Monkfish Fishery Management Plan
Amendment 5

Incorporating
Stock Assessment and Fishery Evaluation (SAFE) Reports
for the 2007 & 2008 Fishing Years
and the
Environmental Assessment

Prepared by
New England Fishery Management Council
and Mid-Atlantic Fishery Management Council

in consultation with
NOAA National Marine Fisheries Service

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Acronyms and Abbreviations

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CPUE	catch per unit of effort
DAM	Dynamic Area Management
DAS	days-at-sea
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	fishery management plan
FW	framework
FY	fishing year
GB	Georges Bank
GOM	Gulf of Maine
HAPC	habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	individual fishing quota
ITQ	individual transferable quota
IVR	interactive voice response reporting system
LOA	letter of authorization
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSRA	Magnuson-Stevens Reauthorization Act of 2007
MSY	maximum sustainable yield
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center

NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NMA	Northern Management Area (Monkfish)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SMA	Southern Management Area (monkfish)
SNE	southern New England
SSB	spawning stock biomass
SSC	Social Science Committee
TAC	total allowable catch
TED	turtle excluder device
TTAC	Target Total Allowable Catch
TTAL	Target Total Allowable Landings
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VEC	Valued Ecosystem Component
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
WGOM	Western Gulf of Maine
WO	weighout
YPR	yield per recruit

1.0 Executive Summary

The monkfish fishery is jointly managed by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental margin. The Councils manage the fishery as two stocks, with the Northern Fishery Management Area (NMA) covering the Gulf of Maine and northern part of Georges Bank, and the Southern Fishery Management Area (SMA) extending from the southern flank of Georges Bank through the Mid-Atlantic Bight to North Carolina (see Figure 1).

The Councils adopted the Monkfish Fishery Management Plan (FMP) in 1999. For the first eight years under the FMP, the fishery was in a rebuilding plan since the stocks were considered overfished (below the biomass target). In 2007, the Northeast Data Poor Stocks Working Group (DPWG) completed a monkfish stock assessment and recommended revisions to the biomass reference points. The Councils adopted the new reference points in December 2007, which resulted in the revisions to the stock status in both areas. Based on the new assessment and reference points, overfishing was not occurring and the stocks were rebuilt (above the biomass target) in both areas. The assessment report, however, contained several cautionary statements, due to the fact that this was the first use of a new assessment model, and to uncertainty in the input data and overall knowledge of monkfish life history and population dynamics.

In 2007, the Councils proposed in Framework 4 to set catch targets (TTACs) at 5,000 mt and 5,100 mt for the NMA and SMA, respectively. The Councils requested the DPWG to evaluate the impact of applying those TTACs for the 2007-2009 fishing years. The DPWG concluded that under those catch targets, fishing mortality rates would remain below the threshold, and biomass would remain in an upward trend above the biomass target. Upon receiving the DPWG report, NMFS approved Framework 4 which included an automatic extension of the TTACs beyond FY2009 if the Councils did not adopt new targets.

Also in 2007, the Magnuson-Stevens Fishery Conservation and Management Act was reauthorized (MSRA), and revised to include, among other things, the requirement that all FMPs establish Annual Catch Limits (ACLs) and measures to ensure accountability (AMs). For stocks not subject to overfishing, such as monkfish, the Act set a deadline of 2011 for the implementation of ACLs and AMs. In 2009, NMFS published revised National Standard 1 Guidelines which the Councils have used to develop ACLs and AMs for all FMPs.

The Councils are addressing two primary purposes with this amendment: To implement the MSRA mandated ACLs and AMs, and to set the specifications of DAS, trip limits and other management measures to replace those adopted in Framework 4. The Councils are also proposing to make modifications to the FMP to improve the Research Set Aside (RSA) Program, to minimize bycatch resulting from trip limit overages, and to allow the landing of monkfish heads.

The following table summarizes the measures comprising the **proposed action**:

Biological and Management Reference Points Control Rules	**MSY**	**MSY=$F_{threshold}$ x B_{target}** N: 17,053 mt S: 25,487 mt
	OFL	**OFL=$F_{threshold}$ x $B_{current}$** N: 22,729 mt S: 28,263 mt
	ABC	**ABC (interim)= Current (2006) biomass x average exploitation rate during recent increases in biomass ((North) 1999-2006 and (South) 2000-2006).** N: 17,485 mt S:13,326 mt
	OY	**OY=ACT**

ACLs and AMs	**ACL**	ACL=ABC
	Reactive AMs	Deduct ACL overage weight from ACT; adjust mgmt. measures in 2nd year after overage year; if Councils do not take appropriate action, RA will use formulaic approach to adjust DAS and trip limits and implement by notice action.
	Proactive AM (ACT) North	**10,750 mt**
	Proactive AM (ACT) South	**11,513 mt**

Specification of DAS and Trip Limits		**DAS**	**Trip limit (tail wt. lbs./DAS)**	
			Permit A & C	**Permit B,D, &H**
	NMA	40	1,250	800
	SMA	28	550	450

Automatic DAS Adjustment for Trip Limit Overage	24 hours and one minute deducted from a vessel's DAS account for a trip limit overage of not more than one day's limit
Changes to the Research Set-Aside (RSA) Program	The Councils may make changes to the RSA program through the framework adjustment process
Landing of Monkfish Heads	Vessels could land unattached monkfish heads provided the total weight of the heads does not exceed 2.32 times the weight of tails on board

The following table summarizes the **No Action Alternatives** to the proposed action:

Biological and Management Reference Points Control Rules	**MSY**	The current plan does not specify these reference points, and is, therefore, not compliant with the MSRA
	OFL	
	ABC	
	OY	OY= Annual target total allowable landings (TTAL), does not include discards

ACLs and AMs	**ACL**	The current plan does not specify ACLs and AMs and is, therefore, not compliant with the MSRA
	Reactive AMs	
	Proactive AM (ACT)	The current plan sets TTALs as the basis for specifying management measures, but this target does not include discards, and is not intended to prevent exceeding the ACL. Current TTALs are 5,000 mt (North) and 5,100 mt (South)

			Trip limit (tail wt. lbs./DAS)	
Specification of DAS and Trip Limits		**DAS**	**Permit A & C**	**Permit B,D, &H**
	NMA	31	1,250	470
	SMA	23	550	450

Automatic DAS Adjustment for Trip Limit Overage	Vessels catching an overage of the daily trip limit must either discard the overage or remain at sea until sufficient time has elapsed to account for the fish on board
Changes to the Research Set-Aside (RSA) Program	Changes to the RSA program must be done through a plan amendment, rather than the framework adjustment process
Landing of Monkfish Heads	Vessels are prohibited from landing detached monkfish heads due to the lack of an established head-to-tail ratio in the regulations

Updated Stock Status

A stock assessment was completed in July 2010 (SARC 50, see Appendix 7), after the Councils had made their final decisions on the measures to be submitted in Amendment 5. The stock status, relative to current biological reference points, remained unchanged from the prior assessment, that is, that both northern and southern stock components are not overfished, and overfishing is not occurring. SARC 50 also recommended new biomass reference points, and recalculated the fishing mortality rate corresponding to the overfishing threshold, Fmax, and concluded that the stock status would not change, even under the new reference points.

Summary of Environmental Consequences of the Proposed Action

As detailed in Section 5.0, Environmental Consequences, the impact of the proposed action is, in nearly all cases, expected to have a neutral or positive impact on the human environment. The only exceptions are those potentially negative impacts on non-target species, protected species and habitat resulting from the increased DAS and trip limits resulting from the increased catch targets. These adverse impacts, however, are not likely to be substantial.

The adoption of ACLs and AMs will contribute to ensuring the overfishing of monkfish does not occur, and if it does, future overfishing will be prevented. These controls will not only have a positive effect on the monkfish resource, but may also have a long-term positive effect on non-target species, protected species, habitat and communities as a result of the improved controls on fishing effort and the resulting long-term sustainability of the fishery. Similarly, the specification of DAS and trip limits at an increased level, but one that is expected to prevent catches from exceeding the ACL, will have a positive effect on the monkfish resource and dependent communities. As noted above, this increase is either neutral or potentially negative for non-target species, protected species and habitat as a consequence of the increase in fishing effort. This effect is potentially mitigated if the increased opportunity to target monkfish will reduce the time that vessels engage in other fisheries, if those other fisheries have a greater interaction with protected species or a greater impact to habitat.

The other proposed measures in Amendment 5 will either be neutral or positive in terms of their environmental impact. The provision to allow vessels to land an overage of the trip limit will reduce monkfish discards and improve catch accounting. The resulting increased efficiency will reduce the time that gear is in the water, with resulting reductions in the potential for interactions with protected species and impacts on habitat. The impact on non-target species is mixed, depending on whether vessels who use their DAS at a faster rate (by landing overages) then re-direct their effort on other species. The other two proposed measures, allowing changes to the RSA program through a framework adjustment and allowing the landing of monkfish heads, are administrative changes with no environmental impact, except, the positive impact that the latter will have on communities resulting from increased vessel revenues.

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2.0 Background, Purpose and Need

2.1 Background

2.1.1 History of the Fishery Management Plan

The initial Monkfish FMP was implemented in 1999, and has been amended several times, most recently in 2007 (Frameworks 4 and 5) and 2008 (Framework 6). A summary of previous management actions is contained in the Background sections of those earlier documents, available on the NEFMC website, www.nefmc.org. A synoptic discussion, focusing on the science and management aspects of the FMP up to Framework 4 is contained in an article attached as Appendix I, (Haring and Maguire, 2008). The three most recent management actions, Frameworks 4, 5 and 6 are summarized below.

For management purposes, the monkfish fishery is divided into two areas, the Northern and Southern Management Areas (NMA and SMA, respectively), Figure 1. While scientific evidence for two biological stocks is uncertain, and additional research, including archival tagging, is ongoing, fisheries in the two areas are clearly distinct. Stock assessments are done on the two areas separately to be able to support the management plan. The NMA monkfish fishery is closely integrated with the multispecies fishery, and is primarily a trawl fishery, while the SMA fishery is primarily a gillnet fishery targeting monkfish almost exclusively. These differences have resulted in some differences in management measures, such as trip limits and DAS allocations, between the two areas.

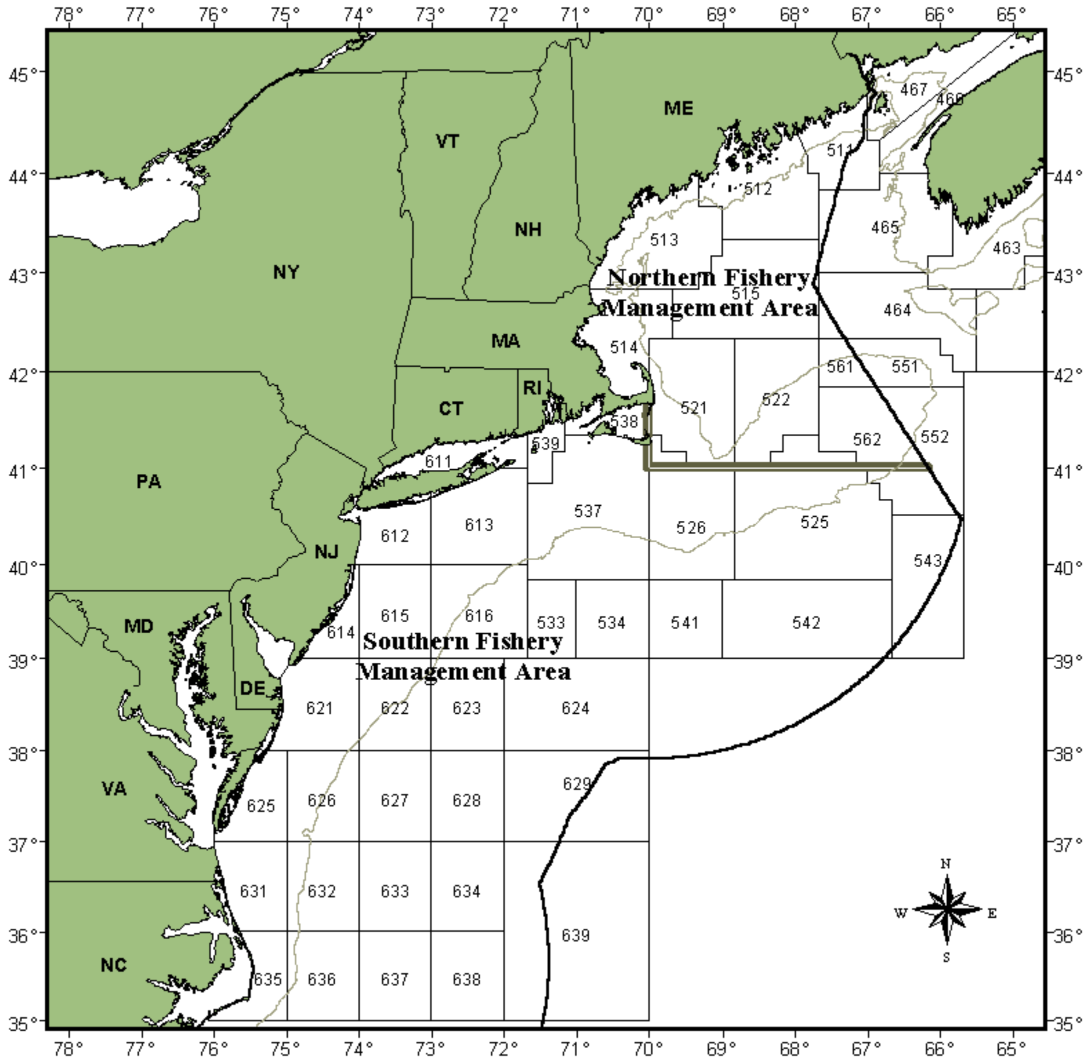


Figure 1 Monkfish fishery management areas and statistical areas.

2.1.1.1 Monkfish Framework 4

The fishing year 2006 was Year 7 of the 10-year rebuilding plan implemented under the original FMP in 1999. The goal of the rebuilding plan was to achieve the biomass target reference points in 2009, as measured by the NEFSC autumn trawl survey three-year average biomass indices. Following several years of increases in the biomass indices for both stocks, the indices lagged behind the rebuilding schedule, and in 2006 were both below the minimum biomass threshold and approximately 50% below their biomass index targets. As a result, the Councils revised the management program so that the goals of the 10-year rebuilding program can be met in 2009 with Framework 4, which they submitted to NMFS in February 2007.

In Framework 4, TTACs were set at 5,000 mt and 5,100 mt for the NMA and SMA, respectively. These TTACs are the basis for calculating the monkfish trip limits and days-at-sea (DAS) allocations for vessels targeting monkfish. Framework 4 also established the requirement for vessels fishing in the NMA on a multispecies DAS, and exceeding the monkfish incidental catch limit, to call in a monkfish DAS, which could be done by Vessel Monitoring Systems (VMS) any time prior to returning to port. Vessels in the SMA were already required to call in a monkfish DAS when exceeding the incidental limit. Framework 4 also reduced the monkfish incidental limit in the NMA from 400 lbs. per DAS (tail wt.) or 50% of the weight of fish on board, whichever is less, to 300 lbs. per DAS or 25% of the total weight of fish on board, whichever is less. The Councils had increased the incidental limit under Framework 2, when the northern stock appeared to be nearly rebuilt, but restored the original incidental limit because the stock status had returned to being overfished in 2006.

Framework 4 retained the 550 lbs. and 450 lbs. SMA monkfish trip limit (tail wt. per DAS) for permit categories ACG and BDH, respectively. Vessels were allocated 31 monkfish DAS, but vessels were limited to an allowance of 23 DAS in the SMA out of the total allocation. In the NMA, trip limits were set at 1,250 lbs. and 470 lbs. (tail wt. per DAS) for permit category AC and BD, respectively. Framework 4 established that the DAS allocations will remain in effect through 2009 unless the TTAC is exceeded in an area during the 2007 fishing year. In that case, the proposed TTAC overage backstop provision would take effect and could result in a recalculation of the DAS allocations that are expected to keep landings below the TTAC based on catch and effort data from the 2007 fishing year. The backstop provision would make no adjustment if the TTAC overage was 10% or less, and would close the directed fishery in a management area if the overage exceeded 30%, resulting in zero DAS and the application of monkfish incidental limits to all vessels.

Other measures adopted under Framework 4 include a change in the northern boundary of the Category H fishery from 38°20’N Lat to 38°40’N Lat, and a change to the monkfish incidental limit on limited access scallop vessels fishing in the closed area access programs.

On April 27, 2007, NMFS published a temporary rule implementing interim measures, while deferring a decision on Framework 4 pending the results of a stock assessment scheduled for July (72 *Federal Register* 20952, April 27, 2007). The interim rule implemented the TTACs and most measures proposed in Framework 4, except the 23 DAS allowance for SMA vessels (retaining the 12 DAS from the prior year), and prohibited the use of carryover DAS. The DPWG completed an assessment of monkfish which included estimates of absolute biomass and recommended revisions to existing biomass reference points from a survey index basis to an absolute biomass basis. Based on that assessment, both stocks are above the recommended biomass targets, and are, therefore, “rebuilt”. The assessment report also emphasized the uncertainty in the model and results, and contained a number cautionary statements.

As a result of the assessment, NMFS approved Framework 4 and published an interim final rule with an effectiveness date of October 22 (72 *Federal Register* 53942, September 21, 2007).

2.1.1.2 Monkfish Framework 5

As a result of the aforementioned DPWG assessment in 2007, the Councils initiated Framework 5 primarily to adopt the recommended biomass reference points, as well as to address the concerns of the Regional Administrator about the effect of carryover DAS on the management program's ability to constrain landings to the TTAC. In addition, the Councils used the opportunity of this adjustment to implement revisions to some other measures to ensure that the management program succeeds in keeping landings within the TTAC levels. Framework 5, which was implemented prior to the start of the 2008 fishing year (73 *Federal Register* 22831, April 28, 2008), reduced the number of unused DAS that could be carried over to the next fishing year from 10 to 4; revised the DAS accounting method for gillnet vessels such that all trips less than 15 hours would be counted as 15 hours, eliminating the provision that trips less than 3 hours would be counted as time used; and, revised the monkfish incidental catch allowance applicable to vessels in the Southern New England Regulated Mesh Area (SNE RMA) fishing with large mesh but not on a monkfish, scallop or multispecies DAS, from 5% of the total weight of fish on board (with no landings cap) to 5% of total weight of fish on board not to exceed 50 lbs. per day, up to 150 lbs. maximum, and also applied this revision to all vessels fishing under a Skate Bait Letter of Authorization (LOA) east of 74°00'W. In addition, Framework 5 modified the Monkfish LOA requirement for vessels fishing under the less restrictive measures for the NMA such that vessels using a VMS would no longer be required to obtain the LOA, but could make the declaration via the VMS.

2.1.1.3 Monkfish Framework 6

One of the elements of the FMP adopted in Framework 4 was a backstop provision that would have adjusted, and possibly closed the directed monkfish fishery in a management area if the landings in FY2009 exceeded the TTAC by more than 30 percent. With the adoption of new biological reference points and revised stock status as a result of the DPWG assessment, as well as the measures adopted in Framework 5 designed to reduce the likelihood of TTAC overages, the Councils concluded that the backstop provision was no longer necessary. They submitted the regulatory change in Framework 6 in April 2008, and the final rule become effective on October 10, 2008, approximately seven months before the start of FY2009 (73 *Federal Register* 52635, September 10, 2008). This was the only action taken in Framework 6.

2.1.1.4 Summary of FY2000-2010 TACs, DAS and trip limits

Since the implementation of the FMP, the applicable trip limits and allocated DAS have been adjusted several times. The target TAC and the method for calculating it have also undergone several changes. The target TACs, allocated DAS and applicable trip limits since adoption of the FMP are summarized in

Figure 2, which also shows landings and landings as a percentage of the TAC. Several factors have contributed to the overage/underage of landings, including availability of monkfish, restrictions or lack thereof on vessels, validity of the target TAC methodology, and "loopholes" in the regulations that enabled vessels to exceed the intended level of effort while operating within the rules applicable at the time. Since the FMP was implemented, the Councils have addressed many of those factors through various amendments and framework adjustments, and they will continue to make improvements as issues are identified and new information becomes available.

Target TACs, trip limits, DAS restrictions, and landings (FY 2000 - FY 2010) for NMA							
			Trip Limits*	Trip Limits*			
Fishing Year	**Target TAC (lbs)**	**Target TAC (mt)**	**Cat. A & C**	**Cat. B & D**	**DAS Restrictions****	**Landings (lbs)**	**Percent of TAC**
2000	12,507,000	5,673	n/a	n/a	40	26,145,000	209%
2001	12,507,000	5,673	n/a	n/a	40	32,745,000	262%
2002	25,737,000	11,674	n/a	n/a	40	31,947,000	124%
2003	39,039,000	17,708	n/a	n/a	40	31,207,000	80%
2004	37,408,000	16,968	n/a	n/a	40	25,905,000	69%
2005	29,012,839	13,160	n/a	n/a	39.3	21,016,671	72%
2006	17,057,168	7,737	n/a	n/a	39.3	14,720,268	86%
2007	11,023,100	5,000	1,250	470	30.3	11,133,346	101%
2008	11,023,100	5,000	1,250	470	30.3	7,777,910	71%
2009	11,023,100	5,000	1,250	470	30.3		
2010	11,023,100	5,000	1,250	470	30.3		
* Trip limits in pounds tail weight per DAS							
** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY2007							

Target TACs, trip limits, DAS restrictions, and landings (FY 2000 - FY 2010) for SMA							
			Trip Limits*	Trip Limits*			
Fishing Year	**Target TAC (lbs)**	**Target TAC (mt)**	**Cat. A & C**	**Cat. B, D, & H**	**DAS Restrictions****	**Landings (lbs)**	**Percent of TAC**
2000	13,281,000	6,024	1,500	1,000	40	17,549,000	132%
2001	13,281,000	6,024	1,500	1,000	40	24,404,000	184%
2002	17,463,000	7,921	550	450	40	16,487,000	94%
2003	22,511,000	10,211	1,250	1,000	40	26,891,000	119%
2004	14,929,707	6,772	550	450	28	13,719,000	92%
2005	21,325,318	9,673	700	600	39.3	21,287,811	100%
2006	8,084,353	3,667	550	450	12	13,027,100	161%
2007	11,243,562	5,100	550	450	23	15,829,172	141%
2008	11,243,562	5,100	550	450	23	14,883,410	132%
2009	11,243,562	5,100	550	450	23		
2010	11,243,562	5,100	550	450	23		
* Trip limits in pounds tail weight per DAS							
** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY2007							

Figure 2 Target TACs, trip limits, DAS restrictions, and landings (FY 2000 - FY 2010)

2.1.2 Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment (Amendment 3)

In 2005, the Councils initiated a joint omnibus amendment to all their FMPs to address the requirements of the Magnuson-Stevens Act to include, in all FMPs, a standardized bycatch reporting methodology (SBRM). SBRM is the combination of sampling design, data collection procedures, and analyses used to estimate bycatch and to determine the most appropriate allocation of observers across the relevant fishery modes. The measures include: bycatch reporting and monitoring mechanisms; analytical techniques and allocation of at-sea fisheries observers; and SBRM performance standard; a review and reporting process; framework adjustment and annual specifications previsions; a prioritization process; and provisions for industry-funded observers and observer set-aside programs. The SBRM amendment is Amendment 3 to the Monkfish FMP, and became effective on February 27, 2008 (73 *Federal Register* 4736, January 28, 2008).

2.1.3 Essential Fish Habitat Omnibus Amendment (Amendment 4)

The Council initiated Phase 1 of the Essential Fish Habitat Omnibus Amendment in 2004, which is Amendment 4 to the Monkfish FMP. The primary purpose of Phase 1 was to review EFH designations, consider HAPC alternatives, describe prey species, and evaluate non-fishing impacts. This action is an amendment to all FMPs in this region. The Council approved the DSEIS for Phase 1 at the February 2007 Council meeting, which then was submitted to NMFS in March 2007. The Council made final decisions on Phase 1 topics at their June 2007 meeting. Phase 2 of the EFH Amendment began in September 2007 to consider the effects of fishing gear on EFH and move to minimize, mitigate or avoid those impacts that are more than minimal and temporary in nature. Phase 2 will also reconsider measures in place to protect EFH in the Northeast region. The entire Amendment (Phase 1 and Phase 2) is expected to be submitted in 2011. On October 5, 2009, NMFS published a Notice of Intent to prepare an EIS (74 *Federal Register* 51126) covering both phases of the EFH Omnibus Amendment.

2.1.4 Other Fishery Management Plans Affecting the Monkfish Fishery

Approximately 97% of the monkfish limited access vessels also hold limited access permits in either the Northeast Multispecies or Atlantic Sea Scallop fisheries. Both of those fisheries have undergone, and continue to undergo changes in the management programs which have direct and indirect effects on the monkfish fishery. In large part due to the success of the scallop FMP and the profitability of the fishery, scallop vessels that also have monkfish limited access permits elect to use their allocated effort to target scallops rather than monkfish, since they would be required to use a scallop DAS to target monkfish, and be prohibited from using a dredge on those trips. As a result, a substantial portion of the allocated monkfish effort (DAS) is not used. In contrast, while some multispecies stocks have responded positively to management (e.g., haddock and redfish) others remain overfished and in need of rebuilding. Consequently, the Multispecies FMP continues to constrain fishing effort and is undergoing some major changes, most notably the adoption of catch shares through the allocation of quota to sectors.

2.1.4.1 Multispecies FMP

Groundfish stocks have been managed under the Magnuson-Stevens Act (MSA) beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was rejected in 1982 with the adoption of the Interim Groundfish Plan, which relied on minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. A more detailed discussion of the history of the management plan up to 1994 can be found in Amendment 5 (NEFMC 1994).

Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented a moratorium on new permits (limited access), reductions in time fished (days-at-sea, or DAS) for some fleet sectors and adopted year-round closures to control mortality. Amendment 5 also increased the minimum mesh size, set limits on vessel upgrading, and implemented a mandatory landings reporting requirement. Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program and accelerated the reduction in DAS first adopted in Amendment 5. Since the implementation of Amendment 7, there were a series of amendments and smaller changes (framework adjustments) that are detailed in Amendment 13 (NEFMC 2003).

Amendment 13 was developed over a four-year period to meet the MSA requirement to adopt rebuilding programs for stocks that are overfished and to end overfishing. Amendment 13 also brought the FMP into compliance with other provisions of the MSA. Subsequent to the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expanded the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock. FW 42 included measures to implement the biennial adjustment to the FMP as well as a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, an extension of the DAS leasing program, and introduced the differential DAS system. FW 43 adopted haddock catch caps for the herring fishery and was implemented August 15, 2006.

Amendment 16 implemented major changes to the groundfish management plan. Notably, it greatly expanded the sector program and implemented Annual Catch Limits in compliance with 2006 revisions to the MSA . The amendment also included a host of mortality reduction measures for “common pool” (i.e. non-sector) vessels and the recreational component of the fishery. Amendment 16 became effective for the current fishing year that started May 1, 2010.

2.1.4.2 Atlantic Sea Scallops

The Council established the Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan. Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access program, a DAS reduction plan to reduce mortality and prevent recruitment overfishing, new gear regulations to improve size selection and reduce bycatch, and a vessel monitoring system to track a vessel's fishing effort. Amendment 4 also created the general category scallop permit for vessels that did not qualify for a limited access permit. Although originally created for an incidental catch of scallops in other fisheries, and for small-scale directed fisheries, the general category fishery and fleet has evolved since its creation in 1994'

In 1998, the Council developed Amendment 7 to the Scallop FMP which established two new scallop closed areas (Hudson Canyon and VA/NC Areas) in the Mid-Atlantic to protect concentrations of small scallops until they reached a larger size and reduced the DAS allocations. In 1999, Framework Adjustment 11 allowed the first scallop fishing within portions of the Georges Bank groundfish closed areas since 1994. Scallop resource surveys and experimental fishing activities had identified areas where scallop biomass was very high due to no fishing in the intervening years. These surveys and experimental fisheries provided more precise estimates of total biomass as well as the distribution and amount of finfish bycatch and allowed the Council to open the southern part of Closed Area II. In 2000, Framework Adjustment 13 expanded the closed area access program.

In 2004, Amendment 10 introduced rotation area management and changed the way that the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited vessels to fish in any area, vessels had to use a portion of their total DAS allocation in the controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. Vessels could fish their open area DAS in any area that was not designated a controlled access area. Subsequent actions have focused on controlling fishing mortality, and have made annual adjustments to the rotational area management program and DAS allocations, as well as other provisions, such as bycatch reduction measures, improved catch monitoring and habitat protections. Notably, Amendment 11, which became effective on June 1, 2008 was designed to control capacity and mortality in the general category scallop fishery. Since 1999, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices. Among other provisions, Amendment 11 implemented a limited entry program for the previously open-access general category fishery. Vessels that qualified are under an ITQ program that has been allocated 5% of the total projected scallop catch.

The most recent scallop actions which may impact interaction with the monkfish fishery are Amendment 15, which will be in place for the 2011 fishing year and Framework 21, which became effective on June 28, 2010. There are three goals of Amendment 15: 1) bring the Scallop FMP in compliance with new requirements of the MSRA (such as ACLs and AMs); 2) address excess capacity in the limited access scallop fishery through potential permit stacking and leasing alternatives; and 3) consider measures to adjust several aspects of the overall program to make the scallop management plan more effective. Potentially, if scallop catch exceeds the ACL, then scallop DAS in open areas would be reduced in the subsequent year. Framework 21 sets specifications and area access programs for FY 2010.

2.1.4.3 Skate FMP Amendment 3

The final rule for Amendment 3 to the Northeast Skate Complex FMP was published on June 16, 2010. This amendment establishes annual catch limits, accountability measures, bait fishery quotas, and skate wing, bait, and incidental skate possession limits to address the following issues:

- Overfished status of thorny skates
- Overfishing of thorny skate
- Implementation of annual catch limits (ACLs) and accountability measures (AMs), a new mandate of the reauthorized Magnuson-Stevens Act, and
- A baseline review process that has become obsolete and less meaningful.

The final action established an incidental skate possession limit of 500 lbs. of wings (1135 lbs. whole), established a 20,000 lbs. whole weight possession limit for vessels with a Skate Bait Letter of Authorization, reduced the skate wing possession limit to 5,000 lbs. (11,350 lbs. whole), and adopted a three-season annual quota system for the skate bait fishery. In-season AMs will reduce allowable skate trip landings to the incidental limit (500 lbs. of skate wings, 1135 lbs. whole) when landings approach (80-90%) allowable levels.

An annual monitoring report and a bi-annual specification process replaced the obsolete baseline review procedures and will describe the expected impacts of recent regulations and pending management alternatives in other fisheries that impact the skate resource. The first annual monitoring report was published in June 2010 and is available at http://www.nefmc.org/skates/annual_reviews/2010%20Annual%20Monitoring%20Report%20Final.pdf.

2.1.5 Actions to Minimize Interactions with Protected Species

Many of the factors that serve to mitigate the impacts of the monkfish fishery on protected species are currently being implemented in the Northeast Region under either the Atlantic Large Whale Take Reduction Plan (ALWTRP) or the Harbor Porpoise Take Reduction Plan (HPTRP). In addition, the Monkfish FMP has undergone repeated consultations pursuant to Section 7 of the Endangered Species Act (ESA), with the most recent Biological Opinion dated April 14, 2003. The conclusion in that Opinion states that the monkfish fishery is not likely to jeopardize the continued existence of North Atlantic right whales, provided that the fishery is complying with the ALWTRP.

A previous Biological Opinion for the Monkfish FMP, dated June 14, 2001, concluded that continued authorization of the fishery was likely to jeopardize the continued existence of ESA-listed right whales as a result of entanglement in gillnet gear used in the fishery. A Reasonable and Prudent Alternative (RPA) was provided to remove the likelihood of jeopardy. The RPA included, in part, implementation of a Seasonal Area Management (SAM) program and a Dynamic Area Management (DAM) program to reduce the likelihood of right whale interactions with gillnet gear used in the monkfish fishery. The RPA measures were implemented as part of the Atlantic Large Whale Take Reduction Plan (ALWTRP). On October 5, 2007, NMFS published a final rule in the *Federal Register* (72 FR 57104) that made many changes to the ALWTRP affecting the use of fixed gillnet gear

in the monkfish fishery, amongst others. These changes included elimination of the DAM program as of April 7, 2008, and elimination of the SAM program as of October 6, 2008. The changes to the ALWTRP, therefore, modified the monkfish fishery in a manner that causes an effect to listed species not considered in the June 14, 2001 Opinion for the fishery. NMFS reinitiated formal consultation on the monkfish fishery on April 2, 2008, in accordance with the regulations at 50 CFR 402.16 to reconsider the effects of the continued authorization of the monkfish fishery on ESA-listed cetaceans and sea turtles. A Biological Opinion was issued for the monkfish fishery on October 29, 2010.
After reviewing the current status of right, humpback, fin, and sei whales as well as loggerhead, leatherback, Kemp's ridley, and green sea turtles, the environmental baseline and cumulative effects in the action area, the effects of the continued operation of the Monkfish FMP, in compliance with the requirements of the ALWTRP, this Opinion concludes that the proposed activity is likely to adversely affect, but not jeopardize the continued existence of these species. As a result, an incidental state statement was prepared for the monkfish fishery. The incidental take statement anticipates for loggerhead sea turtles (a) the annual take of up to 171 individuals over a 5-year average in gillnet gear, of which up to 69 per year may be lethal and (b) the annual take of up to two (2) individual over a 5-year average in trawl gear, of which up to one (1) per year may be lethal; for leatherback sea turtles, the annual lethal or non-lethal take of up to four (4) individuals in trawl gear and gillnet gear combined; for Kemp's ridley sea turtles, the annual lethal or non-lethal take of up to four (4) individual in trawl gear and gillnet gear combined; and for green sea turtles, the annual lethal or non-lethal take of up to five (5) individuals in trawl gear gillnet gear combined. Furthermore, reasonable and prudent measures (RPMs) were established as a means of minimizing sea turtle interactions with the monkfish fishery now and to generate the information necessary in the future to continue to minimize incidental takes. These RPMs are non-discretionary and must be implemented by NMFS, and are as follows:

1. NMFS must seek to ensure that any sea turtles incidentally taken in monkfish fishing gear are handled in such a way as to minimize stress to the animal and increase its survival rate.

2. NMFS must seek to ensure that monitoring and reporting of any sea turtles encountered in monkfish fishing gear: (1) detects any adverse effects such as injury or mortality; (2) assesses the realized level of incidental take in comparison with the anticipated incidental take documented in this Opinion; (3) detects whether the anticipated level of take has occurred or been exceeded; and (4) collects data from individual encounters.

3. NMFS must continue to investigate and implement, within a reasonable time frame following sound research, gear modifications for gear used in the monkfish fishery to reduce incidental takes of sea turtles and/or the severity of the interactions that occur.

Additionally, NMFS must comply with the terms and conditions specified in the Opinion, which are established to implement the above RPMs.

As described below, the regulatory measures of the ALWTRP and the HPTRP must be adhered to by any vessel fishing for monkfish with gillnet gear.

2.1.5.1 Harbor Porpoise Take Reduction Plan

NMFS published the rule implementing the Harbor Porpoise Take Reduction Plan on December 1, 1998. The HPTRP includes measures for gear modifications and area closures, based on area, time of year, and gillnet mesh size. In general, the Gulf of Maine component of the HPTRP includes time and area closures, some of which are complete closures; others are closures to gillnet fishing unless pingers (acoustic deterrent devices) are used in the prescribed manner. The Mid-Atlantic component includes time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Based on an increase in harbor porpoise takes in the overall sink gillnet fishery in recent years, the Harbor Porpoise Take Reduction Team has developed options to reduce takes, and NMFS published a proposed rule on July 21, 2009 (74 *Federal Register* 36058) with four alternatives, including no action. The comment period ended on August 20, 2009.

NMFS published the final rule for the HPTRT on February 19, 2010 (75 *Federal Register* 7383). The changes contined in the new rule address the two primary causes of a recent increase harbor porpoise bycatch in gillnets: increased bycatch in places where measures to prevent it are not currently required, and gaps in compliance with current management measures, such as improper use of pingers. To address these problems, the measures expand when and where “pingers”are required on gillnets off New England, add new seasonal management measures off New Jersey, and define areas off New England that will close to gillnetters (“consequence closures”) if harbor porpoise bycatch exceeds the target rate for each area for two consecutive seasons. In the Mid-Atlantic, a new management area is being created off the coast of New Jersey, encompassing waters where high bycatch has been observed recently. The area will be closed to gillnetting from February 1 to March 15, and gear modified to reduce the risk of bycatch will be required to fish there between January 1 and April 30 every year when gillnet fishing is allowed.

2.1.5.2 Atlantic Large Whale Take Reduction Plan

The ALWTRP contains a series of regulatory measures designed to reduce the likelihood of fishing gear entanglements of right, humpback, and fin whales, and acknowledges benefits to 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.

On June 21, 2005, NMFS published a proposed rule (70 *Federal Register* 35894) for changes to the ALWTRP, and published a final rule on October 5, 2007 (72 *Federal Register* 57104). The new ALWTRP measures expand the gear mitigation measures by: (a) including additional trap/pot and net fisheries (*i.e.*, gillnet, driftnet) to those already regulated by the ALWTRP, (b) redefining the areas and seasons within which the measures would apply, (c) changing the buoy line requirements, (d) expanding and modifying the weak link requirements for trap/pot and net gear, and (e) requiring (within a specified timeframe) the use of sinking and/or neutrally buoyant groundline in place of floating line for all fisheries regulated by the ALWTRP on a year-round or seasonal basis.

2.1.5.3 Atlantic Trawl Gear Take Reduction Strategy (ATGTRS)

In September 2006, the NMFS convened the Atlantic Trawl Gear Take Reduction Team (ATGTRT) under the Marine Mammal Protection Act (MMPA). The ATGTRT was convened to address incidental mortality and serious injury of long-finned pilot whales (Globicephala melas), short-finned pilot whales (Globicephala macrorhynchus), common dolphins (Delphinus delphis), and Atlantic white-sided dolphins (Lagenorhynchus acutus) in several trawl gear fisheries operating in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic Mid-Water Trawl, the Mid-Atlantic Bottom Trawl, Northeast Mid-Water Trawl and the Northeast Bottom Trawl fisheries.

