMP and other management actions affecting the fishery (particularly Multispecies Amendments 5 and 7 and Sea Scallop Amendment 4). The time frame for this analysis, therefore, is primarily the 1980’s and 1990’s for historical information, although trawl survey data extending to the 1960’s is considered, and approximately 5-10 years for reasonably foreseeable future actions affecting the fishery. The geographic scope of the analysis is the range of the monkfish 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 (VEC’s):

1. target species (monkfish)
2. non-target species (incidental catch and bycatch)
3. protected species
4. habitat, and

5. communities.

The cumulative effects determination on these VEC's is based on the following analyses: (1) the discussion in this section of non-fishing actions occurring outside the scope of this FMP; (2) the analysis of direct and indirect impacts contained in the Environmental Consequences section of this SEIS (Section 6.0) and summarized in this section (Sections 6.6.4 and 6.6.5); (3) the summary of past, present and future actions affecting the monkfish fishery; and (4) the cumulative effects of the alternatives provided in Table Table 124 of this section.

NOAA Fisheries staff determined that the 5 VECs (target species, non-target species, protected species, habitat and communities) are appropriate for the purpose of evaluating cumulative effects of the proposed action based on the environmental components that have historically been impacted by fishing, and statutory requirements to complete assessments of these factors under the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, Regulatory Flexibility Act, and several Executive Orders. The VECs are intentionally broad (for example, there is one devoted to protected species, rather than just marine mammals, and one on habitat, rather than Essential Fish Habitat) to allow for flexibility in assessing all potential environmental factors that are likely to be impacted by the action. While subsistence fishing would ordinarily fall under the "communities" VEC, no subsistence fishing or Indian treaty fishing take place in the area managed under this FMP.

The vessels participating in the monkfish fishery must comply with all federal air quality (engine emissions) and marine pollution regulations, and, therefore, do not significantly affect air or marine water quality. Consequently, the management measures contained in Amendment 2 would not likely result in any additional impact to air or marine water quality.

6.6.2 Overview of the proposed action alternatives

This amendment is designed to achieve a number of goals and objectives as outlined in Section 3.0, consistent with the monkfish stock-rebuilding goals established by the FMP, adopted in 1999 and amended in Framework 2 in 2003. The purpose and need for this amendment is summarized in Section 2.12. The proposed action and alternatives considered but not adopted are outlined in Section 4.0, and the direct and indirect impacts on the environment are analyzed and discussed in Section 6.0. A summary of the alternatives (proposed and non-preferred) and associated impacts and issues as presented in the DSEIS is provided in Appendix I.

In summary, as stated in the Goals and Objectives, the proposed actions are primarily designed to address management problems and issues that have arisen since implementation of the FMP, and to comply with applicable laws such as NEPA and the Magnuson-Stevens Act. In some instances, such as Essential Fish Habitat and bycatch minimization requirements, courts have found the FMP to be out of compliance with some elements of applicable law, and have ordered the Councils to remedy the situation which they are doing in this amendment. This amendment also addresses problems and

issues raised the public during the amendment scoping process. In addition, some proposals address NMFS strategic objectives of streamlining the management process and reducing administrative burdens on the agency and public. These actions do not modify the stock rebuilding elements of the original FMP, as modified in Framework 2.

6.6.3 Summary of non-fishing actions and their effect

Following is an assessment of non-fishing impacts on fish habitat and fishery resources. For fish habitat, non-fishing effects have been reviewed in the Essential Fish Habitat Amendment for Monkfish prepared by the NEMFC (Amendment 1 to the Monkfish FMP). Table 122 below, taken from that document, represents the review of the EFH Technical Team of the potential effects of numerous chemical, biological and physical effects to riverine, inshore and offshore fish habitats. Table 122 exhibits twelve representative classes of chemicals, three categories of biological and nineteen types of physical threats, which are categorized as low, moderate or high threats to habitat, based on their geographic location—riverine, inshore and offshore. In general, the closer the proximity to the coast, i.e., close to pollution sources and habitat alternations, the greater the potential for impact.

Riverine and inshore habitats were generally categorized as moderate to high threats whereas the offshore areas were low to moderate. 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 nm² 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.

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 species	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 122- 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

For fishery resources, there are several non-fishing threats that could have a direct and/or indirect impact on monkfish stocks. Several of the items identified as non-fishing threats to fish habitat, identified in Table 122 could also pose a threat, such as the oil spills, pesticides, and radioactive wastes. Generally the closer the proximity of monkfish stocks to the coast, the greater the potential for impact (although predation, a non-fishing impact, would be one threat that would occur everywhere). Monkfish reside or migrate through both inshore and offshore areas at different stages of their lives and during different seasons throughout the year. In the offshore areas, effects of non-fishing activities 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 some fishery resources that spawn in areas in close proximity to active power plants. An additional threat associated with power plants is the discharge of warm water. This thermal discharge is believed to have a negative impact on reproduction capability and recruitment of affected fishery resources. Since monkfish spawning and larval stages occur primarily in the offshore environment, this threat is not as significant as it is for other fish stocks, such as winter flounder.

Other future non-fishing threats to fishery resources could include global warming and siting of wind farms in the coastal or offshore environment. The effects of global warming and rising sea temperature on the life cycles and distribution of fishery stocks are uncertain 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 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 but are likely to be localized to the vicinity of the projects.

6.6.4 Summary of fishing gear effects on fish habitat

Appendix II contains the gear effects and adverse impacts determination analysis, based on the results of the Councils' Gear Effects Workshop and information provided by the NEFMC Habitat Technical Team, as well as a report from the National Research Council on the "Effects of Trawling and Dredging on Seafloor Habitat". This latter 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. Such 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. Table 39 in Appendix II indicates for all demersal life stages, monkfish inhabit bottom habitats with substrates of sand-shell mix, algae covered rocks, hard sand, pebbly gravel or mud. Fishermen in most areas report that their monkfish effort is predominately directed in mud-bottomed areas.

Use of trawls and dredges are common in inshore and offshore areas and somewhat less common in riverine areas. Appendix II of this document 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 managed fisheries including: Northeast Multispecies; Sea Scallops; Monkfish; Mackerel, squid and butterfish; Summer flounder, scup and black seabass; Bluefish; and Spiny dogfish. Scallop dredges are used in the sea scallop fishery and hydraulic clam dredges are used in the surf clam and ocean quahogs fisheries. Smaller trawls are used in inshore areas and lower estuaries, which are managed by states and not subject to the Magnuson-Stevens Act. 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.

6.6.5 Summary of existing threats to protected resources

Six large whale species (right, humpback, fin, sei, blue and sperm whales) and three sea turtles (leatherback, Kemp's ridley and green turtles) found in the region are listed as "endangered" under the Endangered Species Act. The loggerhead turtle is listed as threatened, and two other species, harbor porpoise and barndoor skates, are candidates for listing. The remaining mammal species are protected under the Marine Mammal Protection Act. The right whale continues to be at the highest risk for extinction because of its low numbers and low reproductive status. Table 123 summarizes the past and current threats for the whale species that have a special status because of threats to their continued sustainability.

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. During 1996-2000 in U.S. Atlantic waters, an average of 3.2 whales (right, humpback, fin, sei, sperm, blue and minke, combined) were killed annually by ship strikes, and 7.8 were killed or suffered injuries likely to cause death as a result of gear entanglements (Waring, et al., 2002). 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 at risk to be entangled in net gear (including seines, gillnets and drift nets). Turtles have been entangled in shrimp trawls, pound nets, bottom trawls and sink gillnets. Shrimp trawls are required to use turtle excluder devices.

Protected species are also affected by habitat alteration or destruction. Species such as turtles may be more prone to such impacts because their nests are particularly vulnerable to disturbance or predation. The impacts of pelagic habitat alteration on protected species are less known. Water quality in coastal areas is particularly vulnerable to coastal pollution from nutrients, which can alter the phytoplankton and the food of species such as the right whale. Toxic contaminants, such as PCBs and DDT which are suspected of causing reproductive failure in many vertebrates including marine mammals (Reijnders and Aguilar, 2002), can also accumulate through the prey species and cause adverse effects to a predator that is higher in the food web. 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 (Geraci, et al., 1990; Harwood, 2002).

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 factors discussed above, and other factors, potentially have had cumulative adverse effects on all protected species to varying degrees. Because of a lack of cause-effect data, little is known about the magnitude and scope of these factors and how they have contributed to the species’ special listing. The direct and indirect effects of the alternatives in this amendment are discussed in Section 6.0, and summarized in Appendix I. Table 124 summarizes the cumulative effects of the alternatives in the context of the discussion above.

Species	Status	Threats			
		Ship Strikes	Gear Entanglement	Habitat	Other
Right Whale	Endang Highest risk	High Potential	High potential due sink gillnets, pots, traps	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Low Genetic diversity; Low reproductive rates; Reduction/ Competition of prey; Harassment
Humpback	Endang	High Potential	High potential	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Reduction/ Competition of prey; Harassment
Fin	Endang	High Potential Mortality Less Certain	High potential Mortality Less Certain	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Reduction/ Competition of prey; Harassment
Sei	Endang	Potential but few recorded instances	Potential but no recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	Unknown: Reduction/ Competition of prey; Harassment
Blue	Endang	Potential but few recorded instances	Potential but few recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	Unknown (no data): Ice entrapment
Sperm	Endang	Potential but few recorded instances	Potential but few recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	
Minke	Protected under MMPA	Potential but few recorded instances	Sink Gillnets known threat; Pot/Trap Gear	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Aboriginal subsistence whaling on West Greenland stock (non-U.S. stock)

Table 123- Summary of Threats to Protected Species Potentially Affected by Amendment 2 to the Monkfish Plan.

6.6.6 Summary of past, present and future actions affecting the monkfish fishery

6.6.6.1 Past and present actions

The current condition of the monkfish fishery (in the context of the five VECs) is the result of the cumulative effect of the Monkfish FMP, implemented in 1999, and regulations under other FMPs in the region that impact vessels catching monkfish as well as measures adopted under other laws, particularly the Endangered Species Act and the Marine Mammal Protection Act. The status of the fishery, its stocks, human component and the biological and physical environment, is discussed in the Affected Environment section of this document, Section 5.0. Sections 2.1 - 2.9 contain a discussion of past actions that have cumulatively, and in most cases positively affected the VECs of the monkfish fishery, including regulatory and judicial actions.

In summary, the directed monkfish fishery is relatively young, having emerged over the past three decades and coming under regulation only in 1999 with the adoption of the FMP. The Councils developed the FMP in response to industry and scientific concerns that the increased market demand for monkfish caused landings to increase to unsustainable levels and the stocks were showing symptoms of significant declines (falling survey indices and declining average size of fish in the catch). Since the FMP was implemented in 1999, the northern stock biomass index (3-yr. Average) increased from 0.82 kg/tow to 2.23 kg/tow by the fall, 2002 but declined to 2.03 kg/tow in 2003. The stock is not overfished and is less than 20 percent below B_{target} ($B_{target}=2.50$ kg/tow). During the same period, the southern stock index average has risen from 0.47 kg/tow to 0.93 kg/tow, which is the minimum biomass threshold for determining when the stock is overfished (0.93 kg/tow). Since the stock is not below the threshold, the MMC recommended that NMFS declare the stock no longer overfished.

The original FMP called for a three-year effort reduction program and a plan review to set subsequent management targets and measures. The FMP also included default measures for Year 4 that would have eliminated the directed fishery and only allowed monkfish to be landed under incidental catch limits. Framework 1, in 2002, delayed the default measures one year to allow the Councils to complete the review process which included a Stock Assessment Workshop (SAW 34). Based on that review, the Councils implemented Framework 2, which revised the overfishing definition reference points and established an index- and landings-based method for setting annual harvest targets (TAC's) to achieve optimum yield and biomass rebuilding goals, as well as eliminating the default measures.

The two FMP's that have had the greatest impact on monkfish fishery VECs, other than the Monkfish FMP, are the Sea Scallop and Northeast Multispecies FMP's because of the spatial overlap of the fisheries, the relatively high level of incidental catch of monkfish in those fisheries, and the fact that more than 90 percent of the monkfish limited access permit holders are also permitted in one or the other of those two fisheries (evenly split). Both Multispecies and Sea Scallop fisheries have undergone a series of major actions since 1994 to reduce fishing effort and rebuild overfished stocks. These include Multispecies Amendments 5 –13 and 39 framework adjustments (with two pending), and

Sea Scallop Amendments 4-10 and 16 framework adjustments (with one pending). These actions have reduced overall fishing effort significantly since 1994, and have imposed other restrictions such as year-round and seasonal closed areas, and gear restrictions that have affected both the directed and incidental catch monkfish fishery. Cumulatively, these actions have likely had a positive effect on monkfish, contributing to the increasing stock abundance observed over the past five years. Additional action in both FMP's is pending, and will be discussed below (Section 6.6.6.2).