Because none of the marine mammal stocks of concern to the ATGTRT are classified as a "strategic stock" nor do they currently interact with a Category I fishery it was determined that development of a take reduction plan (TRP) was currently not necessary.

In lieu of a TRP, the ATGTRT agreed to develop an Atlantic Trawl Gear Take Reduction Strategy (ATGTRS). The ATGTRS identifies informational and research tasks as well as education and outreach needs the ATGTRT believes are necessary to provide the basis for achieving the ultimate MMPA goal of achieving zero mortality rate goal (ZMRG). The ATGTRS also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. These voluntary measures are as follows:

- reducing the numbers of turns made by the fishing vessel and tow times while fishing at night; and
- increasing radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area.

2.1.5.4 Final Rule to minimize monkfish gillnet interaction with sea turtles

On December 3, 2002, the agency published a final rule (67 *Federal Register* 71895) establishing seasonally adjusted gear restrictions by closing portions of the mid-Atlantic EEZ waters to fishing with large-mesh (>8") to protect migrating sea turtles, following an interim final rule published March 21 that year. The basis of this rule was that sea turtles migrate northward as water temperatures warmed. At the time the interim and final rules were published, there was no evidence that the primary fishery involved – monkfish – was being prosecuted in state waters. In 2002, when most monkfish fishermen were not permitted under the FMP to fish in the EEZ and the rest were faced with the sea turtle closures, the proportion of North Carolina monkfish landings from state waters increased five-fold to 92%, posing an unforeseen risk to migrating sea turtles since they were not protected in state waters. In response, NMFS published a final rule on April 26, 2006 (71 *Federal Register* 24776) that included modifications to the large-mesh gillnet restrictions. Specifically, the new final rule revises the gillnet restrictions to apply to gillnets having 7-

inch stretched mesh or greater, versus the 8-inch stretched mesh defined in the 2002 final rule, but did not apply this new rule in state waters as considered in the proposed rule. State waters, and Federal waters north of Chincoteague, VA remain unaffected by the large-mesh gillnet restrictions.

2.1.6 Magnuson-Stevens Reauthorization Act and National Standard 1 Guidelines

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) amended the Magnuson-Stevens Act to include new requirements for annual catch limits (ACLs) and accountability measures (AMs) and other provisions regarding preventing and ending overfishing and rebuilding fisheries. The MSRA also established requirements for Councils that adopt Limited Access Privilege Programs (LAPPS), which include individual fishery quotas.

This section describes the legal and regulatory authority and requirements for the Council with respect to managing fisheries, with a focus on the requirement to stop or prevent overfishing and to maintain stocks at sustainable levels while achieving optimum yield for the benefit of the nation. This section also includes the reference points and definitions of relevant terms as provided in the MSRA and NMFS' National Standard 1 Guidelines (NS1 Guidelines, 50 CFR 600, published in 74 *Federal Register* 3178, January 16, 2009).

2.1.6.1 MSRA

2.1.6.1.1 Scientific and Statistical Committee (SSC) responsibilities

MSRA Sec 302 (g)(1)(b): Each scientific and statistical committee shall provide its Council ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, maximum sustainable yield, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices.

2.1.6.1.2 Limits on Council action

MSRA Sec 302 (h)(6): (Each Council shall) develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its scientific and statistical committee or the peer review process established under subsection (g).

2.1.6.1.3 Fishery management plan requirements

MSRA Sec 303 (a)(15): (Any FMP shall) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

2.1.6.2 Overfishing

MSRA Sec 3(34): The terms "overfishing" and "overfished" mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.

2.1.6.3 Optimum yield

MSRA Sec 3(33): The term “optimum”, with respect to the yield from a fishery, means 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 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.

MSRA Sec 301(a)(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.

2.1.6.4 National Standard 1 Guidelines

The MSRA requires the Secretary of Commerce to establish advisory guidelines (which shall not have the force and effect of law), based on the national standards, to assist in the development of FMPs. On January 16, 2009, NMFS published the Final Rule amending the National Standard 1 (NS1) Guidelines (74 *Federal Register* 3178).

2.1.6.4.1 Acronyms:

ABC – Acceptable Biological Catch
ACL - Annual Catch Limit
AM – Accountability Measure
ACT – Annual Catch Target
MFMT – Maximum Fishing Mortality Threshold
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
OFL – Overfishing Limit
OY – Optimum Yield
SDC – Status Determination Criteria

2.1.6.4.2 Summary of items to include in FMPs related to NS1

The Councils must evaluate and describe the following items in their FMPs and amend the FMPs, if necessary, to align their management objectives to end or prevent overfishing (references are to paragraphs in 50 CFR 600.310, NS1 Guidelines):

(1) **MSY** and **SDC** (see paragraphs (e)(1) and (2) of this section).
(2) **OY** at the stock, stock complex, or fishery level and provide the **OY specification analysis** (see paragraph (e)(3) of this section).
(3) **ABC** control rule (see paragraph (f)(4) of this section).
(4) Mechanisms for specifying **ACLs** and possible sector-specific ACLs in relationship to the ABC (see paragraphs (f)(5) and (h) of this section).
(5) **AMs** (see paragraphs (g) and (h)(1) of this section).

(6) Stocks and stock complexes that have statutory exceptions from ACLs… (Note: monkfish does not have a statutory exception, so this part is not apply)

2.1.6.4.3 Maximum Sustainable Yield (MSY)

MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g. gear selectivity), and the distribution of catch among fleets. **Fmsy** is the fishing mortality rate that, if applied over the long term would result in MSY. **Bmsy** means the long-term average size of the stock or stock complex that would be achieved by fishing at Fmsy. Because MSY is a long-term average, it need not be estimated annually, but it must be based on the best scientific information available. When data are insufficient to estimate MSY directly, Councils should adopt other measures of reproductive potential that can serve as reasonable proxies for MSY, Fmsy and Bmsy, to the extent possible.

2.1.6.4.4 Status Determination Criteria (SDC)

SDC mean the quantifiable factors, MFMT, OFL, and MSST, or their proxies that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. “Overfished” relates to biomass, while “overfishing” pertains to a rate or level of removal of fish from a stock. SDC must be expressed in a way that enables the Council to monitor each stock, and determine annually, if possible, whether overfishing is occurring and whether the stock is overfished. In specifying SDC, a Council must provide an analysis of how the SDC were chosen and how they relate to reproductive potential. Each FMP must specify, to the extent possible, objective and measurable SDC.

2.1.6.4.5 Maximum Fishing Mortality Threshold (MFMT)

MFMT means the level of fishing mortality (F), on an annual basis, above which overfishing is occurring.

2.1.6.4.6 Overfishing Limit (OFL)

OFL means the annual amount of catch that corresponds to the estimate of MFMT applied to a stock’s abundance and is expressed in terms of numbers or weight of fish. OFL is an estimate of the catch level above which overfishing is occurring, corresponds to the level that jeopardizes the capacity of a stock to produce MSY on a continuing basis.

2.1.6.4.7 Minimum Stock Size Threshold (MSST)

MSST means the level of biomass below which the stock is considered to be overfished, and corresponds to the level that jeopardizes the capacity of the stock to produce MSY on a continuing basis.

If the fishing mortality rate exceeds the MFMT, or the catch exceeds the OFL for one year or more, overfishing is occurring, and if the estimated stock size in a given year falls below the MSST, the stock is considered overfished.

2.1.6.4.8 Optimum Yield (OY)

OY is a long-term average amount of desired yield from a stock, stock complex or fishery. An FMP must contain conservation and management measures, including ACLs and AMs, to achieve OY on a continuing basis, and provisions for information collection that are designed to determine the degree to which OY is achieved. Exceeding OY does not necessarily constitute overfishing. However, even if no overfishing resulted from exceeding OY, continual harvest at a level above OY would violate NS1, because OY was not achieved on a continuing basis.

OY cannot exceed MSY in any circumstance, and must take into account the need to prevent overfishing and rebuild overfished stocks. If the estimates of MFMT and current biomass are known with a high level of certainty and management controls can accurately limit catch, then OY could be set very close to MSY, assuming no other reductions are necessary for social, economic or ecological factors. The amount of fish that constitutes OY should be expressed in terms of numbers or weight of fish, and may be either a range or single value. All catch, including that resulting from bycatch, scientific research and all fishing activities, must be counted against OY. There should be a mechanism in the FMP for periodic assessment of the OY specification, so that it is responsive to changing circumstances in the fishery.

2.1.6.4.9 Acceptable Biological Catch (ABC), Annual Catch Limits (ACLs), and Annual Catch Targets (ACTs)

ABC is a level of a stock's annual catch that accounts for scientific uncertainty in the estimate of OFL and any other scientific uncertainty. ABC should be expressed in terms of catch, but may be expressed in terms of landings as long as estimates of bycatch and any other fishing mortality not accounted for in the landings are incorporated into the determination of ABC. ABC may equal, but may not exceed OFL.

The ABC control rule means a specified approach to setting the ABC. Control rules are policies for setting limit or target fishing levels, and are established by fishery managers in consultation with fisheries scientists, particularly the SSC. The determination of ABC should be based, when possible, on a probability of 50 percent or less that a catch equal to ABC would result in overfishing. The ABC control rule must articulate how ABC will be set compared to the OFL based on the scientific knowledge about the stock, the scientific uncertainty in the estimate of OFL, and any other scientific uncertainty. An SSC may recommend an ABC that differs from the result of the ABC control rule calculation, based on factors such as data uncertainty, recruitment variability, declining trends in population variables, and other factors, but must explain why.

ACL may equal but cannot exceed the ABC, and may be set annually or on a multiyear basis. ACL is the level of annual catch of a stock that serves as the basis for invoking AMs. ACL may be subdivided into sector ACLs, which may be necessary if the management measures for different sectors differ in the degree of management uncertainty so that appropriate AMs can be developed for each sector. In this usage, "sector" means a distinct user group to which separate management strategies and separate catch quotas apply, such as the commercial sector, recreational sector, or various user groups within a fishery.

ACT is an amount of catch of a stock that is the management target of the fishery, and accounts for management uncertainty in controlling catch at or below the ACL. The ACT control rule means a specified approach to setting the ACT for a stock such that the risk of exceeding the ACL due to management uncertainty is at an acceptably low level, and should articulate how management uncertainty is accounted for in setting ACT. Two sources of management uncertainty that should be accounted for are: uncertainty in the ability of managers to constrain catch so the ACL is not exceeded; and, uncertainty in quantifying the true catch amounts (i.e., estimation errors).

2.1.6.4.10 Accountability Measures (AMs)

AMs are management controls to prevent ACLs, including sector ACLs, from being exceeded, and to correct or mitigate overages of the ACL, if they occur. NMFS identifies two categories of AMs, in-season AMS and AMs for when the ACL is exceeded. [**Note:** for purposes of this amendment, the two categories are referred to as **"proactive" and "reactive" AMs**].

2.1.6.4.10.1 In-season AMs

Whenever possible, FMPs should include in-season monitoring and management measures to prevent catch from exceeding ACLs. In-season AMs could include, but are not limited to: ACT; closure of a fishery; closure of specific areas; changes in gear; changes in trip size or bag limits; reductions in effort; or other appropriate management controls. FMPs should contain in-season closure authority, giving NMFS the ability to close fisheries if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of the fishery is necessary to prevent overfishing.

2.1.6.4.10.2 AMs for when the ACL is exceeded

On an annual basis, the Council must determine as soon as possible after the fishing year if an ACL was exceeded. If an ACL was exceeded, AMs must be triggered and implemented as soon as possible to correct the operational issue that caused the overage, as well as any biological consequences to the stock resulting from the overage when it is known. These AMs could include, among other things, modifications of in-season AMs or overage adjustments. If catch exceeds the ACL for a given stock more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary to improve its performance and effectiveness.

2.2 Purpose and Need

The primary need for this action is to bring the Monkfish FMP into compliance with the 2007 re-authorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSRA). The MSRA included several new requirements, foremost of which is that each fishery adopt annual catch limits (ACLs) to prevent overfishing, including measures to ensure accountability. Since the monkfish stocks are not subject to overfishing, the MSRA requires that the Monkfish FMP achieve compliance by 2011. Therefore, the primary purpose of this amendment is to consider measures that will implement annual catch limits and accountability measures (AMs) to prevent overfishing.

This action is also needed to fully comply with the revised NS1 Guidelines pertaining to the specification of reference point control rules and status determination criteria. On January 16, 2009, NMFS published amended guidelines for National Standard 1 (NS1) of the MSRA (74 *Federal Register* 3178) for setting ACLs and other management reference points, and clarifying the relationship among those reference points. Specifically, these reference points include the Overfishing Limit (OFL), Maximum Sustainable Yield (MSY), Optimum Yield (OY), and Allowable Biological Catch (ABC). In addition, the guidelines provide a framework for various AMs, including in-season AMs, AMs for when the ACL is exceeded, AMs based on multi-year average data, and AMs for State-Federal fisheries. These reference points and AMs are discussed in more detail in Section 2.1.6 above. The purpose is, therefore, to define and adopt management reference points in accordance with the revised Guidelines.

This action is needed because current specifications of target total allowable catch (TTAC), and associated management measures, such as days-at-sea (DAS) and trip limits adopted in Framework 4 for the 2007-2009 fishing years will expire on April 30, 2010. Framework 4 included a provision to continue these specifications in FY2010 and beyond if the Councils do not adopt new specifications prior to that time. However, the Councils' intent was that the extension only be a contingency provision in the event unforeseen circumstances prevented setting specifications at the end of the three-year period. The Councils began working on Amendment 5 in January 2009. Given the rebuilt status of the resource, it was unreasonable to simultaneously develop specifications separately for FY2010. As a result, the TTACs and associated management measures in place or FY2009 will remain in effect for one additional year until the Councils can complete Amendment 5. Since the Councils are proposing to use an Annual Catch Target (ACT) as an in-season, proactive AM, the ACT will serve the same function as the TTAC as being the basis for specifying management measures, after accounting for discards. The third purpose of this amendment, therefore, is to adopt specifications for FY2011-2013 and beyond, if necessary. Revised specifications will include trip limits and DAS for the directed fishery, adjustments to the Research Set Aside (RSA) program, or other administrative or operational revisions to the existing management program.

Table 1 is a summary of the needs for, and purposes of this action.

Need	Purpose	Section
MSRA Compliance	Implement ACLs and AMs to prevent overfishing	3.2
NS1 Guidelines Compliance	Adopt biological and management reference points and control rules consistent with updated NS1 Guidelines	3.1
Expiration of Specifications adopted in Framework 4	1 – Adopt updated catch targets on which to base management measures	3.2.2.3
	2 –Adopt appropriate DAS and trip limits for directed fishery, incidental monkfish	3.3 - 3.6

	catch limits, administrative measures adjustment, other management measures in the current program.	

Table 1 Summary of purposes and needs identified for Amendment 5

2.3 Notice of Intent and Scoping Process

The Councils began development of Amendment 5 in late 2008. The Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) was published February 20, 2009 (74 *Federal Register* 7880) and scoping hearings were held as shown below:

Date	Location
Monday, February 23, 2009	**Gloucester, MA**
Tuesday, February 24, 2009	**Warwick, RI**
Tuesday, March 3, 2009	**Manahawkin, NJ**
Friday, March 6, 2009	**Rockport, ME**

The scoping comment period ended on March 31, 2009.

In the initial stages of Amendment 5, the Councils proposed including alternatives that would have potentially significantly changed the management program through the adoption of a catch share system (e.g., Individually Transferrable Quotas or Sectors). At its September, 2009 meeting, however, the NEFMC considered the time constraints associated with implementing ACLs and AMs for 2011 and voted to narrow the scope of issues to be addressed in Amendment 5, and to defer development of catch shares to the next amendment. The separation of these actions will enable the Councils and NMFS to review and approve ACLs and AMs within the statutory 2011 timeline while giving proper consideration under NEPA to catch shares. After the Councils decided to delay consideration of catch shares to a future amendment, the staff proceeded with development of an EA instead of an EIS because it believed that the other actions under consideration would not likely have a significant impact on the human environment, which has been verified in the analyses contained within this EA, and the finding of no significant impact. On September 20, 2010 NMFS published a NOI to prepare an EA, and retraction of the NOI for the EIS for Amendment 5 (75 *Federal Register* 57262)

2.4 Goals and Objectives

The original FMP specified the following management objectives:

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.

The goals and objectives for this amendment supplement the basic FMP objectives. As discussed in the Purpose and Need Section above, this amendment is primarily intended to bring the FMP into compliance with the new MSRA mandates, and to specify management measures consistent with the FMP goals, including updated specification of catch targets and associated management measures.

3.0 Alternatives under Consideration

The following section describes the alternatives under consideration for Amendment 5, including those that were considered but rejected. During the development of Amendment 5, based on scoping comments and other considerations, the Councils also considered including several alternatives for adjusting some of the applicable incidental catch limits and for adopting catch-share management programs, either ITQs or sectors. In consideration of the MSRA-mandated deadline to implement ACLs and AMs by 2011, and the expiration of current specifications of DAS and trip limits, as well as the time required to fully develop and analyze those other alternatives, the Councils have deferred action on them to a future amendment. Thus, the Councils have not rejected the alternatives, but are deferring further development of them so they can complete the required provisions in a timely manner.

3.1 Biological and Management Reference Points

3.1.1 Alternative 1 – No Action

Current biological and management reference points are used to determine stock status with respect to being rebuilt (biomass targets, B_{target}), being in an overfished condition (biomass thresholds, $B_{threshold}$), and when overfishing is occurring (fishing mortality thresholds, $F_{threshold}$). Framework 5 adopted revised biomass reference points on the recommendation of the Data Poor Stocks Working Group (DPWG, 2007) as shown in Table 2. In 2003, Framework 2 adopted revised $F_{threshold}$ reference points on the recommendation of SAW/SARC 34, and set them equal to F_{max}. Framework 2 also stated that if a future assessment re-estimated the value associated with F_{max}, then the corresponding value of the $F_{threshold}$ reference point would change automatically. The values associated with F_{max} at that time were F=0.2, and those were revised in 2007 by the DPWG to the values shown in Table 2. The DPWG concluded that F_{max} is a proxy for F_{MSY}, and the average observed biomass (B_{target}) is a proxy for B_{MSY}, but a MSY proxy was not determined. These reference points, while they may be the basis for calculating the proposed reference points described in the following sections, do not, in and of themselves, adequately meet the requirements of the MSRA and the NS1 Guidelines.

	B_{target} (mt)	$B_{threshold}$ (mt)	$F_{threshold}$
NMA	92,200	65,200	0.31
SMA	122,500	96,400	0.40

B_{target} = average of total biomass 1980 - 2006
$B_{threshold}$ = lowest value of total biomass 1980 - 2006
$F_{threshold}$ = F_{max}

Table 2 Biological reference points for northern (NMA) and southern (SMA) monkfish management areas.

With respect to OY, the FMP currently sets OY at the catch associated with the target total allowable landings (TTAL). While this approach may be consistent with the MSRA and NS1 Guidelines, the proposed action no longer uses the TTAL as a basis for specifying management measures. Rather, under the proposed action, the ACT will be used for setting management measures, after accounting for discards, and the specification of OY needs to be revised to reflect that change.

3.1.2 Alternative 2 – Preferred Alternative - reference points and control rules

3.1.2.1 MSY control rule and specification

MSY is the long-term equilibrium catch produced by fishing at the rate calculated to achieve MSY (F_{msy}) on a stock that is at the biomass level that can produce MSY (B_{msy}) over the long term. F_{msy} or its proxy is the maximum fishing mortality threshold (MFMT, $F_{threshold}$), above which overfishing is deemed to be occurring. B_{msy} or its proxy is the target biomass reference point (B_{target}). MSY is the product of these two reference points, and the control rule is expressed as:

$$\mathbf{MSY = F_{threshold} \ X \ B_{target}}$$

MSY values are currently calculated to be 17,053 mt and 25,487 mt for Northern and Southern management areas, respectively. The input variables and calculation are shown in Table 3 and are discussed below.

	$F_{threshold}$	M	exploitable B_{2006} (mt)	exploitable B_{target} (mt)*	U = F/Z*(1-e^{-z})	MSY proxy = F/Z*(1-e^{-z})*B	OFL
North	0.31	0.30	97,940	73,484	0.2321	17,053	22,729
South	0.40	0.30	98,250	88,598	0.2877	25,487	28,263

* calculated as average of exploitable biomass (1980-2006) from SCALE using selectivity curve for 2004-2006 for entire time series

B target was defined by DPWG as average of total biomass (1980-2006)

Table 3 PDT calculations of MSY and OFL based on exploitable biomass targets.

<u>Discussion</u>

The PDT calculated MSY using the most recent estimate of $F_{threshold}$ and B_{target} from the DPWG assessment for 2006. These are proxy reference points for F_{msy} and B_{msy}. The DPWG calculated B_{target} as the average of *total* biomass 1980-2006, but for the purpose of determining MSY, *exploitable* biomass needs to be used. For the NMA, the assessment model (Statistical Catch At Length, SCALE) input maintained a consistent selectivity pattern throughout the time series, but for the SMA, three different selectivity patterns were applied to reflect changes in predominant gears during the period. As a result, the PDT recalculated B_{target} as exploitable biomass by applying the selectivity pattern during the most recent period to the entire time series (
Table 4 and Figure 3).

The SSC stated the following in its March 30 Report to the Council:

The 2007 Data Poor Stocks Workshop advanced the monkfish stock assessment as a basis for fishery management by developing an analytical model (Statistical Catch At LEngth, SCALE) that synthesizes all recent information available on the fishery and the resource (catch data, survey data, size distributions and life history). However, substantial sources of uncertainty remain in the SCALE analysis. Although the DPSW accepted the model to estimate stock size and fishing mortality, it was not a reliable basis to determine conventional MSY reference points. Yield-per-recruit was used to derive F_{max} as a proxy for F_{MSY}, and the average estimated biomass during the assessment time series was used as a data-poor proxy for B_{MSY}. The SSC recognizes the uncertainties described in the DPSW report (natural mortality rate, growth rate, magnitude of discards, uncertain survey indices, under-reported historical catch, and a short assessment series). The SCALE model was also not considered to be a suitable basis for projection by the DPSW; as stated in the 2007 assessment summary, "Further work is necessary to develop a complete forecasting approach." These uncertainties influence both components of OFL: the F_{MSY} proxy and stock biomass projections. Therefore, the SSC concludes that the information currently available for monkfish does not support a conventional approach to determining OFL and ABC as provided in National Standard 1 guidelines.

The SSC noted the following in its June 23 Report to the Council:

The 2007 Data Poor Stocks Workshop (NEFSC 2007) concluded that F_{max} is a proxy for F_{MSY}, and the average observed biomass is a proxy for B_{MSY}, but a MSY proxy was not determined. An approximation of MSY was calculated by the PDT as the catch associated with F_{max} and the average observed biomass (17,000 mt for the north and 25,000 mt for the south). However, the F_{MSY} and B_{MSY} proxies were chosen independently and are not consistent (i.e., fishing at F_{max} is not expected to maintain the mean of observed biomass), and MSY should ideally be derived as the long-term yield expected by fishing at F_{MSY}. Given the data-poor status of monkfish, the PDT's calculation of MSY should be used as a proxy until more consistent reference points can be derived.

	Exploitable Biomass (mt)		
	PDT 2009	DPWG 2007	
1980	74,524	86,815	
1981	82,285	95,232	
1982	92,009	105,523	
1983	101,971	115,814	
1984	110,891	124,734	
1985	118,625	132,016	
1986	122,689	134,990	
1987	124,376	135,605	
1988	122,651	133,229	
1989	117,442	127,900	
1990	104,752	115,536	
1991	96,516	108,043	
1992	87,770	98,674	
1993	77,186	88,038	
1994	68,357	80,425	
1995	66,027	79,525	
1996	64,206	67,979	
1997	63,417	67,391	
1998	63,164	67,261	
1999	62,768	66,611	
2000	65,756	69,215	
2001	71,213	74,597	
2002	74,072	77,922	
2003	80,661	85,268	
2004	86,742	86,742	
2005	93,818	93,818	
2006	98,250	98,250	
			difference
average =Btarget proxy	88,598	96,932	8,334

Table 4 Comparison of SMA exploitable biomass estimates from final SCALE runs from DPWG 2007 (3 selectivity blocks) to exploitable biomass derived by applying the most recent selectivity block (2004-2006) to numbers at length output from DPWG 2007 final SCALE run and converting to weight at length.

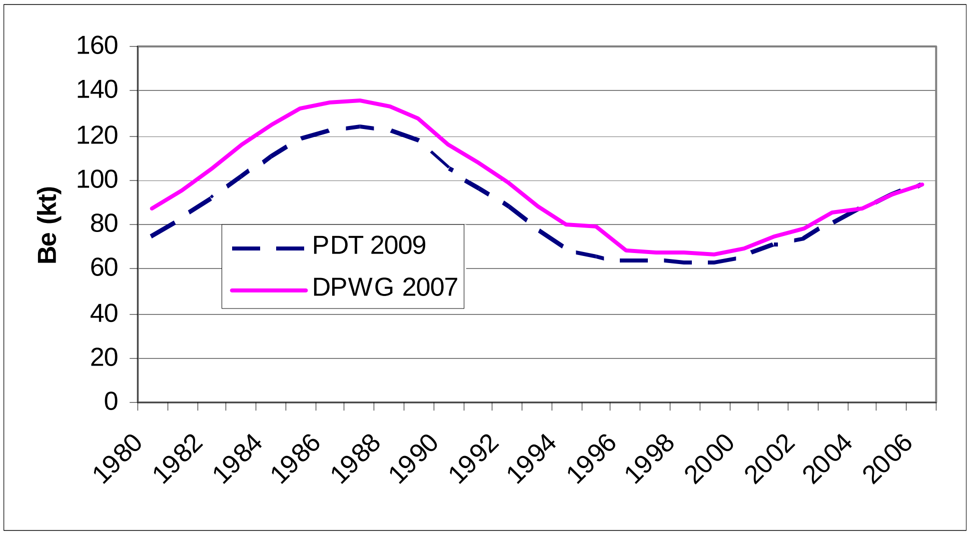


Figure 3 Comparison of SMA exploitable biomass estimates from final SCALE runs from DPWG 2007 (3 selectivity blocks) to exploitable biomass derived by applying the most recent selectivity block (2004-2006) to numbers at length output from DPWG 2007 final SCALE run and converting to weight at length (PDT 2009).

3.1.2.2 OFL control rule and specification

OFL is the amount of catch above which overfishing is deemed to be occurring, that is, it is a status determination criterion for overfishing. It is an annual limit derived as the product of current exploitable biomass and $F_{threshold}$. The OFL control rule is expressed as:

$$\mathbf{OFL = F_{threshold} \; X \; B_{current}}$$

OFL values are currently calculated to be 22,729 mt and 28,263 mt, North and South, respectively. The input variables and calculation are shown in Table 3 and are discussed below.

Discussion

The values associated with $B_{current}$ are from the DPWG for 2006. When a new assessment is completed, (scheduled for 2010), new estimates of current biomass will result in different values for OFL based on the proposed control rule. It should be noted that the current values for OFL are higher than those associated with MSY since the estimate of current biomass is above the biomass associated with producing MSY. This is consistent with the NS1 Guidelines. However, the OFL estimates resulting from the proposed method are very high in comparison to historic landings, reflecting the uncertainty surrounding the estimate of current biomass from the 2006 assessment.

3.1.2.3 ABC control rule and specification

ABC is the level of catch that accounts for scientific uncertainty in the estimate of OFL and any other scientific uncertainty. NS1 Guidelines state that the Council must establish an ABC control rule based on scientific advice from its SSC. Further, the guidelines prescribe that “the determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock’s ABC would result in overfishing.

The SSC observed in its June 23 report to the Council that “considerable uncertainties in the assessment model preclude its use to determine probability of exceeding the projected Overfishing Level of catch.” Therefore, the SSC recommended the method of determining ABC should be considered an interim proxy until Overfishing Level of catch and its uncertainty can be projected.

The SSC recommended that the interim ABC should be derived (ABC control rule) as:

> **the product of the average exploitation rate during the recent period of stable or increasing trend in biomass for each management unit and the most recent estimate of exploitable biomass**.

The PDT reviewed the SCALE model results from the 2007 assessment and determined that the period 1999-2006 and 2000-2006 be used for the NMA and SMA, respectively. The starting years are those where the recent increase was first observed (see Table 5). The calculations produced values for **ABC of 17,485 mt (North) and 13,326 mt (South).** These resulted in buffers between OFL and ABC of 5,234 mt (North) and

14,930 mt (South), or 23% and 53% of the respective OFL values (Table 6).

Discussion

In its March 30 Report, the SSC commented that "the data-poor default method for determining an interim ABC produces catch advice that is substantially less than the nominal OFL, but is not directly associated with overfishing (i.e., it is not directly based on OFL and its uncertainty)." The SSC stated that it will re-consider ABC recommendations for the 2014 fishing year, based on updated information (a stock assessment is scheduled for 2010). The SSC recognizes that the interim ABC for the NMA is slightly greater than the MSY proxy. As described above, the MSY proxy is simply the combination of F_{MSY} and B_{MSY} proxies that were independently derived, and should not be considered a constraint on ABC. National Standard Guidelines provide that the catch associated with overfishing (OFL) will fluctuate above and below MSY, and at high stock sizes ABC may exceed MSY. The most recent estimate of exploitable biomass of monkfish in the north is 33% greater than the B_{MSY} proxy, justifying an interim ABC that is slightly greater than the MSY proxy.

North					South				
Year	Age-1 Recruitment	Exploitable Biomass (kt)	Total Biomass (kt)	F	Year	Age-1 Recruitment	Exploitable Biomass (kt)	Total Biomass (kt)	F
1980	20.50	110.83	127.27	0.05	1980	31.05	86.81	107.91	0.09
1981	14.77	107.23	123.28	0.05	1981	29.96	95.23	116.80	0.06
1982	15.30	104.22	119.68	0.05	1982	24.51	105.52	127.14	0.05
1983	14.84	101.03	115.55	0.05	1983	22.13	115.81	136.88	0.05
1984	13.53	98.12	111.38	0.06	1984	21.65	124.73	144.67	0.04
1985	10.42	94.16	106.18	0.08	1985	20.58	132.02	150.44	0.05
1986	15.11	88.66	99.93	0.07	1986	23.80	134.99	152.10	0.04
1987	14.15	83.50	94.26	0.09	1987	36.12	135.61	152.67	0.04
1988	17.42	76.51	87.14	0.11	1988	14.49	133.23	150.35	0.05
1989	23.66	68.89	80.34	0.15	1989	25.93	127.90	145.58	0.12
1990	27.30	60.25	73.29	0.17	1990	34.10	115.54	133.81	0.10
1991	21.38	53.53	68.36	0.18	1991	39.77	108.04	127.04	0.13
1992	23.33	49.53	66.24	0.22	1992	32.57	98.67	118.80	0.20
1993	36.49	49.15	67.62	0.34	1993	43.95	88.04	110.42	0.26
1994	33.13	46.75	66.12	0.34	1994	35.49	80.43	104.39	0.23
1995	15.48	46.35	66.26	0.41	1995	29.88	79.52	104.05	0.28
1996	20.10	44.93	65.23	0.43	1996	23.35	67.98	101.55	0.35
1997	34.47	45.51	65.33	0.32	1997	24.53	67.39	100.18	0.37
1998	40.99	49.87	69.09	0.20	1998	43.85	67.26	98.37	0.36
1999	52.82	56.78	78.25	0.20	1999	39.26	66.61	96.42	0.29
2000	52.57	61.83	88.35	0.22	2000	34.85	69.21	99.76	0.19
2001	32.21	66.90	97.95	0.30	2001	16.56	74.60	107.38	0.23
2002	26.24	70.35	103.03	0.30	2002	33.33	77.92	112.56	0.19
2003	26.10	77.35	108.33	0.32	2003	50.37	85.27	120.07	0.20
2004	27.85	83.57	110.08	0.23	2004	25.71	86.74	124.26	0.15
2005	22.79	90.33	112.87	0.16	2005	17.44	93.82	129.99	0.15
2006	27.05	97.94	118.70	0.09	2006	30.60	98.25	135.45	0.12
2007	20.50	109.52	129.62	0.06	2007	31.05	104.87	142.74	0.07
2008	20.50	119.88	139.31	0.06	2008	31.05	116.07	151.76	0.07
2009	20.50	125.40	144.02	0.05	2009	31.05	125.14	158.82	0.06

Table 5 DPWG 2007 Estimates of Age-1 recruitment, Exploitable and Total Biomass and Fishing mortality rate from the SCALE model final run, including projections for 2007-2009.

	Start Year	F_{abc}	U_{abc}	Exp. B_{2006} (kmt)	ABC (mt)	OFL-ABC (mt)	Buffer (OFL-ABC)/OFL
NORTH	**1999**	**0.23**	**0.18**	**97.94**	**17,485**	**5,234**	**23%**
SOUTH	**2000**	**0.17**	**0.14**	**98.25**	**13,326**	**14,937**	**53%**

Table 6 PDT Calculation of ABC and the buffers between ABC and OFL

3.1.2.4 OY

The MSRA defines "optimum" with respect to yield from a fishery as 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 maximum sustainable yield from the fishery as reduced by any relevant economic, social and ecological factors; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing maximum sustainable yield." The NS1 Guidelines state that OY must take into account the need to prevent overfishing and rebuild overfished stocks. Setting OY equal to the ACT, as proposed, represents the maximum yield from the fishery while preventing overfishing, after taking into account scientific uncertainty in the overfishing limit in setting ABC, and management uncertainty in setting measures that will not exceed the ABC. Generally, the greatest benefit to the nation, including social and economic considerations, implies maximizing yield from the fishery while not overfishing, and, therefore, the use of the ACT as a numerical value associated with OY would be appropriate.

OY=ACT

3.2 ACL and AMs

Section 303(a)(15), of the MSRA requires Councils to "establish a mechanism for specifying annual catch limits (ACLs) in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability (AMs)". NS1 Guidelines state that ACLs cannot exceed the ABC and, in coordination with AMs must prevent overfishing. Since the purpose of ABC is to account for the scientific uncertainty in the estimate of OFL, the ACL may equal ABC, provided the AMs are sufficient to prevent exceeding the ACL, or account for any overage of ACL so that overfishing does not occur.

3.2.1 Alternative 1 – No Action

The current FMP does not specify an ACL, nor does it have measures that have been identified as those intended to ensure accountability. Rather, the FMP has specified a target total allowable catch level (TTAC) to set management measures at a level that will prevent overfishing and achieve optimum yield. In actuality, the TTAC is a target total allowable landings level, since the current FMP does not account for discards in setting the target. Discards are considered in the stock assessments, however, and in the analyses that determine whether overfishing is occurring. The no action alternative, therefore, with respect to ACLs and AMs, would be to continue the current approach of setting target total allowable landings at a level that is expected to prevent overfishing. This approach does not comply with the MSRA and NS1 Guidelines.

3.2.2 Alternative 2 – Preferred Alternative - ACLs and AMs

3.2.2.1 ACLs

Since the Councils propose using annual catch targets (ACTs) as proactive AMs, see subsections below, that are set sufficiently below the ACL to account for uncertainty in the ability of the management measures to control catch ("management uncertainty"), as well as reactive AMs, they have determined that there is no technical basis for setting the ACL below the ABC. Therefore, the Councils propose that:

> **ACL=ABC**

Discussion

In its March 30 Report, the SSC observed the following:

> *The … proposal to define the annual catch limit (ACL) as equal to the ABC is consistent with the final guidelines to implementing National Standard 1. The buffer between ACL and ACT should account for management uncertainty, avoid exceeding the ACL and avoid reactive accountability measures. The magnitude of recent catch has low risk of exceeding the OFL or the proposed interim ABC. In 2006, total catch was 7,187mt in the north (32% of OFL) and 9,561mt in the south (34% of OFL). According to the PDT's estimate of 2007 landings and status quo discard rates, total catch in 2007 was approximately 5,400mt in the north (24% of OFL) and 8,800mt in the south (31% of OFL). Any reduction in the magnitude or rate of discards would reduce both scientific and management uncertainty.*

3.2.2.2 Reactive AM

NS1 Guidelines describe AMs as management controls designed to prevent ACLs from being exceeded, and to correct or mitigate overages of the ACL if they occur. The latter form of AMs are reactive in that they take effect in the event of an overage. The guidelines say further that "on an annual basis, the Council must determine as soon as possible after the fishing year if an ACL was exceeded. If an ACL was exceeded, AMs must be triggered and implemented as soon as possible to correct the operational issues that caused the ACL overage…". The Councils propose the following reactive AM:

> **If the ACL in a management area is exceeded in a given year, the overage would be deducted on a pound-for-pound basis from the ACT, and adjustments made to management measures would be developed during the year immediately following the year in which the overage occurred, for implementation in the next fishing year. Thus, if the ACL is exceeded, the ACT is to be reduced in the second fishing year following the year in which the overage occurred. In the event the Councils do not take appropriate action, the Regional Administrator will use a formulaic approach that will be developed by the PDT, similar to that used in Framework 2, to adjust DAS and trip limits, and will implement those adjustments by Notice Action published in the *Federal Register* no later than January 1 for subsequent fishing year starting May 1.**

Discussion

The monkfish FMP provides for incidental catch in other fisheries by assigning various incidental landing limits appropriate to the affected fisheries to minimize bycatch. When developing monkfish management measures for the directed fisheries in the north and south, the FMP first deducts the most recent estimate of incidental landings (not total catch) from the landings target (TAC) to determine the amount of fish available to the directed fishery. In other words, the FMP controls directed effort, which is based on the TAC residual after incidental catch, but it does not directly control the incidental catch in fisheries managed by other FMPs. The incidental catch takes precedence due to the fact that monkfish is caught to some degree in almost every fishery, and to attempt to control that catch (other than to allow limited landings) would require the FMP to impose management restrictions on fisheries managed under other FMPs.

Extending this management philosophy to the ACL and reactive accountability measures would mean that the ACL would be apportioned, but not allocated based on observed catch distribution (landings plus discards) by various fisheries (e.g., directed, by gear, and indirect by gear or fishery). When catch exceeds the ACL, the first step in adopting accountability measures would be to determine the source of the overage. If the overage is due to overages by the directed fishery component, then proportional adjustments would be made to the ACT, and associated management measures, for the subsequent year. If the overage is due to catch by incidental fisheries exceeding the expected level, then the amount of the overage would be added to the incidental catch portion of the ACT, with a subsequent recalculation of the directed fishery portion, and associated management measures. This approach would likely apply whether the fishery remained under the current management system, or moved toward a catch-share approach.

The proposed reactive AM requires the Councils to take action as soon as possible after the end of the fishing year, but also provides a backstop authority to the NMFS Regional Administrator to take action if the Councils fail to act in a timely way. This two-tiered approach provides the Councils an opportunity to consider alternative approaches to making the necessary adjustments, but establishes a firm, formulaic approach that ensures accountability whether or not the Councils take action.

3.2.2.3 Proactive AMs (ACT)

A proactive AM would be an ACT that is set sufficiently below the ACL such that the measures that are based on the ACT prevent the ACL from being exceeded, in consideration of all sources of management uncertainty. Proactive AMs, as described below, would set catch targets based on the expectation that, in spite of uncertainty in the effectiveness of management measures, those measures would ensure that the ACL is not exceeded. The ACT which would be the basis for setting management measures (DAS/trip limits), after accounting for incidental catch in non-directed fisheries, and includes discards in all fisheries.

The Councils proposed two options for ACTs for each area. The ACTs can be subdivided into two parts, landings and discards. Discards have been estimated from data compiled for the DPWG assessment, and are based on a three year average for the most recent years in the assessment (2004-2006). The discard rates are 7.5% for the NMA and 29% for the SMA which are applied to the total allowable landings to derive the ACTs.

3.2.2.3.1 NMA ACT Options

	TAL Increase	TAL (mt)	Discards (mt)	NMA ACT (mt)
ACT Option 1	**50 %**	**7,500**	**563**	**8,063**
ACT Option 2	**100 %**	**10,000**	**750**	**10,750**
ACL	**17,480 mt**			

Discard rate for NMA= 7.5%

The Councils' preferred alternative is ACT Option 2 for the NMA.

3.2.2.3.2 SMA ACT Options

	TAL Increase	TAL (mt)	Discards (mt)	SMA ACT (mt)
ACT Option 1	**40 %**	**7,140**	**2,071**	**9,211**
ACT Option 2	**75 %**	**8,925**	**2,588**	**11,513**
ACL	**13,326 mt**			

Discard rate for SMA= 29%

The Councils' preferred alternative is ACT Option 2 for the SMA.

Discussion

In using a proactive AM, the Councils recognized that there is uncertainty in the effectiveness of management measures, as well as uncertainty in the timely monitoring of catch, including discards. By using an ACT to set management measures, the Councils are placing a buffer between the catch target used to set management measures and the catch limit which defines overfishing, after accounting for scientific uncertainty in the OFL. A higher ACT increases the risk that catch will exceed the ACL, and that overfishing will occur. Catch will exceed the ACT if any of the assumptions in the analytical model used to calculate the specification of management measures (DAS and trip limits) are violated. Such violation could occur for a variety of reasons including, but not limited to: that the incidental catch of monkfish in other fisheries is greater in the future than in the baseline year of the model (FY2008); that monkfish catch rates on directed trips is greater than in the baseline year; that DAS utilization rates (DAS used compared to DAS allocated) increase. Furthermore, if a future stock assessment results in a recalculation, and reduction, of the OFL and ABC, under the control rules proposed in this amendment, then there is a greater risk that the ACT will be unacceptably close to, or even exceed the ACL. On the other hand, a higher ACT allows for greater yield from the fishery, providing economic opportunity for fishing businesses and greater availability to the consumer.

3.3 Specification of DAS and Trip Limits Alternatives

This section describes the alternatives under consideration for modifications to measures applicable to vessels fishing in the directed monkfish fishery, that is, while on a monkfish

DAS, as well as the options under consideration for adjustments to DAS and trip limit allocations to achieve the ACT options for each management area.

3.3.1 DAS and Trip Limit Options

3.3.1.1 Alternative 1 (no action)

If the Councils do not adjust the DAS and trip limits, current effort levels would remain in effect under the terms of specifications adopted in Framework 4. These are:

	DAS	Trip limit (tail wt. lbs./DAS)	
		Permit A & C	Permit B,D, &H
NMA	31	1,250	470
SMA	23	550	450

These specifications would not be consistent with the ACT options being proposed since they are based on the TTAC of 5,000 mt and 5,100 mt, NMA and SMA, respectively. Since the proposed ACTs are higher than the TTACs, these specifications would not result in the fishery achieving OY. The exception to this conclusion is with respect to SMA ACT Option 1, due to the TTAC overage in previous fishing years. SMA ACT Option 1 is based on the catch that resulted in FY2008 from these specifications. Therefore, two of the SMA specifications options discussed below retain the current trip limit and DAS allocations to achieve the higher ACT.

3.3.1.2 Alternative 2 – Preferred Alternative - NMA and SMA DAS and trip limit options

The Councils considered a range of DAS and trip limit options under each ACT option presented above. The range of options comprises three approaches: maintain current DAS allocations, and adjust the trip limit; maintain the current trip limit and adjust the DAS allocations; and, adjust both DAS and trip limits. A detailed discussion of the methodology and results is provided in Appendix 2, Monkfish Northern and Southern Fishery Management Area Daily Landings and Days-at-Sea limit Allocations for FY2011-FY2013 (Specifications Report).

In addition, in response to a request by the Monkfish Oversight Committee, PDT developed an option for the NMA that would set the trip limits for all limited access permit categories at the same level with a DAS allocation of 40. The report discusses this analysis and notes that the results are limited by the overall allocation of total allowable landings (TAL) to the BD permit category group. In this circumstance, the AC permit category trip limits are lower than they would be under the standard options. To allow for a higher BD trip limit would require reallocation of permit category AC group TAL allocation to the BD group, which is not a measure that the Councils have agreed to consider, and which would be counter to the basis on which the initial permit qualifications were based. This option was hence not forwarded by the Committee to the Council, and, therefore, is not presented below under alternatives under consideration.

The Specifications Report also contains the results of an analysis requested by the Monkfish Oversight Committee which assumes that monkfish incidental catch in the

NMA would be 50% of recent historical levels as a result of restrictions proposed in Amendment 16 to the Multispecies FMP. Under that scenario, the allocation of TAL to the directed fishery (DAS and trip limits) would increase. The Committee did not specify that this scenario be included as an alternative for consideration in this amendment, and so those options are not included in those described below. Whether or not a 50% reduction in incidental landings would occur is highly uncertain, and, therefore, to include that scenario as alternatives to be considered would be inappropriate. Furthermore, the distribution of landings per DAS and DAS usage rates in FY2008 indicates that even if the allocations were to be increased, very few vessels would avail themselves of that increased opportunity, since the overwhelming majority of vessels did not use their allocated monkfish DAS (median of 6 DAS out of 35 allocated, including carryovers), and landed well below the allowable limit on those monkfish DAS.

3.3.1.2.1 NMA DAS and trip limit options

The two ACT options for the NMA are based on a 50% and 100% increase in the target TAL, or 8,063 mt and 10,750 mt, respectively. The three options for DAS and trip limit allocations are shown in Table 7. It should be noted that the trip limits for the AC permit group is 1,250 lbs. tail wt. per DAS for all options because that is the highest daily average landings prior to the implementation of trip limits in FY2007. **The Councils' preferred NMA alternative is Option 2c, with 40 DAS, and daily tail weight trip limits of 1,250 lbs. (Categories A & C) and 800 lbs. (Categories B & D).**

3.3.1.2.2 SMA DAS and trip limit options

The two ACT options for the SMA are based on a 40% and 75% increase in the target TAL, or 9,211 mt and 11,513 mt, respectively. The three options for DAS and trip limit allocations are shown in Table 8. **The Councils' preferred SMA alternative is Option 2b, with 28 DAS, and daily tail weight trip limits of 550 lbs. (Categories A & C) and 450 lbs. (Categories B, D & H).**

TAC Increase (percent)	NMA TAC (mt)	Discards (mt)	TAL (mt)	NMA OPTION	AC trip limit (tail wt. per DAS)	BD trip limit (tail wt. per DAS)	DAS
50% (ACT Option 1)	8,063	563	7,500	1A	1250	700	31
				1B	1250	470	45
				1C	1250	600	40
100% (ACT Option 2)	10,750	750	10,000	2A	1250	950	31
				2B	1250	470	51
				2C	**1250**	**800**	**40**

Table 7 Specification Options (DAS and trip limits) for the NMA under two ACT options

TAC Increase (percent)	SMA TAC (mt)	Discards (mt)	TAL (mt)	SMA OPTION	AC trip limit (tail wt. per DAS)	BD trip limit (tail wt. per DAS)	DAS
40% (ACT Option 1)	9,211	2,071	7,140	1A	550	450	23
				1B	550	450	23
				1C	700	600	15
75% (ACT Option 2)	11,513	2,588	8,925	2A	700	600	23
				2B	**550**	**450**	**28**
				2C	700	600	23

Table 8 Specification Options (DAS and trip limits) for the SMA under two ACT options

3.3.2 Other adjustments to the DAS and trip limit management program

3.3.2.1 Automatic DAS Adjustment for Trip Limit Overage

The Councils considered a modification to the DAS and trip limits management program that would allow vessels to exceed the daily trip limit by one day's amount, and to have the vessel's DAS accounting balance to be charged accordingly.

3.3.2.1.1 Alternative 1 - No Action

Currently, vessels that exceed the trip limit applicable to the amount of time away from port may not return to port until sufficient time has elapsed or discard the overage. Gillnet vessels that have not hauled through all of their gear also have the choice of leaving fish in their nets and returning on another trip to complete the hauls, which often results in product degradation and discards.

3.3.2.1.2 Alternative 2 – Preferred Alternative - Automatic DAS Adjustment for Trip Limit Overage

Under this alternative, a vessel may exceed the applicable trip limit in the amount equivalent to one day's trip limit, provided the vessel reports that it has an overage via VMS or cell phone prior to crossing the VMS demarcation line. For the terminal DAS, the vessel's DAS account balance would be automatically charged according to one of the following three options:

Option 1: 30 hours would be deducted from a vessel's DAS account (based on the current rule that gillnet vessels are charged a minimum of 15 hours for a trip, times two)
Option 2: 48 hours would be deducted from a vessel's DAS account (based on 2 x 24 hours)
Option 3: 24 hours and one minute would be deducted from a vessel's DAS account (based on the current rule that applies the trip limit to a day or any partial day, including one minute)

The Councils' preferred alternative is Option 3, deduct 24 hours and one minute for a one-day overage of the trip limit.

<u>Discussion</u>: This alternative would enable vessels fishing under the trip limits while on a monkfish DAS to land up to one additional day's limit, and be charged time against their DAS account balance according to one of the three options. For example, under Option 1 if the trip limit applicable to a vessel (based on permit category and area) is 550 lbs. tail wt. per DAS, or part of a DAS, a vessel could land 1100 lbs. tail wt. on a trip lasting less than 24 hours and be charged 30 hours. Under Option 2, the vessel would be charged 48 hours, and under Option 3, 24 hours and one minute. Currently, in order to land 1100 lbs. tail wt., the vessel would have to remain at sea for a minimum of 24 hours and one minute, or discard any amount over 550 lbs. if the trip is less than 24 hours.

3.3.2.2 Category C and D permit GF DAS Usage

3.3.2.2.1 Alternative 1 - No Action - Preferred Alternative -

Vessels holding a monkfish Category C or D permit and a multispecies permit are charged a multispecies Category A DAS for every monkfish DAS used. If the vessel's allocation of multispecies Category A DAS is fewer than the monkfish DAS allocation, the vessel may fish the difference as a monkfish-only DAS but only after all multispecies Category A DAS have been used. This provision is based on the allocation of multispecies Category A DAS, not simply the remaining balance. Therefore, if a vessel begins the fishing year with a multispecies Category A DAS allocation that is greater than its monkfish DAS allocation, then fishes only multispecies DAS to the point where its multispecies Category A DAS balance is less than its monkfish DAS balance, the vessel may only use the number of monkfish DAS that corresponds to the number of remaining multispecies Category A DAS.

3.3.2.2.2 Alternative 2 – Category C and D permit GF DAS Usage

Under this alternative, **vessels holding a limited access monkfish Category C or D permit and a limited access multispecies permit that have a higher monkfish DAS allocation than multispecies Category A DAS allocation could elect when to declare a combination multispecies/monkfish DAS. However, when the balance of monkfish DAS remaining equals the vessel's allocation of multispecies Category A DAS, the vessel will be automatically charged a multispecies Category A DAS for every monkfish DAS used.**

3.3.2.3 Monkfish Vessels in GF Sectors - GF DAS usage requirement

This section describes the alternative being considered for addressing the interaction between the Multispecies FMP and the Monkfish FMP, and, specifically, the rules applicable to vessels fishing in groundfish sectors who are not required to fish on a groundfish DAS.

3.3.2.3.1 Alternative 1 – Preferred Alternative - No Action

Vessels holding a monkfish Category C or D permit and a multispecies permit are charged a multispecies Category A DAS for every monkfish DAS used. A vessel enrolled in a multispecies (groundfish) sector is still allocated multispecies Category A DAS, but may not be required to use those days when fishing for groundfish under the rules of the individual sectors. Thus, when a vessel enrolled in a groundfish sector exceeds the applicable incidental limit for monkfish, it must declare a monkfish DAS, and will be charged a multispecies Category A DAS for every monkfish DAS used.

If the vessel's allocation of multispecies Category A DAS is fewer than the monkfish DAS allocation, the vessel may fish the difference as a monkfish-only DAS, but only after all multispecies Category A DAS are used up. When fishing on a monkfish-only DAS, a vessel is required to fish in one of the monkfish exempted fisheries established under the Multispecies FMP, but is not required to have Annual Catch Entitlement (ACE) for groundfish species in that area. [Note: the Multispecies FMP has established times and areas where vessels not fishing on a multispecies DAS may fish with specified gear, based on minimal incidental catch of multispecies, and those vessels are exempt from the multispecies DAS requirement.] When fishing on a combined monkfish/groundfish DAS, the sector member vessel is not required to fish in one of the monkfish exempted fisheries but is restricted to fishing only in areas where the sector has Annual Catch Entitlement (ACE) remaining, and any catch of multispecies would be charged against that ACE. If the sector has insufficient ACE remaining, or if the sector is closed because it has caught its ACE, then vessels would be able to use any available monkfish-only DAS in an exempted.

3.3.2.3.2 Alternative 2 – Eliminate GF DAS usage requirement

Under this alternative, **a vessel enrolled in a groundfish sector that also has a monkfish Category C or D permit would not be required to use a multispecies Category A (groundfish) DAS in conjunction with its monkfish DAS.** As with the no action alternative, when fishing on a monkfish-only DAS, the vessel is not required to fish in one of the monkfish exempted fisheries established under the Multispecies FMP, but is restricted to fishing only in areas where the sector has ACE remaining, and any catch of multispecies would be charged against that ACE. If the sector has insufficient ACE remaining, or if the sector is closed because it has caught its ACE, then vessels would not be able to use their monkfish only DAS in an exempted fishery due to the potential for incidental catch of multispecies.

The Councils considered two area options for this alternative:
Option 1: this alternative would apply to vessels fishing only in the NMA
Option 2: this alternative would apply to vessels fishing in either the NMA or SMA.

3.4 Changes to the Monkfish Research Set-Aside (RSA) Program

3.4.1 Carryover RSA DAS – No Action Required

See Section 3.7.2, Alternatives Considered but Rejected.

3.4.2 Allow Changes to RSA Program by Framework Adjustment

3.4.2.1 Alternative 1 – No Action

Currently any changes to the Monkfish Cooperative Research Set Aside Program must be done through a plan amendment.

3.4.2.2 Alternative 2 – Preferred Alternative - Allow Changes to RSA Program by Framework Adjustment

Under this alternative, **the Councils could consider and adopt changes to the RSA Program (i.e., increase or decrease RSA set-aside amount) through a framework adjustment to the FMP.**

3.5 Mandatory VMS

3.5.1 Alternative 1 – Preferred Alternative - No Action

The Monkfish FMP does not currently require limited access vessels to use a VMS. Permit Category C and D vessels are already required to use VMS by either the Scallop or Multispecies regulations, since, by definition, C and D permits are those limited access monkfish permits that also hold a limited access permit in either the Scallop or Multispecies fisheries.

3.5.2 Alternative 2 – Mandatory VMS

The Councils considered three options, based on area, for requiring all limited access monkfish vessels to use a VMS unless exempted under the power-down provisions described in Table 9. If a vessel is already required to use a VMS under the regulations of other FMPs, then those regulations, including the applicable power-down provisions, supersede this requirement.

Option 1: All monkfish limited access vessels fishing in the SMA will be required to have an operational VMS when on a monkfish DAS.
Option 2: All monkfish limited access vessels fishing in the NMA will be required to have an operational VMS when on a monkfish DAS.
Option 3: All monkfish limited access vessels will be required to have an operational VMS when on a monkfish DAS.

(2) *Power down exemption*.

(i) Any vessel required to transmit the vessel's location at all times, as required in paragraph (c)(1) of this section, is exempt from this requirement if it meets one or more of the following conditions and requirements:

(A) The vessel will be continuously out of the water for more than 72 consecutive hours, the vessel signs out of the VMS program by obtaining a valid letter of exemption pursuant to paragraph (c)(2)(ii) of this section, and the vessel complies with all conditions and requirements of said letter;

(B) For vessels fishing with a valid NE multispecies limited access permit, or a valid surfclam and ocean quahog permit specified at §648.4(a)(4), the vessel owner signs out of the VMS program for a minimum period of 30 consecutive days by obtaining a valid letter of exemption pursuant to paragraph (c)(2)(ii) of this section, the vessel does not engage in any fisheries until the VMS unit is turned back on, and the vessel complies with all conditions and requirements of said letter; or

(C) The vessel has been issued a limited access herring permit, and is in port, unless required by other permit requirements for other fisheries to transmit the vessel's location at all times. Such vessels must activate the VMS unit and enter the appropriate activity code prior to leaving port.

(D) The vessel has been issued a general scallop permit or a monkfish limited access permit and is required to operate VMS as specified in §648.10(b)(1)(iv), is not in possession of any scallops or monkfish onboard the vessel, is tied to a permanent dock or mooring, and the vessel operator has notified NMFS through VMS by transmitting the appropriate VMS power down code, that the VMS will be powered down, unless required by other permit requirements for other fisheries to transmit the vessel's location at all times. Such a vessel must repower the VMS prior to moving from the fixed dock or mooring. VMS codes and instructions are available from the Regional Administrator upon request;

(E) For vessels fishing with a valid monkfish limited access permit, the vessel owner signs out of the VMS program for a minimum period of 30 consecutive days by obtaining a valid letter of exemption pursuant to paragraph (c)(2)(ii) of this section, the vessel does not engage in any fisheries *where a VMS is required* until the VMS unit is turned back on, and the vessel complies with all conditions and requirements of said letter.

(ii) *Letter of exemption*.

(A) *Application*. A vessel owner may apply for a letter of exemption from the VMS transmitting requirements specified in paragraph (c)(1) of this section for his/her vessel by sending a written request to the Regional Administrator and providing the following: The location of the vessel during the time an exemption is sought; and the exact time period for which an exemption is needed (i.e., the time the VMS signal will be turned off and turned on again); and, in the case of a vessel meeting the conditions of paragraph (c)(2)(i)(A) of this section, sufficient information to determine that the vessel will be out of the water for more than 72 continuous hours. The letter of exemption must be on board the vessel at all times, and the vessel may not turn off the VMS signal until the letter of exemption has been received.

(B) *Issuance*. Upon receipt of an application, the Regional Administrator may issue a letter of exemption to the vessel if it is determined that the vessel owner provided sufficient information as required under paragraph (c)(2) of this section, and that the issuance of the letter of exemption will not jeopardize accurate monitoring of the vessel's DAS. Upon written request, the Regional Administrator may change the time period for which the exemption is granted.

Table 9 VMS power down exemptions under the proposed mandatory VMS alternative. Text is current regulatory language (CFR 648.9), modified as shown by shading.

3.6 Allow landing of Monkfish Heads

3.6.1 Alternative 1 -1 No Action

Vessels are prohibited from landing monkfish heads unattached. Currently, vessels may only land whole fish or tails, as there is a tails-to-whole conversion factor in the FMP and implementing regulations.

3.6.2 Alternative 2 – Preferred Alternative - Allow landing of Monkfish Heads

Under this proposal, **vessels could land unattached monkfish heads provided the total weight of the heads does not exceed 2.32 times the total weight of tails on board.**

3.7 Alternatives Considered but Rejected

3.7.1 ACT Options

During the development of Amendment 5, the Councils considered using the current target TAC plus estimated discards as the basis for one of the ACT options. Under that option the ACTs would be 5,375 mt (NMA) and 6,579 mt (SMA). On the recommendation of the Monkfish Committee and Advisory Panel, the Councils rejected that option. In making the recommendation, the Committee noted that such a low catch target option is unnecessary considering the status of the stocks (rebuilt and overfishing not occurring). Furthermore, in the SMA, that ACT option would have resulted in reduced DAS allocations since there was an overage of the target TAC in 2007 and 2008. The Committee also heard comment that if there is no basis for retaining those options, they should be removed because they will distract the public from commenting on the more realistic options, and will cause unnecessary distress in the public hearing process.

When the NEFMC was deciding on final measures from the range of alternatives presented in the EA, it conditionally identified NMA ACT Option 2 as its preferred alternative but tasked the PDT with analyzing a third option prior to voting to submit the amendment. The third option was not included in the draft EA and public hearing process. It would have set the NMA ACT at 13,988 mt, or 80% of the ACL. Upon review of the Option 3 analysis, at the June 2010 meeting, the Council took no action, and, therefore, Option 2 remained as the preferred alternative.

3.7.2 Carryover RSA DAS

At the time that the Councils developed the draft of this amendment document, vessels that received RSA DAS for research and/or compensation, from projects awarded RSA grants, were required to fish those DAS before the end of the fishing year. Unused RSA DAS could not be carried forward to the following fishing year. In March, 2010, NMFS published a final rule implementing a technical amendment (75 *Federal* Register 12141, March 15, 2010) that adopted one of the Councils' options, allowing a project that has been awarded RSA DAS but has not used up those DAS before the end of the fishing year to carryover the unused portion of the DAS to the following year. Carryover RSA DAS may not be accumulated for future years. Following this action, the Councils no longer needed to consider any changes to the RSA Program with respect to allowing carryover DAS.

4.0 Affected Environment (SAFE Report for 2007 and 2008)

4.1 Biological Environment and Stock Status

4.1.1 Monkfish Life History

The most recent published summary of monkfish life history and population dynamics is contained in an article by Richards, *et al.*, 2008 and included here as Appendix 3. The paper uses data from resource surveys spanning the period 1948-2007. The authors noted that "monkfish exhibited seasonal onshore-offshore shifts in distribution, migrated out of the southern Mid-Atlantic Bight (MAB) in mid-spring, and re-appeared there in autumn". This observation is reflected in the seasonal pattern of fishery activity, particularly in the SMA. The authors also observed that "sex ratios at length for fish 40-65 cm long were skewed toward males in the southern MAB, but approximated unity elsewhere, suggesting that a portion of the population resides outside sampled areas. Growth was linear at 9.9 cm per year, and did not differ by region or sex. Maximum observed size was 138 cm for females and 85 cm for males. Length at 50% maturity for males was 35.6 cm (4.1 yrs. old) in the north and 37.9 cm (4.3 yrs. old) in the south; for females, 38.8 cm (4.6 yrs. old) in the north and 43.8 cm (4.9 yrs. old) in the south. Ripe females were found in shallow (<50 m.) and deep (>200 m) water in the south, and in shallow (<50 m) in the north."

4.1.2 Stock Status

Monkfish were assessed within the Data Poor Stocks Working Group (DPWG) in 2007, with the terminal year of the assessment being 2006. The DPWG Report is summarized in Table 10. The DPWG concluded that both northern and southern management components are not overfished and overfishing is not occurring. The DPWG Report also stressed that these conclusions be considered in the context of the high degree of uncertainty due to, among other things, input data quality, assumptions (such as natural mortality rates), the newness of the assessment model, and the lack of complete understanding about basic biological parameters, such as growth and reproduction rates. The full assessment report is available online at http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0713/.

	North	South	Comment
$F_{threshold}$ (MFMT)	0.31	0.40	F_{MSY} proxy based on F_{max}
$F_{current}$ (2006)	0.09	0.12	Not updated for 2007, 2008
B_{target}	92,200 mt	122,500 mt	B_{MSY} proxy
$B_{current}$ (2006)	118,700 mt	135,500 mt	Not updated for 2007, 2008
$B_{threshold}$ (MSST)	65,200 mt	96,400 mt	

Table 10 Monkfish reference points and status (2006) based on DPWG 2007 assessment

More recently, the 50th Stock Assessment Review Committee (SARC 50) completed another assessment, and the report was issued in July, 2010. While the information in this assessment was not considered by the Councils in evaluating the alternatives and selecting preferred alternatives, the results of the assessment have been incorporated into this EA, particularly with respect to stock status and projections of the impacts of the preferred alternatives. The Summary Report of SARC 50 is contained in Appendix VII. SARC 50 concluded that both stock components are above their respective biomass thresholds , including the newly recommended biomass thresholds that have not yet been adopted into the FMP, indicating they are not overfished. Additionaly, SARC 50 determined that fishing mortality is below Fthreshold, indicating that overfishing is not occurring.

4.1.3 Bycatch of non-target species in the fishery

Information about the absolute level of bycatch species in the directed monkfish fishery is not available, according to the EIS for Amendment 2. Nevertheless, Amendment 2 stated that winter skates and dogfish are the predominant species discarded in the NMA monkfish fisheries, while winter and thorny skates, as well as dogfish are discarded in the SMA. While there is no new information about changes in the types of bycatch, the status of these three species has changed, and the updated information is summarized below:

- **Winter skate –** not overfished, overfishing is not occurring
- **Thorny skate –** overfished, overfishing is not occurring,
- **Spiny dogfish –** no biomass target adopted in the FMP, but there is an approved minimum biomass threshold under which the stock would be considered not overfished, and overfishing is not occurring.

4.1.4 Marine Mammals and Protected Species

There are numerous protected species that inhabit the environment within the Monkfish FMP management unit. These species are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. Thirteen of these species are classified as endangered or threatened under the ESA, while the remainder are protected by the provisions of the MMPA. Actions taken to minimize the interaction of the fishery with protected species are described in Section 2.1.5 of this document.

4.1.4.1 Species Present in the Area

The following species that may occur in the operations area of the monkfish fishery (Gulf of Maine to Cape Hatteras) are protected under the Endangered Species Act and/or Marine Mammal Protection Act.

Cetaceans

Species	Status
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)[a]	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Spotted dolphin (*Stenella frontalis*)	Protected
Striped dolphin (*Stenella coeruleoalba*)*	Protected
Northern bottlenose whale (*Hyperoodon ampullatus*)*	Protected
Beaked whale (*Ziphius and Mesoplodon spp*.)*	Protected
Pygmy or dwarf sperm whale (*Kogia spp*.)*	Protected

False killer whale (*Pseudorca crassidens*)*	Protected
Melonheaded whale (*Peponocephala electra*)*	Protected
Rough-toothed dolphin (*Steno bredanensis*)*	Protected
White-beaked dolphin (*Lagenorhynchus albirostris*)*	Protected

Pinnipeds

Species	Status
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Hooded seal (*Cystophora cristata*)	Protected
Harp seal (*Phoca groenlandicus*)	Protected
Ringed seal (*Phoca hispida*)*	Protected
Bearded seal (*Erignathus barbatus*)*	Protected

Sea Turtles

Species	Status
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)[b]	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened

Fish

Species	Status
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)[c]	Endangered

Note:

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

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

c Gulf of Maine distinct population segment (DPS)

* Non ESA-listed species protected by the MMPA that utilize this environment and have no documented interaction with the type of gear used by the monkfish fishery.

4.1.4.2 Species Not Likely to be Affected

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve unintentional interactions with fishing gear. Trophic interactions are more "active" and occur when protected species attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with various types of fishing gear used by the monkfish fishery through the year. Large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer, relatively abundant during the fall, and some are still present in winter. The potential for entanglements to occur is assumed to be higher in areas where more gear is set and in areas with higher concentrations of protected species.

NMFS has determined that the action being considered in this EA (i.e., approval of the Amendment 5) is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. NOAA Fisheries has also determined that the action being considered is not expected to adversely affect critical habitat that has been designated for North Atlantic right whales and the Gulf of Maine DPS of Atlantic salmon, which occur within the action area. Shortnose sturgeon and salmon belonging to the Gulf of Maine DPS of Atlantic salmon occur within the general geographical areas fished by the monkfish fishery, but they are unlikely to occur in the area where the fishery would operate given their numbers and distribution. Therefore, none of these species are likely to be affected by the monkfish fishery. The following discussion provides the rationale for these determinations. Additional non-ESA listed species that may occur in the operations area that are not known to interact with the specific gear types that would be used by the monkfish fishery will not be discussed in this assessment.

North Atlantic right whales 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 Opinion). Cape Cod Bay and Great South Channel were designated critical habitat for right whales due to their importance as spring/summer foraging grounds for this species. Although the physical and biological processes shaping acceptable right whale habitat are poorly understood, 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 will, therefore, not be considered further in this Opinion.

Atlantic Salmon Critical Habitat

Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the GOM DPS of Atlantic salmon (74 FR 29300; June 19, 2009). Designation of critical habitat is focused on the known primary constituent elements (PCEs) within the occupied areas of a listed species that are deemed essential to the conservation of the species. Within the GOM DPS, the PCEs for Atlantic salmon are 1) sites for spawning and rearing and 2) sites for migration (excluding marine migration; although successful marine migration is essential to Atlantic salmon, NMFS was not able to identify the essential features of marine migration and feeding habitat or their specific locations at the time critical habitat was designated. Because there is no history or likelihood of future monkfish fishing activity to occur within estuaries corresponding to the GOM DPS of Atlantic Salmon, the associated fishing activities are not expected to alter attributes of Atlantic salmon critical habitat.

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

The wild populations of Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River are listed as endangered under the ESA. 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 (Reddin 2006). Results from a 2001-2003 post-smolt trawl survey in the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid to late May (Lacroix and Knox 2005). Therefore, commercial fisheries deploying small mesh active gear (pelagic trawls and purse seines within 10-m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the action being considered in this assessment will affect the Gulf of Maine DPS of Atlantic salmon given that operation of the monkfish fishery does not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found and monkfish gear operates in the ocean at or near the bottom rather than near the surface. Thus, this species will not be considered further in this EA.

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

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring *et al.* 2002). In the North Atlantic, blue whales are most frequently sighted in the St. Lawrence from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the mid- and north Atlantic areas of the outer continental shelf (CeTAP 1982). Calving for the species occurs in low latitude waters outside of the area where the monkfish fishery operates. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. There have been no observed fishery-related mortalities or serious injuries to blue whales during 1996-2000 (Waring *et al.*, 2002). Given that the species is unlikely to occur in areas where the monkfish fishery operates, and the operation of the fishery does not affect the availability of blue whale prey or areas where calving and nursing of young occur, the proposed action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the EEZ. However, the distribution of the sperm whales in the EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring *et al.* 2007). Typically, sperm whale distribution is concentrated east-northeast of Cape Hatteras in winter and shifts northward in the spring when whales are found throughout the Mid-Atlantic Bight (Waring *et al.* 2007). In summer, distribution extends further northward to areas east and north of Georges Bank and the Northeast Channel region, as well as the continental shelf south of New England. Distribution moves south of New England in fall, back to the Mid-Atlantic Bight (Waring *et al.* 2007). In contrast, the monkfish fishery operates in continental shelf waters. The average depth over which sperm whale sightings occurred during the CeTAP surveys was 1,792 m (CeTAP 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 1,000 m and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin *et al.* 2002). There has been no observed fishery-related mortalities or serious injuries to sperm whales during 2001-2005 (Waring *et al.*, 2007). Given that sperm whales are unlikely to occur in areas (based on water depth) where the monkfish fishery operates, and the operation of the fishery does not affect the availability of sperm whale prey or areas where calving and nursing of young occur, the proposed action would not be likely to adversely affect sperm whales.

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

4.1.4.3 Species Potentially Affected

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

4.1.4.3.1 Sea Turtles

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

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

Sea turtles are known to be captured in gillnet and trawl gear; gear types that are used in the monkfish fishery. The following table, Table 11, provides recent information on observed turtle interactions with the monkfish fishery for the period 2003 – Dec. 2008. The data have not been analyzed with respect to trends or impact of effort controls and/or sea turtle closures relative to monkfish fishery. Gillnet gear is the most prevalent gear used in the SMA monkfish fishery.

Year	Month	Species	Statistical Area	Gear Type
2003	August	Unknown	537	Sink gillnet
2003	August	Unknown	537	Sink gillnet
2003	August	Unknown	537	Sink gillnet
2004	May	Loggerhead	621	Sink gillnet
2004	June	Loggerhead	612	Sink gillnet
2004	October	Leatherback	615	Sink gillnet
2004	November	Leatherback	613	Sink gillnet
2006	December	Leatherback	537	Sink gillnet

Table 11 Turtle Interactions in Gillnet Gear Targeting Monkfish, 2003-Dec. 2008.
Source: NEFSC Observer Data

On November 16, 2007, NMFS and the US Fish and Wildlife Service (USFWS) received a petition from the Center for Biological Diversity and Oceana requesting that loggerhead turtles in the Northwest Atlantic Ocean be reclassified as a DPS with endangered status and that critical habitat be designated. NMFS and the USFWS found that both petitions presented substantial information that the petitioned actions may be warranted. As a result of these petitions, NMFS and USFWS convened a biological review team (BRT) in February 2008 to review the best available scientific information, determine whether DPSs exist, and assess the extinction risk for each potential DPS. The BRT organized their evaluation by ocean basin: Pacific Ocean, Atlantic Ocean (including the Mediterranean Sea), and Indian Ocean. This status review was completed in August 2009. Overall, the BRT concluded that the Northeast Atlantic and Mediterranean DPSs are at immediate risk of extinction; the North Pacific, South Pacific, North Indian, Southeast Indo-Pacific, Northwest Atlantic DPSs are currently at risk of extinction; and the Southwest Indian and South Atlantic DPSs are likely not currently at immediate risk of extinction (NMFS and USFWS 2009).

It should be noted that the status review document prepared by the BRT is not a listing decision. NMFS and the USFWS must next evaluate the report and determine what, if any, action is appropriate under the ESA. Possible decisions by the agencies include: No change in listing status; a change in listing status for the species as currently defined (single species range wide); identification of DPS; and proposing to list some or all of them as either threatened or endangered. The agencies will prepare proposed determinations and publish those in the *Federal Register* and solicit public comment. The agencies will then review the comments and prepare a final determination. Typically a listing action becomes effective 30 days after publication of the final rule in the *Federal Register*. Only after that final listing decision is announced in the *Federal Register* would DPSs be applied, if deemed necessary and warranted, and a new listing be in effect.

4.1.4.3.2 Large Cetaceans

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

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf and Maine and Georges Bank, and low latitude winter calving grounds (Perry *et al.* 1999, Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry *et al.* 1999, Waring *et al.* 2009). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle *et al.* 1993, Wiley *et al.* 1995, Perry *et al.* 1999, Brown *et al.* 2002).

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

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

Gillnet gear is known to pose a risk of entanglement causing injury and death to large cetaceans. Right whale, humpback whale, and minke whale entanglements in gillnet gear have been documented (Johnson *et al.* 2005; Waring *et al.* 2009). However, it is often not possible to attribute the gear to a specific fishery.

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

4.1.4.3.3 Small Cetaceans

Numerous small cetacean species (dolphins; pilot whales; and harbor porpoise) that occur within the area are known to interact with monkfish fishing gear. Seasonal abundance and distribution of each species in Mid-Atlantic, Georges Bank, and/or Gulf of Maine, Georges Bank, and southern New England/Mid-Atlantic waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso’s dolphin), and still others occupy all three habitats (e.g., common dolphin, spotted dolphin). Information on the western North Atlantic stocks of each species is summarized in Waring *et al.* (2009). Small cetaceans are known to interact with gillnet and trawl gear (Waring *et al*. 2009).

With respect to harbor porpoise specifically, the most recent Stock Assessment Reports show that the number of harbor porpoise takes is increasing, moving closer to the Potential Biological Removal level calculated for this species (610 animals/year from 2001-2005) rather than declining toward the long-term Zero Mortality Rate Goal (ZMRG), which is 10 percent of PBR (approximately 75 animals). Observer information collected from January 2005 to June 2006 has indicated an increase in porpoise bycatch throughout the geographic area covered by the Harbor Porpoise Take Reduction Plan (HPTRP) in both the Gulf of Maine and Mid-Atlantic regions and in monkfish gear specifically (NMFS, Discussion Paper on Planned Amendments to the Harbor Porpoise TRP 2007). The Harbor Porpoise Take Reduction Team developed options to reduce takes, and NMFS published a proposed rule on July 21, 2009 (74 *Federal Register* 36058) with four alternatives including no action. The comment period on this rule ended on August 20, 2009 and the final rule was published on February 19, 2010 (75 *Federal Register* 7383).

The following changes were implemented in the 2010 amendments to the HPTRP:

New England

- Expand the size of the Massachusetts Bay Management Area, as well as pinger use to include November;
- Establish the Stellwagen Bank Management Area and require pingers from November 1 through May 31;
- Establish the Southern New England Management Area where pingers are required from December 1 through May 31; and
- Establish the Cape Cod South Expansion Consequence Closure Area and Coastal Gulf of Maine Consequence Closure Area. These areas would be closed to gillnetting for two to three months if harbor porpoise bycatch levels are too high.

Mid-Atlantic

- Establish the Mudhole South Management Area, with a seasonal closure and gear modifications for large and small mesh gear;
- Modify the northern boundary of the waters off New Jersey Management Area to intersect with the southern shoreline of Long Island, NY at 72° 30' W longitude; and
- Modify tie-down spacing requirement for large mesh gillnets in all Mid-Atlantic management areas (waters off New Jersey, Mudhole North and South, and Southern Mid-Atlantic Management Areas).