Other FMPs that likely have had an impact on the fishery VECs include those managing other demersal species in the region, such as the Skate FMP (implemented 2003), Spiny Dogfish FMP (implemented 2000), and the Summer Flounder, Scup, Black Sea Bass FMP (1996 and amendments). To varying degrees, these management plans, as well as others in the region, have directly or indirectly affected the monkfish fishery by causing effort to shift among fisheries and by changes to the levels of incidental catch of monkfish. It is not possible within this document to analyze all of the inter-relationships of these management plans with the monkfish fishery because in most cases these relationships are not well understood and vary widely for individual vessels and areas.

In addition to FMPs implemented by the Councils, other actions that have directly and cumulatively affected the monkfish fishery VEC's include three federal court decisions, two marine mammal take reduction plans, and a final rule implemented by NMFS under authority of the Endangered Species Act to protect sea turtles (see Section 2.8). Cumulatively, these actions have limited areas open to fishing on a seasonal basis, specifically to gillnet gear, and have prescribed gear restrictions, including the mandatory use of acoustic deterrent devices in some areas, net limits and buoy line specifications.

Actions and orders by the federal courts have had a cumulative effect on the VECs of the monkfish fishery. In particular, three cases described in Section 2.5.2 have affected the monkfish fishery, *Hall v. Evans*, *AOC v. Daley*, and *CLF v. Evans*. In the case of *Hall v. Evans* the court found that the gear-based differential trip limit in the original FMP was violated three of the national standards in the Magnuson-Stevens Act, and ordered that the gillnet limit be increased to the level the trawl limit. As a result, of this action, the Councils had to reduce the trip limits for both gear sectors in order to meet the target TAC when it set the limits in Framework 1. *AOC v. Daley* was the case in which the court determined that the environmental assessments prepared for the EFH provisions of the FMP did not adequately consider a range of alternatives as required under NEPA. As a result of this determination, the Councils have undertaken in this amendment to consider broader range of alternatives that would minimize the impact of the fishery on the EFH of all managed species. Thirdly, the case of *CLF v. Evans* focused on the Multispecies FMP rebuilding plans and resulted in an interim rule significantly reducing fishing effort, and a negotiated settlement under which the NEFMC is developing Multispecies Amendment 13. Since approximately half of the monkfish limited access permit holders also hold multispecies permits, the court's action have already affected fisheries and communities directly (reduced effort and landings) and indirectly (displaced effort). The cumulative effect of these past actions cannot be individually assessed,

however, the current state of the fishery is the result of the synergistic effect of all of the actions described above.

6.6.6.2 Reasonably foreseeable future actions

Future actions considered in this section include actions taken under this FMP, actions taken under other FMPs that affect vessels catching monkfish, and actions taken to protect marine mammals or threatened and endangered species. Given that monkfish fishing occurs in relative isolation from other (than fishing) spatially co-occurring activities (for example, shipping and recreational boating), it is unlikely that any regulatory action or other changes in those activities will have an impact on the fishery, or vice versa.

Other activities that could potentially have an impact on monkfish fishing, such as development of offshore energy facilities or offshore aquaculture projects, are not likely to occur in the reasonably foreseeable future (over the next ten years). Although a few offshore aquaculture proposals have been developed in the past, and feasibility studies are currently underway, these projects face a number of technical and environmental obstacles that reduce the likelihood these projects will actually become commercially viable within the next five to seven years.

Included in the reasonably foreseeable future actions that may have an impact on the monkfish fishery are other FMP amendments in various stages of development or implementation, the most notably Multispecies Amendment 13 and Sea Scallop Amendment 10, both of which have been adopted this year, and several follow-up framework adjustments. Both Amendments 13 and 10 will have direct and indirect impacts on monkfish vessels since most monkfish vessels are also permitted in one of those other fisheries and are directly affected by the cumulative effect of the proposed action and those other amendments.

How, and to what magnitude, the effort reductions and area closures or other management measures in Amendments 10 and 13, or subsequent Multispecies or Scallop FMP actions, affect monkfish effort cannot be reliably predicted. On the one hand, if overall effort is reduced, presumably overall monkfish incidental catch levels will also decline (positive). On the other hand, management restrictions in those other fisheries could cause some vessels to redirect their effort toward monkfish (possibly negative, mitigated by the monkfish effort management program implemented by Framework 2). For example, Multispecies Framework 40A (see Section 2.9.2) establishes a pilot program that enables vessels to use their multispecies B Regular DAS to target monkfish while having a minimal impact on groundfish species of concern.

Even vessels not directly impacted by virtue of having a scallop or multispecies permit could be affected by the displacement of effort resulting from restrictions imposed on those fisheries, and by any measures, such as area closures to protect EFH, that restrict the operation of all fishing with specific gear types. The alternatives under consideration to address the conservation and EFH objectives in those other amendments are likely to have a short-term adverse impact on most monkfish vessels that may be somewhat mitigated by actions proposed in this amendment, particularly the establishment of an offshore monkfish fishery program.

Other potential future actions whose effects would be cumulative to the proposed action include actions taken to protect marine mammals, endangered and threatened species. Current measures in effect are discussed in Section 2.8. 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 effect on the monkfish VECs 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 and fin whales with commercial fisheries. The agency is also preparing to publish a proposed rule for a Bottlenose Dolphin Take Reduction Plan. Both of these actions may affect the operations of the monkfish fishery.

In the more distant future, two other actions outside the fisheries arena could potentially affect the monkfish fishery VEC's due to their geographic overlap: offshore windfarms and offshore oil and gas exploration/drilling. In the case of the windfarm project, the current proposal under consideration would site the facility in Nantucket Sound, which would not likely have a significant effect on the monkfish fishery because it does not overlap. That proposal is controversial, however, and the Army Corps of Engineers is currently preparing an Environmental Impact Statement that may include alternatives that would site the facility further offshore. In that case, there is a potential, but unknown impact on the monkfish fishery, depending on the exact location and other parameters of the project. In the case of offshore oil and gas exploration, a current federal moratorium is preventing any such activities. According the recent media reports, discussions have begun in Washington on reconsidering the moratorium, in which case the potential exists for such activities to have an effect on the monkfish fishery VEC's, since one of the primary areas of interest is Georges Bank. As with the windfarm proposal, however, insufficient detail is available to determine the potential effects of such activities with any reasonable certainty or specificity.

With advances in fishing technology and ongoing restrictions in traditional fisheries, some vessels may begin to develop deepwater fisheries, much like what occurred in Europe over the past two decades. Not much is known at this time about the potential for such fisheries in the northwest Atlantic, nor about how such fisheries would interact, directly or indirectly, with deepwater components of the monkfish fishery or its essential fish habitat. Furthermore, such fisheries would likely have an impact on deepwater coral habitat whose role in the life stages of monkfish and other deepwater species currently being harvested, such as red crab, is not well known. The deepwater fisheries do not have management plans in place at this time, although such plans would likely be implemented

if such fisheries were to begin. The cumulative effect of the development of deepwater fisheries and the associated FMP's is not ascertainable at this time.

6.6.7 Cumulative effects of the proposed action

The following table Table 124 summarizes the anticipated cumulative effects of the proposed action on each of the five VECs compared to taking no action. The cumulative effects determination is based on the preceding analysis of non-fishing activities, fishing gear effects, direct and indirect impacts in the context of the past, present and reasonably foreseeable future actions discussed in the preceding section, as well as the analysis of the direct and indirect impacts in Sections 6.2 - 6.5.

In summary, the proposed measures viewed together, are not likely to have a significant cumulative effect on the environment. As a whole, these measures are likely to have a slightly positive effect on communities, since they address a number of issues identified by the affected public, such as regulatory discards and the inability to profitably conduct a traditional offshore fishery. The measures proposed to minimize impacts of the fishery on EFH (SFMA roller restriction and canyon closures) are also positive, but since they are effectively preventative, rather than restrictive on current fishing activities, the impacts are also not significant. The impact of the proposals on the other VECs is essentially neutral compared to no action.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	Non-target Species	Protected Species	Habitat	Communities
Incidental Catch – 50 lbs./day, 150 max.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – GC scallop and surf clam dredge vessels	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – Summer flounder vessels west of 72°30'W	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Minimum Fish Size	Could negatively impact yield-per-recruit if vessels target smaller monkfish in SFMA. No impact if measure simply converts discards to landings.	No Impact.	No Impact.	No Impact.	Slightly positive due to reduced discards and improved profitability.
Closed Season	No Impact. Spawning area closure (no action) has no apparent biological benefit.	No Impact. Spawning area closure (no action) has no apparent biological benefit.	Could negatively impact protected species, but not clearly or significantly, since varying amounts of gear is still deployed during this period under no action.	No Impact. Short time of closure period under no action is not significantly different, in terms of habitat impacts than proposed elimination of closed season.	Slightly positive due to increased flexibility.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	Non-target Species	Protected Species	Habitat	Communities
Offshore SFMA Fishery Program	Could result in effort shift from inshore to offshore with no overall increase (neutral), but could result in re-activation of monkfish effort (negative), mitigated by DAS pro-rating, gear requirements and other program elements (positive).	Could reduce impact on inshore and multispecies stocks by vessels shifting effort offshore where catch of other species is minimal. Monkfish/multispecies vessels will use multispecies DAS while fishing in the program and, therefore, not have those DAS available to target multispecies).	Would likely have a positive impact, or at least mitigate impacts on protected species since overall effort (DAS) is reduced under proposed action, and vessels must use VMS which will improve information regarding protected species interactions, to the extent they occur offshore.	No impact, or slightly negative. May affect deep water benthic habitats at continental margin as vessels return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels may mitigate these effects.	Positive for larger vessels able to fish offshore due to higher profitability, and restores a pre-FMP fishery
Modification of Permit Qualification – South of 38°N	May shift effort from inshore (state waters) to offshore grounds with no overall effort increase. May also result in some effort increase compared to no action if vessels participate who are not currently active in MF fishery (<5 vessels expected). Overall potential effort limited by season/area.	No Impact.	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures.	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures. Most, if not all affected vessels use gillnets.	Positive for the small number of affected vessels due to increased opportunity and value of vessel permit, and their communities.
Modify the Framework Adjustment Procedure	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.
NAFO Regulated Area Exemption Program	No direct impact on domestic stocks. Could result in increase in effort on NAFO Area stocks, limited greatly by logistical considerations.	No Impact.	No Impact.	No Impact.	Likely positive due to increased flexibility, but cannot be quantified.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	Non-target Species	Protected Species	Habitat	Communities
EFH – SFMA Roller Gear Restriction	No impact. Vessels targeting monkfish already use this gear, which is intended to prevent expansion of the fishery into complex bottom types, especially offshore canyons.	No direct impact but could be positive on species inhabiting complex habitats, particularly offshore canyons by limiting ability to trawl in those areas.	No Impact.	Positive but not significant – sets maximum roller gear diameter equivalent to size currently in use in the area; prevents expansion of trawl effort into complex bottom areas and canyons.	Slightly negative for vessels not already using this gear, otherwise neutral.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	Positive but not a significant impact since minimal monkfish fishing occurs in those areas.	No impact likely. Vessels targeting monkfish do not fish in these areas.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry “buy-in” to science supporting management.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry “buy-in” to science supporting management.
Clarification of Vessel Baseline	No impact. This is an administrative change.	Unknown social impact, or slightly positive since any adjustment is at vessel owner’s request only.			

Table 124 – Summary of cumulative effects of Amendment 2 proposed action compared to taking no action

6.6.8 Cumulative effects of non-preferred alternatives

The following Table 125 shows the cumulative effects of non-preferred alternatives.

Alternative	Details	Impacts/issues	Cumulative effects
DAS Alternative 1	<ol style="list-style-type: none"> 1. Two alternatives (see Alt. 1a and 1b below) 2. Annual declaration – vessels may elect to fish under Alt. 2 (no action) rules 3. Enrolled vessels may combine DAS usage on trip-by-trip basis 4. When on MF-only DAS, Category C & D vessels would fish as Category A & B 5. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1. 	<ol style="list-style-type: none"> 1. Allows for MF specific gear requirements on directed trips – minimize bycatch and EFH impacts 2. Could result in overall increase in fishing effort (vessels could fish MF and Scallop or Multispecies DAS allocations separately) 3. Reduces opportunity cost for vessels targeting monkfish 4. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 5. Economic impact likely to be positive or neutral on affected vessels (Category C & D) 6. Goal II, Objectives 2 & 3; Goals III & V 	<ol style="list-style-type: none"> 1. Target species: Neutral. TACs/trip limits adjusted annually to achieve rebuilding. Reduced MS and scallop effort (A13 and A10) will likely reduce incidental catch. 2. Non-target species: Positive. Reduced bycatch under large mesh on MF only DAS. 3. Protected species: Neutral or negative, depending on how vessels respond to restrictions in other fisheries, and protection measures adopted outside of the FMP process. 4. Habitat: Positive. Gear requirement on MF only DAS, combined with Amendment 10 and 13 measures will reduce impact on EFH. 5. Communities: Positive. Provides opportunity for vessels facing restrictions in other fisheries.