The Atlantic Trawl Gear Take Reduction Team (ATGTRT) was organized in 2006 to implement a plan to address the incidental mortality and serious injury of long-finned pilot whales, short-finned pilot whales, common dolphins, and Atlantic white-sided dolphins in several trawl gear fisheries. In lieu of a TRP, the ATGTRT agreed to develop an Atlantic Trawl Gear Take Reduction Strategy (ATGTRS). The ATGTRS identifies informational and research tasks as well as education and outreach needs the ATGTRT believes are necessary to provide the basis for achieving the ultimate MMPA goal of achieving ZMRG. The ATGTRS also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. These voluntary measures are as follows:

- Reducing the numbers of turns made by the fishing vessel and tow times while fishing at night; and
- Increasing radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area.

4.1.4.3.4 Pinnipeds

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

Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents; therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during the winter.

4.2 Physical and Biological Environment

The Northeast U.S. Shelf Ecosystem (Figure 4) 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 (Sherman *et al.* 1996). The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing 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 in areas of glacially rafted hard bottom.

Pertinent physical and biological characteristics of each of these sub-regions are described in this section, along with a short description of the physical features of coastal environments. Monkfish habitats are described in Section 4.4.1. Information on the affected physical and biological environments included in this amendment was extracted from Stevenson *et al.* (2004). The primary source references used by Stevenson *et al.* are not cited in the text. They are: Backus 1987; Schmitz *et al*. 1987; Tucholke 1987; Wiebe *et al*. 1987; Cook 1988; Reid and Steimle 1988; Stumpf and Biggs 1988; Abernathy 1989; Townsend 1992; Mountain 1994; Beardsley *et al*. 1996; Brooks 1996; Sherman *et al*. 1996; Dorsey 1998; Kelley 1998; NEFMC 1998; Steimle *et al*. 1999. References used to describe the biological features of the affected environment and to describe monkfish habitats are cited in the text.

4.2.1 Gulf of Maine

Physical Environment

Although not obvious in appearance, the Gulf of Maine (GOM) 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 5). The 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 that result in a rich biological community.

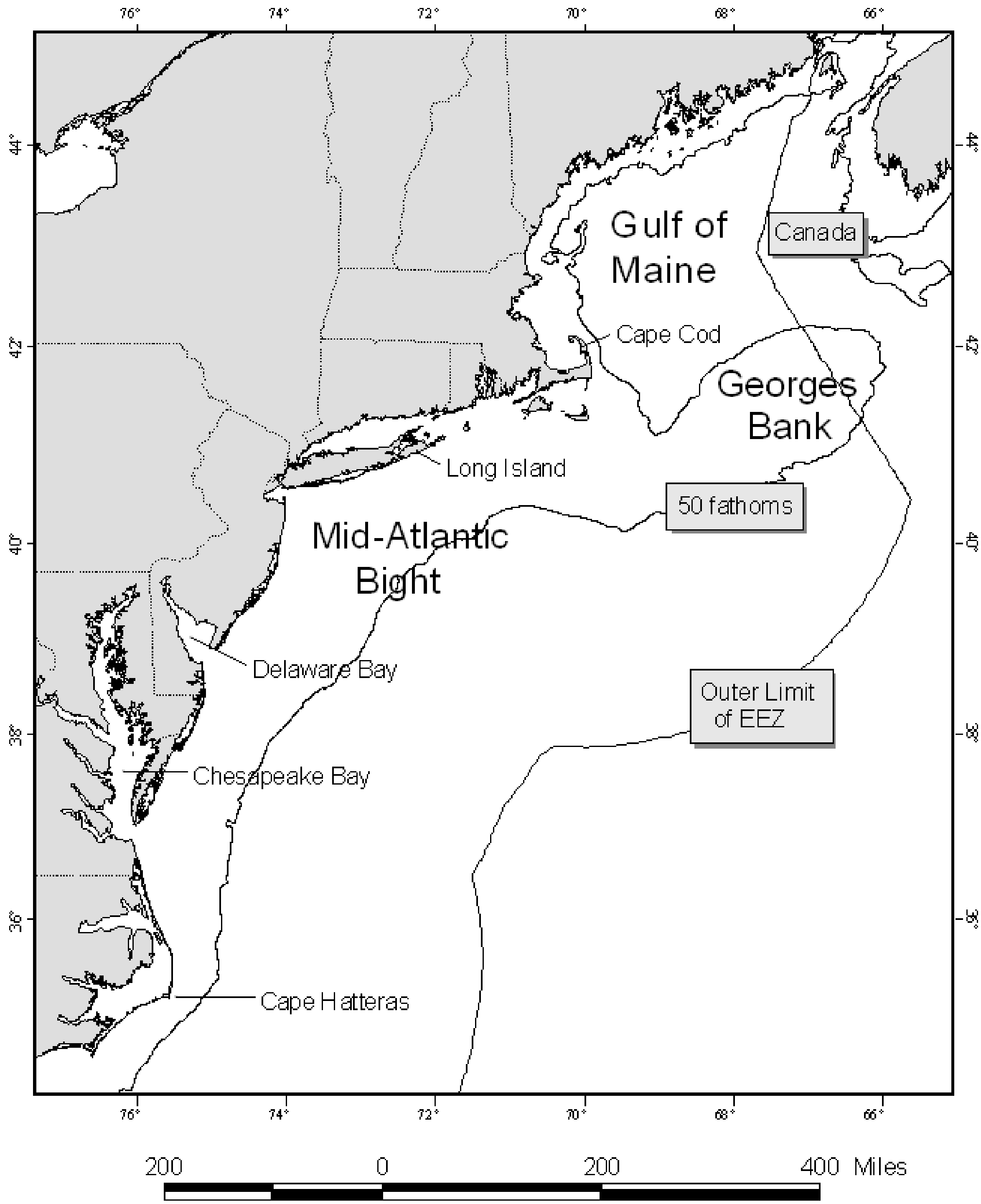


Figure 4 **Northeast U.S Shelf Ecosystem.**

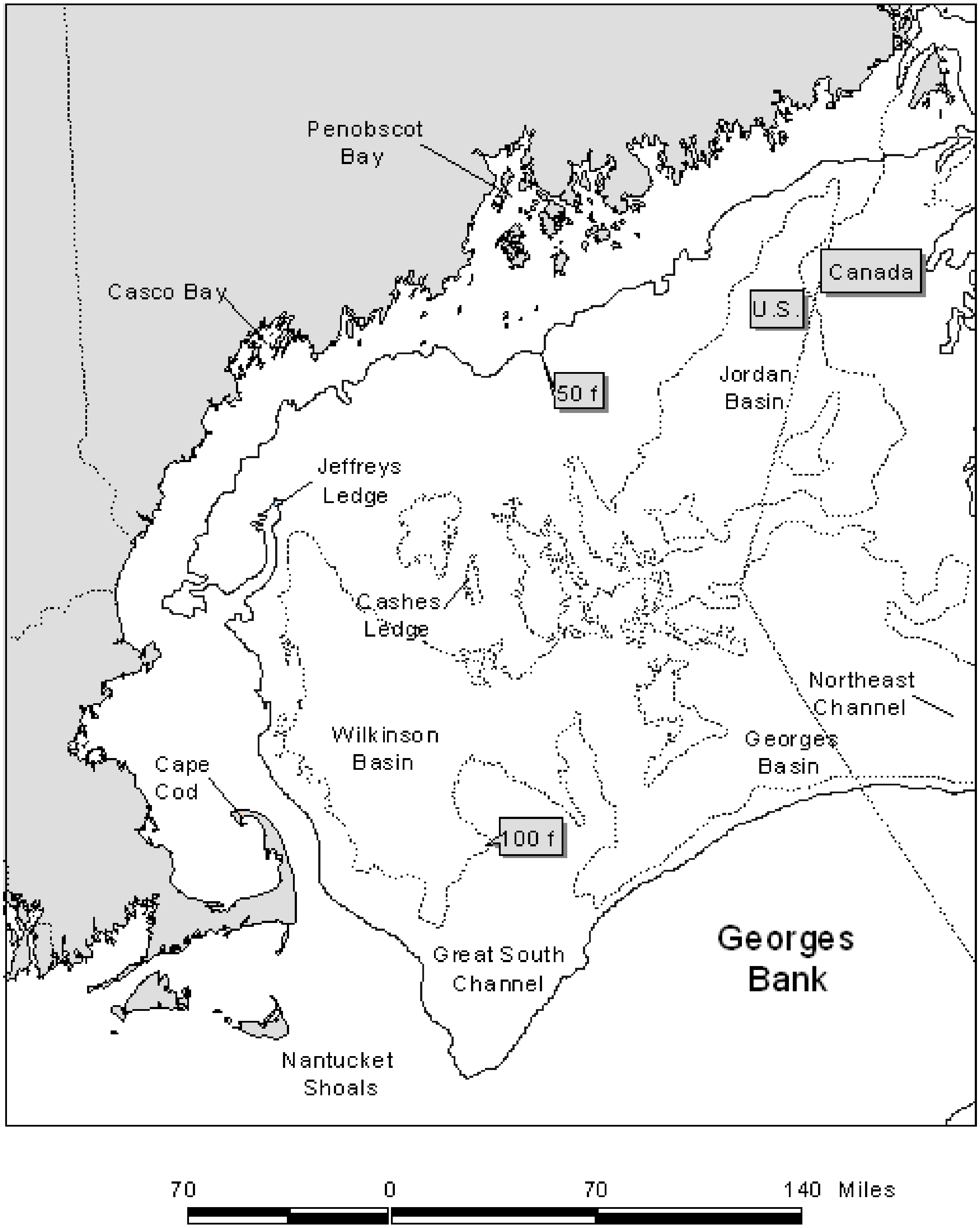


Figure 5 **Gulf of Maine.**

The GOM is topographically unlike any other part of the continental border along the U.S. Atlantic coast. The GOM's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. It contains twenty-one distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan (Figure 5). 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 Gulf 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 that was left after most of it was removed by the glaciers. Others are glacial moraines and a few, like Cashes Ledge, are outcroppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the GOM, particularly in its deep basins (Figure 6). 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 GOM 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 abruptly border 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 GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

An intense seasonal cycle of winter cooling and turnover, springtime freshwater runoff, and summer warming influences oceanographic and biologic processes in the GOM. The Gulf has a general counterclockwise nontidal surface current that flows around its coastal margin (Figure 7). 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.

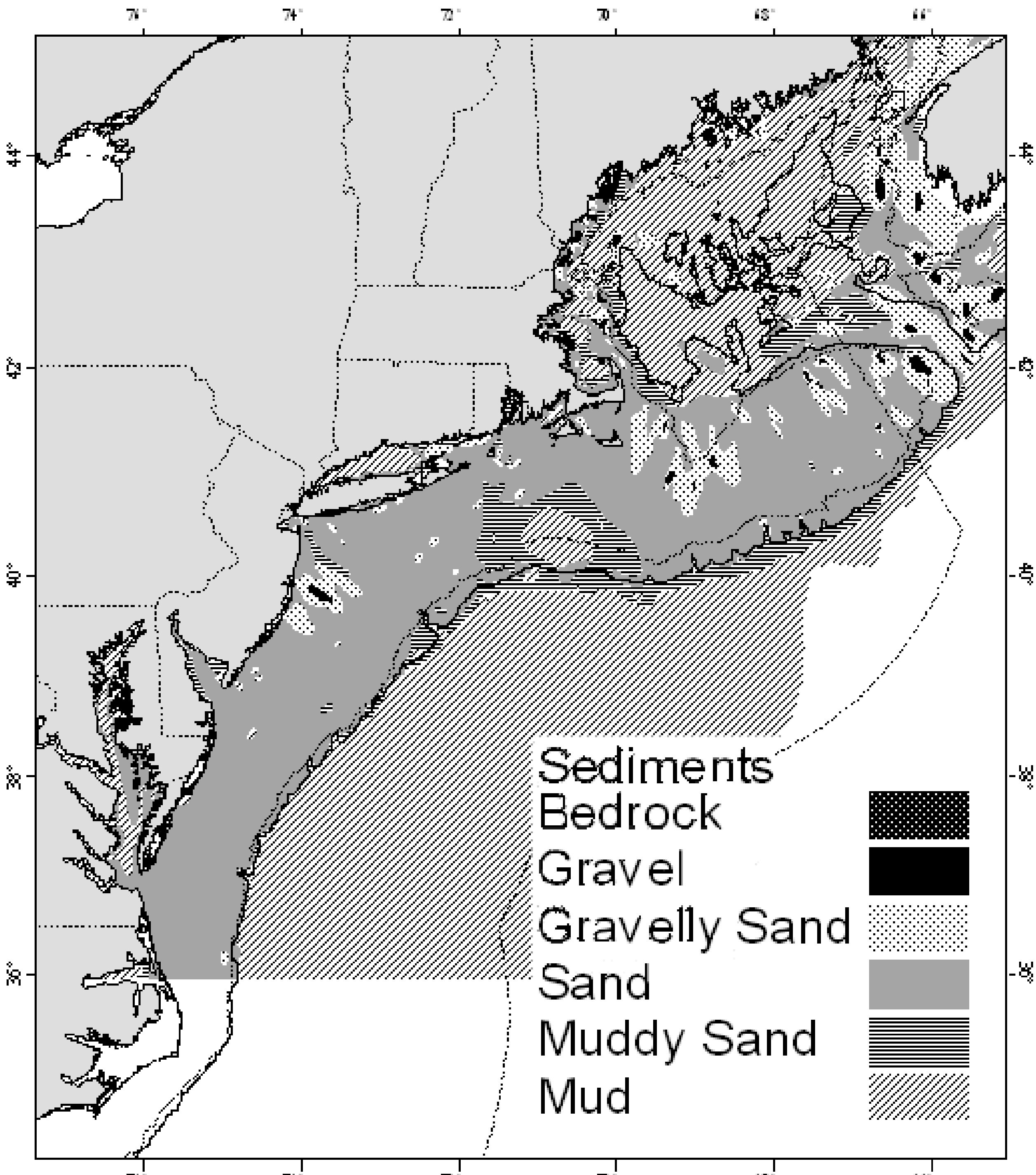


Figure 6 Northeast region sediments, modified from Poppe *et al.* (1989a and b).

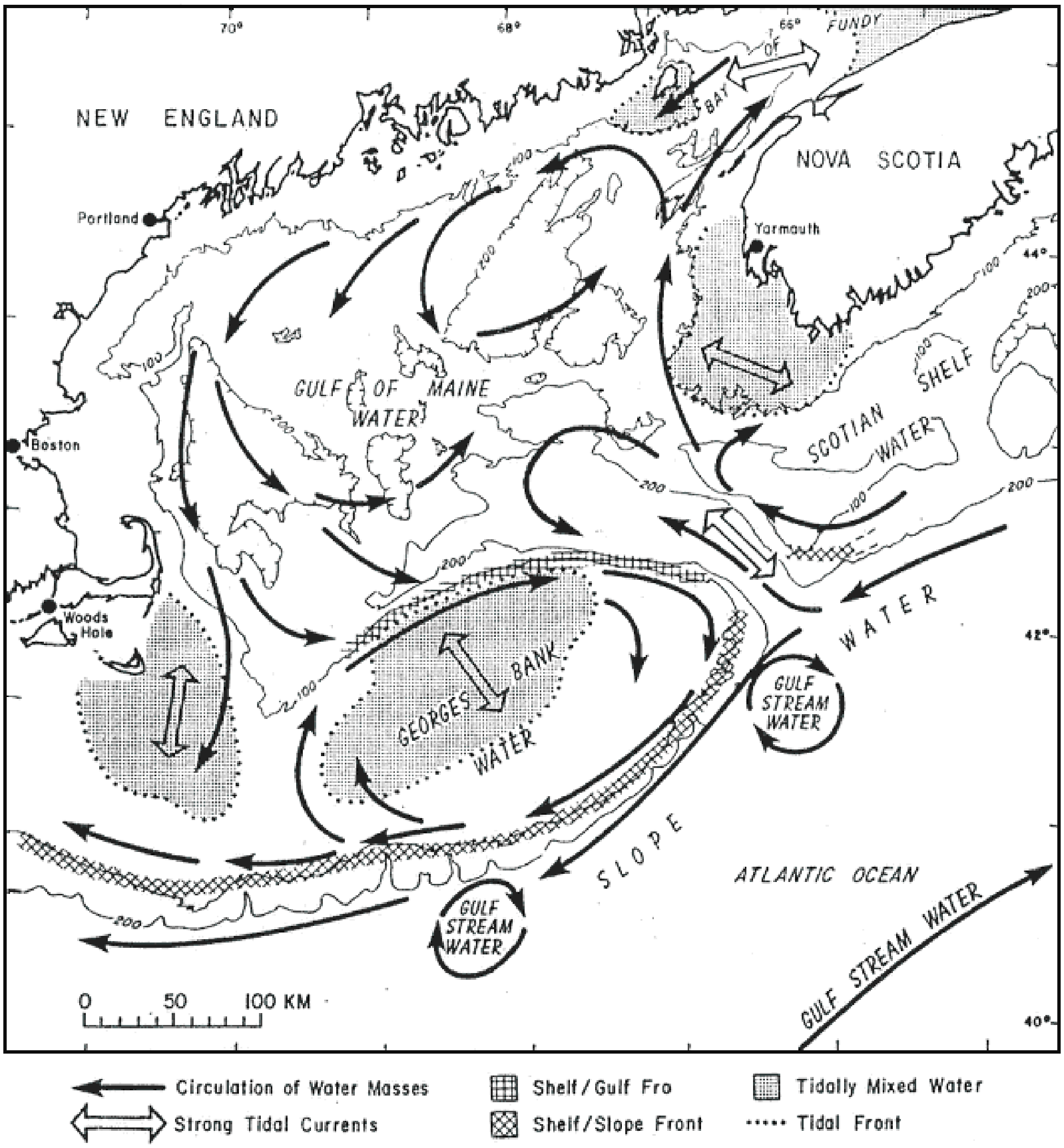


Figure 7 Water mass circulation patterns in the Georges Bank - Gulf of Maine region.

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.

GOM 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 the "Gulf Stream and Associated Features" section, below), and strong winds that can create currents as high as 1.1 m/s 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.

Benthic Invertebrates

Based on 303 benthic grab samples collected in the GOM during 1956-1965, Theroux and Wigley (1998) reported that, in terms of numbers, the most common groups of benthic invertebrates in the GOM were annelid worms (35%), bivalve mollusks (33%), and amphipod crustaceans (14%). Biomass was dominated by bivalves (24%), sea cucumbers (22%), sand dollars (18%), annelids (12%), and sea anemones (9%). Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven bottom assemblages. These assemblages are identified in Table 12 and their distribution is indicated in Figure 8. This classification system considers predominant taxa, substrate types, and seawater properties.

Demersal Fish

Demersal fish assemblages for the GOM and Georges Bank were part of broad scale geographic investigations conducted by Gabriel (1992) and Mahon *et al.* (1998). 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 (1992) found that the most persistent feature over time in assemblage structure from Nova Scotia to Cape Hatteras was the boundary separating assemblages between the GOM and Georges Bank, which occurred at approximately the 100 m isobath on northern Georges Bank. Overholtz and Tyler (1985) identified five assemblages for this region. 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 classified these two species as unique to the deepwater Gulf of Maine-Georges Bank assemblage. Results of these two studies are compared in Table 13.

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 - 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 cerianthids 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 - 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°C and salinities are at least 35 ppt; sediments may be either fine muds or a mixture of mud and gravel.

Geographical distribution of assemblages is shown in Figure 5.

Table 12 Gulf of Maine benthic assemblages as identified by Watling (1998).

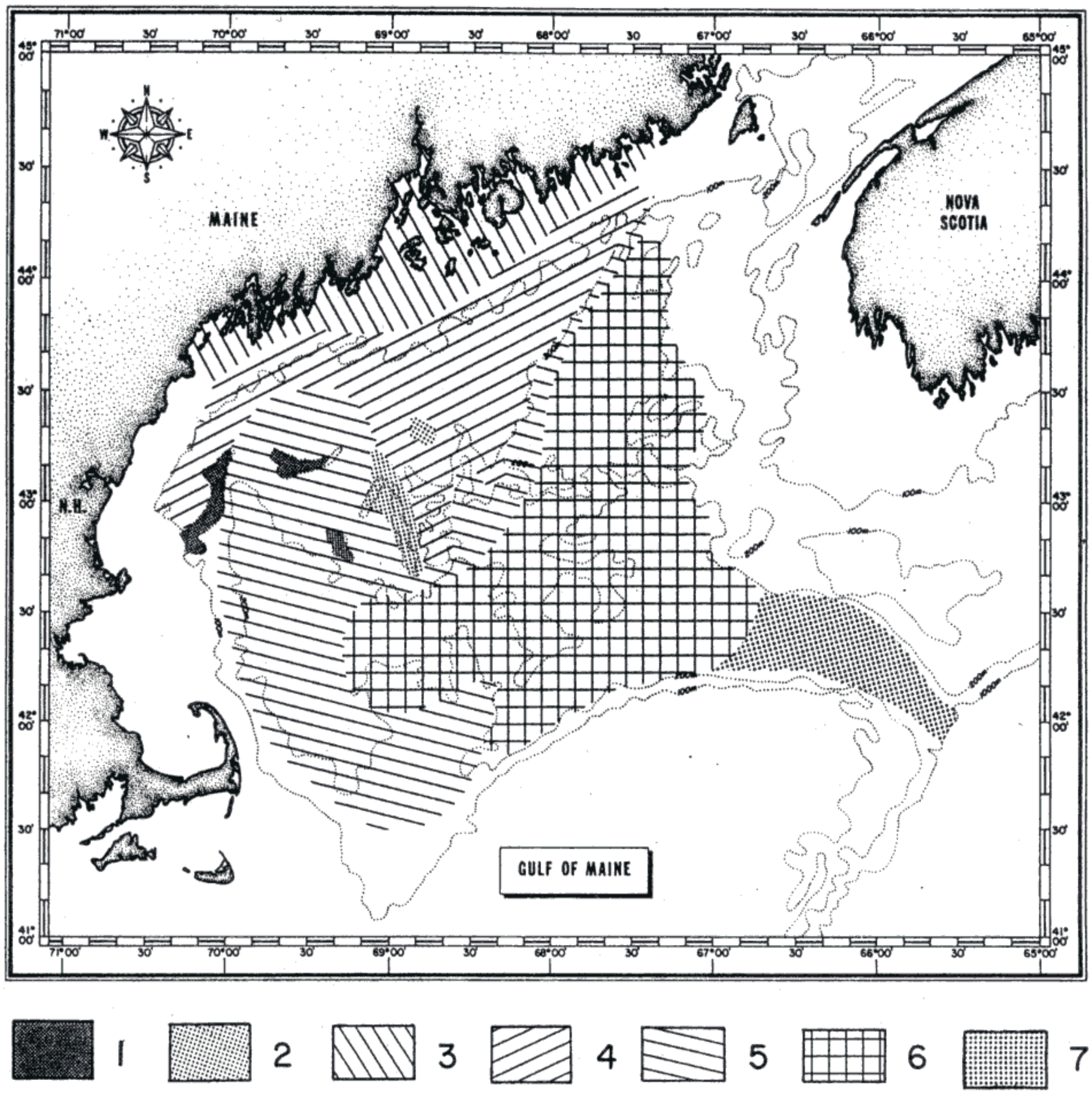


Figure 8 Distribution of the seven major benthic assemblages in the Gulf of Maine.

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

Table 13 Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine.

4.2.2 Georges Bank

Physical Environment

Georges Bank is a shallow (3 - 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed by the Wisconsinian glacial episode. It 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 the "Continental Slope" section, below, for more on canyons). The interaction of several environmental factors, including availability and type of sediment, current speed and direction, and bottom topography, has formed seven sedimentary provinces on eastern Georges Bank (Valentine and Lough 1991), which are described in Table 14 and depicted in Figure 9. The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

The central region of the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. 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 (Figure 5), 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 travelling dune and swale morphology is also found in the Mid-Atlantic Bight, and further described in that section of the document. 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, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity (Valentine, pers. comm.).

Sedimentary Province	Depth (m)	Description	Benthic Assemblage
Northern Edge / Northeast Peak (1)	40 - 200	Dominated by gravel with portions of sand, common boulder areas, and tightly packed pebbles. Representative epifauna (bryozoa, hydrozoa, anemones, and calcareous worm tubes) are abundant in areas of boulders. Strong tidal and storm currents.	Northeast Peak
Northern Slope and Northeast Channel (2)	200 - 240	Variable sediment type (gravel, gravel-sand, and sand) scattered bedforms. This is a transition zone between the northern edge and southern slope. Strong tidal and storm currents.	Northeast Peak
North /Central Shelf (3)	60 - 120	Highly variable sediment type (ranging from gravel to sand) with rippled sand, large bedforms, and patchy gravel lag deposits. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Central and Southwestern Shelf - shoal ridges (4)	10 - 80	Dominated by sand (fine and medium grain) with large sand ridges, dunes, waves, and ripples. Small bedforms in southern part. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Central and Southwestern Shelf - shoal troughs (5)	40 - 60	Gravel (including gravel lag) and gravel-sand between large sand ridges. Patchy large bedforms. Strong currents. (Few samples – submersible observation noted presence of gravel lag, rippled gravel-sand, and large bedforms.) Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas includes amphipods, sand dollars, and burrowing anemones.	Central Georges
Southeastern Shelf (6)	80 - 200	Rippled gravel-sand (medium and fine grained sand) with patchy large bedforms and gravel lag. Weaker currents; ripples are formed by intermittent storm currents. Representative epifauna includes 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

Sediment provinces as defined by Valentine *et al*. (1993) and Valentine and Lough (1991), with additional comments by Valentine (pers. comm.) and benthic assemblages assigned by Theroux and Grosslein (1987). See text for further discussion on benthic assemblages.

Table 14. Sedimentary provinces and associated benthic landscapes of Georges Bank.

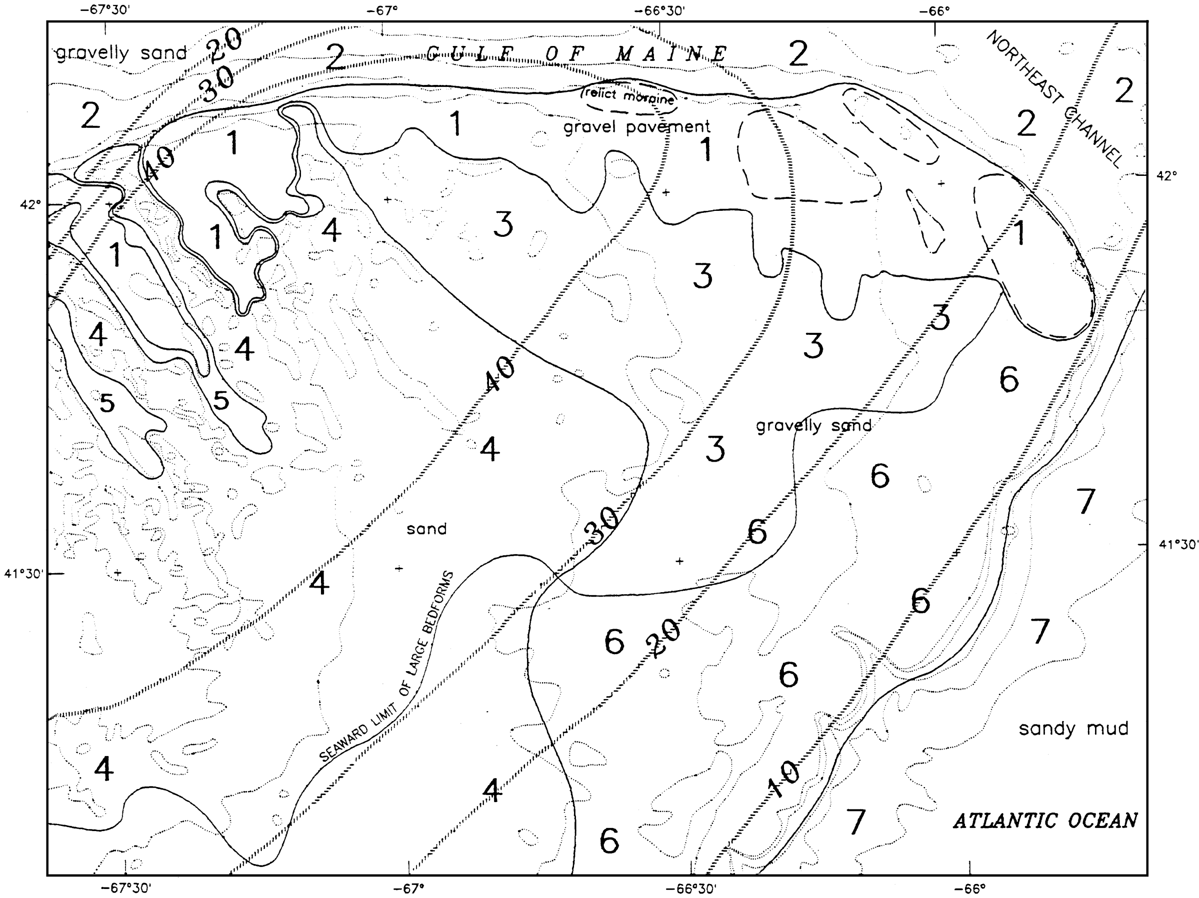


Figure 9 **Sedimentary provinces of eastern Georges Bank.**

Based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/s). Relict moraines (bouldery seafloor) are enclosed by dashed lines. See Table 14 for descriptions of provinces. Source: Valentine and Lough (1991).

Oceanographic frontal systems separate water masses of the GOM and Georges Bank from oceanic waters south of the 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 all can occur simultaneously (Figure 7). 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 plankton, including fish eggs and larvae.

Invertebrates

Amphipod crustaceans (49%) and annelid worms (28%) numerically dominated the contents of 211 samples collected on Georges Bank during 1956-1965 (Theroux and Wigley 1998). Biomass was dominated by sand dollars (50%) and bivalves (33%). Theroux and Grosslein (1987) utilized the same database to identify four macrobenthic invertebrate assemblages. They noted that the boundaries between assemblages were not well defined because there is considerable intergrading between adjacent assemblages. Their assemblages are associated with those identified by Valentine and Lough (1991) in Table 14.

The Western Basin assemblage is found in the upper Great South Channel region at the northwestern corner of the Bank, in comparatively deepwater (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. Valentine and Lough (1991) did not identify a comparable assemblage; however, this assemblage is geographically located adjacent to Assemblage 5 as described by Watling (1998) (Table 12, Figure 8).

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

The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of 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 with burrowing or motile habits.

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

Demersal Fish

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 GOM that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel (1992) identified six assemblages, which are compared with the results of Overholtz and Tyler (1985) in Table 12. Mahon *et al.* (1998) found similar results.

4.2.3 Mid-Atlantic Bight

Physical Environment

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 4). 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/s at the surface and 2 cm/s 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/s that increases to 100 cm/s near inlets.

Slope water tends to be warmer than shelf water because of its proximity to the Gulf Stream, and 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; *e.g.*, 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, nearshore 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 deep. Temperatures decrease at the rate of about 0.02ºC 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 2.2ºC 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 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 - 4.7ºC.

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 the “Continental Slope” section, below). The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales (Figure 10 and Figure 11).

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 glacier outwash 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 that 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 (Figure 10 and Figure 11). 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 sand-shell and sand-gravel. On the slope, silty sand, silt, and clay predominate.

Some sand ridges (Figure 10) are more modern in origin than the shelf’s glaciated morphology. 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.

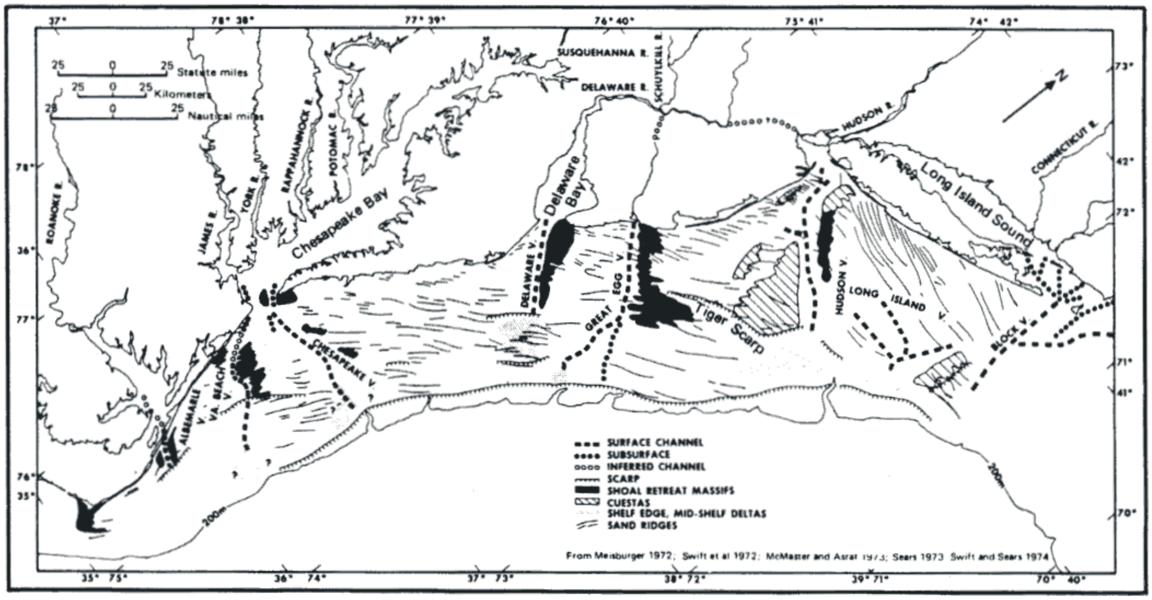


Figure 10 Mid-Atlantic Bight submarine morphology.
Source: Stumpf and Biggs (1988).

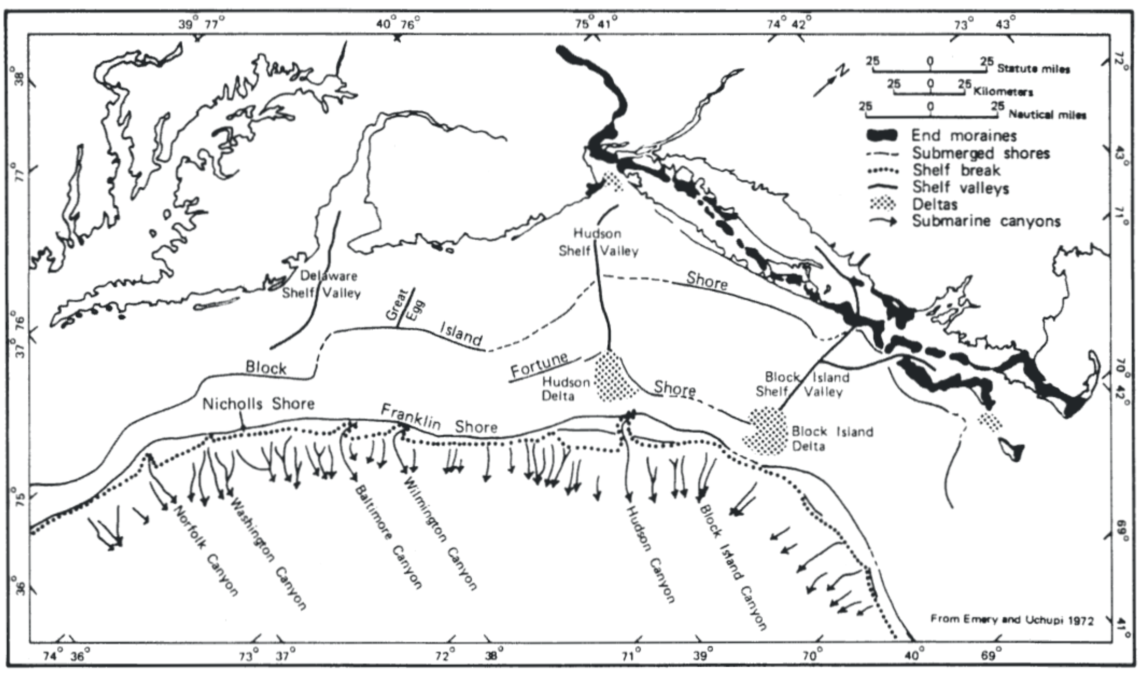


Figure 11 Major features of the mid-Atlantic and southern New England continental shelf.
Source: Stumpf and Biggs (1988).

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.

Sediments are uniformly distributed over the shelf in this region (Figure 6). A sheet of sand and gravel varying in thickness from 0 - 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.

The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. Most of this area was discussed under Georges Bank; however, one other formation of this region deserves note. The mud patch is located just southwest of Nantucket Shoals and southeast of Long Island and Rhode Island (Figure 6). Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally resuspended 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 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. The overview by Steimle and Zetlin (2000) used NOAA hydrographic surveys to plot rocks, wrecks, obstructions, and artificial reefs, which together were considered a fairly complete list of nonbiogenic reef habitat in the Mid-Atlantic estuarine and coastal areas (Figure 12).