Alternative	Details	Impacts/Issues	Cumulative Effects
DAS Alternative 1a – Area-based de-coupled DAS (SFMA only) by annual declaration	<ol style="list-style-type: none"> 1. Category C & D vessels annual declaration to have option of MF only DAS in the SFMA 2. Vessel not declaring could fish for monkfish in either area on combined DAS only 3. Vessels declaring may only fish for monkfish in the SFMA, and under incidental limit in NFMA (could not be issued NFMA exemption letter) 	<ol style="list-style-type: none"> 1. Vessels declared in may retain the option to fish MF-only or combined DAS in the SFMA 2. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1, SFMA section only 3. Options below for gear requirement on MF only or combined DAS 	Unable to discern the difference between the two alternatives, in terms of cumulative effects, except that Alternative 1b provides greater flexibility since it does not restrict the ability to separate DAS to one area. These alternatives are a subset of DAS Alternative 1, discussed above.
DAS Alternative 1b – Annual declaration for de-coupled DAS, not area based	<ol style="list-style-type: none"> 1. Category C & D vessels annual declaration to have option of MF only DAS (not limited by area) 	<ol style="list-style-type: none"> 1. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1. 2. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 3. Options below for gear requirement on MF only or combined DAS 	

Alternative	Details	Impacts/Issues	Cumulative Effects
DAS Alternative 1 Option 1a – Fleet MF DAS (MAFMC preferred alternative)	<ol style="list-style-type: none"> 1. 40 DAS to all limited access permit holders 2. Trip limits/DAS based on current (Framework 2) formula 	<ol style="list-style-type: none"> 1. Same allocations as under original FMP 2. Inherent allocation of latent MF effort 3. Option to have variable Fleet DAS and uniform trip limits not practicable 	Unable to discern the difference between the two alternatives, in terms of cumulative effects on target species, non-target species, habitat, protected species. Option 1a may have positive cumulative effect on communities where vessel's monkfish activity has been lower during the Option 1b qualification period but may face restrictions in other fisheries in the future. These alternatives are a subset of DAS Alternative 1, discussed above.
DAS Alternative 1 Option 1b – Individual MF DAS	<ol style="list-style-type: none"> 1. Vessels would have individual share of a pool of DAS based on relative proportion of monkfish landings 1997-2001 2. Allocation based on individual share X total DAS pool 3. Total DAS pool based on portion of TAC available to directed fishery divided by average catch per DAS 	<ol style="list-style-type: none"> 1. DAS allocations range from 0 (145 vessels) to more than 145 (average on 40 vessels holding 20% of the total pool) 2. Vessels would have 40 DAS pending appeal of individual allocation 3. Effort allocations based on past performance (minimize latent effort) 4. Some vessels that qualify for a limited access permit would not have DAS allocation but could lease DAS (if adopted) 	

Alternative	Details	Impacts/Issues	Cumulative Effects
<p>DAS Alternative 1 Option 2a – Implement transferable MF only DAS under Amendment 2 rule</p>	<ol style="list-style-type: none"> 1. Program would take effect upon implementation of Amendment 2 2. DAS transfer program to be based on Multispecies Amendment 13 program with monkfish specific consideration 3. Two options, plus no action, for lease or sale of DAS (see Decision 1d, below) 	<ol style="list-style-type: none"> 1. Uncertainty about outcome of Amendment 13 decisions and final program details 2. Would allow for potential activation of latent effort under Fleet DAS (Option 1a above) 	<p>Both alternatives are a subset of DAS Alternative 1, discussed above. Both alternatives would allow for transferable DAS, either upon implementation or in the future. Transferable DAS could have a negative cumulative effect on target species, non-target species habitat and protected species if the program results in increased effort, otherwise neutral. Could have a positive cumulative effect on those communities where such programs would promote more efficient use of capital especially where vessels can accumulate DAS and effort is being restricted under other FMP actions. Could have a negative cumulative effect on communities where vessels sell or lease DAS outside of the community and reduce or terminate fishing activity.</p>
<p>DAS Alternative 1 Option 2b – Include transferable DAS in list of possible actions under framework adjustment process</p>	<ol style="list-style-type: none"> 1. Program details and implementation would take place under a future Council action 	<ol style="list-style-type: none"> 1. Would allow for development of DAS transfer consistent with program (if) adopted in Multispecies Amendment 13 with monkfish-specific considerations 	

Alternative	Details	Impacts/Issues	Cumulative Effects
Transferable DAS Option 1 – No action	1. Transfer of DAS prohibited	1. No impact compared to current program under Fleet DAS 2. Under Individual DAS, if adopted, inactive vessels would have no DAS or reduced DAS allocations and be unable to activate	These alternatives are a subset of DAS Alternative 1, discussed above. The NEFMC has adopted both a leasing and a sale provision in Multispecies Amendment 13, but not in Scallop Amendment 10. Provisions for conservation neutrality and/or capacity reduction through transfer “tax” would be positive for VECs, unless total active effort increases in spite of those protections.
Transferable DAS Option 2 – DAS Leasing	1. Based on alternatives under consideration in Amendment 13, with MF specific considerations 2. Options for conservation equivalency, limitations on number of DAS leased, and program expiration.	1. Could result in activation of latent effort under Fleet DAS 2. Would enable vessels with low individual DAS allocations (if adopted) to increase effort to profitable levels, at a cost, while providing high allocation vessels with flexibility to use or lease DAS 3. Effectiveness of conservation neutrality provisions are uncertain	
Transferable DAS Option 3 – Sale of DAS	1. Based on Multispecies Amendment 13 proposals 2. Options for restricting proportion of transferable DAS and reactivation of sold DAS.	1. Could result in activation of latent effort unless safeguards are developed to maintain conservation neutrality. 2. Amendment 13 formula for defining active/effective effort not directly applicable to monkfish fishery 3. Practicability may depend on outcome of Amendment 13 decision regarding permit splitting.	

Decision 2	Details	Impacts/Issues	Cumulative Effects
Incidental Catch Alternative 1 – No action	1. 50 lbs. tails per trip (possession limit) on small mesh trips	1.	No cumulative effect on non-target species, protected species and habitat. Alternatives 2 and 3 would reduce already insignificant discards on target species and have a proportionally positive effect on communities where fisheries covered under this incidental limit operate due to modestly increased landings allowed.
Incidental Catch Alternative 3 –	1. 50 lbs. tails/day; 500 lbs. maximum	1. Intended to reduce discards 2. Would benefit small mesh trips up to 10 days (freezer boats) 3. Would have minimal impact on total incidental catch of monkfish	

Alternative	Details	Impacts/Issues	Cumulative Effects
GC Scallop/clam dredge Alternative 1 – No action	1. Prohibited from possessing monkfish	1. No evidence these vessels are discarding monkfish	No cumulative effect on non-target species, protected species and habitat. Preferred alternative would reduce already insignificant discards on target species and have a proportionally positive effect on communities where fisheries covered under this incidental limit operate due to modestly increased landings allowed.

Alternative	Details	Impacts/Issues	Cumulative Effects
Incidental catch limit west of 72°30' Alternative 1 – No action	1. Incidental limit on fluke vessels east of 74° is 50 lbs. possession limit (tail wt.)	1. Multispecies interim rule changed monkfish limit from 5% of total wt. on board as a result of shifting Mid-Atlantic Reg. Mesh Area boundary	No cumulative effect on non-target species, protected species and habitat. Preferred alternative would reduce discards on target species and have a proportionally positive effect on Mid-Atlantic communities where fisheries covered under this incidental limit operate due to landings allowed.

Alternative	Details	Impacts/Issues	Cumulative Effects
Minimum trawl mesh size Alternative 2 –	1. 12" sq. codend; 12' dia. belly and wings 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size	1. Target species: Alt. 2 & 3 will result in reduced discards and increased yield per recruit (not quantified) 2. Non-target species: Alt. 2 & 3. will result in reduced bycatch (not quantified). 3. Protected species: Neutral 4. Habitat:: Positive. Lower incidental catch of other species reduces incentive to fish in areas where those species are caught, lowering fishery impact on such habitat. 5. Communities: unknown, but likely positive if yield per recruit is increased and bycatch reduced. Cost of gear upgrading not expected to be significant since nets, codends replaced regularly.
Minimum trawl mesh size Alternative 3 –	1. 12" sq. codend; multispecies mesh in body and wings. 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size	

Alternative	Details	Impacts/Issues	Cumulative Effects
Minimum fish size Alternative 1 – No action	<ol style="list-style-type: none"> 1. 11" tail or 17" whole, NFMA 2. 14" tail or 21" whole, SFMA 	<ol style="list-style-type: none"> 1. Minimum size cited as primary reason for MF discards in trawl and scallop fishery 	Neutral for all VEC's except target species and communities. Moderately negative due to discards.
Minimum fish size Alternative 2, Option 2–	<ol style="list-style-type: none"> 1. Uniform size both areas 2. 10" tail/15" whole 	<ol style="list-style-type: none"> 1. Reduces discards of small monkfish in the SFMA 2. Does not eliminate regulatory discards due to minimum size 3. Goal II; Goal III; Goal IV, Objective 2; Goal VII 	Moderately positive for target species and communities due to reduced discards and improved landings data.
Minimum fish size Alternative 3 –	<ol style="list-style-type: none"> 1. No minimum size 	<ol style="list-style-type: none"> 1. Eliminates regulatory discards due to minimum size (not market cull) 2. PDT recommendation 3. Improves data on commercial catch-at-age used in assessments 	
Minimum fish size Alternative 4 –	<ol style="list-style-type: none"> 1. Applies only on monkfish-only DAS, if DAS are decoupled. Councils would select from options above for multispecies/monkfish DAS 2. 14" tail/21" whole in both areas 	<ol style="list-style-type: none"> 1. Works in conjunction with increased minimum mesh size on monkfish-only DAS; allows for retention of smaller monkfish caught with groundfish gear on combined multispecies/monkfish DAS 2. Selectivity characteristics of large mesh not quantified; impact on reducing discards uncertain 	Cumulative effects fall between those discussed in Alternatives 1 & 2 above

Alternative	Details	Impacts/Issues	Cumulative Effects
Closed Season Alternative 1 – No action	<ol style="list-style-type: none"> 1. Category A & B vessels: 20-day block out of the fishery April – June; Category C & D/Multispecies vessels: 20-day block March-May; Category C & D/Scallop vessels: no requirement 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled 	<ol style="list-style-type: none"> 1. Not effective at shifting effort away from spawning period due to relatively short closure 	No cumulative effect expected on the five VECs.
Closed Season Alternative 3 –	<ol style="list-style-type: none"> 1. Increase time out requirement to 40-day block 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled 	<ol style="list-style-type: none"> 1. May provide improved spawning protection, although benefits not certain or well understood for monkfish 	Could have a negative cumulative effect on vessels/communities in other fisheries if the additional time out requirement is during periods of high activity or profit. Would have a positive cumulative effect on non-target species that spawn during this period (multispecies) and on protected species if vulnerable to the gear during this period. Cumulative effect on habitat or target species unknown.

Alternative	Details	Impacts/Issues	Cumulative Effects
Offshore SFMA Fishery Alternative 1 – No action	<ol style="list-style-type: none"> 1. All SFMA vessels within gear and permit categories treated equally 	<ol style="list-style-type: none"> 1. Offshore fishery not profitable for most vessels due to trip limits and, for some vessels, requirement to use multispecies or scallop DAS 	Would continue the negative cumulative effect of the FMP on those vessels/communities that had a dependence on the offshore fishery prior to FMP implementation, and on the target and non-target species to which those vessels re-directed their effort. Neutral or negative on habitat, depending on where those vessels have redirected their effort. Neutral on protected species.

Alternative	Details	Impacts/Issues	Cumulative Effects
Modification of permit qualification for vessels fishing south of 38°N. Landings criteria are the same in all alternatives as current permit requirements. Four alternatives differ on qualification period, four years prior to date shown below . If sea turtle closures severely restrict fishing opportunity, area may be expanded to 38°20'N. All other regulations applicable to vessels fishing in the SFMA would apply. Preliminary estimate of number of new permits is given; all would be in Category B & D (lower landings threshold)			
Permit Qualification Alternative 1	1. June 15, 1998, full year landings	1. est. new permits: 7	All alts., including no action, essentially the same with neutral or unknown cumulative effects on all VECs except communities. Alts. 1-4 could have a positive cumulative effect on communities where vessels would qualify for ltd. access permit, but not expected to be significant due to small number of vessels and limited fishery season.
Permit Qualification Alternative 2	1. June 15, 1997, full year landings	1. est. new permits: 3	
Permit Qualification Alternative 4	1. June 15, 1997, landings during March 15 –June 15	1. est. new permits: 3	
Permit Qualification Alternative 5 – no action	1. vessels that have not qualified under original FMP would not be issued limited access permit	1. est. new permits: 0	

Alternative	Details	Impacts/Issues	Cumulative Effect
NAFO Area Exemption Alternative 2 – no action	1. no exemption, must use DAS and comply with trip limits and other FMP regulations.	1.	No cumulative effect expected.

Alternative	Details	Impacts/Issues	Cumulative Effect
EFH Alternative 1 - no action	1. Measures that would be in effect if the Councils took no action on this or other (Multispecies, Scallop) amendments	1. Monkfish trawl fishery has a low impact on monkfish EFH but high impact on vulnerable EFH of some other species	Taking no action would result in continued adverse effects on habitat and other negative impacts of current levels of fishing on target species, non-target species and protected resources. Cumulative effect of no action on communities is unknown.
EFH Alternative 2	1. No specific action on EFH	1. Other actions in Amendment 2 to be analyzed for EFH benefits	The cumulative effect of other actions in Amendment 2 is discussed in other sections of this table under each measure.
EFH Alternative 3	1. Actions taken under Multispecies Amendment 13 and Scallop Amendment 10, in FSEIS incorporated into Alt. 1 since those amendments were implanted after DSEIS publication.	1. Action taken under other FMPs to be analyzed for EFH benefits	Effort reductions and habitat protection measures in these amendments will have a positive cumulative effect on all VECs, except the near-term effect on communities which is expected to be negative.
EFH Alternative 4, Option 2	1. Includes six elements that could be taken together or separately.	1. Designed to minimize ability and incentive to fish in complex bottom. Would also minimize bycatch of regulated species. 2. As a package not tested and not in commercial use. Could be part of trawl experimental fishery adopted under this amendment	Would have a positive cumulative effect on all VECs, except protected resources which is unknown. Would reduce bycatch of target and non-target species, minimize fishery effect on complex habitat, and have a positive effect on communities due to the reduction in discards and the increased opportunity to target monkfish in a clean, directed fishery.
EFH Alternative 5c – Major steep-walled canyons closure	1. Up to twelve identified canyons from Norfolk Canyon to Heezen Canyon (at the Hague Line) 2. Two options: close to trawl gear or all gears, on a MF DAS 3. Closure of waters deeper than 200 m. (~100 fathoms)	1. some overlap with reported monkfish effort, particularly Atlantis, Oceanographer and Hudson Canyons	Would have an unknown or positive cumulative effect on the VECs, particularly habitat and non-target species (coral) due to precautionary action to protect these areas from reasonably foreseeable future development of deepwater fisheries. Avoid future economic cost of managing such fisheries after they become established. Would also have a positive, but indirect effect on essential fish habitat of species that are currently found in adjacent areas.

Alternative	Details	Impacts/Issues	Cumulative Effect
Cooperative Research programs funding. Two alternatives, not including no action, could both be adopted. Four options for DAS set aside/exemptions under consideration: 50, 100, 200, or 500 DAS. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others.			
Research Alternative 3 – no action	1. Vessels conducting research under EFP or NMFS' RFP may not land monkfish unless they complete an Environmental Assessment to analyze the impacts of a DAS exemption	1.	Research projects <i>per se</i> not likely to have a significant cumulative effect. If research results in improvements to management program and scientific understanding, effects would be positive for all VECs, depending on the specific results and follow-on actions.

Alternative	Details	Impacts/Issues	Cumulative Effect
Vessel Upgrading Baseline Alternative 1 – no action	1. Vessel has baseline of vessel when issued its limited access permit; may have two different baselines for permits issued under different FMPs if permit was transferred between issuance	1. Vessels with dual baselines may have to forego a limited access permit in order to upgrade or transfer another limited access permit..	The no action and proposed alternative are neutral with respect to all VECs, except communities. The proposed action would have a positive effect on those communities where vessel upgrading is limited by the more restrictive monkfish permit limitations (no action).

Alternative	Details	Impacts/Issues	Cumulative Effect
NFMA trawl experimental fishery Alternative 2	<ol style="list-style-type: none"> Vessels would operate under a Letter of Authorization from NMFS. Vessels could operate under the DAS set aside or exemption, if adopted under the previous section Three area/seasons identified in the GOM 	<ol style="list-style-type: none"> Primary purpose is to determine if a trawl exempted fishery can be established (under the 5% multispecies bycatch rule), and under what gear/area/season restrictions Would also provide opportunity to test the proposed trawl configuration under commercial conditions for reducing bycatch and EFH impacts. Goal II, Objective 3; Goal III; Goal V, Objectives 1 & 2 	Experimental fishery would be of relatively short duration 1-3 years, therefore, cumulative effect would not likely be significant compared to no action, except , perhaps for the fishing opportunity for vessels facing restrictions in other fisheries (positive on communities). Any action taken as a result of the experimental fisheries, however, could have a positive or negative cumulative effect on one or all of the VECs, depending on the specific actions taken.

Alternative	Details	Impacts/Issues	Cumulative Effect
Change the fishing year. Three alternatives plus no action. Based on alternatives under consideration in Multispecies Amendment 13, but Councils could choose independently from what is adopted in Amendment 13. Would require prorating of DAS during transition period; alternatives provided in next section.			
Fishing Year Alternative 2	1. Jan. – Dec.	1. Aligns fishing year with stock assessment data 2. Not as important in monkfish as in multispecies. 3. Could create staff/administrative workload issues if many plans start simultaneously	These alternatives are administrative in function and would not have a cumulative effect on the VECs.
Fishing Year Alternative 3	1. Oct. – Sept.	1. Fishing year would start at the beginning of the peak monkfish landings and price cycle	
Fishing Year Alternative 4	1. July - June	1. Fishing year would start at the low point in monkfish landings and price cycle	

Alternative	Details	Impacts/Issues	Cumulative Effect
DAS Prorating alternatives. One of the following two alternatives is only necessary if the Councils select a different fishing year under the previous set of alternatives. They do not apply if the Councils take no action on the fishing year question.			
DAS Prorating Alternative 1	1. Transition period is from May 1, 2005 to start of new fishing year. 2. Allocations based on # months in transition period divided by 12, times Amendment 2 DAS allocations	1. Shorter transition period	These alternatives are a subset of the alternatives to modify the fishing year discussed above. They are administrative in function and have no cumulative effect on any of the VECs.
DAS Prorating Alternative 2	1. Transition period is from May 1, 2005 through the next full fishing year 2. Allocations based on # months from May 1, 2005 to new fishing year start date divided by 12 times the Amendment 2 DAS allocations, plus Amendment 2 DAS allocations	1. Longer transition period, may provide greater flexibility for vessels	

Table 125 – Summary of cumulative effects of Amendment 2 non-preferred alternatives

6.7 Impact on Stellwagen Bank National Marine Sanctuary

The Gerry Studds Stellwagen Bank National Marine Sanctuary, established in 1992, is the only such area in the northeast to be so designated under the Marine Protection, Research and Sanctuaries Act (see Figure 87). The designation does not prohibit fishing, although it prohibits mining of sand and gravel and the transfer of petroleum products in the area, and it protects cultural resources (shipwrecks), and requires federal agencies considering any action in the vicinity of the Sanctuary to consult with the Secretary of Commerce.

Monkfish fishing occurs within the Sanctuary boundaries, mostly on trips using gillnets. Based on 2001 data, 5.9 percent of all directed monkfish trips were taken within the Sanctuary boundaries, of which almost 90 percent were gillnet trips (316 trips out of about 360 trips). Monkfish landings on directed trips in the Sanctuary were about 0.6 million pounds, or about three percent of all directed trip landings. (See Figure 88.)

The alternatives under consideration in this amendment are not likely to have a significant effect on the sanctuary, even if DAS are separated, considering that fishing is not an activity regulated by the Sanctuary and already occurs both inside and outside the area. The areas under consideration for a trawl experimental fishery (that could result in establishment of an exempted fishery) are outside of the Sanctuary boundary.

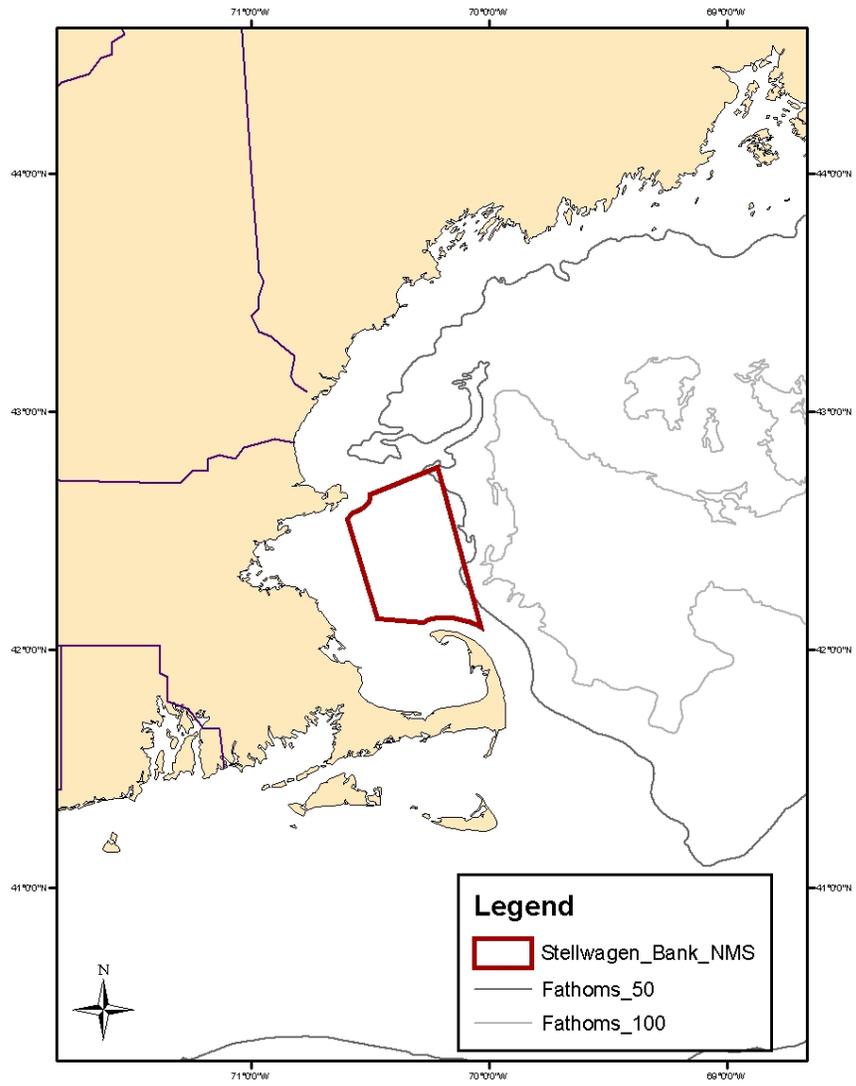


Figure 87 Location of Stellwagen Bank National Marine Sanctuary

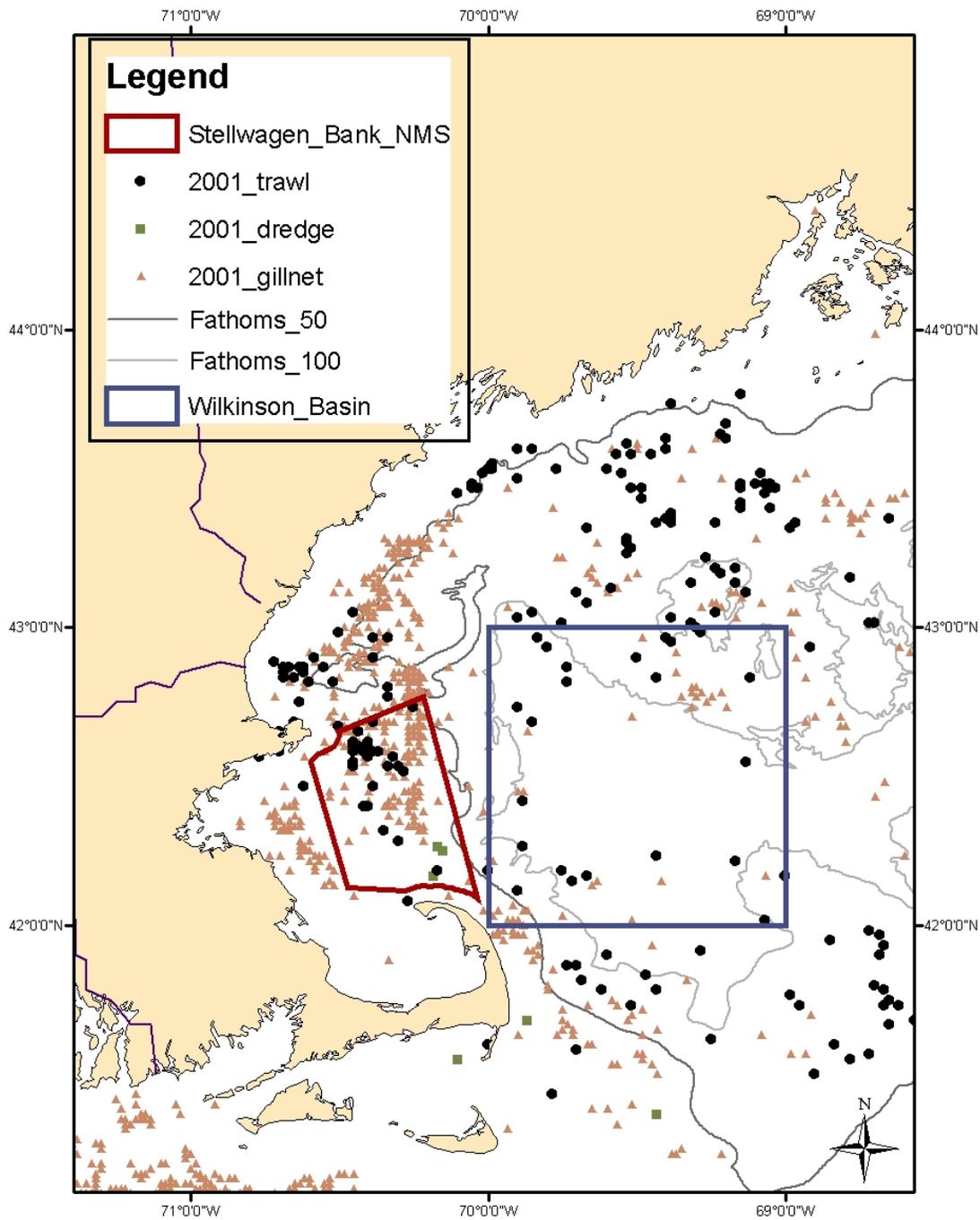


Figure 88 Directed monkfish fishing effort in the vicinity of the Stellwagen Bank National Marine Sanctuary.