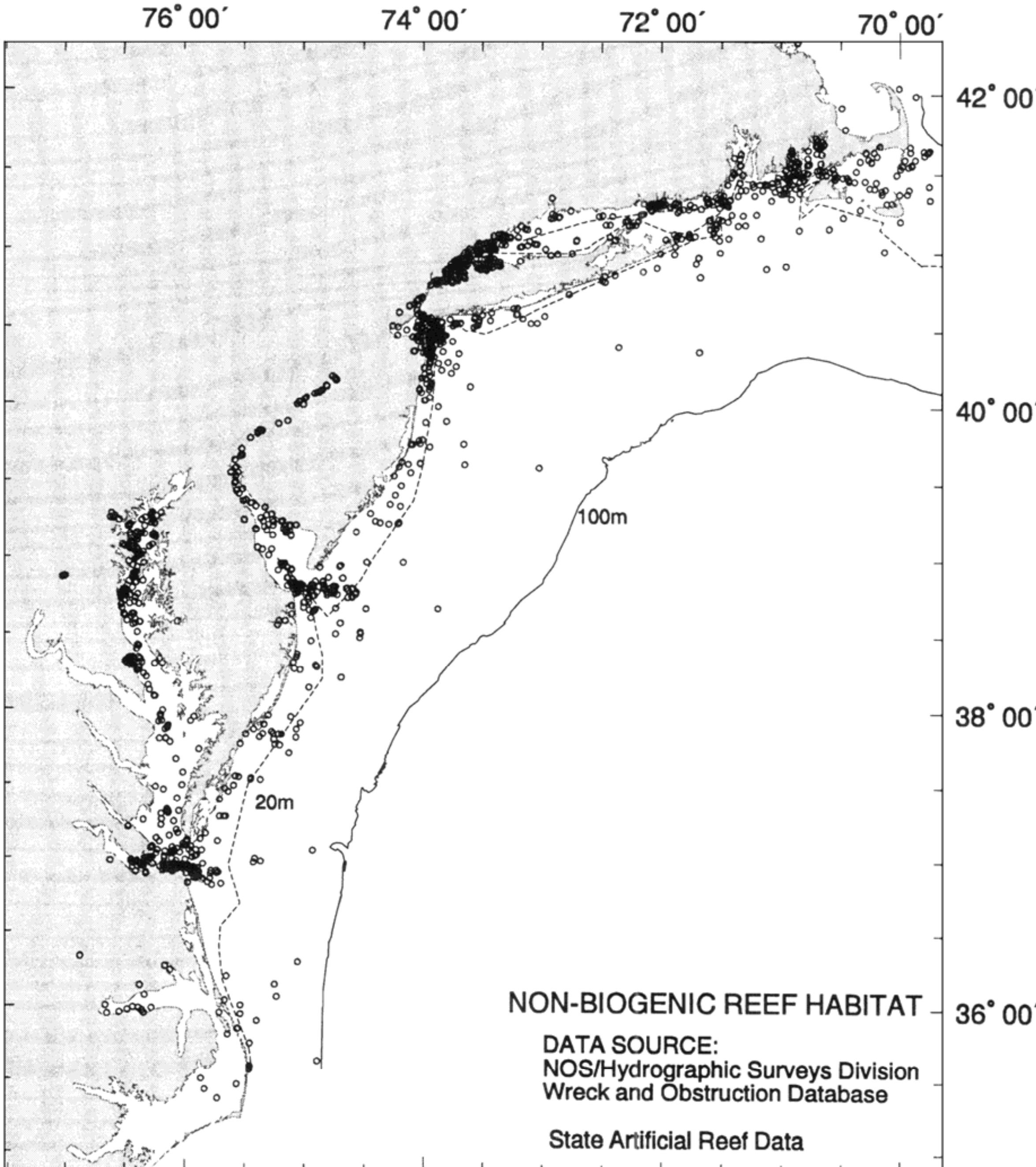


Figure 12 Summary of all reef habitats (except biogenic, such as mussel or oyster beds) in the Mid-Atlantic Bight.
Source: Steimle and Zetlin (2000).

Invertebrates

Wigley and Theroux (1981) reported on the faunal composition of 563 bottom grab samples collected in the Mid-Atlantic Bight during 1956-1965. Amphipod crustaceans and bivalve mollusks accounted for most of the individuals (41% and 22%, respectively), whereas mollusks dominated the biomass (70%). Three broad faunal zones related to water depth and sediment type were identified by Pratt (1973). The "sand fauna" zone was defined for sandy sediments (1% or less silt) that are at least occasionally disturbed by waves, from shore out to 50 m (Figure 10). The "silty sand fauna" zone occurred immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material. Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley, 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 15). Sediments in the region studied (Hudson Shelf Valley south to Chesapeake Bay) were dominated by sand with little finer materials. 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 (1979) incorporated this variation in his subdivisions. Much overlap of species distributions was found between depth zones, so the faunal assemblages represented more of a continuum than distinct zones.

Demersal Fish

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 1984). 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 15). 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.

Steimle and Zetlin (2000) described representative epibenthic/epibiotic, motile epibenthic, and fish species associated with sparsely scattered reef habitats that consist mainly of manmade structures (Table 17).

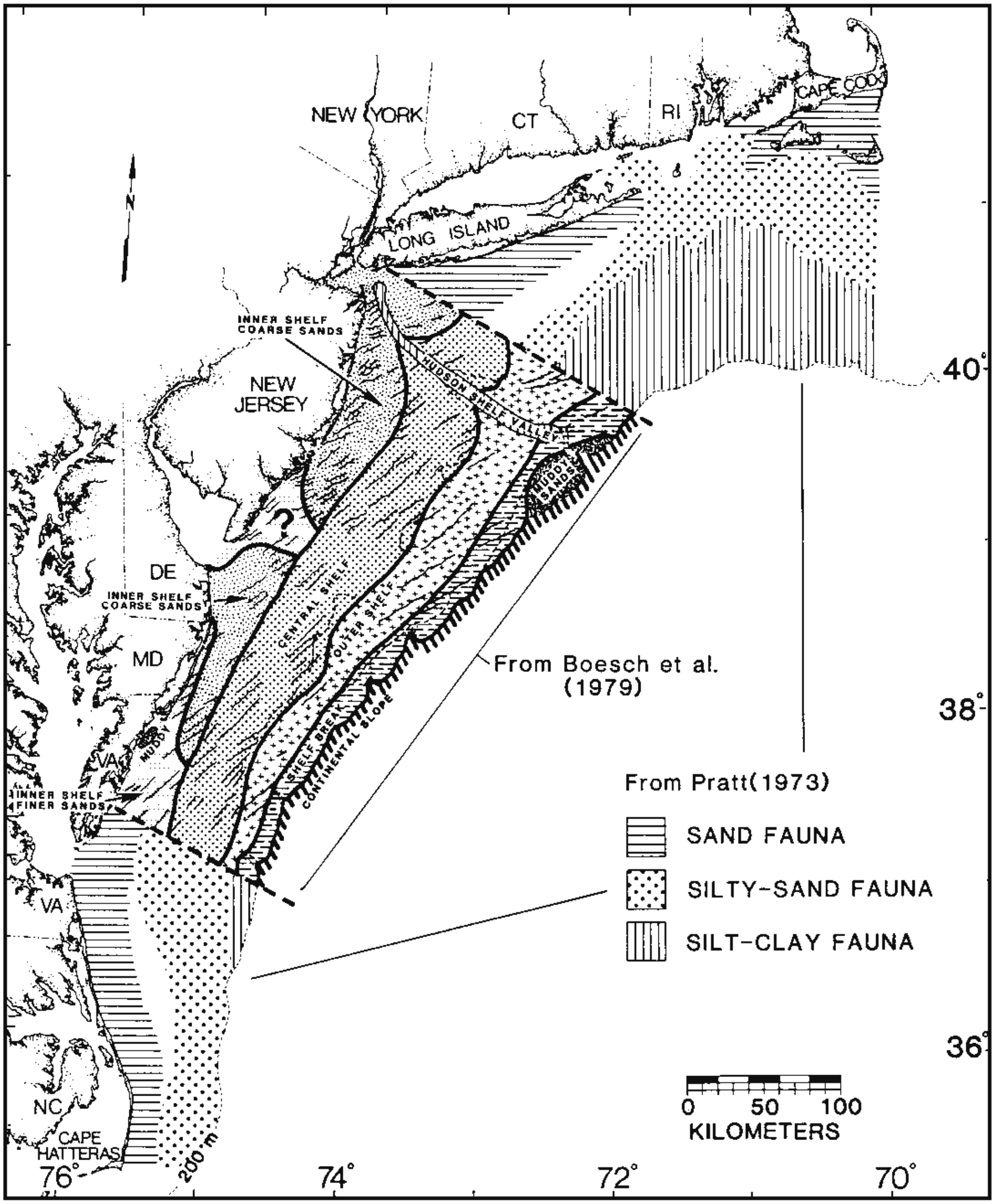


Figure 13 Schematic representation of major macrofaunal zones on the mid-Atlantic shelf. Approximate location of ridge fields indicated. Source: Reid and Steimle (1988).

Habitat Type [after Boesch (1979)]	Description		
	Depth (m)	Characterization [Pratt (1973) 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)	*Polychaetes: 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

As described by Pratt (1973) and Boesch (1979) with characteristic macrofauna as identified in Boesch (1979).

Table 15 Mid-Atlantic habitat types.

Season	Species Assemblage				
	Boreal	Warm temperate	Inner shelf	Outer shelf	Slope
Spring	Atlantic cod little skate sea raven goosefish winter flounder longhorn sculpin ocean pout silver hake 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 silver hake red hake goosefish 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

As determined by Colvocoresses and Musick (1984).

Table 16 Major recurrent demersal finfish assemblages of the Mid-Atlantic Bight during spring and fall.

Location (Type)	Representative Flora and 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 and 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 grouper, smooth dogfish, summer flounder, scad, bluefish, amberjack, Atlantic cod, tautog, ocean pout, conger eel, sea raven, rock gunnel, radiated shanny
Shelf (rocks and boulders, wrecks and 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

As described in Steimle and Zetlin (2000).

Table 17 Mid-Atlantic reef types, location, and representative flora and fauna.

4.2.4 Continental Slope

Physical Environment

The continental slope extends from the continental shelf break, at depths between 60 - 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; and 3) sediment slumping.

The slope is cut by at least 70 large canyons between Georges Bank and Cape Hatteras (Figure 14 and Figure 15) and numerous smaller canyons and gullies, many of which may feed into the larger canyon systems. The New England Seamount Chain including Bear, Mytilus, and Balanus Seamounts 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 - 300 m, below which fine silt and clay-size particles predominate (Figure 6). Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope because of glacial rafting. Sand pockets may also be formed because 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 nonviscous flow. Slumps may involve localized, short, down-slope movements by blocks of sediment. 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. 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 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 were formed because of fluvial drainage (*e.g.*, 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: deepwater (colder than 4°C), the thermocline (4 - 17°C), and surface water (warmer than 17°C). In the North American Basin, deepwater accounts for two-thirds of all the water, the thermocline for about one-quarter, and surface water the remainder. In the slope water north of Cape Hatteras, the only warm water occurs in the Gulf Stream and in seasonally influenced summer waters.

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 straightforward water mass compared with either the deepwater 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 the “Gulf Stream” section). 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.

Shelf and slope waters of the northeast region are intermittently affected by the Gulf Stream. The Gulf Stream begins in the Gulf of Mexico and flows northeastward at an approximate rate of 1 m/s (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. Intrusions from the Gulf Stream constitute the principal source of variability in slope waters off the northeastern shelf.

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 near 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.

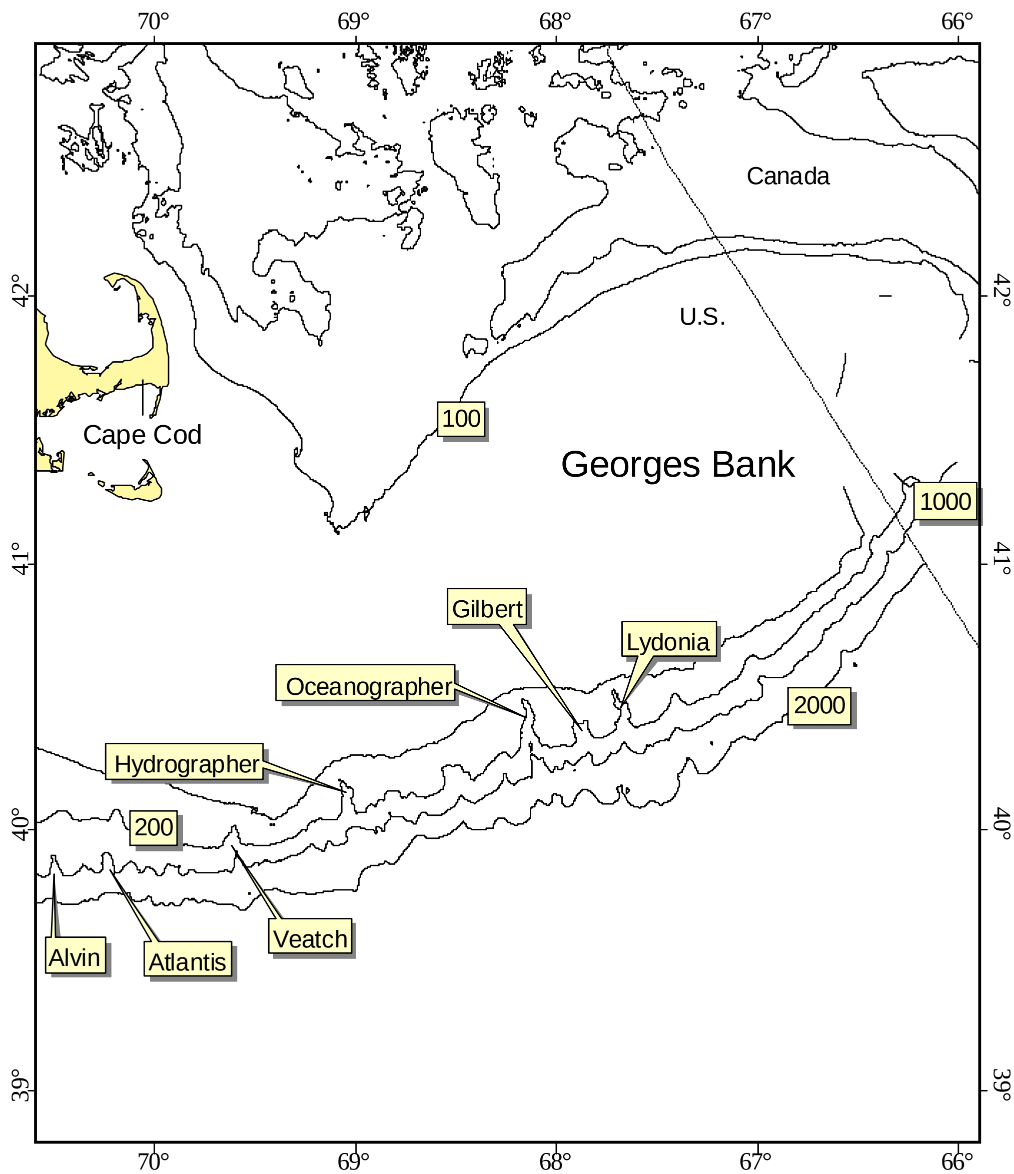


Figure 14 Principal submarine canyons on southern flank of Georges Bank. Depths in meters.

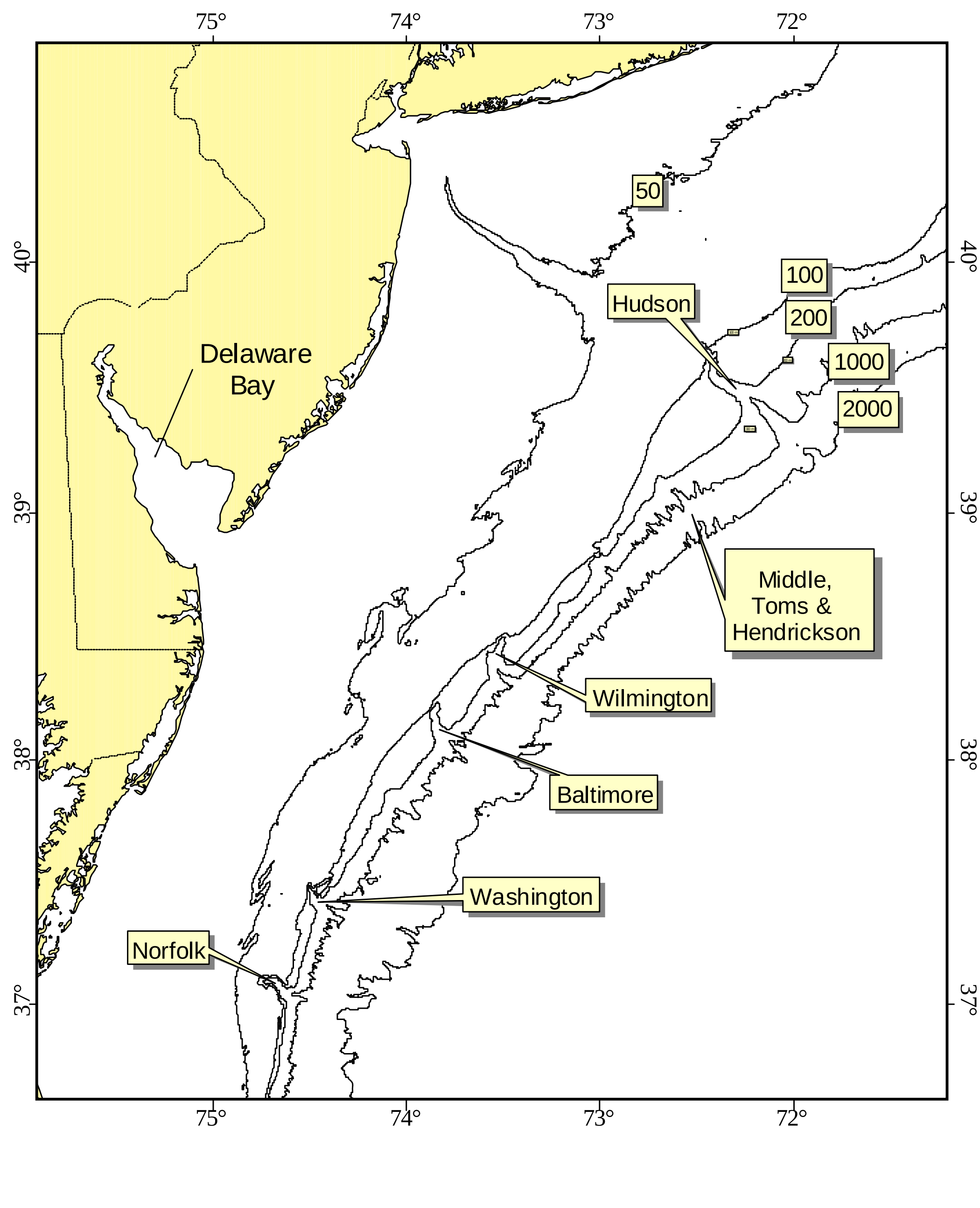


Figure 15 Principal submarine canyons in Mid-Atlantic Bight. Depths in meters.

Invertebrates

Polychaete annelids represent the most important slope faunal group in terms of numbers of individuals and species (Wiebe *et al.* 1987). Ophiuroids (brittle stars) 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 is the peracarid crustaceans (which includes amphipods, cumaceans, and isopods). 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 m, 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 18).

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.

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 (Cooper *et al.* 1987; Hecker 2001). The canyon habitats in Table 19 were classified by Cooper *et al.* (1987).

Demersal Fish

Most finfish identified as slope inhabitants on a broad spatial scale (Colvocoresses and Musick 1984; Overholtz and Tyler 1985; Gabriel 1992) (Table 13) are associated with canyon features as well (Cooper *et al.* 1987) (Table 19). 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.

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

From Hecker (1990)

Table 18 Faunal zones of the continental slope of Georges Bank and Southern New England.

Habitat Type	Geologic Description	Canyon Locations	Most Commonly Observed Fauna
I	Sand or semiconsolidated silt substrate (claylike consistency) with less than 5% overlay of gravel. Relatively featureless except for conical sediment mounds.	Walls and axis	Cerianthid, pandalid shrimp, white colonial anemone, Jonah crab, starfishes, portunid crab, greeneye, brittle stars, mosaic worm, red hake, fourspot flounder, shellless hermit crab, silver hake, gulf stream flounder
II	Sand or semiconsolidated silt substrate (claylike consistency) with more than 5% overlay of gravel. Relatively featureless.	Walls	Cerianthids, galatheid crab, squirrel hake, white colonial anemone, Jonah crab, silver hake, sea stars, ocean pout, brittle stars, shellless hermit crab, greeneye
III	Sand or semiconsolidated 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, sea stars, ocean pout, conger eel, brittle stars, Jonah crab, lobster, blackbelly rosefish, galatheid crab, mosaic worm, tilefish
IV	Consolidated silt substrate, heavily burrowed/excavated. Slope generally more than 5º and less than 50º. Termed “pueblo village” habitat.	Walls	Sea stars, blackbelly rosefish, Jonah crab, lobster, white hake, cusk, ocean pout, cleaner shrimp, conger eel, tilefish, galatheid crab, shellless hermit crab
V	Sand dune substrate.	Axis	Sea stars, white hake, Jonah crab, goosefish

From Cooper *et al.* (1987). Faunal characterization is for depths < 230 m only.

Table 19 Habitat types for the canyons of Georges Bank, including characteristic fauna.

4.3 Fishing Effects on EFH

This section provides a general discussion of the effects of fishing on EFH. Section 5.4 of the FSEIS to Amendment 2 evaluated the potential adverse effects of gears used in the directed monkfish fishery on EFH for monkfish and other federally-managed species and the effects of fishing activities regulated under other Federal FMPs on monkfish EFH. The evaluation considered the effects of each activity on each type of habitat found within EFH. Since monkfish EFH has been determined to not be vulnerable to any fishing gear (Stevenson, *et al.* 2004, NEFMC 2004), the discussion focuses on gears used in the directed monkfish fishery (trawls and gillnets) that potentially could impact EFH on other fisheries.

The two gears used in the directed monkfish fishery are bottom trawls and bottom gill nets which are described in detail in Section 1.2.1 of Appendix 2 to Amendment 2 to the Monkfish FMP. Since dredges are prohibited in the directed monkfish fishery, they do not need to be evaluated in the gear-specific discussion below, but they are noted in the general discussion of fishing effects on EFH.

Generally, otter trawls are towed at speeds of 2-3 knots over the bottom and the trawl doors and footrope contact the benthic environment. Conversely, while sink gill nets are deployed on the ocean bottom, they are stationary or static, anchored at each end and left in place for varying periods of time. Gillnets have been determined to not have an adverse effect on EFH (NEFMC 2004) and are, therefore, omitted from further discussion in this section.

Appendix 2 of Amendment 2 to the Monkfish FMP (NEFMC 2004) describes the general effects of bottom trawls on benthic marine habitats. The primary source document used for this analysis was an advisory report prepared for the International Council for the Exploration of the Seas (ICES 2000) that identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats. This report is based on scientific findings summarized in Lindeboom and de Groot (1998), which were peer-reviewed by an ICES working group. The focus of the report is the Irish Sea and North Sea, but it also includes assessments of effects in other areas. Two general conclusions were: 1) low-energy environments are more affected by bottom trawling; and 2) bottom trawling can affect the potential for habitat recovery (*i.e.*, after trawling ceases, benthic communities and habitats may not always return to their original pre-impacted state). Regarding direct habitat effects, the report also concluded that:

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

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

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

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

A more recent evaluation of the habitat effects of trawling (and dredging) was prepared by the Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002). Trawl gear evaluated by the Committee included bottom otter trawls and beam trawls. Dredge gear included hydraulic clam dredges, non-hydraulic oyster, conch, and crab dredges, and scallop dredges with and without teeth. This report identified four general conclusions regarding the types of habitat modifications caused by trawls and dredges.

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

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

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

The contents of a second expert panel report, produced by the Pew Charitable Trusts and entitled "Shifting Gears: Addressing the Collateral Impacts of Fishing Methods in U.S. Waters" (Morgan and Chuenpagdee 2003), was also summarized in Amendment 13 to the Multispecies FMP. This group evaluated the habitat effects of ten different commercial fishing gears used in U.S. waters. 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. As in the ICES and NRC reports, 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).

Results of a review of 44 gear effect studies published through the summer of 2002 that were relevant (same gears and habitats) to the NE region of the U.S. (see Stevenson *et al.* 2004) are also summarized in Amendment 2. Based on these studies, positive and negative effects of bottom otter trawls, New Bedford-style scallop dredges, and hydraulic clam dredges are summarized by substrate type in Amendment 13, along with recovery times (when known). Whenever possible, only statistically significant results were reported. In general, these studies confirm the previous determinations of potential adverse impacts of trawls and dredges found in the ICES (2000), NRC (2002), NEFSC (2002), and Morgan and Chuenpagdee (2003) reports. The results of these 44 studies are summarized below for each gear/habitat type combination. Studies of the effects of multiple gear types are not included. Physical and biological effects for each gear-substrate category are summarized in separate paragraphs. When necessary, biological effects are summarized separately for single disturbance and repeated disturbance experimental studies, and for non-experimental studies. For more detailed information, including the identification of each study, see Stevenson *et al.* (2004). An updated summary of gear effects research studies that are relevant to the NE region will be included in the revised gear effects section of the NEFMC Omnibus EFH Amendment 2 (Phase 2), which is currently being developed.

Otter Trawls – Mud

Results of 11 studies are summarized, five done in North America, four in Europe, and one in Australia. One was performed in an inter-tidal habitat, one in very deep water (250 m), and the rest in a depth range of 14-90 meters. Seven of them were experimental studies, three were observational, and one was both. Two examined physical effects, six of them assessed biological effects, and three studies examined physical and biological effects. One study evaluated geochemical sediment effects. In this habitat type, biological evaluations focused on infauna: all nine biological assessments examined infaunal organisms and four of them also included epifauna. Habitat recovery was monitored on five occasions. Two studies evaluated the long-term effects of commercial trawling, one by comparing benthic samples from a fishing ground with samples collected near a shipwreck, while another evaluated changes in macrofaunal abundance during periods of low, moderate, and high fishing effort during a 27-year time period. Four of the experimental studies were done in closed or previously un-trawled areas and three in commercially fished areas. One study examined the effects of a single tow and six involved multiple tows, five restricted trawling to a single event (*e.g.*, one day) and two examined the cumulative effects of continuous disturbance.

<u>Physical Effects</u>

Trawl doors produce furrows up to 10 cm deep and berms 10-20 cm high on mud bottom. Evidence from four studies indicates that there is a large variation in the duration of these features (2-18 months). There is also evidence that repeated tows increase bottom roughness, fine surface sediments are re-suspended and dispersed, and rollers compress sediment. A single pass of a trawl did not cause sediments to be turned over, but single and multiple tows smoothed surface features.

<u>Biological Effects</u>

Single disturbance experimental studies
Two single-event studies were conducted in commercially trawled areas. Experimental trawling in intertidal mud habitat in the Bay of Fundy (Canada) disrupted diatom mats and reduced the abundance of nematodes in trawl door furrows, but recovery was complete after 1-3 months. There were no effects on infaunal polychaetes. In a sub-tidal mud habitat (30-40 m deep), benthic infauna were not affected. In two assessments performed in areas that had not been affected by mobile bottom gear for many years, effects were more severe. In both cases, total infaunal abundance and the abundance of individual polychaete and bivalve species declined immediately after trawling. In one of these studies, there were also immediate and significant reductions in the number of species and species diversity. Positive effects included reduced porosity, increased food value, and increased chlorophyll production in surface sediments. Most of these effects lasted less than 3.5 months. In the other, two tows removed 28% of the epifauna on mud and sand substrate and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for mud bottom.

Repeated disturbance experimental studies
Two studies of the effects of repeated trawling were conducted in areas that had been closed to fishing for six years and >25 years. In one, multiple tows were made weekly for a year and, in the other, monthly for 16 months. In one case, 61% of the benthic species sampled tended to be negatively affected, but significant reductions were only noted for brittlestars. In the other, repeated trawling had no significant effect on the numbers of infaunal individuals or biomass. In this study, the number of infaunal species increased by the end of the disturbance period. Some species (*e.g.*, polychaetes) increased in abundance, while others (*e.g.*, bivalves) decreased.

Community structure was altered after five months of trawling and did not fully recover until 18 months after trawling ended.

Observational studies
An analysis of benthic sample data collected from a fishing ground over a 27-year period of high, medium, and low levels of fishing effort showed an increased abundance of organisms belonging to taxa that were expected to increase at higher disturbance levels, whereas those that were expected to decrease did not change in abundance. Results of another study indicated that a trawling ground had fewer benthic organisms and fewer species than an un-exploited site near a shipwreck. Trawling in deep water apparently dislodged infaunal polychaetes, causing them to be suspended in near-bottom water.

Otter Trawls – Sand

Results of 14 studies are summarized. Six studies were conducted in North America (three in a single long-term experiment on the Grand Banks), four in Australia, and four in Europe. Ten are experimental studies. Eight of them were done in depths less than 60 m, one at 80 m, and four in depths greater than 100 m. Three studies examined the physical effects of trawling, ten were limited to biological effects, and one examined both. Five of the biological studies were restricted to epifauna, one only examined infauna, and five included epifauna and infauna. The only experiment that was designed to monitor recovery was the one on the Grand Banks, although surveys conducted in Australia documented changes in the abundance of benthic organisms five years after closed areas were established. Two studies compared benthic communities in trawled areas of sandy substrate with undisturbed areas near a shipwreck. Six studies were performed in commercially exploited areas, five in closed areas, two compared closed and open areas, and one was done in a test tank. All the experimental studies examined the effects of multiple tows (up to 6 per unit area of bottom) and observational studies in Australia assessed the effects of 1-4 tows on emergent epifauna. Trawling in four studies was limited to a single event (1 day to 1 week), whereas the Grand Banks experiment was designed to evaluate the immediate and cumulative effects of annual 5-day trawling events in a closed area over a three-year period.

<u>Physical effects</u>

A test tank experiment showed that trawl doors produce furrows in sandy bottom that are 2 cm deep, with a berm 5.5 cm high. In sandy substrate, trawls smoothed seafloor topographic features, re-suspended and dispersed finer surface sediment, but had no lasting effects on sediment composition. Trawl door tracks lasted up to one year in deep water, but only for a few days in shallow water. Seafloor topography recovered within a year.

<u>Biological effects</u>

Single disturbance experimental studies
Two single-event studies were conducted in commercially trawled areas. In one of these studies, otter trawling caused high mortalities of large sedentary and/or immobile epifaunal species. In the other, there were no effects on benthic community diversity. Neither of these studies

investigated effects on total abundance or biomass. Two studies were performed in un-exploited areas. One study documented effects on attached epifauna. In one, single tows reduced the density of attached macrobenthos (>20 cm) by 15% and four tows by 50%. In the other, two tows removed 28% of the epifauna on mud and sand substrate, and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for sand bottom. Total infaunal abundance was not affected, but the abundance of one family of polychaetes was reduced.

Repeated disturbance experimental studies
Intensive experimental trawling on the Grand Banks reduced the total abundance and biomass of epibenthic organisms and the biomass and average size of a number of epibenthic species. Significant reductions in total infaunal abundance and the abundance of 15 taxa (mostly polychaetes) were detected during only one of three years, and there were no effects on biomass or taxonomic diversity.

Observational studies
Changes in macrofaunal abundance in a lightly trawled location in the North Sea were not correlated with historical changes in fishing effort, but there were fewer benthic organisms and species in a trawling ground in the Irish Sea than in an un-exploited site near a shipwreck. In the other "shipwreck study," however, changes in infaunal community structure at increasing distances from the wreck were related to changes in sediment grain size and organic carbon content. The Alaska study showed that epifauna attached to sand were less abundant inside a closed area, significantly so for sponges and anemones. A single tow in a closed area in Australia removed 89% of the large sponges in the trawl path.

Otter Trawls – Gravel/Rocky Substrate

Three studies of otter trawl effects were conducted on gravel and rocky substrates. All three were conducted in North America. Two were done in glacially-affected areas in depths of about 100 to 300 meters using submersibles and the third was done in a shallow coastal area in the southeast U.S. One involved observations made in a gravel/boulder habitat in two different years before and after trawling affected the bottom. The other two were experimental studies of the effects of single trawl tows. One of these was done in a relatively un-exploited gravel habitat and the other on a smooth rock substrate in an area not affected by trawling. Two studies examined effects to the seafloor and on attached epifauna and one only examined effects on epifauna. There were no assessments of effects on infauna. Recovery was evaluated in one case for a year.

Physical effects

Trawling displaced boulders and removed mud covering boulders and rocks and rubber tire ground gear left furrows 1-8 cm deep in less compact gravel sediment.

Biological effects

Trawling in gravel and rocky substrate reduced the abundance of attached benthic organisms (*e.g.*, sponges, anemones, and soft corals) and their associated epifauna and damaged sponges, soft corals, and brittle stars. Sponges were more severely damaged by a single pass of a trawl than soft corals, but 12 months after trawling all affected species – including one species of stony coral – had fully recovered to their original abundance and there were no signs of damage.

Otter Trawls – Mixed Substrates

Three studies of the effects of otter trawls on mixed substrates are summarized. All three were conducted in North America and relied on sonar and observations made by divers or from a submersible. One of them combined submersible observations and benthic sampling to compare the physical and biological effects of trawling in a lightly fished and heavily fished location in California with the same depth and variety of sediment types. One was a survey of seafloor features produced by trawls in a variety of bottom types and the other primarily examined the physical effects of single trawl tows on sand and mud bottom.

<u>Physical effects</u>

Trawl doors left tracks in sediments that ranged from less than 5 cm deep in sand to 15 cm deep in mud. In mud, fainter marks were also made between the door tracks, presumably by the footgear. A heavily trawled area had fewer rocks, shell fragments, and biogenic mounds than a lightly trawled area.

<u>Biological effects</u>

The heavily trawled area in California had lower densities of large epifaunal species (*e.g.*, sea slugs, sea pens, starfish, and anemones) and higher densities of brittle stars and infaunal nematodes, oligochaetes, and one species of polychaete. There were no differences in the abundance of mollusks, crustaceans, or nemerteans between the two areas. However, since this was not a controlled experiment, these differences could not be attributed to trawling. Single trawl tows in Long Island Sound attracted predators and suspended epibenthic organisms into the water column.

4.4 Essential Fish Habitat

4.4.1 Monkfish Essential Fish Habitat

Section 5.1 of the FSEIS to Amendment 2 described benthic habitats that exist within the range of the monkfish fishery biological characteristics of regional systems, and assemblages of fish and benthic organisms. It also included a description of canyon habitats on the edge of the continental shelf. 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, excerpted from the Habitat Omnibus Amendment, describe the environmental needs and natural distribution of Monkfish. For more information on Monkfish EFH refer the Habitat Omnibus Amendment (1998). Note that figures 4.1 and 4.2 (EFH for eggs and larvae) referenced in the following excerpt are not shown, and an additional figure is added, showing combined adult and juvenile monkfish EFH designations. Figure 16 shows the areas designated as EFH for juvenile monkfish (corresponding to Figure 4.3 in the excerpt), Figure 17 shows EFH designated for adult monkfish (Figure 4.4 in the excerpt), and Figure 18 shows the combined areas designated as monkfish EFH.

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.