Also shown is the proposed Wilkinson Basin experimental fishery area that could be designated a monkfish trawl exempted area pending the results of research.

7.0 MAGNUSON-STEVENSONS ACT CONSISTENCY

The Magnuson-Stevens Fishery Conservation and Management Act specifies ten National Standards, fourteen required provisions and several discretionary provisions to be contained in each FMP or amendment. The following discussion summarizes how this amendment complies with the Magnuson-Stevens Act.

7.1 National Standards

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The following section summarizes, in the context of the National Standards, the analyses and discussion of the proposed action that appear in various sections of this framework adjustment document.

(1) 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 does not significantly modify the stock-rebuilding program established by the original FMP and modified by Framework Adjustment 2. As noted in Section 2.7, Framework 2 implemented a streamlined procedure for setting optimum yield on an annual basis and for preventing overfishing. While the Councils initially identified a proposal to separate DAS usage requirements on permit Category C and D vessels as their preferred alternative in the DSEIS, in the final recommendation they decided to adopt the no action alternative because of concerns that the proposal would result in increased effort and potentially jeopardize the rebuilding program. The other measures proposed in this amendment do not significantly affect the stock rebuilding program.

(2) Conservation and management measures shall be based upon the best scientific information available.

Several sources of data were used in the development of Amendment 2, including the analysis of impacts. These data sources include, but are not limited to, landings data from vessel trip reports and dealer weighout reports, catch data collected in the NOAA Fisheries Observer Program, effort data collected in the DAS call-in and, where applicable, the electronic vessel monitoring system programs, fisheries independent data collected in the NOAA Fisheries bottom trawl surveys, cooperative research projects, and deep-sea corals and habitat data collected by NOAA-funded National Undersea Research Center. The Councils have determined that these are the best available scientific data, and that the analyses in this document are compliant with the Data Quality Act (see Section 8.7).

(3) 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 FMP established a two-area management program for monkfish, covering the exploitable range of the species. SARC 34 discussed the basis for assessing goosefish as a single stock, versus two stocks, and concluded that information was insufficient to make a determination on a biological basis. The SARC noted that the choice of number of management units is independent of the number of assessment units, and that the use of two management units may be required because of the characteristically different fisheries that occur in the two areas, in terms of gear,

catch composition, seasonality and other parameters. The Councils considered a single-stock approach, but rejected it for further analysis and consideration prior to the development of the DSEIS (see Section 4.2.1.1).

(4) 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 manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed action does not discriminate between residents of different states. While the FMP measures developed to achieve the conservation goals of the FMP may have a differential impact on sectors of the industry, that differential impact is not the purpose. The two-area management program is based on differences in the fisheries between the two areas, and not based on allocation of fishing privileges differently among sectors of the industry. In fact, all limited access permit holders may fish in either management area, subject to the rules that apply in each. In this amendment, the Councils propose to admit qualifying vessels for a limited access permit based on the relatively late development of the monkfish fishery at the southernmost end of the range of the fishery, and to restrict those vessels to the area where those vessels fished during the qualification period.

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

The proposed action includes a number of measures that reduce the potential for regulatory discards in fisheries where monkfish is taken incidentally, thereby promoting economic efficiency. The proposal to establish an offshore fishery program also promotes economic efficiency by allowing for higher trip landings, while maintaining an equitable per-vessel opportunity compared to non-participating vessels through an adjustment to the DAS allocations in exchange for the higher trip limits. Overall, while the FMP generally, and the proposed action in particular, may have differential impacts among different fishery groups, economic allocation is not one of the goals and objectives.

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

As noted in discussion of National Standards 3 and 4, the two-area management approach, is intended to take into account the differences in fisheries between the two areas. Other measures in the FMP, such as the permit categories and gear- and area-based incidental catch limits are also based on the wide differences among different fisheries that catch monkfish as a target or incidental catch species. The proposed action furthers the Councils' recognition of these differences, particularly the adjustments to the incidental catch limits, the establishment of an offshore fishery program, the modification of permit qualification criteria for vessels at the southernmost extent of the fishery, and the southern area roller gear restriction.

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

This amendment contains several measures that minimize costs to vessels, either directly or indirectly, such as measures that reduce discards (adjustments to the incidental catch limit and minimum fish size, and the offshore fishery program). The Councils also propose measures in this amendment that reduce administrative and enforcement costs, such as the uniform minimum fish size and the VMS requirement in the offshore fishery. This FMP does not duplicate measures or regulations implemented under other FMPs, but coordinates with them. For example, this FMP uses DAS controls in the multispecies FMP to regulate effort levels in the northern area fishery, in recognition of the overlap between the two fisheries. This FMP also applies the multispecies minimum mesh size regulations on vessels that have multispecies limited access permits who are fishing on a monkfish DAS.

(8) 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 economic impacts on such communities.

The measures proposed in this amendment are not likely to result in significant adverse impacts on affected fishing communities and, in fact, many will have a positive, but not significant impact compared to taking no action. The impact of the proposed action on fishing communities is analyzed and discussed in Section 6.5, and specifically with regards to this national standard in Section 6.5.3. This discussion concludes that “of importance to this particular management plan is the general trend toward neutral or positive outcomes”.

(9) 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 Councils propose several measures specifically intended to minimize bycatch, including regulatory discards, and a number of measures that will directly or indirectly minimize bycatch although that is not their primary purpose. The measures are listed below:

1. Adjust incidental catch limits for monkfish in other fisheries to minimize the regulatory discarding due to trip limits. (Section 4.1.1)
2. Reduce the minimum fish size for monkfish in the SFMA (Section 4.1.2)
3. Provide incentives (DAS set-aside or exemptions) to vessels to engage in cooperative research, including research on gear, fishing methods or other measures that will reduce bycatch of monkfish or other species. (Section 4.1.9)
4. Close areas of deep-water coral concentrations, Oceanographer and Lydonia Canyons (Section 4.1.8.2)

In addition to the proposed action items listed above, the Councils also considered but did not adopt several other measures that may have also had the effect of minimizing bycatch. Those measures, and the rationale for not being adopted are discussed in Section 4.2.2. They are listed here:

1. Separate monkfish DAS from multispecies and sea scallop DAS, and require large mesh on monkfish-only DAS. This action would reduce bycatch of small monkfish and other species on monkfish DAS due to the larger mesh requirements. (Section 4.2.2.1.1)
2. Reduce or eliminate the minimum fish size for monkfish (Section 4.2.2.4)
3. Implement a trawl experimental fishery in the NFMA for the purpose of establishing an exempted fishery with minimal bycatch of regulated multispecies. (Section 4.2.2.12)
4. Require monkfish trawl vessels to use a net designed to minimize the ability of the vessel to fish in areas where groundfish species are more abundant (that is, rough or complex bottom habitat), to minimize the ability of the net to catch most groundfish species (by reducing the nets ability to “herd” fish, by reducing headrope overhang, and by allowing more escapement through the larger meshes). (Section 4.2.2.9.3), and
5. Increase trawl minimum mesh size on a monkfish DAS (Section 4.2.2.3).
6. Close areas of deep-water coral concentrations, up to 12 canyons along the northeast continental shelf (Section 4.2.2.9.4.1)

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

This amendment does not substantially change the impact of the FMP on safety at sea. The requirement that vessels enrolling in the offshore fishery use electronic vessel monitoring systems, while adopted for enforcement and monitoring purposes, promotes safety by facilitating precise vessel location and two-way communications with vessels.

7.2 Required Provisions

Section 303 of the MSFCMA contains fourteen additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall:

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

This amendment modifies provisions of the FMP but does not significantly change the existing stock rebuilding program. As discussed in the previous section, this amendment is consistent with the National Standards.

(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;*

The fishery and its components, including biological, social and economic aspects, are described in the Affected Environment section of the EIS. There is no foreign fishing, and there are no known Indian treaty fishing rights.

(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;

Both monkfish stocks are in the middle of a rebuilding program implemented by the original FMP and modified by Framework 2. The status of the stocks, relative to the biomass targets is shown in Figure 11 and Figure 12. Both stocks are no longer overfished, nor rebuilt, but are progressing near (SFMA) or ahead (NFMA) of schedule to be rebuilt by 2009. Stock assessments have been unable to specify maximum sustainable yield, primarily due to a lack of historical catch data. Optimum yield, however, is specified in Framework 2 as the annual catch targets calculated to achieve the annual rebuilding biomass targets (which are based on trawl survey biomass indices). The method for that calculation is described in Section 2.7.

(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;

The monkfish fishery is in a rebuilding program that places annual limits on the amount of fish that can be harvested, that is, optimum yield. Even though the fishery is managed under a limited access program, there is sufficient harvesting capacity to take optimum yield, and, in fact, there is sufficient capacity to take additional fish, as evident from the amount of unused DAS allocated. As such, there is no amount of optimum yield available for foreign fishing. Sufficient domestic processing capacity also exists to utilize the monkfish harvested by United States vessels.

(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;

Section 5.3 of this document, Human Environment, contains a description of the fishery and processing sector. The Councils' Monkfish Monitoring Committee compiles and publishes this information annual as part of the Stock Assessment and Fishery Evaluation Report. There is no significant recreational or charter fishery for monkfish.

(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 framework adjustment mechanism established in the FMP provides the Council with the ability to change regulations to address issues such as vessel safety within the context of the fishery management program on an annual, or as needed basis.

(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;

Section 5.0, and particularly Section 5.4, contains the description of monkfish essential fish habitat, and Section 6.3 contains the habitat assessment of the proposed action and alternatives.

(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;

The Council prepares annually a Stock Assessment and Fishery Evaluation (SAFE) Report. Section 5.0 of this document contains the information and data for the 2002 fishing year that is usually provided in the SAFE Report. The 2003 SAFE Report will be incorporated into the documents supporting the annual adjustment for the 2005 fishing year to be submitted by January, 2005.

(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;

The impacts of the proposed action and alternatives, including cumulative impacts, impacts on the physical and human environments are discussed in Section 6.0 of this document.

(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;

Framework 2 implemented revisions to the threshold biomass reference point that better align the FMP with NMFS' national standards guidelines. Since both monkfish stocks were overfished at the time the FMP was implemented in 1999, the current management program is designed to rebuild the stocks to target biomass levels by 2009. The program that includes objective and measurable criteria for determining annually the status of the stocks is described in Section 2.7.

- (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;*

NMFS currently has in place extensive reporting requirements for all vessels participating in the Federal monkfish fishery, including requirements to report all bycatch. In addition, NMFS increased observer coverage to the 10 percent level for the Northeast (NE) multispecies fishery, which substantially overlaps the monkfish fishery particularly in NFMA, for the 2004 fishing year as mandated by Congress in the budget appropriation for Fiscal Year 2004. NMFS has recently determined that 5 percent observer coverage on all trips fished under a NE multispecies DAS would provide sufficiently robust statistical data to assess and estimate the amount and type of bycatch of regulated species in the NE multispecies fishery. As a result, NMFS intends to maintain observer coverage in the NE multispecies fishery at a minimum level of 5 percent in future years, absent a similar budget appropriation requiring a greater level of observer coverage.

To the extent that vessels have on board a NMFS observer while fishing for monkfish on a multispecies DAS, the increase in observer coverage in the NE multispecies fishery will provide an increase in data on bycatch in the monkfish fishery. Additionally, VMS would be mandatory in the Offshore Fishery Program. Since VMS allows the tracking of predominant fishery locations, coordination of this information with observer coverage may allow for more accurate bycatch assessment and projection. Also, the Study Fleet Pilot Program can provide another source of bycatch information for the different gear types and areas. The Study Fleet Pilot Program is designed to enhance fishery-dependent data necessary for management decisions through the development of electronic reporting technology. The pilot project initially placed NMFS personnel and contracted individuals on board 15 vessels to work with the captain and crew in determining how electronic reporting devices can be integrated in to their fishing operations. Phase Two of the pilot project has been expanded to involve a total of 30 vessels.

On March 6, 2003, NMFS unveiled a national bycatch strategy aimed at further reducing bycatch through fishing gear improvements, standardized reporting, and education and outreach. One objective of the national bycatch strategy is to develop a national approach that standardizes bycatch reporting. This program will also assess regional progress toward meeting national bycatch objectives and strategies. As part of this national bycatch strategy, each Regional Office of NMFS was tasked with producing regional implementation plans and timelines to implement the national bycatch goal. The Northeast Regional Office (NERO) of NMFS unveiled its regional bycatch plan entitled "Current Bycatch Priorities and Implementation Plan" on November 28, 2003. As part of this plan, NERO in conjunction with the New England and Mid-Atlantic Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and the Northeast and Mid-Atlantic Sea Grant programs, sponsored the Northeast Regional Bycatch Workshop on June 29 – July 1, 2004. The proceedings from this workshop are available from NERO, and online at <http://www.nero.noaa.gov/nero/hotnews/index.html>.

For the reasons noted above, and given the fact that NMFS is approaching the bycatch issue on a national level versus on a fishery-by-fishery basis, the Councils determined that is not appropriate or practicable to implement a significantly new or expanded reporting methodology focused just on the monkfish fishery through this amendment. Therefore, no additional specific

bycatch monitoring alternatives are being recommended in Amendment 2. However, the Councils recommend that further observer coverage aimed specifically at the monkfish fishery be established at a level sufficient to characterize the amount and type of bycatch in this fishery consistent with NMFS' development of bycatch monitoring strategies.

Measures proposed in this amendment to minimize bycatch and/or bycatch mortality are discussed in the previous section under National Standard 9.

(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;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch data.

(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;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch and vessel data. Commercial fishery sectors are described in the Affected Environment section of the EIS accompanying the original FMP and updated in the Affected Environment Section of this SEIS (Section 5.0).

(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.

As noted under the discussion of National Standard 4 in the previous section, while regulations may have a differential impact on different sectors of the industry, that differential impact is not the purpose, and is done in a manner that is intended achieve the conservation and rebuilding goals of the FMP. The two-area management program is based on differences in the fisheries between the two areas, and not to allocate fishing privileges differently among sectors of the industry.

8.0 CONSISTENCY WITH OTHER APPLICABLE LAW

8.1 National Environmental Policy Act (NEPA)

8.1.1 Introduction

This SEIS addresses the requirements of NEPA to fully consider the impact of proposed actions on the quality of the human environment, consistent with NOAA's policies and guidelines as described in Administrative Order 216-6, as well as subsequent guidance provided at the regional level by NMFS' staff. In addition to the analyses and discussion throughout the rest of this document, this section contains the specific EIS elements not addressed in other sections, such as identification of areas of controversy and issues to be resolved, if any. This document contains some changes from the DSEIS, reflecting the Councils' selection of proposed action and

rationale for rejection/selection of particular alternatives. This document also incorporates additional analyses to address public comment on the DSEIS, as well as a complete set of public comments received and the Councils' response (Appendix III).

Based in part on the issues identified during scoping, this EIS includes an evaluation of the effects of fishing on EFH and an analysis of alternatives to minimize to the extent practicable the adverse effects on EFH from fishing. The EIS considers and evaluates alternatives to minimize adverse effects to the extent practicable and include consideration of measures such as closed areas, effort reductions and gear modifications.

The analysis considers the no-action, along with a range of other reasonable alternatives. Information from the original FMP and the EA for Amendment 1 is reflected in this analysis. However, additional information and the selection of alternatives come from a review of the best scientific information available, including new information made available since the fishery management plan amendments were originally completed.

Section 5.0 of the EIS describes the affected biological, physical and human environment. This includes a discussion of the areas and habitat types in the area that EFH is designated. The section's description of the affected environment details the physical and biological resources affected by the alternatives, including a description of the Atlantic Coast shelf ecosystem, benthic habitat, fishery activity and relevant biological resources with an emphasis on benthic organisms.

Section 5.4 includes an evaluation of gear effects on EFH. Specifically, the section describes the gears used, distribution and use of the different gears, the types of gear effects, the vulnerability of the EFH to the gear type and a determination of the adverse effects of gears on EFH.

Section 4.1.8 describes the alternatives for minimizing the adverse effects of fishing on EFH. The section discusses significant issues associated with each alternative including those identified during scoping. The discussion of each alternative for minimizing the effects of fishing on EFH describes the associated fishery management measures. This section concludes with a discussion and explanation of alternatives that were considered but not carried forward for further analysis. The description of alternatives provides a broad summary and comparison of each alternative.

Section 6.0 contains the analysis and discussion of the environmental consequences of the proposed action and alternatives. Specifically, Section 6.3 describes the environmental consequences of each alternative for minimizing the effects of fishing on EFH. For each alternative to minimizing adverse effects of fishing on EFH, the chapter describes the practicability of the associated fishery management measures and evaluates the environmental consequences in relation to effects on EFH, the fishery, other fisheries, and protected resources. The discussion of potential impacts resulting from each alternative is presented in comparative form that clearly distinguishes the environmental consequences of each alternative. The discussion includes a description of the conservation benefits and the adverse impacts of the alternatives.

Appendix II and other parts of this document also include material to satisfy the requirements of the NMFS guidelines at 50 CFR part 600, Subpart J for mandatory requirements of an FMP to:

1. Identify any fishing activities that are not managed under the MSA that may adversely effect EFH.
2. Identify activities other than fishing that may adversely effect EFH. For each activity, the FMP should describe known and potential adverse effects to EFH.
3. Identify actions to encourage the conservation and enhancement of EFH, including recommended options to avoid, minimize, or compensate for the adverse effects, especially in HAPCs.
4. List the major prey species for the species in the fishery management unit and discuss the location of prey species' habitat. Consider adverse effects on prey species and their habitats that may result from actions that reduce their availability, either through direct harm or capture, or through adverse effects to prey species' habitats.
5. Recommendations, in priority order, for research effects necessary to improve upon the description and identification of EFH, the identification of threats to EFH from fishing and other activities and the development of conservation and enhancement measures for EFH.
6. Conduct a cumulative impact analysis that describes impacts on an ecosystem or watershed scale (Cumulative effects of multiple gear types is included in the Gear Effects Evaluation Section)

8.1.2 Scoping

The Councils distributed a scoping document on November 15, 2001 to approximately 400 interested parties and members of the press, and published a Notice of Intent to prepare an SEIS and formally initiate scoping on December 10, 2001 (66 *FR* 63666). In addition to written scoping comments, the Councils received oral comment at a Monkfish Oversight Committee meeting on January 14, 2002, the NEFMC meeting on January 15, and the MAFMC meeting on January 30.

In April 2002, a member of the NEFMC staff visited several ports in the southern range of the fishery to gather information on the fishing communities in the area and take comments from members of the industry there. While not formal scoping hearings, the information collected contributed to the formulation of alternatives and identification of issues considered in this amendment, particularly those pertaining to the revision of the limited entry provisions. Those meetings took place as follows: Point Pleasant, NJ (4/19); Barnegat Light, NJ (4/19); Cape May, NJ (4/21); Wanchese, NC (4/25); Chincoteague, VA (4/26); and Ocean City, MD (4/26).

The Councils held supplemental scoping hearings (67 *FR* 54609, August 23, 2002), specifically to take additional public comment on the proposals to modify the limited entry qualification criteria on September 11 (in Providence, RI and Manteo, NC) and September 12 (in Chincoteague, VA), 2002.

NMFS published a Notice of Intent (NOI) to prepare a supplemental EIS for the EFH components of the Northeast Multispecies and Atlantic Sea Scallop Fishery Management Plans on February 1, 2001 (66 FR 8568). While not specifically addressing the Monkfish FMP, the process is relevant to this amendment given the close connection between multispecies and scallop fishing and monkfish fishing, and the significant overlap of vessels permitted in the three fisheries. The public comment period was open until April 4, 2001. NMFS (and/or the Council) solicited public comment to identify a range of alternatives for identifying and describing EFH and HAPCs and requested information on adverse effects of fishing activities on EFH and HAPCs. NMFS (and/or the Council) solicited public comment on appropriate management measures and alternatives to minimize, to the extent practicable, any adverse effects of fishing on EFH. NMFS (and/or the Council) held 1 public scoping meeting. The meeting occurred in Gloucester, MA on February 22, 2001. No scoping comments were submitted on essential fish habitat issues.

Following the formal scoping period, during the development of Amendment 2, the Councils received a number of comments at Council and Monkfish Committee meetings that were addressed in the DSEIS, even though they had not been raised during the scoping period. Among these was the matter of protecting deep-sea coral habitats which resulting in the inclusion of alternatives proposed and adopted for closing such areas. During the period between scoping and completion of the DSEIS, the Councils implemented Framework 2, to address the rebuilding issues identified during the scoping period that required immediate attention because of the impending default measures in the original FMP that would have unnecessarily shut down the directed monkfish fishery. Also during the period between scoping and completion of the DSEIS, the NEFMC developed and implemented important amendments to the Multispecies (Amendment 13) and Sea Scallop (Amendment 10) FMPs, as well as several framework adjustments to those plans. These actions directly affected vessels fishing for monkfish, and were considered in the selection of final measures proposed in this amendment.

8.1.3 Areas of Controversy

Based on the public comment received on the DSEIS, as presented and summarized in Appendix III, the Councils have concluded that there are no areas of controversy in the proposed action. As reflected in those comments, the alternative that would have separated monkfish DAS usage from multispecies and scallop DAS usage requirements (Decision 1, Appendix I) was the only controversial proposal in the DSEIS, and the Councils did not adopt it, even though it was originally their preferred alternative.

8.1.4 Issues to be Resolved

This section will be completed for the final EIS based on comments received on the DSEIS. Several issues have been identified, however, during the development of this amendment that will be addressed in the future under separate action, and are described below.

8.1.4.1 Measures to minimize fishery interactions with sea turtles

The Councils considered including in this amendment alternative approaches to the sea turtle protection measures implemented by NMFS under the authority of the Endangered Species Act for the large mesh gillnet fishery in the southern end of the range. But, as indicated in Section 4.1.6.2, the development of specific measures, depended on the completion of analysis sea-surface temperature data and other analyses that were not done in time to be included in this

amendment. Therefore, no specific measures are proposed for Amendment 2 at this time, but the Councils may take action in the future under the framework adjustment process.

8.1.4.2 Essential Fish Habitat requirements

In addition to the actions being considered in this amendment to minimize the impact of the monkfish fishery on EFH, a number of other Magnuson-Stevens Act requirements (as outlined in NMFS' guidelines) remain to be addressed. In the March 2003, the NEFMC initiated a Habitat Omnibus Amendment that will be considered as Amendment 3 to the Monkfish FMP, as well as Amendment 14 to the Multispecies FMP, Amendment 11 to the Sea Scallop, Amendment 2 to the Herring FMP, and Amendment 1 to the Skate, Red Crab, and the Atlantic Salmon FMPs. This Omnibus Amendment will be driven by the following Council-approved goals and objectives:

GOALS:

1. Redefine, refine or update the identification and description of all EFH for those species of finfish and mollusks managed by the Council, including the consideration of HAPCs;
2. Identify, review and update the major fishing activities (MSA and non-MSA) that may adversely affect the EFH of those species managed by the Council;
3. Identify, review and update the major non-fishing activities that may adversely affect the EFH of those species managed by the Council;
4. Identify and implement mechanisms to protect, conserve, and enhance the EFH of those species managed by the Council to the extent practicable;
5. Define metrics for achieving the requirements to minimize adverse impacts to the extent practicable;
6. Integrate and optimize measures to minimize the adverse impacts to EFH across all Council managed FMPs;
7. Update research and information needs;
8. Review and update prey species information.

OBJECTIVES:

- A. Identify new data sources and assimilate into the process to meet goals (state, federal and other data sources);
- B. Implement review of existing HAPCs and consider modified or additional HAPCs ;
- C. Review EFH designations and refine or redefine where appropriate as improved data and analysis become available;

- D. Develop analytical tools for designation of EFH, minimization of adverse impacts, and monitoring the effectiveness of measures designed to protect habitat;
- E. Modify fishing methods and create incentives to reduce the impacts on habitat associated with fishing;
- F. Support restoration and rehabilitation of fish habitat which have already been degraded (by fishing and non-fishing activities);
- G. Support creation and development of fish habitat where appropriate and when increased fishery resources would benefit society;
- H. Develop a strategy for prioritizing habitat protection;
- I. Develop criteria for establishing and implementing dedicated habitat research areas;
- J. Design a system for monitoring and evaluating the benefits of EFH management actions including dedicated habitat research areas.