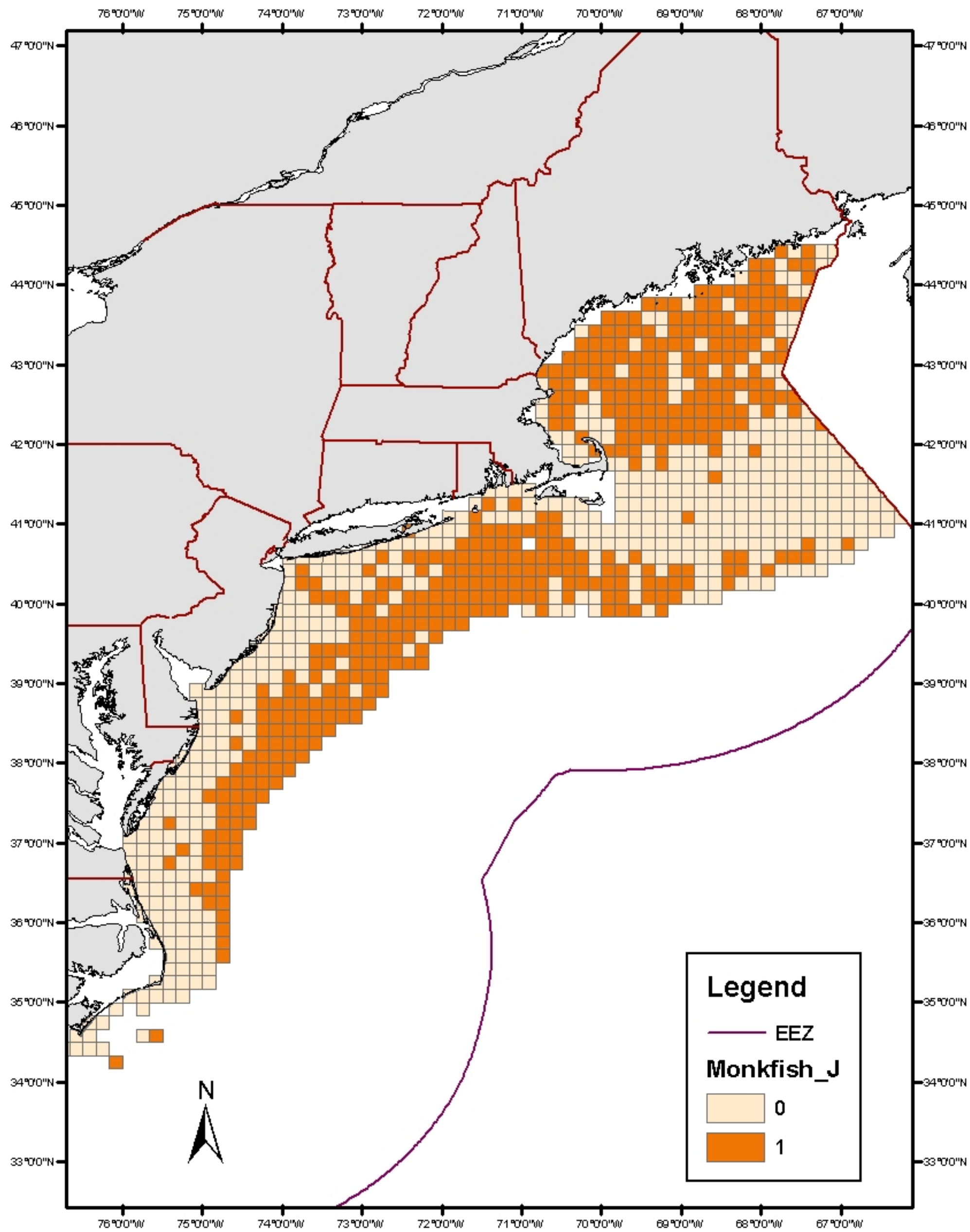


Figure 16 EFH Designation for Juvenile Monkfish is highlighted in the shaded ten-minute squares

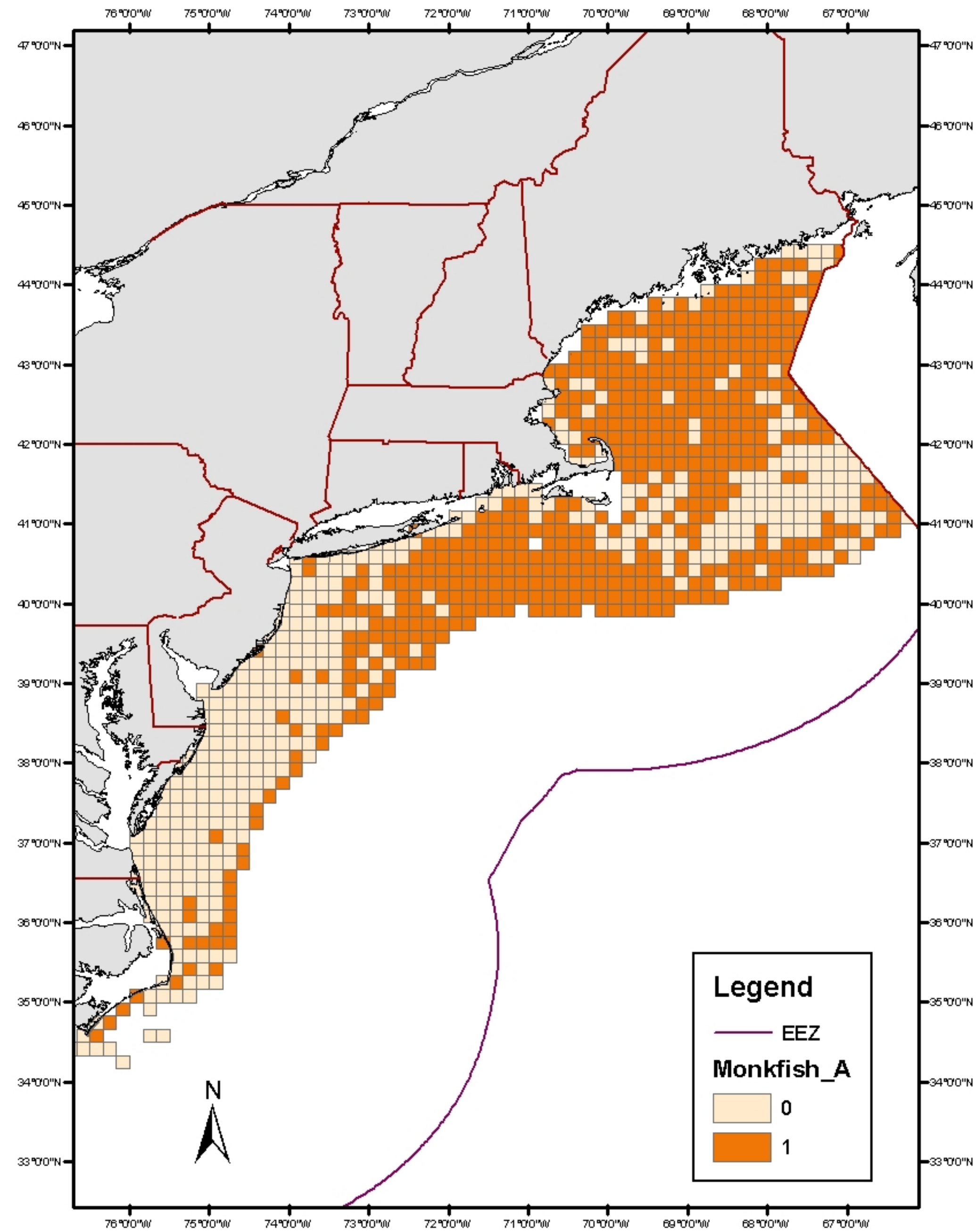


Figure 17 EFH Designations for Adult Monkfish is highlighted in the shaded ten-minute squares

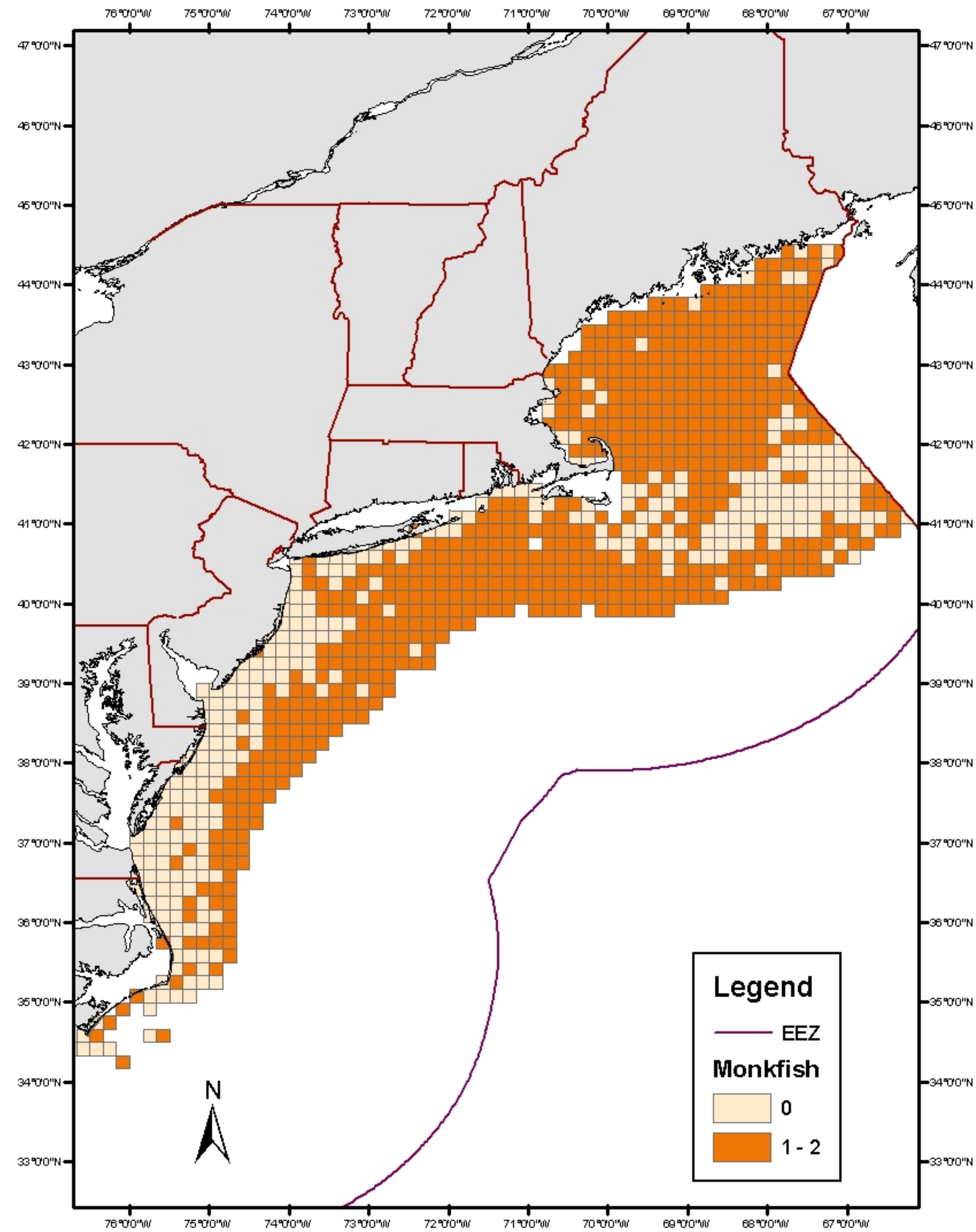


Figure 18 EFH Designation for both Juvenile and Adult Monkfish combined is highlighted in the shaded ten-minute squares

4.4.2 Essential Fish Habitat of Other Species vulnerable to Bottom Trawl Gear

The environment that could potentially be affected by the proposed action has been identified as EFH for benthic life stages of species that are managed under the NE Multispecies; Atlantic Sea Scallop; Monkfish; Deep-Sea Red Crab; Northeast Skate Complex; Atlantic Herring; Summer Flounder, Scup, and Black Sea Bass; Tilefish; Squid, Atlantic Mackerel, and Butterfish; Atlantic Surfclam and Ocean Quahog Fishery Management Plans. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the geographic range, depth, and bottom types for all the benthic life stages of the species managed under these FMPs are summarized in the following table (Table 20).

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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 herring	eggs	GOME, GB and following estuaries: Englishman/Machias Bay, Casco Bay, and Cape Cod Bay	20 – 80	Bottom habitats attached to gravel, sand, cobble or shell fragments, also on macrophytes
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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Monkfish	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
Monkfish	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	eggs	GOME, GB, southern NE, and middle Atlantic south to Delaware Bay, and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts and Cape Cod Bay	<50	Bottom habitats, generally in hard bottom sheltered nests, holes, or crevices
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	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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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	eggs	GB, inshore areas of GOME, southern NE, and middle Atlantic south to Delaware Bay	<5	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel
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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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	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	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	Throughout substrate to a depth of 3 ft within Federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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	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)	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)	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
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	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	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	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Longfin squid	eggs	GB, southern NE and middle Atlantic to mouth of Chesapeake Bay	<50	Egg masses attached to rocks, boulders and vegetation on sand or mud bottom

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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	l0 - 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	l0 - 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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
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	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

Table 20 EFH descriptions for all benthic life stages of federally-managed species in the U.S. Northeast Shelf Ecosystem. Species with EFH vulnerable to bottom tending gear are shaded (see Stevenson *et al.* 2004).

4.4.3 Effect of the Monkfish fishery on Essential Fish Habitat

Section 5.4 of the FSEIS to Amendment 2 evaluated the potential adverse effects of gears used in the directed monkfish fishery on EFH for monkfish and other federally-managed species and the effects of fishing activities regulated under other Federal FMPs on monkfish EFH. The evaluation considered the effects of each activity on each type of habitat found within EFH. The two gears used in the directed monkfish fishery are bottom trawls and bottom gill nets which are described in detail in Section 1.2.1 of Appendix 2 to Amendment 2 to the Monkfish FMP. Generally, otter trawls are towed at speeds of 2-3 knots over the bottom and the trawl doors and footrope contact the benthic environment. Conversely, while sink gill nets are deployed on the ocean bottom, they are stationary or static, anchored at each end and left in place for varying periods of time.

Monkfish EFH has been determined to only be minimally vulnerable to bottom-tending mobile gear (bottom trawls and dredges) and bottom gillnets (see Appendix 2 of Amendment 2 FSEIS). Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. However, the monkfish trawl fishery does have more than a minimal and temporary impact on EFH for a number of other demersal species in the region. Adverse impacts that were more than minimal and not temporary in nature were identified for the following species and life stages, based on an evaluation of species life history and habitat requirements and the spatial distributions and impacts of bottom otter trawls in the region (Stevenson *et al*., 2004):

> *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).

There are no species or life stages for which EFH is more than minimally vulnerable to bottom gill nets (Stevenson *et al*., 2004).

4.4.4 Measures to Minimize Adverse Impacts of the Monkfish Fishery on EFH

In Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP, the NEFMC 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 DAS and some gear modifications, in Amendment 13 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 NMA and the habitat closed areas extend into the SMA, 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 implemented 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. The Councils closed 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. These two canyon areas are outside the range of the multispecies and scallop fisheries, but could be areas in which, or adjacent to where deep-water monkfish fisheries occur.

4.5 Human Environment, Vessels, Ports and Communities

This section updates information provided in the annual SAFE Report for the Monkfish FMP, adding data for the 2007 and 2008 fishing years.

4.5.1 Vessels and Fishery Sectors

The following sections show the distribution of effort and landings by permit category, area and gear type.

4.5.1.1 Permits

In 2008, there were 758 monkfish limited access permits, of which 341 were Category C permits holding limited access permits in either a Multispecies (60%) or Scallop (48%) fisheries, and 351 were Category D permits, primarily (99%) holding limited access Multispecies permits (Table 21). Overall, 73% of monkfish limited access permit holders also hold multispecies limited access permits. Vessels in all monkfish permit categories also hold limited access permits in a number of New England and Mid-Atlantic fisheries. Since Amendment 2, there are an additional seven Category H limited access permits issued for vessels fishing off the North Carolina/Virginia coast.

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	NUMBER OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	SUMMER FLOUNDER	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACKEREL/ BUTTERFISH	TILEFISH
A	18	10	5	10	1	0	0	0	8	1	1
B	41	21	5	19	3	0	0	0	12	0	3
C	341	127	256	285	205	0	0	163	141	112	1
D	351	123	207	319	346	0	0	18	154	104	5
H	7	2	0	0	0	0	0	0	0	0	0
TOTAL	758	283	473	633	555	0	0	181	315	217	10

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENT OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	SUMMER FLOUNDER	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACKEREL/ BUTTERFISH	TILEFISH
A	18	56%	28%	56%	0%	0%	0%	0%	44%	6%	6%
B	41	51%	12%	46%	7%	0%	0%	0%	29%	0%	7%
C	341	37%	75%	84%	60%	0%	0%	48%	41%	33%	0%
D	351	35%	59%	91%	99%	0%	0%	5%	44%	30%	1%
H	7	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%
TOTAL	758	37%	62%	84%	73%	0%	0%	24%	42%	29%	1%

Table 21 Number and Percent of monkfish limited access vessels also issued a limited access permit in other fisheries in 2008, by permit category

The FMP also provides an open-access permit (Category E) for vessels that did not qualify for a limited access permit so those vessels can land monkfish caught incidentally in other fisheries. Table 22 shows that the number of category E permits increased rapidly during the first few years of the FMP, but has declined steadily since 2005, from 2,379 permits to 2,136 permits in 2008.

Fishing Year	Number of permits
1999	1466
2000	1882
2001	1991
2002	2142
2003	2120
2004	2256
2005	2379
2006	2310
2007	2265
2008	2163
TOTAL	4042

Table 22 Monkfish open-access (Category E) permits issued each year since implementation of the FMP in 1999.
*The "**total**" is the number of unique Category E permits issued since inception of the plan.*

4.5.1.2 Landings and Revenues

Table 23 shows monthly landings for FY2007 (a) and FY2008 (b) by area and gear, as well as total monthly landings since FY2002. Table 24 shows annual landings by management area and gear for FY1999-FY2008. Landings in both areas combined have declined each year since FY2005, and are approximately 40% of what they were at the peak in FY2003, and were at the lowest level since the inception of the FMP in 1999 (Figure 19). Monkfish landings increased between FY2002 and FY2003, principally due to the increase trip limits in the SMA but declined in FY2004 as trip limits and DAS allocations were reduced in that area. In FY2005 total landings increased by 1,272 mt, or about 7% due to an increase in SMA landings as a result of increased trip limits and DAS allocations, and in spite of a decline of 20% in NMA landings from the previous year. NMA landings have declined each year since FY2001, although trip limits were only established in FY2007, and in FY2008 were about 24% of what they were at the peak.

Table 25 shows monthly landings by gear from the dealer reports for FY2007 and FY 2008, both as reported (landed weight) and converted to live weight. The lower landed weights reflect the fact that monkfish are landed as tails only, and as whole fish. The lower ratio of landed weight to live weight for otter trawls (0.38), compared to gillnets (0.74), is the result of a greater proportion of tails being landed by otter trawls, while gillnet vessels land mostly whole fish. Readers should note that Table 25 includes all landings in the dealer database, while other tables reporting landed weights are filtered by permit category, and, therefore, may not include some dealer landings for which there is no permit number associated.

Figure 20 shows the long-term trend in landings (live weight equivalent) and revenues based on a calendar year. While landings have declined over 60% since the peak in 1997, nominal revenues have only declined by 22% since that time. Table 26, which is based on fishing year and landed weights, not calendar year and live weights as in Figure 20, shows a similar trend in revenues, but a long-term trend of higher nominal prices as reflected in the revenue per landed wt. trend.

Figure 21 illustrates the seasonal pattern of monkfish landings in FY2006, and the distinct difference between NMA and SMA fisheries, not only in terms of seasonality, but also in terms of the predominant gear. In the NMA, trawl gear is the primary gear landing monkfish, and gillnet gear landings are a small proportion during the winter months. In the SMA, on the other hand, gillnet gear accounts for the majority of monkfish landings, with a peak in the late spring/early summer months when fish are migrating from deeper water, and showing less of a winter effect. Figure 22 shows the annual distribution of landings by gear for each area since FY1999. While the NMA pattern is fairly consistent over that period in terms of the proportion landed by gear type, the proportion of landings accounted for by trawl vessels has declined in the SMA, although it nearly doubled in FY2005 from the previous year.

(A) FY 2007

	MAY - 2007	JUN - 2007	JUL - 2007	AUG - 2007	SEP - 2007	OCT - 2007	NOV - 2007	DEC - 2007	JAN - 2008	FEB - 2008	MAR - 2008	APR - 2008	MAY 07- APR 08		2007*		2006*		Fishing Year* Landings
															May07-Apr08 as a % of Target TAC	Target TAC	May06-Apr07 as a % of Target TAC	Target TAC	
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Percent of Area		Metric Tons		Metric Tons	Metric Tons
NORTHERN	**231**	**404**	**522**	**471**	**460**	**504**	**338**	**387**	**446**	**474**	**419**	**393**	**5,050**	**41%**	**101%**	**5,000**	86%	**7,737**	
OTTER TRAWL	217	263	239	227	247	365	233	288	432	473	413	387	3,786	31%	76%		62%		
GILLNET	12	140	264	186	166	97	79	94	13	1	6	6	1,065	9%	21%		22%		
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%		0%		
OTHER GEARS	1	1	18	58	46	42	25	5	1	1	0	0	199	2%	4%		2%		
SOUTHERN	**1,183**	**802**	**396**	**306**	**235**	**430**	**825**	**926**	**642**	**423**	**317**	**697**	**7,180**	**59%**	**141%**	**5,100**	161%	**3,667**	
OTTER TRAWL	133	111	123	133	99	144	82	84	94	175	143	134	1,454	12%	29%		47%		
GILLNET	908	577	195	63	16	138	599	734	481	170	127	507	4,514	37%	89%		92%		
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%		0%		
OTHER GEARS	142	115	77	109	120	149	144	107	67	78	47	57	1,212	10%	24%		22%		
ALL AREAS	**1,413**	**1,206**	**917**	**776**	**695**	**934**	**1,163**	**1,314**	**1,088**	**897**	**737**	**1,090**	**12,230**	**100%**					
OTTER TRAWL	350	374	363	360	346	509	315	373	526	648	556	521	5,240	43%					
GILLNET	920	716	460	249	182	234	678	829	494	171	133	513	5,579	46%					
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%					
OTHER GEARS	143	116	95	168	167	191	169	112	68	78	48	57	1,411	12%					
LANDINGS - ALL AREAS																			
Fishing Year 2007	**1,413**	**1,206**	**917**	**776**	**695**	**934**	**1,163**	**1,314**	**1,088**	**897**	**737**	**1,090**	**12,230**						**12,230**
Fishing Year 2006	**1,314**	**1,490**	**1,181**	**909**	**880**	**1,104**	**1,140**	**1,130**	**967**	**671**	**951**	**848**	**12,586**						**12,586**
Fishing Year 2005	**2,040**	**3,040**	**1,862**	**1,487**	**1,343**	**1,100**	**1,616**	**1,413**	**1,523**	**1,143**	**1,309**	**1,313**	**19,189**						**19,189**
Fishing Year 2004	**1,806**	**1,979**	**1,581**	**1,380**	**1,304**	**1,243**	**1,803**	**1,681**	**1,264**	**1,173**	**1,235**	**1,478**	**17,927**						**17,927**
Fishing Year 2003	**2,681**	**3,199**	**1,913**	**1,746**	**1,420**	**2,253**	**2,823**	**1,907**	**1,976**	**2,386**	**2,172**	**1,797**	**26,273**						**26,273**
Fishing Year 2002	**1,574**	**2,093**	**1,489**	**1,382**	**1,524**	**1,643**	**1,937**	**2,203**	**2,015**	**1,762**	**2,631**	**1,553**	**21,807**						**21,807**

(B) FY2008

	MAY - 2008	JUN - 2008	JUL - 2008	AUG - 2008	SEP - 2008	OCT - 2008	NOV - 2008	DEC - 2008	JAN - 2009	FEB - 2009	MAR - 2009	APR - 2009	MAY 08 - APR 09		2008*		2007*		Fishing Year* Landings
															May08-Apr09 as a % of Target TAC	Target TAC	May07-Apr08 as a % of Target TAC	Target TAC	
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Percent of Area		Metric Tons		Metric Tons	Metric Tons
NORTHERN	**170**	**237**	**295**	**266**	**268**	**294**	**249**	**284**	**505**	**378**	**393**	**187**	**3,528**	**34%**	**71%**	**5,000**	**101%**	**5,000**	
OTTER TRAWL	158	145	141	127	169	230	163	221	489	376	392	186	2,798	27%	56%		76%		
GILLNET	10	87	150	135	95	61	85	62	16	1	1	1	702	7%	14%		21%		
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%		0%		
OTHER GEARS	3	6	4	5	4	3	1	1	0	2	0	0	28	0%	1%		4%		
SOUTHERN	**1,470**	**1,121**	**379**	**270**	**271**	**371**	**559**	**528**	**579**	**324**	**241**	**637**	**6,751**	**66%**	**132%**	**5,100**	**141%**	**5,100**	
OTTER TRAWL	103	105	65	136	142	152	89	140	83	144	70	182	1,410	14%	28%		29%		
GILLNET	1,264	815	204	39	19	142	442	350	464	154	138	397	4,428	43%	87%		89%		
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%		0%		
OTHER GEARS	103	202	110	96	110	77	27	39	32	26	33	58	912	9%	18%		24%		
ALL AREAS	**1,641**	**1,359**	**674**	**537**	**539**	**665**	**808**	**812**	**1,084**	**703**	**634**	**824**	**10,279**	**100%**					
OTTER TRAWL	261	250	206	262	312	382	253	361	572	520	462	368	4,208	41%					
GILLNET	1,274	901	354	173	114	203	527	411	480	155	139	398	5,130	50%					
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0%					
OTHER GEARS	106	208	114	101	114	79	28	40	32	28	33	58	941	9%					
LANDINGS - ALL AREAS																			
Fishing Year 2008	**1,641**	**1,359**	**674**	**537**	**539**	**665**	**808**	**812**	**1,084**	**703**	**634**	**824**	**10,279**						**10,279**
Fishing Year 2007	**1,413**	**1,206**	**917**	**776**	**695**	**934**	**1,163**	**1,314**	**1,088**	**897**	**737**	**1,090**	**12,230**						**12,230**
Fishing Year 2006	**1,314**	**1,490**	**1,181**	**909**	**880**	**1,104**	**1,140**	**1,130**	**967**	**671**	**951**	**848**	**12,586**						**12,586**
Fishing Year 2005	**2,040**	**3,040**	**1,862**	**1,487**	**1,343**	**1,100**	**1,616**	**1,413**	**1,523**	**1,143**	**1,309**	**1,313**	**19,189**						**19,189**
Fishing Year 2004	**1,806**	**1,979**	**1,581**	**1,380**	**1,304**	**1,243**	**1,803**	**1,681**	**1,264**	**1,173**	**1,235**	**1,478**	**17,927**						**17,927**
Fishing Year 2003	**2,681**	**3,199**	**1,913**	**1,746**	**1,420**	**2,253**	**2,823**	**1,907**	**1,976**	**2,386**	**2,172**	**1,797**	**26,273**						**26,273**
Fishing Year 2002	**1,574**	**2,093**	**1,489**	**1,382**	**1,524**	**1,643**	**1,937**	**2,203**	**2,015**	**1,762**	**2,631**	**1,553**	**21,807**						**21,807**

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. Landings in live weight.
3. Gear data are based on vessel trip reports.
* Fishing Year is May 1 through April 30.

Table 23 Monkfish landings by area, gear and month for FY2006 (converted to live weight).

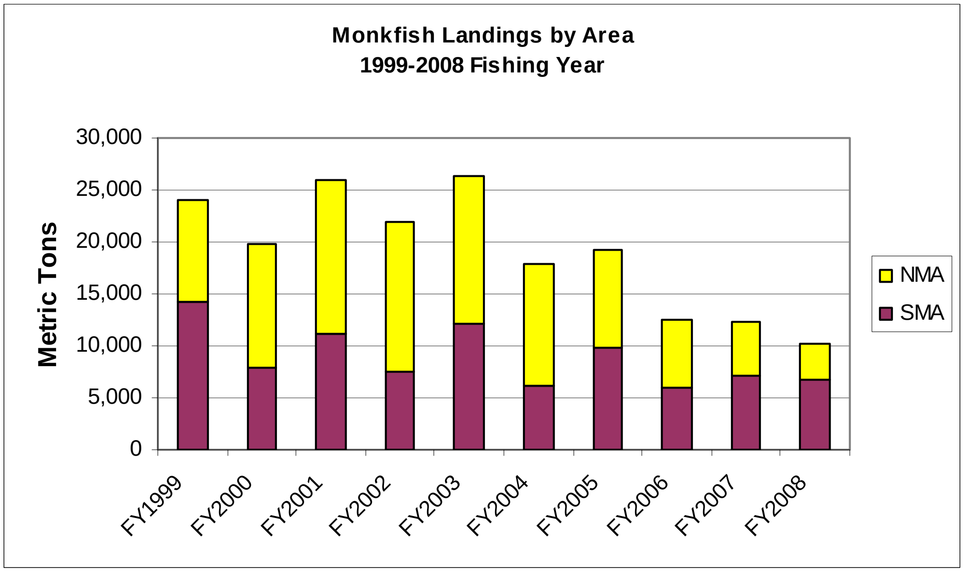


Figure 19 Monkfish landings by management area, FY1999 – 2008

Metric tons	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
NORTHERN	9,720	11,859	14,853	14,491	14,221	11,704	9,325	6677	5,050	3,528
OTTER TRAWL	7,568	8,608	11,132	11,247	10,982	8,319	6,897	4808	3,786	2,798
GILLNET	1,651	2,947	3,416	3,152	3,024	3,336	2,361	1738	1,065	702
HOOK	0	0	1	0	0	2	3	2	0	0
OTHER GEARS	501	304	303	92	214	47	64	130	199	28
	0	0	0	0	0	0				
SOUTHERN	14,311	7,960	11,069	7,478	12,052	6,223	9,897	5909	7,180	6,751
OTTER TRAWL	5,382	3,359	2,628	1,114	1,619	1,482	2,886	1734	1,454	1,410
GILLNET	6,953	3,155	6,799	5,359	9,196	3,963	6,022	3365	4,514	4,428
HOOK	1	1	0	1	0	2	0	0	0	0
OTHER GEARS	1,975	1,445	1,643	1,005	1,236	776	989	810	1,212	912
	0	0	0	0	0	0				
ALL AREAS	24,031	19,819	25,922	21,969	26,272	17,927	19,222	12586	12,230	10,279
OTTER TRAWL	12,950	11,967	13,760	12,361	12,601	9,801	9,783	6542	5,240	4,208
GILLNET	8,604	6,102	10,214	8,510	12,220	7,299	8,384	5103	5,579	5,130
HOOK	1	2	1	1	1	4	3	2	0	0
OTHER GEARS	2,475	1,749	1,946	1,097	1,451	823	1,052	940	1,411	941

Table 24 Monkfish landings by management area and gear, FY1999 – 2008

(A)

LIVE WEIGHT for FY 2007

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Unspecified	Total Pounds
May	585,153	90,403	1,789,680	53,747	513,210	3,032,193
June	783,858	94,093	1,278,009	31,591	428,744	2,616,295
July	799,289	89,615	756,959	8,213	401,258	2,055,334
August	689,527	175,923	409,618	3,289	442,271	1,720,628
September	627,915	228,099	289,556	4,989	378,034	1,528,593
October	805,459	236,315	503,039	6,280	500,993	2,052,086
November	608,452	169,248	1,337,411	8,582	459,322	2,583,015
December	717,049	70,204	1,685,194	19,713	385,585	2,877,745
January	994,409	69,006	1,006,958	24,795	292,105	2,387,273
February	1,201,653	90,469	327,630	4,110	347,604	1,971,466
March	1,082,821	30,287	291,139	2,568	198,160	1,604,975
April	1,024,934	45,659	989,518	550	287,479	2,348,140
TOTAL	**9,920,519**	**1,389,321**	**10,664,711**	**168,427**	**4,634,765**	**26,777,743**

Source: NMFS Statistics Office, dealer weighout database

** May include data from CT vessels without a 2006 Monkfish permit*

LANDED WEIGHT for FY 2007

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Unspecified	Total Pounds
May	215,783	27,263	1,456,463	39,120	206,079	1,944,708
June	269,745	28,760	979,141	29,377	192,747	1,499,770
July	262,191	27,147	533,190	6,567	187,803	1,016,898
August	226,658	54,263	255,909	1,475	159,361	697,666
September	213,696	68,730	177,060	3,349	142,867	605,702
October	283,182	75,119	374,302	3,153	190,934	926,690
November	211,548	59,702	1,130,055	7,099	209,117	1,617,521
December	252,486	25,143	1,428,922	19,539	160,365	1,886,455
January	346,486	22,009	886,300	24,325	117,110	1,396,230
February	419,831	28,826	271,988	3,335	116,926	840,906
March	379,497	10,432	216,441	823	69,958	677,151
April	347,781	15,074	800,657	228	133,748	1,297,488
TOTAL	**3,428,884**	**442,468**	**8,510,428**	**138,390**	**1,887,015**	**14,407,185**

(B)

LIVE WEIGHT for FY 2008

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Unspecified	Total Pounds
May	467,066	67,823	2,292,856	14,263	501,662	3,343,670
June	559,059	100,310	1,511,422	8,712	571,319	2,750,822
July	408,334	66,369	635,406	8,099	308,438	1,426,646
August	491,305	85,611	295,165	9,523	296,200	1,177,804
September	569,270	115,997	193,442	6,881	303,522	1,189,112
October	755,844	95,893	370,994	7,523	237,486	1,467,740
November	539,950	31,893	935,111	24,237	201,788	1,732,979
December	763,489	36,909	742,877	19,560	191,225	1,754,060
January	1,179,163	18,814	1,013,318	12,408	156,435	2,380,138
February	1,046,807	23,147	320,241	20,312	137,030	1,547,537
March	1,003,188	29,378	212,830	5,239	126,671	1,377,306
April	839,197	24,246	693,936	16,857	156,804	1,731,040
TOTAL	**8,622,672**	**696,390**	**9,217,598**	**153,614**	**3,188,580**	**21,878,854**

Source: NMFS Statistics Office, dealer weighout database

** May include data from CT vessels without a 2006 Monkfish permit*

LANDED WEIGHT for FY 2008

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Unspecified	Total Pounds
May	157,870	21,638	1,833,500	9,090	229,763	2,251,861
June	189,975	30,984	1,138,124	2,774	218,030	1,579,887
July	138,836	21,060	404,087	3,509	116,759	684,251
August	158,924	29,027	169,230	4,817	94,401	456,399
September	185,934	39,263	100,486	2,752	93,410	421,845
October	266,100	33,164	292,890	4,680	91,279	688,113
November	195,284	12,070	742,642	21,978	104,634	1,076,608
December	276,424	13,524	559,465	15,358	82,726	947,497
January	417,142	7,185	912,976	11,334	65,369	1,414,006
February	335,700	9,879	302,758	21,022	56,612	725,971
March	327,308	9,419	182,535	3,648	47,330	570,240
April	274,163	9,711	589,680	14,660	66,080	954,294
TOTAL	**2,923,660**	**236,924**	**7,228,373**	**115,622**	**1,266,393**	**11,770,972**

Table 25 FY2007 (A) and FY2008 (B) monkfish landings from dealer reports, showing live weight (top) and landed weights (bottom).

Note: does not include landings in the dealer database for which there is no permit number associated, while other tables reporting landed weights are not filtered by permit category, and, therefore, include all dealer landings

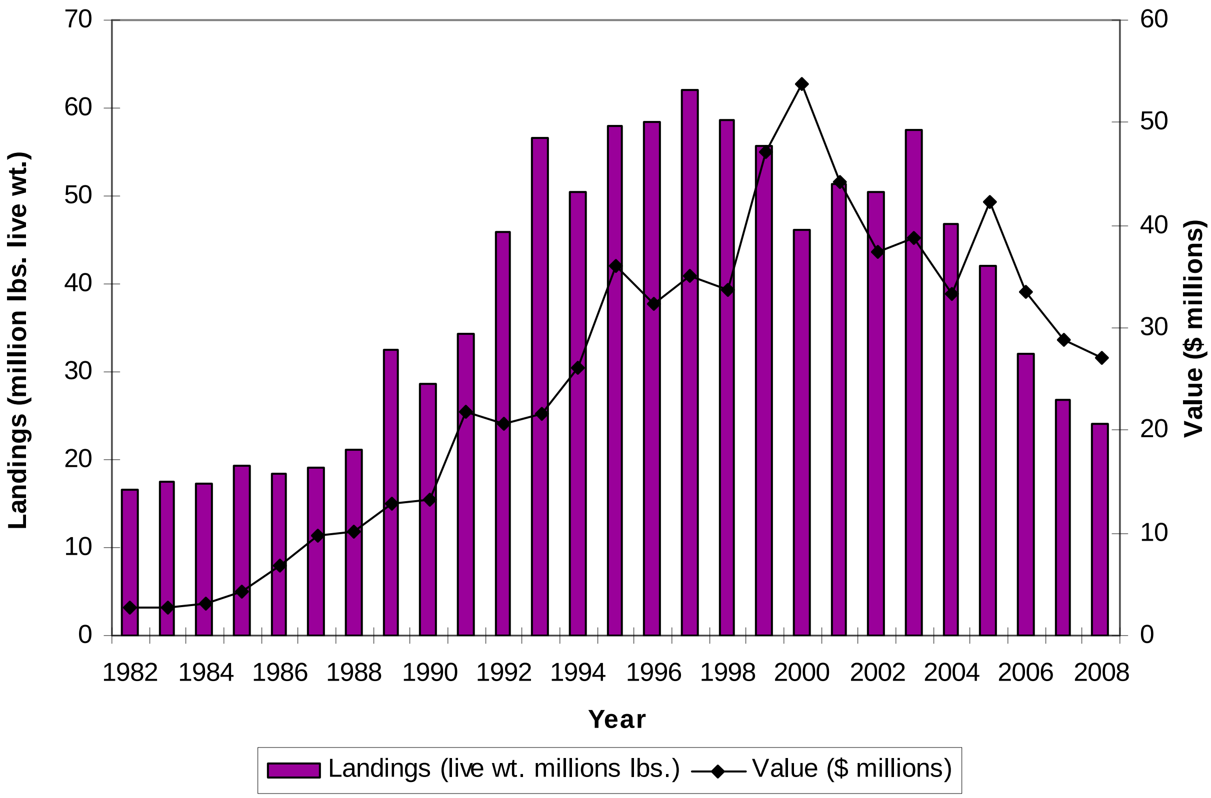


Figure 20 Calendar year monkfish landings and revenues, 1982-2008.