8.1.5 LIST OF PREPARERS

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PDT- Monkfish Plan Development Team

HPDT- Habitat Plan Development Team

NEFMC – New England Fishery Management Council

MAFMC – Mid-Atlantic Fishery Management Council

NERO – NMFS Northeast Regional Office

NEFSC – Northeast Fishery Science Center

8.1.6 SEIS CIRCULATION LIST

The Councils and NOAA Fisheries distributed the DSEIS and “Dear Reviewer” letter to the following agencies for review:

Agency	Address
EPA – Boston Regional Office	Mr. Ira Leighton, Regional Administrator Environmental Protection Agency One Congress Street Boston, MA 02114-2023
EPA – New York Regional Office	Ms. Jeanne M. Fox, Regional Administrator Environmental Protection Agency 290 Broadway, 26 th floor New York, NY 10007
EPA – Philadelphia Regional Office	Mr. Stanley Laskowski Director of Environmental Services Division Environmental Protection Agency 1650 Arch Street Philadelphia, PA 19103-2029
EPA – Atlanta Regional Office	Mr. John H. Hankinson, Jr., Regional Administrator Environmental Protection Agency 61 Forsyth Street, SW Atlanta, GA 30303
Marine Mammal Commission	Mr. David Cottingham Executive Director Marine Mammal Commission 4340 East-West Highway, Room 905 Bethesda, Maryland 20814
Atlantic States Marine Fisheries Commission	Mr. John V. O’Shea Executive Director Atlantic States Marine Fisheries Commission 1444 Eye Street, N.W. 6th Floor Washington, D.C. 20005
U.S. Coast Guard – First District Commander	Commander First Coast Guard District (OLE) Coast Guard Building 408 Atlantic Avenue Boston, Massachusetts 02110-3350
U.S. Coast Guard – Fifth District Commander	Commander Fifth Coast Guard District (OLE) Federal Building 431 Crawford Street Portsmouth, Virginia 23704-5004
U.S. Dept. of State	Mr. William Gibbons-Fly Director, Office of Marine Conservation Department of State Washington, D.C. 20520

In addition, copies were distributed on request to interested members of the public, and were available on the NEFMC website.

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8.1.8 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 or 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.

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. (*AIIn@* 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. For monkfish, B_{threshold} was specified in Framework 2 as 1/2B_{Target} (see below).

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy, and was set in the original Monkfish FMP as the median of the 3-yr. running average of the 1965-1981 autumn trawl survey biomass index.

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 is not 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.

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.

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.

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.

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 time allocated by an FMP to vessels on which the vessel can exceed any incidental catch limit for the species managed by that FMP .

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.

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, the outer limit of which is 200 nautical miles from the Territorial Sea baseline (usually the shoreline) over which the U.S. government exercises jurisdiction over resources and other maritime activities.

Exempted 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).

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. Framework 2 established F_{MSY} as the 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.

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.

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 (or Larval) 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.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

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.

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 Nematoda, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemertean: 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 condition 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.

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.

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 $B_{\text{threshold}}$ (defines overfished) and $F_{\text{threshold}}$ (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

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.

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 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.

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.

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

8.2 Regulatory Impact Review

This section addresses the requirements of Executive Order 12866 and the Regulatory Flexibility Act.

8.2.1 Executive Order 12866

E.O. 12866 requires a review of proposed regulations to determine whether 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, or the principles set forth in the Executive Order.

Of these four criteria, the following discussion focuses only on the expected magnitude of the economic impacts of the proposed action. While a summary of these impacts is provided here, a more detailed discussion appears in Section 6.4.1.

The proposed action would implement a number of changes to the monkfish fishery, some technical in nature and some more administrative. Changes in the incidental catch limit for vessels fishing with small mesh, scallop and clam dredge vessels, and summer flounder vessels fishing west of 72°30' W are proposed, which would reduce the amount of monkfish being discarded while enhancing economic opportunities. A proposed change in the minimum fish size in the southern management area would also work towards this goal. Economic analysis provided in Section 6.4.1 finds that using FY2001 data the maximum revenue gain from the proposed changes to incidental trip limits would be just over \$500,000. It is not possible to assess accurately the economic benefit of the change in minimum fish size without detailed information on the size distribution of the commercial catch in both areas.

Elimination of the requirement for limited access vessels to take a 20-day block out of the fishery is proposed, which will provide vessels with greater flexibility in deciding when to fish for monkfish. Another change that may assist vessels in using their available time more wisely is the proposed establishment of an offshore SFMA fishery. Economic opportunities would be restored for some vessels fishing south of 38° 20'N under the proposed modification of permit qualifications for these vessels. It is possible that the addition of these vessels will have an impact on the trip limits for other vessels fishing in the SFMA since the TAC would be distributed over an increased number of vessels, but the economic impact from this change cannot be accurately estimated.

Additions to the list of actions that may be considered under the framework adjustment procedure are also proposed, but these changes are administrative in nature and do not entail economic impacts. Vessels issued a High Seas Fishing Compliance permit and fishing in the NAFO regulatory area would be freed from the regulatory burden of compliance with EEZ regulations under the proposed exemption program. While the economic impact of this change is likely to be positive due to the regulatory relief afforded, the magnitude of the impact cannot be estimated.

Measures to minimize the impact of the monkfish fishery on EFH are also proposed. Trawl roller gear would be limited to a diameter of six inches for vessels fishing on a monkfish DAS in the SFMA, and Oceanographer and Lydonia Canyons would be closed to monkfish vessels. The economic effect of the canyon closures is estimated to be zero since no trips took place in the closure area during 1999 and 2001, while the impact of the change in roller gear diameter is mitigated since most vessels fishing in the SFMA already use this size.

Two alternatives for facilitating cooperative research programs are proposed, a research DAS set-aside and a DAS exemption program. While it is possible that vessels using their full allocation of DAS and not participating in these programs will lose fishing opportunities, the change is distributional in nature since vessels participating in such programs may see an increase in their fishing opportunities, and vessels not using their full allocation will not be affected. Finally, elimination of the dual vessel-upgrading baseline applying to a vessel modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit is proposed. The vessel's baseline would be that which applied when the vessel received its original federal permit. This change would not have an immediate economic impact on a vessel's ability to earn fishing income since no proposed measures are tied to the physical dimensions of the vessel.

Overall, the economic effect of the proposed measures will be to increase flexibility in monkfish trip planning and scheduling while providing participants with greater opportunities to retain monkfish. While there may be some short-run costs associated with some of the measures, the protection afforded to EFH and the potential benefits to stock rebuilding can be reasonably expected to contribute to the recovery of the stock. As stock size increases and it becomes possible to ease restrictions on fishing for and the retention of monkfish, both consumers and producers will see economic benefits. Profits for fishing vessels should increase as they are permitted to retain more monkfish while using fewer inputs. This should be at least somewhat offset by reductions in the price received for monkfish as the market supply increases, but the efficiency gains can be expected to lead to greater profitability. As supply increases, the price of monkfish for consumers will also decrease, so they will also benefit. The magnitude of these changes and their distribution between consumers and producers will depend on the slope of the demand and supply curves, but it is reasonable to assume that these changes will be positive from a net national benefit standpoint.

The aggregate economic impact of the proposed measures would not rise to the \$100 million threshold for a significant action. As discussed above, using FY2001 data the maximum revenue gain from the proposed changes to incidental trip limits would be just over \$500,000. While accurate assessment of economic benefits for changes to the other proposed measures is not possible due to data limitations or the nature of the changes, these changes would be reasonably

expected to have only a small economic impact. Therefore, the proposed action is not significant for purposes of E.O. 12866.

8.2.2 Regulatory Flexibility Act

The proposed actions would provide regulatory relief to small fishing vessels participating in the monkfish fishery. In 2001, there were 723 monkfish limited access vessels, 687 of which were participants during FY2001. In addition, there were 1977 incidental catch permits, 1023 of which participated in the fishery. Under the SBA size standards for small fishing entities (\$3.5 million), all of the participating vessels are considered small, as gross sales by any entity do not exceed this threshold.

The proposed actions will affect differing numbers of current and potential participating vessels within the fishery. For this reason, the discussion below addresses each proposed action separately, identifying where possible the conditions under which vessels may participate, the potential number of affected entities, and an assessment of the possible economic impacts. Since the economic impacts of the proposed action and non-preferred alternatives are discussed in detail in Section 6.4, this section provides only a summary of these impacts.

8.2.2.1 Incidental catch trip limit

Using FY2001 VTR records, the change to the trip limit for incidental catch would affect 835 trips by 112 vessels, providing these small entities an opportunity to retain more monkfish than under current conditions. Since the proposed change represents an increase over current trip limits, it is impossible to provide a precise estimate of the economic benefit provided by the change, however, an upper bound estimate of the economic benefit can be calculated by assuming that all trips would retain the maximum allowable limit. Using the average 2001 monkfish price of \$2.53 per lb., the maximum revenue gain would be \$192,000, an average benefit of \$1,700 in gross fishing revenue for the 112 vessels that would benefit.

Under the non-preferred alternative that would have increased the maximum amount of monkfish that could be retained by extending the maximum trip duration to 10 days over which the benefits could accrue, the maximum revenue gain for the 112 affected vessels would increase to \$322,000, an average benefit of \$2,900 per vessel.

8.2.2.2 Incidental catch trip limit – general category scallop dredge and clam dredge vessels

Based on FY2001 VTR data, 1,620 trips by 52 vessels would potentially be affected by the proposed change to the incidental catch limit for general category scallop and clam dredge vessels. Most of these trips were 24 hours or less and nearly all were less than 48 hours. Thus, the maximum benefit from a 50 lb. trip limit would be \$204,000, again using the average 2001 monkfish price of \$2.53 per pound. This maximum benefit assumes that catch rates on every trip would be at least 50 lbs., which is unlikely since the median landings on incidental landings were only 25 lbs. At this median level, the revenue gain would be approximately \$102,000, an average of just under \$2,000 per vessel. The proposed incidental trip limit would provide only a modest increase above this level since few general category scallop or clam dredge trips are more than 24 hours, and nearly all are less than 48 hours. Assuming median landings, the maximum benefit would be only \$10,250 more than that of the 50 lb. incidental trip limit.

8.2.2.3 Incidental catch trip limit – summer flounder vessels west of 72°30'W

Based on FY2001 VTR records, the proposed change to the incidental catch limit for summer flounder vessels would affect 114 vessels. Using these VTR records, an estimate of the potential revenues that would be restored to these vessels can be calculated. Adjusting the observed monkfish landings by the current incidental catch limit of 50 lbs. per trip, the average annual restored landings per vessel would be 326 lbs., translating to \$825 per vessel at the average 2001 monkfish price per pound of \$2.53. However, the impact varies greatly across vessels, ranging from no impact for vessels without an observed trip exceeding 50 lbs. to almost \$10,000.

8.2.2.4 Minimum fish size

The proposed change to the minimum fish size affects only vessels that fish in the SFMA, since the minimum size will now be uniform between the 2 management areas, at the current size restriction in the NFMA. Thus, for FY2001 the 170 vessels that fished in the SFMA only would face reduced regulatory burden as well as increased economic opportunities. The 73 additional vessels that chose to fish in both management areas would also benefit, though only on the trips they take to the SFMA. However, as was noted above, without detailed information on the size distribution of the commercial catch in both areas an accurate assessment of the economic benefit that will accrue to each vessel is not possible.

Other non-preferred alternatives for minimum fish size included a uniform 10-inch minimum tail size, eliminating the minimum size requirement, and an alternative that was contingent on the adoption of a monkfish-only DAS program and would have applied a different minimum size when the vessel was on a monkfish-only DAS. As with the proposed change, it is impossible to estimate with any accuracy the economic benefit of these alternatives without information on the size distribution of the catch. However, the 10-inch minimum tail size option would have increased economic opportunities for all vessels fishing for monkfish, and eliminating the minimum size would have provided for the greatest economic opportunity for vessels participating in the monkfish fishery. The alternative that was contingent on the non-preferred monkfish-only DAS program could possibly have resulted in losses in economic opportunity for vessels fishing in the NFMA on a monkfish-only DAS.

8.2.2.5 Closed season or time out of the fishery

The proposal to remove the 20-day block out of the fishery requirement would result in a reduction in regulatory burden compared to current conditions for the 45 Category A and B monkfish limited access vessels. Currently, category C & D vessels also holding a scallop permit do not face this requirement, and those holding a multispecies permit, are required to take a 20-day block under the Multispecies FMP. However, the extent of the regulatory relief provided by the removal of this requirement is unknown. The 20-day block out of the fishery only means that vessels cannot call in a monkfish DAS. The vessels are still able to fish in other fisheries and retain monkfish up to the bycatch limits for those fisheries. Since the 20-day block may be taken at any time during the prescribed period, vessels can choose the block they expect to be the most advantageous. Nonetheless, as was earlier noted, removal of this requirement does afford the vessels greater flexibility in choosing when to fish for monkfish and when to fish for other species.

The non-preferred alternative would have doubled the current 20-day block to 40 days where vessels could choose to take the entire 40 days consecutively or as two 20-day blocks. This

change would have placed a greater burden on trip scheduling and planning since weather can be quite variable during the season. While the economic impacts are unclear, this alternative would have been more burdensome than the no action alternative in a relative sense.

If monkfish DAS had been separated, scallop vessels would also have been required to take time out of the monkfish fishery. This would have represented a change from the flexibility currently available to scallop vessels, but the impact may not have been substantial since scallop vessels would more likely be engaged in a directed scallop fishery than a monkfish fishery due to improvements in the scallop resource. Further, if scallop vessels took advantage of separated monkfish DAS to take a monkfish-only trip, they would be more likely to take such a trip during the fall and early winter months when monkfish prices are peaking. Therefore, there would not likely have been an adverse impact on scallop vessels from the time-out requirement.