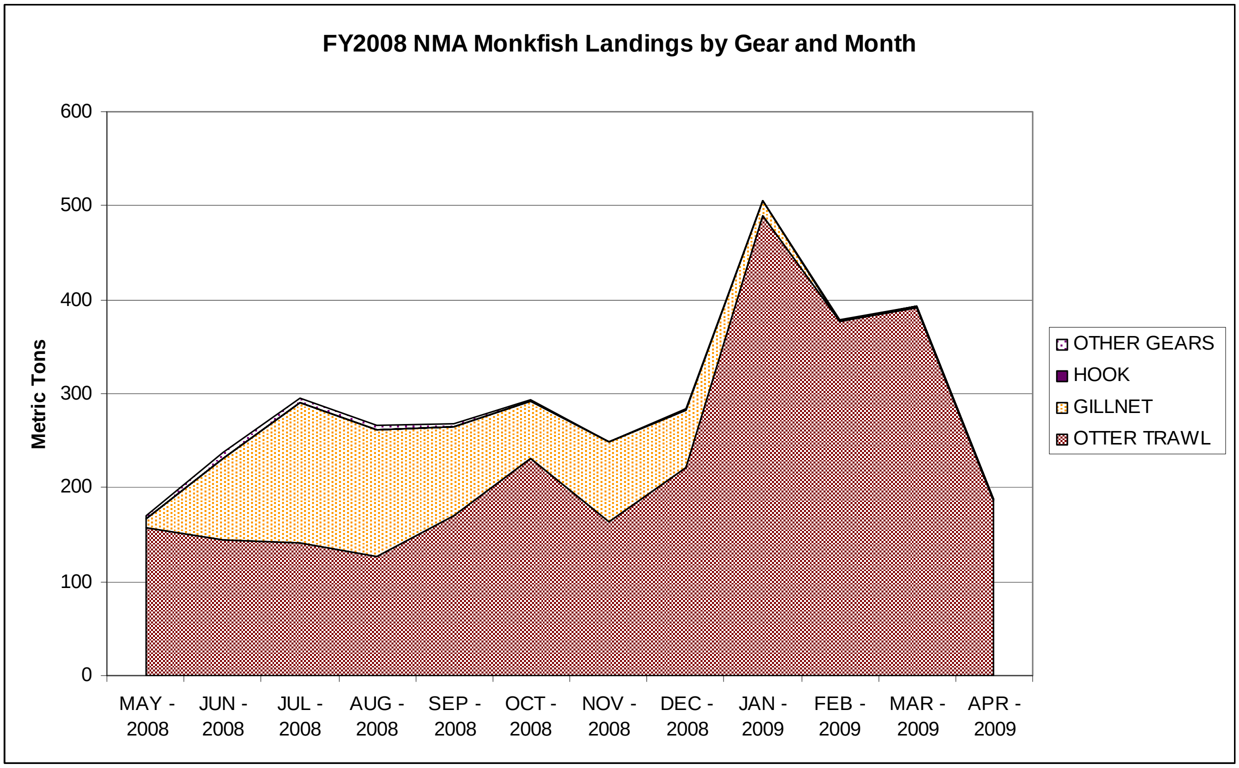
Fishing Year (May 1 - April 30)	Landings* (1,000 lbs. landed wt.)	Revenues* ($1,000)	Revenue ($) per landed wt. (lb)
1995	18,415.6	$24,758.8	1.3
1996	20,732.6	$26,188.5	1.3
1997	21,774.3	$30,127.0	1.4
1998	24,156.0	$34,682.0	1.4
1999	26,077.2	$48,713.7	1.9
2000	23,422.8	$46,122.9	2.0
2001	30,519.6	$42,353.5	1.4
2002	25,312.0	$35,256.4	1.4
2003	29,341.7	$37,504.3	1.3
2004	17,843.1	$30,142.3	1.7
2005	22,242.9	$41,688.6	1.9
2006	14,299.2	$27,790.3	1.9
2007	13,832.1	$28,530.9	2.1
2008	11,498.1	$22,854.7	2.0

** May include data from CT vessels without a 2001-2006 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 26 Fishing year landings (in landed weights) and revenues, and revenue per landed wt., 1995 – 2008

(a)



(b)

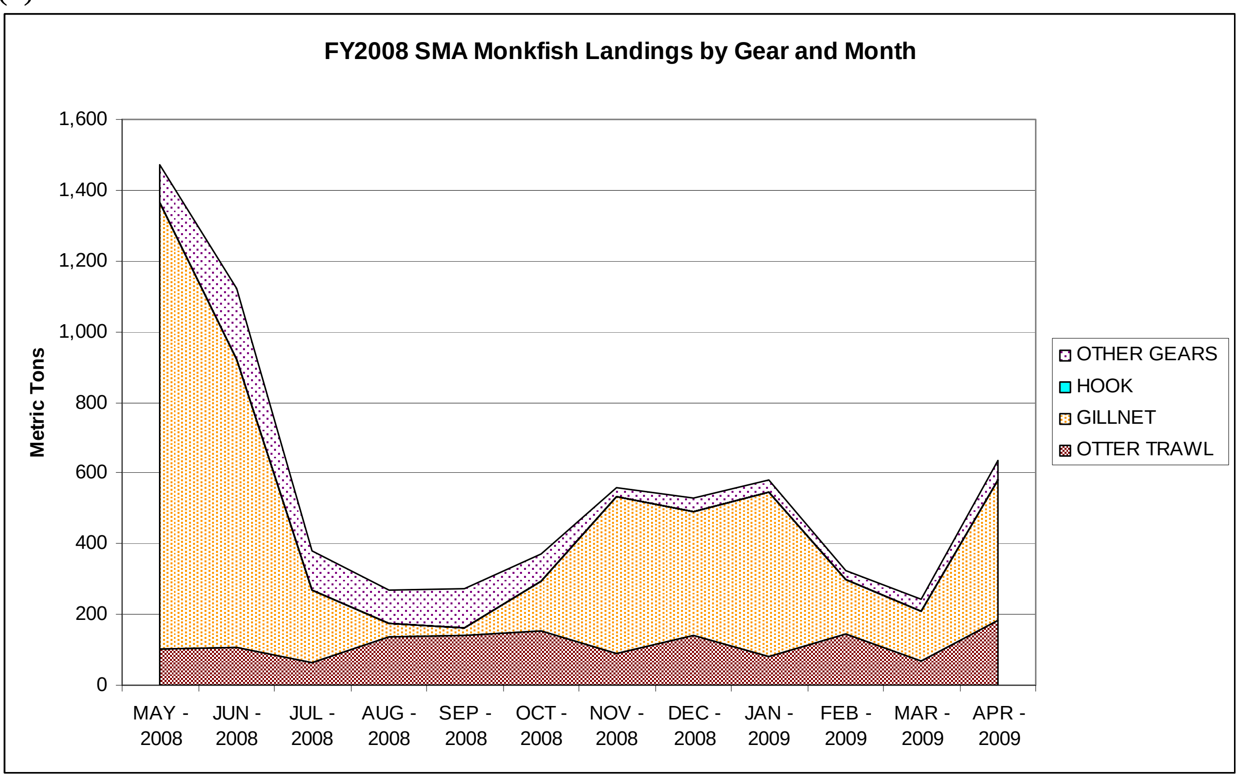
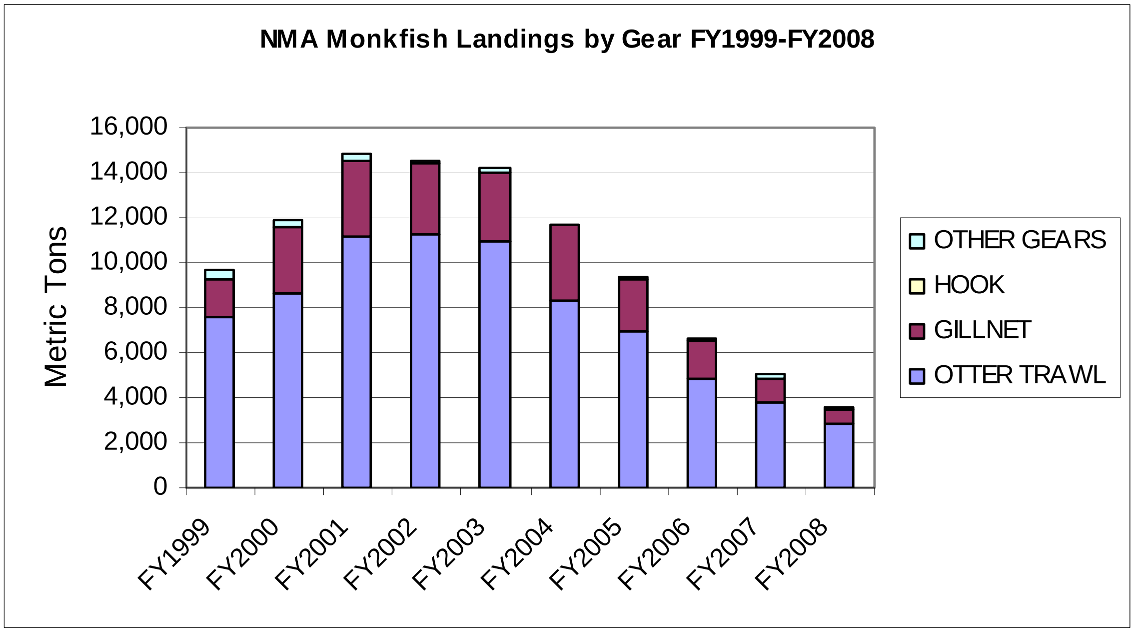


Figure 21 FY2008 NMA (a) and SMA (b) monkfish landings by gear and month

(a)



(b)

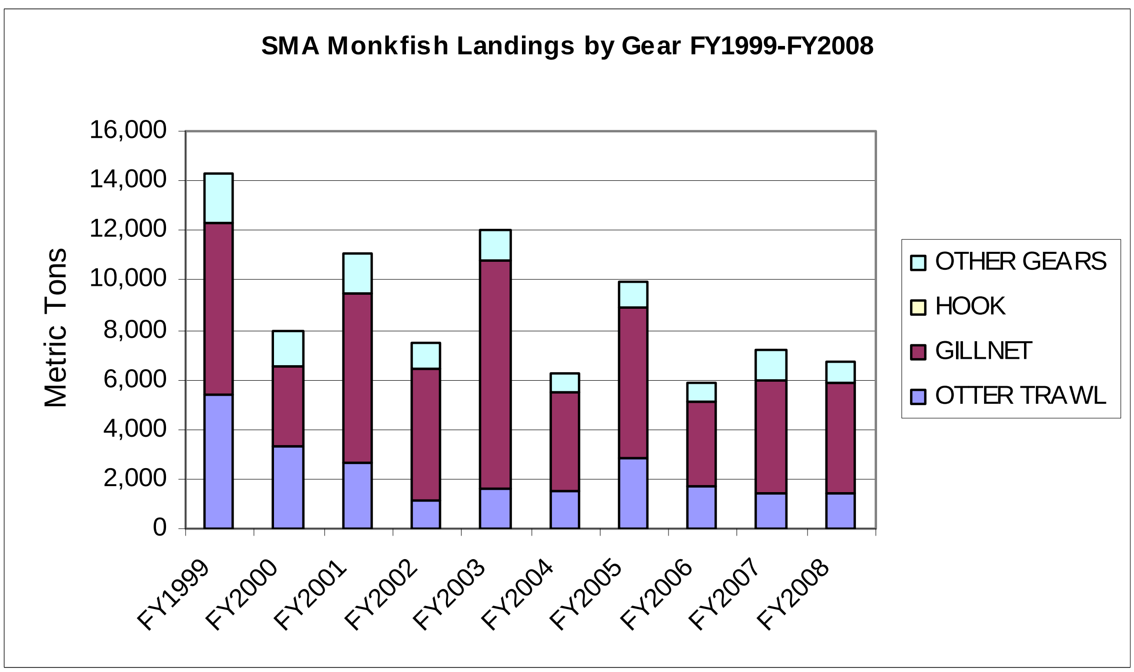


Figure 22 NMA (a) and SMA (b) monkfish landings by gear, FY1999 – 2008

While Massachusetts continues to account for the greatest proportion of all monkfish landings, all states have seen a decline in monkfish landings (Table 27). The state with the largest decline has been Maine, which used to be among the top two or three, and was in 2008 7th out of 10, leading only Maryland, North Carolina, and New Hampshire. New Hampshire has also shown a marked decline after rising in importance through the early years of the FMP. Landings in Maine and New Hampshire are entirely from the northern stock component, and the recent decline in those states' landings is reflective of the overall decline in landings from the northern stock component.

Table 28 and Table 29, below, show monkfish landings and revenues as a percentage of total landings and revenues by permit categories for FY1995 – 2008. For years prior to 2001, data is based on vessels that held a monkfish permit in 2001. For later years, the data is based on vessels that held a permit in those years. Data for Connecticut is shown separately because there may have been landings by vessels that did not have a Federal permit in 2001 – 2004 due to the way that state's landings are reported to NMFS.

Category A and B vessels continue to show a proportionally higher dependence on monkfish than Category C and D vessels, which also hold limited access permits in either scallops or multispecies. Category C vessels, of which 48% also hold scallop limited access permits have seen their dependence on monkfish revenues decline steadily as revenues from scallops have increased, and in FY2008 obtained only 3.7% of their total revenues from monkfish compared to approximately 13% prior to the implementation of the FMP and the rebound in the scallop resource.

When viewed by vessel length category (Table 30 and Table 31), a decreased reliance on monkfish is evident for all size classes since peaking in 1999-2000, especially in most recent years.

When viewed in aggregate, vessels that hold a monkfish permit are not significantly reliant on monkfish, as monkfish has accounted for less than 10% of total revenues during FY1995-2003, Table 32 and Table 33, and approximately 4% in FY2006-2008. While prior to FY2004 the proportion of monkfish remained relatively constant (4-5% of landings, 7-11% of revenues), it has declined in recent years. The proportion of most other species remained relatively constant, although the proportion of scallop landings and revenues has increased substantially, reflecting improvements in the scallop fishery in recent years.

STATE	Thousands of Pounds of Monkfish													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
CT*	1,029	733	592	574	557	603	787	455	585	373	420	294	315	301
MA	10,023	8,955	9,893	11,353	11,167	10,643	12,298	10,684	12,059	8,346	10,794	7,141	5,973	4,754
MD	178	524	382	322	341	107	158	38	119	48	140	106	158	132
ME	1,815	1,932	2,102	1,986	3,193	3,993	5,012	4,971	3,716	2,902	2,091	977	525	290
NC	0	431	445	395	432	166	167	112	187	48	10	2	1	0
NH	329	401	523	452	801	1,477	1,928	1,233	909	1,087	790	397	199	149
NJ	1,414	2,321	2,680	3,903	4,371	2,825	5,261	3,886	5,349	2,195	3,245	2,521	3,021	2,661
NY	248	513	654	775	573	435	707	694	1,044	538	1,065	575	1,008	823
RI	2,829	4,080	3,732	3,597	3,969	2,720	3,519	2,808	4,617	1,928	2,901	1,824	2,073	1,864
VA	550	841	773	799	671	455	683	431	758	379	786	462	558	524
TOTAL	**18,416**	**20,733**	**21,774**	**24,156**	**26,077**	**23,423**	**30,520**	**25,312**	**29,342**	**17,843**	**22,243**	**14,299**	**13,832**	**11,498**

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

** May include data from CT vessels without a 2001-2006 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 27 Monkfish landings by state (landed weight), FY1995-2008

Monkfish Permit Category	1,000 pounds, landed weight													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
A	453	817	563	1,093	1,277	845	1,152	1,072	1,375	727	1,117	596	932	992
% of Total A Landings	49.1%	54.1%	13.4%	10.0%	20.5%	6.5%	6.8%	4.6%	4.9%	14.1%	14.3%	9.2%	8.2%	8.6%
B	322	583	479	992	1,474	1,050	2,084	1,594	1,932	916	1,839	1,171	1,617	1,549
% of Total B Landings	14.0%	18.2%	23.4%	24.1%	36.9%	30.2%	46.4%	40.1%	48.9%	28.9%	42.7%	37.3%	44.6%	47.6%
C	11,504	12,322	12,364	12,144	11,876	10,583	12,708	10,359	11,021	6,700	8,486	5,445	4,798	3,702
% of Total C Landings	10.4%	9.3%	7.5%	8.2%	8.5%	6.9%	6.4%	7.9%	8.5%	5.3%	8.4%	6.1%	5.2%	3.8%
D	4,094	5,020	6,139	7,509	8,982	8,905	11,974	10,388	12,941	8,021	9,060	5,685	5,165	4,422
% of Total D Landings	4.6%	5.3%	5.8%	6.7%	11.1%	9.7%	11.7%	9.9%	12.9%	8.0%	10.7%	8.3%	7.2%	5.9%
H											207	197	183	204
% of Total H Landings											29.5%	28.1%	32.3%	32.5%
E (Open Access)	1,014	1,257	1,637	1,845	1,911	1,459	1,816	1,452	1,489	1,106	1,114	912	875	569
% of Total E Landings	0.5%	0.6%	0.5%	0.6%	0.8%	0.6%	0.7%	0.6%	0.4%	0.3%	0.3%	0.3%	0.3%	0.2%
CT	1,029	733	592	574	557	580	787	448	583	373	420	294	263	61
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	4.5%	2.9%	3.8%	2.4%	3.2%	2.8%	3.1%	2.3%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	30,520	25,312	29,342	17,843	22,243	14,299	13,832	11,498

Source: NMFS Statistics Office, dealer weighout database

** May include data from CT vessels without a 2001-2006 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 28 Monkfish landings as a percent of total landings by permit category, 1995-2008.

Monkfish Permit Category	$1,000, nominal (not discounted)													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
A	$582	$849	$663	$1,262	$2,011	$1,428	$1,615	$1,439	$1,432	$900	$1,819	$953	$1,296	$1,405
% of Total A Revenues	36.9%	41.4%	35.7%	51.2%	63.5%	46.6%	50.6%	42.5%	35.8%	38.2%	47.9%	29.8%	35.4%	33.2%
B	$391	$583	$552	$1,183	$2,528	$1,699	$2,828	$2,099	$1,998	$1,094	$2,861	$1,722	$2,261	$2,075
% of Total B Revenues	24.6%	33.5%	38.7%	49.6%	62.2%	48.1%	60.3%	53.3%	54.2%	31.4%	50.6%	41.5%	46.1%	51.6%
C	$16,014	$16,423	$18,091	$18,501	$23,250	$22,380	$17,503	$14,713	$15,582	$12,742	$16,799	$11,541	$11,987	$8,745
% of Total C Revenues	13.0%	12.0%	13.3%	14.0%	13.5%	11.5%	9.2%	7.4%	7.1%	5.0%	6.0%	4.6%	4.7%	3.7%
D	$4,736	$5,649	$7,514	$10,076	$16,043	$16,620	$16,836	$14,434	$15,721	$13,016	$16,995	$10,985	$10,082	$8,705
% of Total D Revenues	8.2%	9.3%	11.2%	14.9%	20.4%	19.9%	20.2%	17.3%	18.4%	14.4%	17.4%	12.3%	11.7%	9.9%
H											$302	$291	$217	$224
% of Total H Revenues											40.6%	49.9%	49.0%	49.3%
E (Open Access)	$1,263	$1,452	$2,270	$2,642	$3,471	$2,848	$2,504	$1,970	$2,000	$1,842	$2,315	$1,966	$2,262	$1,540
% of Total E Revenues	1.1%	1.2%	1.7%	2.1%	2.4%	1.9%	1.6%	1.2%	1.0%	0.7%	0.7%	0.7%	0.7%	0.5%
CT	$1,772	$1,233	$1,036	$1,018	$1,410	$1,148	$1,067	$603	$772	$548	$597	$333	$426	$163
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	3.5%	2.2%	2.5%	1.7%	1.6%	0.9%	1.1%	4.0%
TOTAL MONK REVENUE	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$42,354	$35,256	$37,504	$30,142	$41,689	$27,790	$28,531	$22,856

Source: NMFS Statistics Office, dealer weighout database

** May include data from CT vessels without a 2001-2006 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 29 Monkfish revenues as a percent of total revenues by permit category, 1995-2008.

Vessel Length Category	1,000 pounds, landed weight													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
0-29 Feet	70	61	21	20	50	62	73	54	55	42	26	1	1	4
% of Total 0-29 Landings	11.7%	10.5%	3.1%	2.5%	6.9%	7.1%	6.8%	6.5%	8.5%	4.9%	2.0%	0.1%	0.3%	1.0%
30-49 Feet	5,303	6,317	6,415	8,458	10,537	9,291	13,067	11,384	14,782	8,987	11,345	7,146	7,958	6,942
% of Total 30-49 Landings	8.7%	10.3%	10.7%	13.3%	18.5%	17.0%	24.0%	23.7%	28.3%	17.9%	22.9%	14.8%	15.2%	12.3%
50-69 Feet	2,675	3,771	3,398	4,057	4,550	4,983	7,056	5,919	6,364	3,249	4,073	2,240	2,063	1,685
% of Total 50-69 Landings	3.5%	4.7%	3.2%	4.7%	5.5%	5.9%	8.7%	7.6%	8.4%	4.6%	6.7%	3.9%	3.6%	2.8%
70-89 Feet	7,228	8,208	9,629	9,217	8,904	7,469	8,250	6,846	6,754	4,582	5,780	4,214	3,051	2,438
% of Total 70-89 Landings	4.0%	4.4%	3.6%	3.8%	4.0%	3.4%	3.5%	3.1%	2.9%	1.9%	3.0%	2.4%	1.7%	1.4%
90+ Feet	2,109	1,643	1,718	1,830	1,480	1,038	1,285	661	805	610	600	405	496	368
% of Total 90+ Landings	2.1%	1.3%	1.2%	1.1%	1.2%	0.7%	0.6%	0.4%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%
CT	1,029	733	592	574	557	580	787	448	583	373	420	294	263	61
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	4.5%	2.9%	3.8%	2.4%	3.2%	2.8%	3.1%	2.3%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	30,520	25,312	29,342	17,843	22,243	14,299	13,832	11,498

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001-2008 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 30 Monkfish landings as a percent of total landings by vessel length category, 1995 - 2008

Vessel Length Category	$1,000, nominal (not discounted)													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
0-29 Feet	$72	$60	$34	$25	$99	$98	$98	$66	$61	$57	$42	$2	$3	$11
% of Total 0-29 Revenues	8.3%	8.3%	3.3%	2.4%	8.9%	9.4%	8.4%	6.3%	6.4%	5.3%	3.2%	0.1%	0.2%	1.1%
30-49 Feet	$5,657	$6,474	$7,049	$9,933	$16,887	$16,199	$18,410	$15,353	$15,822	$11,744	$18,739	$11,414	$11,902	$10,640
% of Total 30-49 Revenues	13.1%	15.1%	15.4%	20.2%	29.3%	29.3%	31.0%	27.9%	28.1%	20.4%	20.9%	14.0%	14.1%	12.1%
50-69 Feet	$3,524	$4,530	$4,488	$5,718	$8,669	$9,963	$9,931	$8,460	$8,583	$6,307	$8,285	$5,086	$5,377	$3,994
% of Total 50-69 Revenues	7.2%	8.4%	7.7%	10.3%	13.0%	13.6%	13.5%	11.3%	11.0%	7.5%	8.2%	5.5%	5.9%	4.4%
70-89 Feet	$10,548	$11,509	$14,712	$14,957	$18,420	$16,034	$11,161	$9,894	$11,040	$10,142	$12,783	$9,926	$9,323	$7,021
% of Total 70-89 Revenues	7.1%	7.2%	8.6%	8.8%	8.7%	6.8%	4.8%	4.0%	3.9%	2.9%	3.3%	2.7%	2.5%	2.1%
90+ Feet	$3,186	$2,383	$2,808	$3,031	$3,228	$2,682	$1,687	$880	$1,227	$1,344	$1,243	$1,028	$1,501	$1,025
% of Total 90+ Revenues	5.6%	3.8%	4.7%	5.4%	4.9%	3.8%	2.3%	1.2%	1.4%	1.2%	1.0%	1.0%	1.4%	0.9%
CT	$1,772	$1,233	$1,036	$1,018	$1,410	$1,148	$1,067	$603	$772	$548	$597	$333	$426	$163
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	3.5%	2.2%	2.5%	1.7%	1.6%	0.9%	1.1%	4.0%
TOTAL MONK REVENUE	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$42,354	$35,256	$37,504	$30,142	$41,689	$27,790	$28,531	$22,855

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001-2008 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 31 Monkfish revenues as a percent of total revenues by vessel length category, 1995 – 2008

Species Category	1,000 pounds, landed weight													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Dogfish	33,914	32,392	23,902	34,127	22,942	6,742	4,129	3,632	2,285	1,577	2,203	4,346	2,888	4,016
Dogfish % of Total Landings	7.8%	6.8%	4.0%	5.9%	4.6%	1.3%	0.7%	0.7%	0.4%	0.3%	0.4%	0.9%	0.6%	0.8%
Fluke	7,829	7,941	7,732	9,396	9,478	8,670	11,375	12,092	13,992	16,000	10,218	9,919	5,246	5,349
Fluke % of Total Landings	1.8%	1.7%	1.3%	1.6%	1.9%	1.7%	1.9%	2.3%	2.2%	2.6%	1.7%	2.0%	1.0%	1.0%
Monkfish	18,416	20,733	21,774	24,156	26,077	23,423	30,520	25,312	29,342	17,843	22,243	14,370	13,832	11,498
Monkfish % of Total Landings	4.2%	4.3%	3.7%	4.2%	5.2%	4.5%	5.0%	4.8%	4.6%	2.9%	3.8%	2.9%	2.7%	2.2%
Multispecies	47,365	53,830	62,951	67,977	68,654	88,081	102,517	83,362	81,268	75,713	63,124	48,026	58,864	65,403
Multispecies % of Total Landings	10.8%	11.3%	10.6%	11.7%	13.6%	16.8%	17.0%	16.0%	12.6%	12.4%	10.7%	9.7%	11.7%	12.2%
Scallops	14,535	15,852	11,834	12,565	23,332	35,380	47,297	50,541	58,583	60,688	53,108	59,065	58,688	51,258
Scallops % of Total Landings	3.3%	3.3%	2.0%	2.2%	4.6%	6.8%	7.8%	9.7%	9.1%	9.9%	9.0%	11.9%	11.6%	9.6%
Skates	9,134	17,503	16,740	18,756	18,061	17,643	17,987	16,849	20,890	15,163	15,378	15,977	20,946	19,954
Skates % of Total Landings	2.1%	3.7%	2.8%	3.2%	3.6%	3.4%	3.0%	3.2%	3.2%	2.5%	2.6%	3.2%	4.2%	3.7%
Other	306,209	329,535	448,958	412,327	334,735	343,322	390,973	330,310	436,943	424,469	421,911	343,949	343,499	377,035
Other % of Total Landings	70.0%	69.0%	75.6%	71.2%	66.5%	65.6%	64.6%	63.3%	67.9%	69.4%	71.7%	69.4%	68.2%	70.5%
TOTAL LBS. LANDED	437,402	477,786	593,890	579,303	503,280	523,261	604,797	522,098	643,303	611,452	588,184	495,652	503,963	534,514

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001-2008 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 32 FY1995-2008 Landings of monkfish and other species as a percent of total landings, on vessels with a monkfish permit in 2001 – 2008.

Species Category	$1,000, nominal (not discounted)													
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Dogfish	$6,610	$6,003	$3,555	$5,876	$4,072	$1,798	$1,110	$870	$537	$444	$565	$1,121	$682	$1,225
Dogfish % of Total Revenues	1.9%	1.6%	1.0%	1.6%	0.9%	0.4%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%
Fluke	$13,961	$13,243	$14,061	$14,418	$16,148	$13,663	$14,303	$16,649	$20,898	$23,387	$18,658	$20,822	$13,316	$11,577
Fluke % of Total Revenues	4.1%	3.6%	3.8%	3.9%	3.7%	2.9%	3.1%	3.5%	3.9%	3.7%	2.5%	3.1%	1.9%	1.8%
Monkfish	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$42,354	$35,256	$37,504	$30,142	$41,689	$27,442	$28,531	$22,855
Monkfish % of Total Revenues	7.3%	7.1%	8.2%	9.5%	11.0%	9.9%	9.0%	7.3%	6.9%	4.7%	5.6%	4.1%	4.1%	3.6%
Multispecies	$57,323	$60,825	$71,309	$82,758	$83,994	$93,590	$102,072	$98,877	$88,851	$79,971	$81,588	$73,506	$81,222	$80,878
Multispecies % of Total Revenues	16.8%	16.5%	19.3%	22.6%	19.0%	20.0%	21.8%	20.5%	16.4%	12.6%	11.0%	10.9%	11.6%	12.9%
Scallops	$75,624	$92,763	$76,005	$72,999	$122,812	$169,407	$171,466	$201,193	$244,876	$335,213	$414,629	$373,586	$387,355	$349,164
Scallops % of Total Revenues	22.2%	25.2%	20.6%	19.9%	27.8%	36.3%	36.6%	41.8%	45.1%	52.7%	56.1%	55.6%	55.5%	55.7%
Skates	$2,708	$5,440	$3,071	$3,471	$3,234	$3,598	$3,105	$3,489	$4,518	$3,241	$4,313	$5,414	$6,475	$5,380
Skates % of Total Revenues	0.8%	1.5%	0.8%	0.9%	0.7%	0.8%	0.7%	0.7%	0.8%	0.5%	0.6%	0.8%	0.9%	0.9%
Other	$159,711	$163,907	$171,432	$152,363	$162,812	$138,606	$133,675	$125,062	$145,211	$163,784	$177,253	$170,210	$180,063	$155,783
Other % of Total Revenues	46.9%	44.5%	46.4%	41.6%	36.9%	29.7%	28.6%	26.0%	26.8%	25.7%	24.0%	25.3%	25.8%	24.9%
TOTAL REVENUE	$340,696	$368,369	$369,559	$366,568	$441,785	$466,785	$468,085	$481,396	$542,395	$636,182	$738,695	$672,101	$697,643	$626,861

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001-2008 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 33 FY1995-2008 Revenues of monkfish and other species as a percent of total landings, on vessels with a monkfish permit in 2001-2008.

4.5.1.3 Days-at-sea (DAS)

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. Beginning in FY2005 seven vessels qualified for a permit Category H fishery under the provisions adopted in Amendment 2, for vessels fishing exclusively in the southernmost area of the fishery.

In the NMA, until this year under Framework 4 which took effect in FY2007, vessels were not required to use a monkfish DAS, as there was no monkfish trip limit when a limited access vessel is on a multispecies DAS. Therefore, DAS usage was been well below the total DAS allocated, and primarily reflected monkfish fishing activity in the SMA. Starting in FY2007, vessels in both areas were required to use a monkfish DAS when exceeding the applicable incidental limit. The effect of this requirement shows the total DAS used increased from FY2006. DAS used by permit category since the inception of the plan is shown in Figure 23.

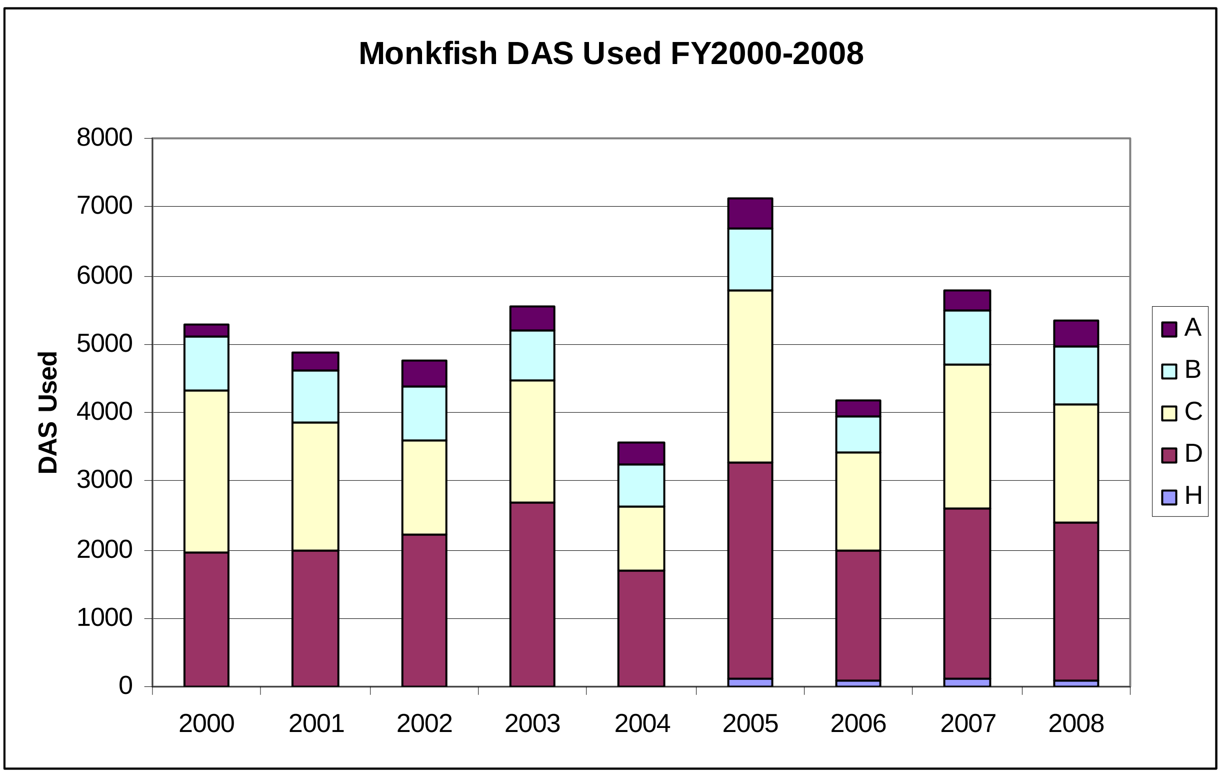


Figure 23 DAS used by permit category, FY2000 – 2008.

As shown in Table 34, only about one-third of the limited access vessels used at least one monkfish DAS in FY2007 and FY2008, and the total DAS used was only about one-quarter of the total allocated. This represents a substantial amount of latent effort in the fishery, however, even among active vessels (those that used at least one monkfish DAS), not all allocated DAS are used. Only about 64% of allocated DAS were used by active vessels. Part of this latent effort can be explained by the fact that nearly one-half of the permit category C vessels, 153 vessels, are limited access scallop vessels who choose not to use a scallop DAS to target monkfish under the monkfish DAS usage requirements because of the greater profitability of using scallop DAS to target scallops (Table 35).

A second part of the unused DAS, even among active vessels, appears to result of the low monkfish DAS usage rate by vessels fishing in the NMA. For active vessels, that is, those that used at least one DAS, in FY2008, the usage rate is distinctly different between the two management areas. Of the 125 active vessels in the NMA most were not constrained by the allocation of 31 DAS, plus 4 DAS carryover, and the median number of DAS used in the NMA was 6 DAS (Figure 24). In contrast, among the 214 active vessels in the SMA the median number of DAS used was 22 of their 27 available DAS, (23 plus 4 carryover) (Figure 25). All vessels in the SMA had 4 carryover DAS, regardless of DAS usage in the prior year, since their full allocation was 31 DAS, with a restriction that only 23 could be used in the SMA.

FY2007 (May 2007 - April 2008)

Permit Category	All Vessels				Active Vessels*			
	Total Number of Permits	DAS Allocated	DAS Used	% Used	Number of Active Vessels	DAS Allocated	DAS Used	% Used
A	15	455	284	62%	12	364	284	78%
B	41	1,242	771	62%	30	909	771	85%
C	339	10,272	2,125	21%	102	3,091	2,125	69%
D	366	11,090	2,485	22%	137	4,151	2,485	60%
H	7	212	103	49%	6	182	103	57%
TOTAL	**768**	**23,270**	**5,768**	**25%**	**287**	**8,696**	**5,768**	**66%**

Source: NMFS Days-at-Sea (DAS) database.

** Active = vessels that used at least 1 Monk Fish DAS*

FY2008 (May 2008 - April 2009)

Permit Category	All Vessels				Active Vessels*			
	Total Number of Permits	DAS Allocated	DAS Used	% Used	Number of Active Vessels	DAS Allocated	DAS Used	% Used
A	18	545	378	69%	15	455	378	83%
B	41	1,242	859	69%	36	1,091	859	79%
C	341	10,332	1,703	16%	94	2,848	1,703	60%
D	351	10,635	2,298	22%	124	3,757	2,298	61%
H	7	212	102	48%	7	212	102	48%
TOTAL	**758**	**22,966**	**5,340**	**23%**	**276**	**8,363**	**5,340**	**64%**

Source: NMFS Allocation Management System (AMS) database.

** Active = vessels that used at least 1 Monk Fish DAS*

Table 34 Monkfish DAS usage, FY2007 & FY 2008

FY2007

Permit Category	Area	Number of Active Vessels	Monkfish	Monkfish/ Multispecies	Monkfish/ Scallop	DAS Used	Average DAS Usage
A	NMA	7	55	0	0	55	7.9
B	NMA	14	39	0	0	39	2.8
C	NMA	52	0	981	0	981	18.9
D	NMA	78	0	744	0	744	9.5
Total		**151**	**94**	**1,725**	**0**	**1,819**	**12.0**
A	SMA	12	230	0	0	230	19.2
B	SMA	30	732	0	0	732	24.4
C	SMA	65	0	1,143	0	1,143	17.6
D	SMA	95	0	1,741	0	1,741	18.3
H	SMA	6	0	103	0	103	17.2
Total		**208**	**962**	**2,987**	**0**	**3,949**	**19.0**

Source: NMFS Days-at-Sea (DAS) database.

** Active = vessels that used at least 1 Monk Fish DAS*

FY2008

Permit Category	Area	Number of Active Vessels	Monkfish	Monkfish/ Multispecies	Monkfish/ Scallop	DAS Used	Average DAS Usage
A	NMA	6	15	0	0	15	2.5
B	NMA	18	32	0	0	32	1.8
C	NMA	47	0	741	0	741	15.8
D	NMA	53	0	520	0	520	9.8
Total		**124**	**47**	**1,261**	**0**	**1,308**	**10.5**
A	SMA	15	363	0	0	363	24.2
B	SMA	36	827	0	0	827	23.0
C	SMA	60	0	961	0	961	16.0
D	SMA	95	0	1,778	0	1,778	18.7
H	SMA	7	0	102	0	102	14.6
Total		**213**	**1,190**	**2,841**	**0**	**4,031**	**18.9**

Source: NMFS Days-at-Sea (DAS) database.

** Active = vessels that used at least 1 Monk Fish DAS*

Table 35 Monkfish-only, Monkfish/Multispecies and Monkfish/Scallop DAS Usage by active vessels by area, FY2007 and FY2008.

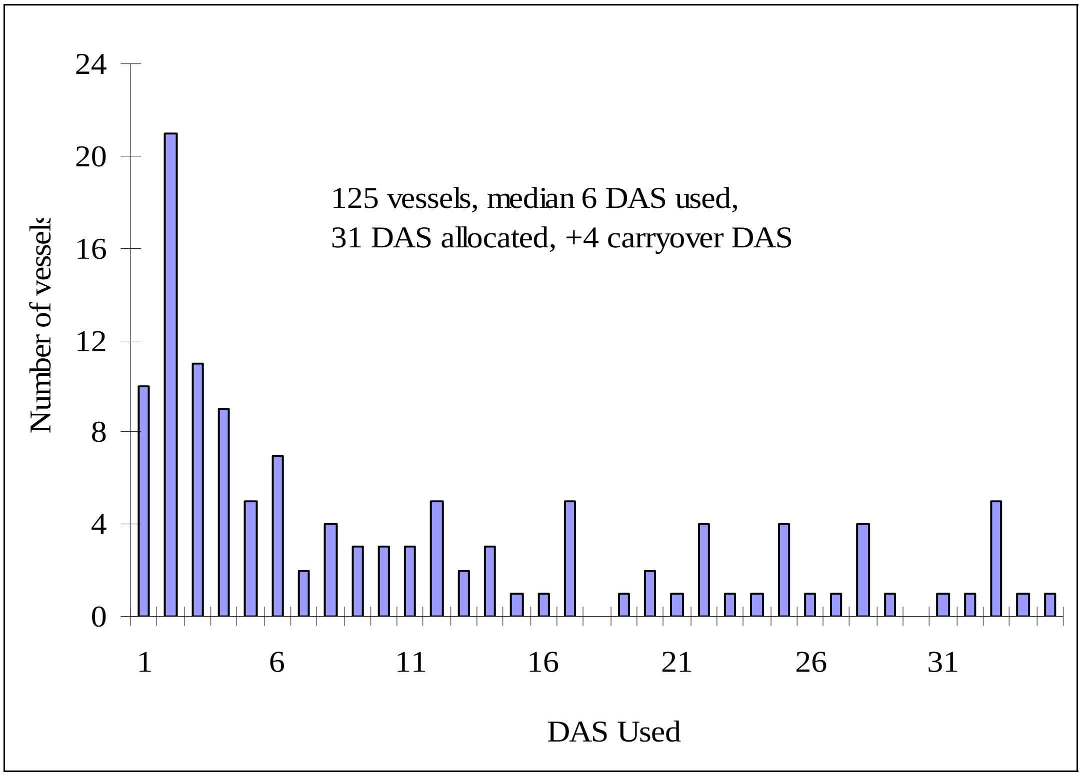


Figure 24 2008 NMA monkfish DAS usage frequency distribution.