8.2.2.6 Offshore SFMA fishery

The proposed offshore SFMA monkfish fishery program would be voluntary and would allow vessels to use their available fishing time more efficiently by effectively increasing the amount of monkfish that could be retained per DAS. Over a fishing season, a vessel participating in the program could potentially achieve higher profitability because more monkfish could be retained using fewer overall inputs. While VMS would be required for participating vessels and vessels currently not having VMS would have to bear the cost of installation, each individual would be able to weigh the benefits and costs of participating in the program.

8.2.2.7 Modification of permit qualifications for south of 38°00'N

Economic opportunities would be restored for some vessels fishing south of 38° 00'N under the proposed modification of permit qualifications for these vessels. It is possible that the addition of these vessels will have an impact on the trip limits for other vessels fishing in the SFMA since the TAC would be distributed over an increased number of vessels, but this economic impact from this change cannot be accurately estimated. Preliminary estimates indicate that 5 additional vessels would qualify for a limited access monkfish permit under the proposed action, while the non-preferred alternatives for qualification criteria would have granted permits to either 3 or 7 vessels. From January 1, 1995 to the implementation date of the FMP in November, 1999, these 5 vessels averaged approximately \$78,000 in revenues from monkfish, out of total revenues of \$480,000 for the period.

8.2.2.8 Modifications to the framework adjustment procedure

The proposed action would modify the framework adjustment process, expanding the list of frameworkable measures to include transferable monkfish DAS, measures to minimize impact on protected species, and requirements to use bycatch reduction devices. While the individual frameworkable measures have associated economic impacts and regulatory burdens, adding these measures to the list of actions that can be taken under the framework adjustment process is administrative in nature and does not affect the current situation faced by any participant in the fishery. The economic impact of each measure will be analyzed in the associated framework action, should the measures be given further consideration by the Councils.

8.2.2.9 NAFO regulated area exemption program

The proposed action would exempt anyone fishing in the NAFO regulatory area from EEZ regulations. Vessels would be assumed compliant with NAFO regulations and would be issued a

High Seas Fishing Compliance permit, relieving participating vessels from dual compliance with both NAFO and EEZ regulations. While this will provide vessels with greater flexibility compared to current regulations, the economic impact of this change cannot be estimated since the extent that current regulations inhibit domestic vessels from participating in the NAFO Regulatory Area is unknown. However, this reduction in regulatory burden would be likely to have a positive economic impact since the EEZ measures are more restrictive than their NAFO counterparts.

8.2.2.10 Measures to minimize fishery impact on EFH

It is impossible to calculate the economic impacts of the proposed actions to minimize the impact of the monkfish fishery on EFH using available data. Restricting the trawl roller gear diameter to a six-inch maximum for vessels fishing on a monkfish DAS in the SFMA may have some short-term negative economic on some vessels, since vessels using non-conforming gear will be required to bear the cost of making the necessary change. However, this roller gear diameter is already used by most vessels in the SFMA, thus reducing the potential impact, although the effect is not quantifiable since the number of non-conforming vessels cannot be determined.

The economic effect of the proposed closure of Oceanographer and Lydonia Canyons to monkfish vessels was estimated by identifying the fishing activity taking place within the areas using the position coordinates provided in VTRs for calendar years 1999 and 2001. No trips were identified as having taken place within the proposed closure area, so based upon this analysis the economic effect of the closure would be zero.

Among the non-preferred alternatives were measures to change the trawl configuration and a proposal to close up to 12 large, steep-walled canyons. The proposed changes to the trawl configuration could have had some short-term negative economic effects depending on the trawl configuration chosen and the management area in which the configuration would have applied. Vessels would have borne the cost of changes to any non-conforming gear, and vessels may not have been able to fish in certain areas. Using 2001 VTR data, closing the 12 canyons would have affected between 3 and 24 trips depending on the option chosen, so this alternative would have been more burdensome than the chosen alternative.

8.2.2.11 Cooperative research programs funding

The economic impacts of the changes to the cooperative research programs funding would be at most redistributive in nature. The 500 DAS set-aside that will be established will be drawn equally from the DAS allocations of all monkfish vessels. Thus, monkfish vessels that use their full allocation of DAS and do not participate in research projects will experience a loss in fishing opportunities, while other vessels could expand their fishing opportunities through participation in such projects. Vessels not using their full allocation of DAS will not be affected.

8.2.2.12 Clarification of vessel baseline history

Clarification of vessel baseline would not have an immediate economic impact on a vessel's ability to earn fishing income in the monkfish fishery, since no proposed measures are tied to the physical dimensions of the vessels. However, the value of the vessel could be affected depending on whether the baseline is higher or lower than the current monkfish baseline, and there may be implications for the pool of trading partners should a DAS leasing program be developed.

8.2.2.13 Other non-preferred alternatives.

Several alternatives that were considered by the Councils but not adopted do not appear in the preceding discussion. There was a proposal to modify the requirement that monkfish vessels also holding a scallop or multispecies limited access permit must use a scallop or multispecies DAS while fishing on a monkfish DAS. Another proposed change was to the minimum trawl mesh size on directed monkfish DAS. A NFMA monkfish trawl experimental fishery was proposed. Finally, there was a proposal to change the fishing year for monkfish. The economic impacts of these non-preferred alternatives are discussed below.

8.2.2.13.1 Monkfish DAS usage by scallop and multispecies limited access permit holders

The economic impact of separating DAS on the 328 Category C and 334 Category D permit holders would have depended on whether they held a multispecies or scallop permit and where they fish or plan to fish. Overall, separation of DAS would not make any vessel worse off than under the no action alternative, since all vessels would have the option to fish under current regulations rather than under separated DAS. The economic impact, therefore, was likely to have been positive or at worst neutral relative to the no action alternative. However, this assumes that the overall effort level within the monkfish fishery would not have changed because of the DAS separation. If vessels that were previously not active in the fishery became so due to separated DAS, the trip limits and DAS allocated to currently active vessels would have to be reduced proportionally to maintain the same overall level of effort. In this case, the economic opportunities of current participants in the fishery could have been reduced.

8.2.2.13.2 Minimum trawl mesh size on directed monkfish DAS

Had any of the mesh alternatives been adopted, vessels would have been required to replace any nonconforming gear to the appropriate configuration. Since the alternatives would have applied only to trawl gear, the economic effects would have been felt only by vessels using large mesh otter trawls.

8.2.2.13.3 NFMA monkfish trawl experimental fishery

If the experimental fishery had been approved, vessels would have been able to retain both their groundfish and monkfish catch while engaged in the experiment. Had the experiment proven successful, an exempted trawl fishery could have been established allowing a larger number of vessels increased fishing opportunities under DAS separation. Since DAS separation was rejected, there would be little economic benefit for trawl vessels to use larger mesh since they would be better off using groundfish gear and fishing with no trip limit in the NFMA.

8.2.2.13.4 Change fishing year

While one of the proposed options would have increased the cost of applying for and administering renewals of permits by putting monkfish at odds with the renewal schedule of every other FMP in the Northeast, this non-preferred alternative would have had limited economic impact.

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 Councils have concluded that while most of the measures proposed in this amendment will have no impact on fishery interactions with protected species, some potential negative impacts may result from eliminating the closed season and modifying the permit qualification criteria for vessels fishing in the southernmost range of the fishery. Conversely, the Councils have concluded that the offshore fishery program may have a positive effect on fishery-protected species interactions as a result of the reduced DAS allocations to participating vessels. The Councils expect these impacts, positive or negative, will not be significant and the overall effect of the proposed amendment and the prosecution of the monkfish 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. The Councils are seeking the concurrence of NMFS in this matter. For further information on the potential impacts of this fishery and the proposed management action on listed species see Sections 5.1.7 and 6.2.3 of this document.

8.4 Marine Mammal Protection Act

The Councils have reviewed the impacts of the Monkfish FMP and this amendment on marine mammals, and have concluded that the management actions proposed are consistent with the provisions of the MMPA are not likely to produce negative impacts beyond the status quo, and will not alter any existing measures to protect the species likely to inhabit the monkfish fishery management unit. For further information on the potential impacts of the fishery, and the proposed management action on marine mammals, see Sections 5.1.7 and 6.2.3 of this document.

8.5 Coastal Zone Management Act

The Council has made an initial determination that the proposed action is consistent to the maximum extent practicable with the approved coastal management programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This determination is being submitted for review by the responsible state agencies under §307 of the Coastal Zone Management Act concurrent with the submission of the proposed action to NMFS for review and implementation.

8.6 Paperwork Reduction Act

Materials and analysis required under the PRA will be submitted separately and presented in the Amendment 2 proposed rule.

8.7 Data Quality Act

The following sections address the requirements of the Data Quality Act pursuant to the Office of Management and Budget Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by Federal Agencies (*67 Federal Register* 8451, February 22, 2002).

1. Utility of Information Product:

The intended users of the information contained in Amendment 2 are individuals involved in the monkfish fishery, including fishing vessels, fish dealers, fish processors, and other persons interested in the management of the monkfish fishery. The information contained in this FSEIS is beneficial to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures being proposed, and the impacts of those measures. Specifically, the FSEIS provides the intended users with a comprehensive analysis

(biological, social, economic, and cumulative) of the impacts of the proposed management measures contained in Amendment 2, and rationale behind the selection of these measures. The FSEIS will also contain a discussion of the impacts of the alternative management measures that were considered in the DSEIS, but were not selected as preferred alternatives by the Councils, including a discussion concerning why these alternatives were not selected. Finally, the proposed rule for Amendment 2 will provide the public with the opportunity to comment on the proposed management measures contained in this FSEIS.

The information contained in the FSEIS includes detailed, and relatively recent information on the monkfish resource, and fishing gear impacts, and therefore represents an improvement over previously available information. For example, Appendix II contains an extensive gear effects evaluation. The document has been revised based on comments received on the DSEIS. Specifically, the document outlines the management measures being proposed by the New England and Mid-Atlantic Fishery Management Councils after taking into account public comments on the proposed alternatives contained in the DSEIS.

The information product will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act, and therefore, may be improved based on any comments received. Furthermore, the NOA for Amendment 2 will provide a 60-day public comment period on the amendment as required by the Magnuson-Stevens Fishery Conservation and Management Act.

The media being used in the dissemination of the information contained in Amendment 2 will be the Federal Register notices for the proposed rule, the (Notice of Availability) NOA for the amendment, and the NOA for the FSEIS. These documents will be made available in printed publication and on the Northeast Regional Office Internet website (www.nero.noaa.gov). In addition, the FSEIS will be made available on CD-rom from the New England Fishery Management Council, and on their website at www.nefmc.org.

2. Integrity of Information Product:

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

3. Objectivity of Information Product

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

Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

National Standard 2 of the Magnuson-Stevens Act states that a FMP's conservation and management measures shall be based upon the best scientific information available. Several sources of data were used in the development of Amendment 2, including the analysis of impacts. These data sources include, but are not limited to, landings data from vessel trip reports and dealer weighout reports, catch data collected in the NOAA Fisheries Observer Program, effort data collected in the DAS call-in and, where applicable, the electronic vessel monitoring system programs, fisheries independent data collected in the NOAA Fisheries bottom trawl surveys, cooperative research projects, and deep-sea corals and habitat data collected by NOAA-funded National Undersea Research Center. The Councils and NOAA Fisheries have determined that these are the best available scientific data.

The proposed management measures contained in Amendment 2 represent the policy choices made, and are supported by the available science. The management measures contained in Amendment 2 are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing and rebuild the monkfish resource while maintaining a sustainable level of monkfish harvest, and to be consistent with the National Standards established in the Magnuson-Stevens Act. The proposed management measures are fully described in Section 4.1 of the document in order to distinguish them from associated analyses and underlying science, which is subsequently described in different sections, and consistent with the EIS format prescribed by NEPA.

The data and analyses used to develop and analyze the measures contained in Amendment 2 are included in this FSEIS, and will be summarized in the proposed and final rules for the amendment. Further, the FSEIS includes appropriate references to sections of the document that contain detailed descriptions of source material (i.e. literature cited, appendices), as well as references to tables, figures and analyses.

The information contained in this FSEIS concerning monkfish stock status was peer reviewed according to standard methodology (Stock Assessment Review Committee; SARC). Furthermore, scientists of diverse affiliation (Federal, State, Private, International) were involved in the development of Amendment 2 through the input of various committees and entities (e.g., Plan Development Team, Scientific and Statistical Committee, Northeast Fisheries Science Center, New England Fishery Management Council, Habitat Technical Committee).

With respect to the review of Amendment 2, the review process will involve the New England Fishery Management 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, population biology, economics, and sociology. The Council review process involves public meetings at which affected stakeholders have opportunities to provide comments on the Amendment. Reviews by staff at the Regional Office are conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of Amendment 2 and clearance of the proposed 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 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 neutral or positive outcomes that have been predicted in this amendment may differentially affect some populations. However, due to data constraints and other concerns the means for conducting this analysis are not yet available. Due to the mobile lifestyle of many vessel crew members and processing plant workers, the U.S. Census does not adequately capture these populations. Nonetheless, many of the participants in the monkfish industry (crew and shoreside support industries) may come from lower income and/or ethnic minority populations who may be vulnerable to more restrictive management measures. This amendment is not expected to disproportionately or adversely effect the health or human environment of minority or low-income populations, given the overall conclusions of no significant environmental effects.

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