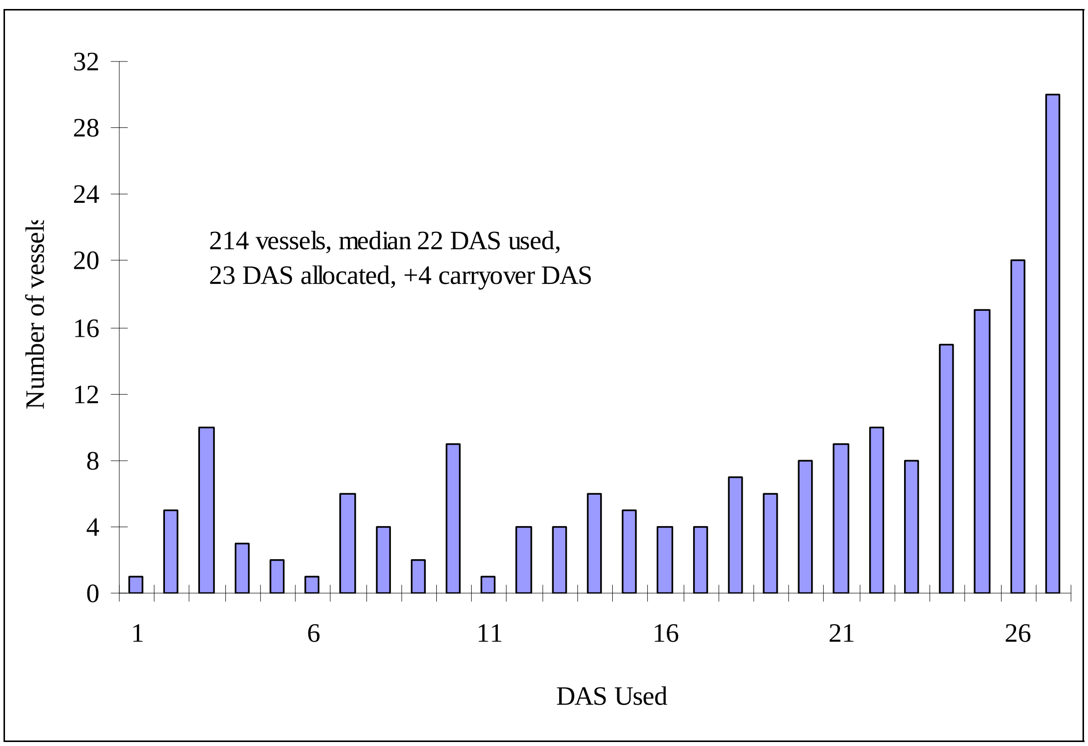


Figure 25 2008 SMA monkfish DAS usage frequency distribution.

4.5.2 Ports and communities

This section updates information contained in the FSEIS for Amendment 2, as well as in the SAFE Report for the 2006 fishing year prepared in conjunction with Framework 5. The Monkfish FMP references Amendments 5 and 7 to the Northeast Multispecies FMP and Amendment 4 to the Sea Scallop FMP for social and cultural information about monkfish ports, including port profiles. Because of the nature of the monkfish fishery, there is significant overlap between the vessels and communities involved with the monkfish fishery and those involved with the multispecies (groundfish) and scallop fisheries. Many of the same boats that target monkfish or catch them incidentally also target groundfish or scallops. Only about six percent of the limited access monkfish permit holders do not also hold limited access permits in either the multispecies or scallop fisheries.

For the purposes of this SAFE Report, "primary monkfish ports" are defined as those averaging more than $1,000,000 in monkfish revenues from 1994-1997 (based on the dealer weighout data presented in Table 45 of the Monkfish FMP). "Secondary monkfish ports" are defined as those averaging more than $50,000 in monkfish revenues from 1994-1997 (based on the dealer weighout data presented in the Monkfish FMP.

Primary monkfish ports include:

- Portland, ME
- Boston, MA
- Gloucester, MA
- New Bedford, MA
- Long Beach/Barnegat Light, NJ, and
- Point Judith, RI.

Secondary monkfish ports include:

- Rockland, ME
- Port Clyde, ME
- South Bristol, ME
- Ocean City, MD
- Chatham, MA
- Provincetown, MA
- Scituate, MA
- Plymouth, MA
- Westport, MA
- Portsmouth, NH
- Point Pleasant, NJ
- Cape May, NJ
- Greenport, NY
- Montauk, NY
- Hampton Bay, NY
- Newport, RI

- Hampton, VA, and
- Newport News, VA.

Table 36 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 - 2008. Table 37 shows monkfish 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 NMA, while the proportion of NMA landings in New Bedford has declined from about 50% in previous years to 38% in 2007 and 29% in 2008. Nearly all of Pt. Judith’s landings are from the SMA. Portland and Boston’s landings are almost entirely from otter trawls, while otter trawls make up about 62% of New Bedford landings. Gloucester and Pt. Judith landings are evenly split between trawls and gillnets. New Hampshire, New York and New Jersey landings are predominately (>75%) caught by gillnet gear. This is similar to the distribution by gear for each port in previous fishing years, as reported in earlier SAFE reports, except that in FY2003 New Bedford monkfish landings by scallop dredge (included in “other gear” in the table) were 18% of the port’s monkfish landings, while in FY2004 those declined to 12% and in FY2005 to 9%, before returning to 2003 levels in FY2006 and increasing to 29% in 2007. The proportion of landings by dredges in New Bedford declined slightly in 2008 to 22%.

Port landings and revenue data based on May-April fishing year is presented in Table 38 and Table 39, for primary and secondary ports (as identified in the original FMP), respectively, for FY1995-FY2008. Data is based on the vessel’s homeport and, for FY2008, on the vessel’s principal port of landing as indicated on the permit application. Vessels homeported in New Bedford recorded the highest monkfish landings and revenues from 1995-1999, although their share has declined in recent years. In FY2007 and FY2008, the port of Long Beach/Barnegat Light, NJ, emerged as the homeport with the highest landings. Portland, which averaged nearly 1.8 million pounds from 1995-2003 has declined steadily, and in 2008 landed only 0.25 million pounds.

There has been an overall decline in landings and revenues from the peak during the FY1999-FY2001 period that is reflected in the port data. In nearly all cases, the revenues from monkfish as a percentage of total revenues by port also declined, the exceptions being Chatham, MA and Hampton Bays, NY (Table 40). While some of these effects could be due to increases in revenues from other fisheries (such as scallops in New Bedford), in most cases it can be attributable to declines in monkfish landings.

HOMEPORT		FY 2000 by Category						FY 2001 by Category						FY 2002 by Category						FY 2003 by Category						FY 2004 by Category					
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL
PRIMARY PORTS		4	16	196	153	351	720	4	16	200	161	366	747	4	17	194	158	403	776	5	17	203	160	396	781	4	15	206	161	398	784
Portland	ME	X	X	11	16	18	46	X	X	11	10	21	43	X	X	10	14	20	45	X	X	12	17	27	57	X	X	15	19	24	58
Boston	MA	X	X	46	47	137	233	X	X	42	49	128	222	X	X	43	43	126	215	X	X	39	40	116	198	X	X	39	29	100	169
Gloucester	MA	X	X	18	34	104	156	X	X	19	35	110	164	X	X	18	33	138	189	X	X	20	34	129	183	X	X	21	38	133	192
New Bedford	MA	X	X	93	30	41	165	X	X	100	34	53	187	X	X	94	35	68	197	X	X	102	33	68	203	X	X	102	44	77	223
Barnegate Light	NJ	X	13	9	12	17	52	X	13	10	17	19	61	X	14	11	17	15	59	X	14	10	20	19	65	X	15	11	17	23	68
Point Judith	RI	X	X	19	14	34	68	X	X	18	16	35	70	X	X	18	16	36	71	X	X	20	16	37	75	X	X	18	14	41	74
SECONDARY PORTS		X	6	56	73	335	470	3	8	57	73	362	503	3	8	59	74	388	532	5	10	61	77	396	549	4	11	64	82	451	612
Rockland	ME	X	X	X	X	5	7	X	X	X	X	8	10	X	X	X	X	4	5	X	X	X	X	3	4	X	X	X	X	6	7
Port Clyde	ME	X	X	3	3	6	12	X	X	5	3	5	13	X	X	5	3	5	13	X	X	5	4	5	14	X	X	5	5	5	15
South Bristol	ME	X	X	X	3	6	11	X	X	X	3	5	10	X	X	X	3	4	9	X	X	X	4	3	9	X	X	X	5	6	13
Ocean City	MD	X	X	X	X	13	13	X	X	X	X	14	14	X	X	X	X	14	14	X	X	X	X	16	16	X	X	X	X	18	18
Chatham	MA	X	X	X	11	47	58	X	X	X	12	46	58	X	X	X	12	69	81	X	X	X	14	71	85	X	X	X	15	64	79
Provincetown	MA	X	X	X	5	11	16	X	X	X	6	12	18	X	X	X	5	13	18	X	X	X	3	14	17	X	X	X	3	20	23
Scituate	MA	X	X	3	7	27	37	X	X	X	7	26	34	X	X	X	7	30	38	X	X	X	6	31	38	X	X	X	7	32	39
Plymouth	MA	X	X	X	X	13	15	X	X	X	X	17	21	X	X	X	X	18	22	X	X	X	3	17	23	X	X	X	3	24	31
Westport	MA	X	X	X	6	14	21	X	X	X	6	18	25	X	X	X	5	18	24	X	X	X	5	19	25	X	X	X	4	19	23
Portsmouth	NH	X	X	4	14	17	35	X	X	3	12	19	34	X	X	3	10	23	36	X	X	3	10	19	32	X	X	3	12	32	47
Point Pleasant	NJ	X	3	X	3	27	35	X	4	X	X	30	39	X	3	X	5	32	42	X	4	X	4	33	44	X	4	X	4	37	47
Cape May	NJ	X	X	19	5	49	73	X	X	16	6	55	79	X	X	18	5	59	84	X	X	20	6	66	94	X	X	23	6	75	106
Greenport	NY	X	X	X	X	4	6	X	X	X	X	5	6	X	X	X	X	6	7	X	X	X	X	7	8	X	X	X	X	7	8
Montauk	NY	X	X	4	5	68	77	X	X	4	6	71	81	X	X	4	7	65	77	X	X	4	8	65	79	X	3	5	8	74	90
Hampton Bay	NY	X	X	X	X	5	8	X	X	X	X	4	7	X	X	X	X	5	8	X	X	X	X	7	9	X	X	X	X	6	7
Newport	RI	X	X	5	X	13	20	X	X	4	5	16	26	X	X	5	7	12	25	X	X	7	8	8	24	X	X	7	8	13	29
Hampton	VA	X	X	4	X	3	7	X	X	4	X	4	8	X	X	5	X	3	8	X	X	3	X	3	7	X	X	4	X	X	7
Newport News	VA	X	X	9	3	7	19	X	X	11	X	7	20	X	X	11	X	8	21	X	X	11	X	9	21	X	X	11	X	11	23
OTHER PORTS		8	10	89	122	1,177	1,406	9	15	78	103	1,253	1,458	8	15	75	103	1,346	1,547	6	13	76	104	1,317	1,516	5	15	73	112	1,392	1,597
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**	**16**	**40**	**340**	**341**	**2,109**	**2,846**	**13**	**41**	**343**	**355**	**2,241**	**2,993**

HOMEPORT		FY 2005 by Category							FY 2006 by Category							FY 2007 by Category							FY 2008 by Category						
		A	B	C	D	E	H	TOTAL	A	B	C	D	E	H	TOTAL	A	B	C	D	E	H	TOTAL	A	B	C	D	E	H	TOTAL
PRIMARY PORTS		5	16	202	164	404	X	791	7	16	207	173	381	X	784	6	17	215	180	397	X	815	7	16	224	169	389	X	805
Portland	ME	X	X	12	20	23	X	55	X	X	12	22	22	X	56	X	X	12	24	23	X	59	X	X	12	22	21	X	55
Boston	MA	X	X	36	29	81	X	147	X	X	32	29	65	X	127	X	X	32	26	61	X	119	X	X	34	23	55	X	112
Gloucester	MA	X	X	22	42	128	X	192	X	X	23	41	128	X	192	X	X	26	49	144	X	219	X	X	32	44	150	X	226
New Bedford	MA	X	X	102	43	101	X	248	X	X	110	46	90	X	249	X	X	114	47	87	X	249	X	X	116	49	88	X	255
Barnegate Light	NJ	X	15	12	14	28	X	71	3	15	11	17	27	X	73	3	17	11	15	27	X	73	3	16	12	13	23	X	67
Point Judith	RI	X	X	18	16	43	X	78	X	X	19	18	49	X	87	X	X	20	19	55	X	96	X	X	18	18	52	X	90
SECONDARY PORTS		X	14	66	81	484	X	647	X	10	61	76	514	X	663	X	13	58	85	503	X	662	3	10	56	82	478	X	631
Rockland	ME	X	X	X	X	5	X	6	X	X	X	X	6	X	7	X	X	X	X	3	X	4	X	X	X	X	3	X	4
Port Clyde	ME	X	X	6	4	4	X	14	X	X	4	4	3	X	11	X	X	X	3	3	X	8	X	X	X	3	3	X	8
South Bristol	ME	X	X	X	5	5	X	12	X	X	X	6	5	X	13	X	X	X	5	6	X	13	X	X	X	5	5	X	12
Ocean City	MD	X	X	X	X	19	X	19	X	X	X	X	26	X	26	X	X	X	X	25	X	25	X	X	X	X	21	X	21
Chatham	MA	X	X	X	15	60	X	77	X	X	X	15	58	X	73	X	X	X	18	56	X	74	X	X	X	19	58	X	77
Provincetown	MA	X	X	X	3	16	X	19	X	X	X	3	11	X	14	X	X	X	4	8	X	12	X	X	X	X	10	X	12
Scituate	MA	X	X	X	8	28	X	36	X	X	X	5	25	X	31	X	X	X	8	22	X	31	X	X	X	7	27	X	36
Plymouth	MA	X	X	3	X	21	X	28	X	X	X	X	19	X	23	X	X	X	X	18	X	22	X	X	X	X	16	X	18
Westport	MA	X	X	X	X	18	X	20	X	X	X	X	17	X	19	X	X	X	X	16	X	18	X	X	X	X	13	X	15
Portsmouth	NH	X	X	3	12	31	X	46	X	X	X	9	38	X	49	X	X	X	11	37	X	50	X	X	X	8	22	X	32
Point Pleasant	NJ	X	4	X	5	48	X	58	X	X	X	6	49	X	58	X	3	X	4	50	X	58	X	X	X	6	52	X	63
Cape May	NJ	X	X	26	7	105	X	139	X	X	25	7	123	X	156	X	X	27	10	130	X	168	X	X	24	10	123	X	158
Greenport	NY	X	X	X	X	7	X	8	X	X	X	X	6	X	7	X	X	X	X	6	X	7	X	X	X	X	6	X	7
Montauk	NY	X	4	5	8	73	X	90	X	4	7	8	77	X	96	X	5	6	8	78	X	98	X	5	6	9	80	X	101
Hampton Bay	NY	X	X	X	X	9	X	10	X	X	X	X	12	X	15	X	X	X	X	9	X	12	X	X	X	X	8	X	10
Newport	RI	X	X	7	8	16	X	32	X	X	7	7	15	X	31	X	X	6	7	13	X	29	X	X	6	7	11	X	27
Hampton	VA	X	X	X	X	4	X	6	X	X	X	X	10	X	12	X	X	X	X	8	X	9	X	X	X	X	6	X	7
Newport News	VA	X	X	11	X	15	X	27	X	X	8	X	14	X	22	X	X	8	X	15	X	24	X	X	8	X	14	X	23
OTHER PORTS		7	12	78	103	1,481	6	1,687	6	13	80	108	1,403	7	1,618	7	11	66	101	1,353	7	1,545	8	15	61	100	1,289	7	1,480
TOTAL		**14**	**42**	**346**	**348**	**2,369**	**6**	**3,125**	**14**	**39**	**348**	**357**	**2,298**	**7**	**3,065**	**15**	**41**	**339**	**366**	**2,253**	**7**	**3,022**	**18**	**41**	**341**	**351**	**2,156**	**7**	**2,916**

Source: NMFS Statistics Office, permit databases

Table 36 Monkfish permits by port, FY2000 – 2008.

Ports where there are fewer than three permits are marked “x” for confidentiality reasons.

PORT/ STATE	MAY 07 -APR 08	STOCK AREAS				GEAR TYPES							
		NORTHERN		SOUTHERN		OTTER TRAWL		GILLNET		HOOK		OTHER GEARS	
	Metric Tons	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent
Portland, ME	705	698	99%	7	1%	658	93%	47	7%	0	0%	0	0%
Gloucester, MA	1,711	1,676	98%	35	2%	1,206	70%	505	30%	0	0%	0	0%
Boston, MA	849	838	99%	11	1%	849	100%	0	0%	0	0%	0	0%
New Bedford, MA	3,195	1,200	38%	1,995	62%	1,522	48%	758	24%	0	0%	915	29%
Point Judith, RI	957	36	4%	921	96%	540	56%	402	42%	0	0%	15	2%
MAINE	759	752	99%	7	1%	695	92%	63	8%	0	0%	0	0%
NEW HAMPSHIRE	137	136	99%	1	1%	13	9%	125	91%	0	0%	0	0%
MASSACHUSETTS	6,475	4,091	63%	2,384	37%	3,643	56%	1,906	29%	0	0%	925	14%
RHODE ISLAND	1,545	62	4%	1,483	96%	623	40%	843	55%	0	0%	79	5%
CONNECTICUT	123	0	0%	123	100%	22	18%	59	48%	0	0%	42	34%
NEW YORK	773	3	0%	770	100%	103	13%	659	85%	0	0%	11	1%
NEW JERSEY	1,929	6	0%	1,923	100%	99	5%	1,576	82%	0	0%	254	13%
OTHER NORTHEAST	488	0	0%	488	100%	41	8%	348	71%	0	0%	99	20%
TOTAL	**12,230**	**5,050**	**41%**	**7,180**	**59%**	**5,240**	**43%**	**5,579**	**46%**	**0**	**0%**	**1,411**	**12%**

PORT/ STATE	MAY 08-APR 09	STOCK AREAS				GEAR TYPES							
		NORTHERN		SOUTHERN		OTTER TRAWL		GILLNET		HOOK		OTHER GEARS	
	Metric Tons	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent	Metric Tons	Percent
Portland, ME	402	401	100%	2	0%	353	88%	50	12%	0	0%	0	0%
Gloucester, MA	1,318	1,289	98%	29	2%	943	72%	375	28%	0	0%	0	0%
Boston, MA	737	697	94%	41	6%	737	100%	0	0%	0	0%	0	0%
New Bedford, MA	2,608	759	29%	1,849	71%	1,290	49%	740	28%	0	0%	577	22%
Point Judith, RI	927	39	4%	888	96%	507	55%	386	42%	0	0%	33	4%
MAINE	423	421	100%	2	0%	368	87%	56	13%	0	0%	0	0%
NEW HAMPSHIRE	98	97	100%	0	0%	12	13%	85	87%	0	0%	0	0%
MASSACHUSETTS	5,231	2,961	57%	2,270	43%	3,013	58%	1,637	31%	0	0%	581	11%
RHODE ISLAND	1,382	42	3%	1,340	97%	525	38%	767	55%	0	0%	91	7%
CONNECTICUT	167	0	0%	167	100%	45	27%	76	46%	0	0%	46	27%
NEW YORK	842	6	1%	836	99%	102	12%	732	87%	0	0%	8	1%
NEW JERSEY	1,690	1	0%	1,690	100%	113	7%	1,419	84%	0	0%	159	9%
OTHER NORTHEAST	446	0	0%	446	100%	30	7%	359	80%	0	0%	57	13%
TOTAL	**10,279**	**3,528**	**34%**	**6,751**	**66%**	**4,208**	**41%**	**5,130**	**50%**	**0**	**0%**	**941**	**9%**

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. Landings in live weight.
3. Gear data are based on vessel trip reports.

Table 37 Preliminary FY2007 & 2008 monkfish landings by primary port (excluding Long Beach/Barnegat Light, NJ) and State, by gear.

HOME PORT		MONKFISH LANDINGS AND REVENUES														Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2008
Portland, ME	1,000 Lbs.	1,446.2	1,604.8	1,691.7	1,472.8	2,542.9	2,995.8	1,487.6	1,498.2	1,436.1	990.0	895.8	587.7	441.9	247.2	500.4
	$1,000	$2,257.6	$2,393.9	$2,707.1	$2,640.2	$5,472.7	$6,707.8	$2,004.9	$2,289.6	$2,667.0	$2,471.3	$2,088.9	$1,692.8	$1,476.7	$735.1	$1,506.7
Boston, MA	1,000 Lbs.	822.8	674.0	917.6	781.9	1,267.6	960.9	4,964.1	4,777.8	4,291.2	2,829.7	3,405.7	2,478.8	1,492.1	1,242.8	545.9
	$1,000	$1,082.5	$936.3	$1,300.3	$1,104.1	$2,240.1	$2,027.5	$6,737.6	$6,629.9	$5,947.0	$5,165.8	$6,202.5	$4,724.3	$3,769.6	$3,020.3	$1,521.2
Gloucester, MA	1,000 Lbs.	1,675.6	1,154.1	844.3	941.6	1,700.9	2,364.8	2,090.8	2,055.4	1,961.8	1,353.3	1,771.0	980.5	668.8	800.2	1,029.1
	$1,000	$1,620.8	$1,097.7	$1,037.9	$1,382.6	$3,060.7	$4,441.5	$3,053.4	$2,923.5	$2,604.0	$2,702.3	$3,504.5	$2,083.0	$1,595.5	$1,667.5	$2,266.6
New Bedford, MA	1,000 Lbs.	5,983.8	5,789.6	7,345.5	8,537.1	7,026.5	5,515.4	3,452.8	2,319.5	2,584.6	2,003.6	2,343.2	1,569.3	1,681.5	1,364.8	1,523.4
	$1,000	$8,980.7	$8,260.4	$11,686.0	$13,926.2	$14,442.8	$11,783.9	$4,697.9	$3,278.4	$3,918.8	$4,191.3	$5,514.6	$3,984.9	$4,567.7	$3,709.9	$4,047.1
Long Beach/Barnegat Light, NJ	1,000 Lbs.	846.4	1,382.2	729.0	1,702.9	2,568.7	1,801.5	3,582.0	2,435.4	3,625.5	1,418.0	2,013.4	1,607.1	1,895.7	1,640.0	1,612.7
	$1,000	$1,210.6	$1,531.5	$977.7	$2,099.9	$4,430.7	$3,049.4	$4,807.6	$3,227.3	$3,870.5	$1,797.6	$3,261.3	$2,366.1	$2,861.0	$2,527.7	$2,478.5
Point Judith, RI	1,000 Lbs.	1,194.2	2,444.6	2,125.9	1,485.1	1,708.7	1,635.0	643.4	511.9	954.3	422.3	837.6	400.1	647.4	513.0	974.5
	$1,000	$1,645.1	$3,366.8	$3,248.1	$2,175.5	$3,275.3	$3,423.8	$1,008.6	$779.4	$1,381.3	$672.8	$1,825.1	$1,032.2	$1,764.6	$1,328.7	$2,047.8

Source: NMFS Statistics Office, dealer weighout & permits databases

Pounds are in landed weight

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 38 Monkfish landings and revenues for monkfish primary ports, by homeport in FY1995 – 2008, and principal port, FY2008.

HOME PORT		MONKFISH LANDINGS AND REVENUES														Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2008
Rockland, ME	1,000 Lbs.	47.7	42.5	37.1	56.3	53.9	74.0	8.3	3.8	3.1	7.3	0.9	0.0	0.0	0.0	1.5
	$1,000	$61.2	$55.3	$54.3	$90.0	$113.2	$184.5	$15.5	$5.5	$5.4	$14.3	$2.4	$0.0	$0.0	$0.0	$4.4
Port Clyde, ME	1,000 Lbs.	119.2	120.0	183.0	210.4	294.3	325.1	543.5	471.9	386.6	293.8	203.5	90.2	58.6	43.6	51.6
	$1,000	$148.5	$152.7	$260.9	$328.4	$581.8	$749.5	$748.4	$676.8	$679.8	$645.7	$505.2	$242.0	$187.6	$398.0	$421.6
South Bristol, ME	1,000 Lbs.	126.4	109.5	89.9	93.3	106.6	219.2	278.7	238.3	233.6	235.6	191.5	77.8	132.3	103.3	103.3
	$1,000	$162.9	$145.1	$131.2	$146.5	$217.4	$494.5	$410.1	$342.7	$431.7	$539.2	$470.6	$223.7	$448.6	$313.5	$313.5
Ocean City, MD	1,000 Lbs.	178.5	520.8	348.5	282.0	314.1	106.7	3.1	2.6	2.4	3.3	4.0	4.2	2.2	1.5	3.7
	$1,000	$241.0	$450.5	$310.3	$254.1	$347.4	$154.4	$4.6	$4.2	$3.9	$5.5	$7.9	$9.2	$5.1	$3.3	$8.4
Chatham, MA	1,000 Lbs.	126.3	97.5	117.2	231.6	212.7	475.3	613.4	944.1	1,317.9	649.7	1,194.5	830.8	645.0	511.6	517.1
	$1,000	$110.9	$936.3	$126.9	$237.2	$327.1	$771.5	$829.9	$1,229.6	$1,364.5	$750.1	$1,905.7	$1,265.7	$958.7	$780.1	$796.2
Provincetown, MA	1,000 Lbs.	83.3	38.8	24.4	85.6	79.9	35.1	25.9	19.8	38.0	39.2	21.1	11.3	5.9	2.6	3.2
	$1,000	$108.0	$51.8	$36.7	$141.5	$136.4	$76.8	$37.7	$26.4	$75.2	$84.0	$57.2	$30.5	$18.4	$8.3	$10.2
Scituate, MA	1,000 Lbs.	58.9	45.3	43.2	330.0	331.0	434.4	100.0	206.8	202.9	117.6	173.0	171.7	181.9	159.8	69.2
	$1,000	$67.9	$53.0	$50.3	$391.6	$561.5	$745.7	$147.7	$266.4	$216.1	$186.3	$324.0	$258.9	$346.0	$319.5	$228.4
Plymouth, MA	1,000 Lbs.	53.5	33.0	27.6	42.3	13.9	276.5	585.5	613.1	717.2	306.1	168.4	85.7	41.4	22.3	22.3
	$1,000	$61.6	$37.6	$25.5	$55.8	$24.3	$508.0	$826.2	$795.9	$704.8	$403.5	$308.1	$146.8	$144.2	$35.6	$35.6
Westport, MA	1,000 Lbs.	809.6	856.9	461.4	539.0	451.9	307.4	685.7	549.5	830.6	246.4	164.3	61.2	83.4	48.3	107.1
	$1,000	$764.5	$768.5	$387.6	$543.3	$691.2	$568.3	$1,022.6	$739.3	$799.1	$248.5	$272.4	$83.0	$112.2	$60.2	$127.6
Portsmouth, NH	1,000 Lbs.	370.7	387.9	519.9	474.7	845.3	1,253.7	1,098.7	671.8	562.9	439.4	434.0	143.1	91.0	74.4	244.6
	$1,000	$447.5	$443.0	$636.9	$532.5	$1,319.5	$2,122.7	$1,578.8	$967.0	$641.6	$612.1	$751.8	$219.1	$152.0	$110.6	$388.0
Point Pleasant, NJ	1,000 Lbs.	84.3	517.7	1,091.5	1,578.5	1,286.0	772.5	337.9	128.3	401.2	312.1	190.8	146.6	212.2	271.1	181.5
	$1,000	$111.4	$565.8	$1,096.5	$1,884.9	$2,320.0	$1,208.2	$441.5	$164.4	$395.6	$401.9	$302.5	$251.5	$369.3	$432.9	$317.4
Cape May, NJ	1,000 Lbs.	273.0	312.6	465.0	316.3	124.3	117.5	187.5	117.9	162.1	87.5	117.7	143.2	180.3	116.7	121.8
	$1,000	$370.1	$389.2	$571.7	$398.2	$255.7	$266.2	$248.2	$134.7	$206.3	$131.6	$217.6	$279.2	$448.9	$260.3	$267.1
Greenport, NY	1,000 Lbs.	26.1	48.9	62.9	41.9	12.1	3.6	6.9	19.8	7.8	13.6	22.1	12.2	6.1	9.0	9.0
	$1,000	$35.1	$72.0	$86.2	$62.2	$20.0	$8.7	$10.7	$32.6	$14.5	$36.6	$61.8	$35.0	$20.6	$27.3	$27.3
Montauk, NY	1,000 Lbs.	46.9	53.0	92.2	157.4	79.7	47.2	146.7	238.4	569.5	239.2	382.1	275.8	572.6	504.3	549.9
	$1,000	$62.3	$74.2	$135.9	$246.9	$170.1	$122.2	$237.5	$358.4	$691.9	$370.4	$630.4	$470.1	$881.2	$674.8	$725.7
Hampton Bays, NY	1,000 Lbs.	87.0	318.9	309.5	454.3	415.7	316.6	93.2	138.8	128.9	8.2	47.0	12.0	53.6	57.7	57.7
	$1,000	$120.5	$516.1	$589.6	$733.0	$661.6	$562.6	$134.4	$191.2	$134.8	$11.8	$72.1	$28.5	$85.0	$169.7	$169.7
Newport, RI	1,000 Lbs.	312.0	406.9	436.3	406.8	581.5	360.9	614.2	671.1	1,234.6	594.5	864.8	445.5	484.7	445.6	414.5
	$1,000	$388.0	$505.4	$558.1	$584.3	$1,229.4	$808.1	$848.2	$917.9	$1,507.4	$817.8	$1,565.9	$834.9	$858.1	$685.7	$642.0
Hampton, VA	1,000 Lbs.	256.2	336.0	113.4	134.9	42.2	35.8	20.7	3.6	4.7	7.4	12.1	7.6	11.3	6.7	11.8
	$1,000	$326.5	$350.5	$129.3	$178.5	$79.1	$76.1	$23.8	$3.6	$6.3	$11.6	$20.1	$13.9	$23.4	$13.9	$26.6
Newport News, VA	1,000 Lbs.	184.3	253.9	373.0	275.2	95.9	90.0	39.6	43.8	37.3	30.4	34.3	39.5	34.3	17.7	26.3
	$1,000	$221.1	$285.0	$454.0	$333.1	$140.4	$106.5	$42.9	$50.9	$43.3	$41.4	$52.9	$75.3	$76.6	$40.9	$63.2

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. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

HOME PORT		MONKFISH LANDINGS AND REVENUES														Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2008
All Other Ports	1,000 Lbs.							8699.4	6182.4	7063.9	4830.2	6373.5	3935.5	4207.7	3293.8	2816.2
	$1,000							$12,153	$8,618	$8,421	$7,299	$11,129	$6,846	$7,360	$5,531	$4,414
Summary of "Primary", "Secondary" and "Other" Ports								30,310	24,864	28,758	17,478	21,866	14,117	13,832	11,498	11,498
								$42,072	$34,654	$36,732	$29,612	$41,054	$27,196	$28,531	$22,855	$22,855

Table 39 Monkfish landings and revenues for monkfish secondary and other ports, by homeport in FY1995 – 2008, and principal port, FY2008.

HOME PORT		Number of Vessels	FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
1	**Westport, MA**	16	56.9%	69.0%	42.5%	40.8%	49.6%	51.2%	62.9%	37.4%	47.3%	28.9%	30.7%	8.9%	8.6%	7.9%
2	**Port Clyde, ME**	19	10.6%	7.7%	13.7%	19.2%	37.6%	44.6%	36.5%	32.7%	36.1%	35.4%	13.4%	3.8%	7.4%	6.4%
3	**Plymouth, MA**	15	6.0%	4.2%	6.3%	7.9%	7.5%	38.5%	29.8%	28.6%	4.6%	22.8%	6.8%	13.6%	4.9%	5.3%
4	**South Bristol, ME**	6	7.1%	7.6%	7.5%	13.5%	22.6%	42.5%	32.4%	27.7%	35.6%	34.1%	35.9%	0.9%	0.0%	0.0%
5	**Portsmouth, NH**	30	11.8%	12.5%	19.8%	19.4%	38.4%	39.9%	49.8%	37.8%	31.3%	28.4%	29.9%	15.1%	8.7%	8.1%
6	**Scituate, MA**	35	5.9%	3.5%	3.2%	20.2%	30.5%	40.5%	34.5%	17.5%	30.7%	13.7%	9.7%	6.5%	7.2%	8.7%
7	**Boston, MA**	41	13.1%	10.8%	14.0%	13.5%	27.4%	30.8%	20.6%	23.6%	23.3%	27.8%	30.2%	24.1%	18.6%	17.3%
8	**Portland, ME**	87	12.5%	13.0%	13.9%	14.4%	23.5%	26.2%	22.2%	27.6%	26.3%	27.4%	22.8%	19.2%	14.0%	13.9%
9	**Rockland, ME**	4	17.6%	22.4%	4.1%	9.0%	12.3%	14.3%	9.5%	2.8%	4.2%	0.3%	0.0%	0.0%	0.0%	0.0%
10	**Long Beach/Barnegat Light, NJ**	78	17.7%	21.6%	14.8%	28.6%	39.1%	22.3%	34.2%	24.0%	25.1%	8.5%	12.3%	11.2%	12.8%	13.0%
11	**Gloucester, MA**	217	10.2%	6.9%	5.2%	5.8%	13.2%	18.0%	15.8%	15.1%	12.9%	14.2%	13.1%	11.0%	10.2%	9.6%
12	**Point Judith, RI**	154	6.6%	12.7%	9.1%	8.5%	10.6%	13.3%	11.2%	8.0%	8.5%	4.2%	7.7%	5.3%	8.6%	8.7%
13	**Newport, RI**	68	6.2%	9.5%	10.1%	10.7%	23.6%	11.4%	13.3%	12.1%	18.0%	7.8%	6.4%	3.4%	6.5%	5.8%
14	**Chatham, MA**	100	2.8%	22.4%	2.6%	4.9%	5.7%	11.2%	9.3%	19.9%	18.1%	10.8%	20.9%	14.8%	11.5%	10.7%
15	**Point Pleasant, NJ**	134	2.0%	7.1%	10.6%	19.0%	19.1%	9.0%	13.8%	8.0%	7.1%	3.7%	4.1%	3.4%	3.3%	4.4%
16	**New Bedford, MA**	475	13.4%	9.4%	14.0%	15.8%	11.5%	8.1%	5.9%	4.1%	4.5%	3.5%	3.9%	2.6%	2.8%	2.4%
17	**Hampton Bays, NY**	61	2.5%	9.5%	8.1%	10.0%	10.1%	7.9%	9.7%	7.0%	6.4%	3.4%	11.7%	8.0%	12.3%	12.6%
18	**Ocean City, MD**	77	7.3%	15.0%	12.3%	11.7%	15.3%	4.3%	4.8%	0.8%	2.2%	1.4%	2.2%	1.5%	1.9%	1.6%
19	**Provincetown, MA**	28	9.0%	4.9%	2.5%	8.1%	6.7%	4.3%	0.9%	2.2%	4.3%	4.9%	3.2%	2.4%	2.1%	1.7%
20	**Montauk, NY**	118	0.9%	1.4%	1.8%	3.3%	2.1%	1.6%	2.3%	3.4%	6.2%	3.4%	4.8%	3.0%	5.8%	5.5%
21	**Cape May, NJ**	249	1.5%	1.8%	2.4%	1.9%	1.4%	1.2%	0.7%	0.5%	0.6%	0.3%	0.9%	0.8%	0.7%	0.4%
22	**Greenport, NY**	5	1.7%	2.6%	2.9%	2.0%	1.3%	1.0%	1.1%	0.6%	0.2%	0.1%	0.5%	0.5%	1.4%	0.5%
23	**Hampton, VA**	52	4.0%	5.1%	2.7%	2.9%	1.2%	0.8%	0.6%	0.2%	0.2%	0.3%	0.5%	0.3%	0.6%	0.5%
24	**Newport News, VA**	75	1.8%	2.2%	3.9%	2.8%	0.9%	0.5%	0.2%	0.2%	0.2%	0.1%	0.1%	0.2%	0.2%	0.2%

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

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002-2008 fishing year data are based on vessels issued a monkfish permit during the 2002-2008 fishing years, respectively.

Table 40 Monkfish Revenues, FY1995-2008, as a Percentage of Total Revenues by Port

4.5.2.1 Vessels by Principal Port and Owner's Residence

When applying for a permit the vessel owner must identify a "Principal Port" for the vessel, theoretically the port where their vessel lands most often. Further, the vessel owner must report his or her address. Table 1 shows the number of permits where a vessel listed a specific combination of principal port and owner's address on any Federal monkfish permit. Where there is a significant direct match between vessel owner address and vessel principal port both positive and negative social impacts will be greater.

There are 26 towns with 20 or more permits in one or both of these categories (principal port or home address) (see Table 41). Of these, only 9 (shaded) have 50 or more permits. These are, in descending order of number of permits, New Bedford (276 & 195) and Gloucester (253 & 180), MA; Cape May, NJ (167 & 75); Montauk, NY (117 & 78); Point Judith, RI (108 & 0); Chatham, MA (90 & 26); Barnegat Light/Long Beach, NJ (72 & 32); Portland, ME (72 & 26); and Point Pleasant/Point Pleasant Beach, NJ (50 & 12).

Only four ports (in **bold**) have at least a 65% match between principal port and owner's residence: New Bedford, Gloucester, and Scituate, MA; and Montauk, NY.

ST	City	Principal Port	Owner's Residence	% vessels listing same port as principal port and as residence
MA	**NEW BEDFORD**	**276**	**195**	**71%**
MA	**GLOUCESTER**	**253**	**180**	**71%**
NJ	CAPE MAY	167	75	45%
NY	**MONTAUK**	**117**	**78**	**67%**
RI	POINT JUDITH	108		0%
MA	CHATHAM	90	26	29%
NJ	BARNEGAT LIGHT	72	32	44%
ME	PORTLAND	72	26	36%
NJ	POINT PLEASANT	50	12	24%
MA	BOSTON	43	2	5%
MA	**SCITUATE**	**40**	**27**	**68%**
MD	OCEAN CITY	40	4	10%
NH	PORTSMOUTH	39	10	26%
VA	NEWPORT NEWS	38	18	47%
NC	WANCHESE	31	14	45%
NY	SHINNECOCK	31		0%
RI	NEWPORT	28	12	43%
NJ	BELFORD	28	9	32%
NH	RYE	25	12	48%
MA	NEWBURYPORT	24	12	50%
MA	FAIRHAVEN	23	13	57%
MA	PLYMOUTH	23	12	52%
NJ	ATLANTIC CITY	23	1	4%
MA	GREEN HARBOR	22	2	9%
NH	SEABROOK	21	13	62%
VA	HAMPTON	20	10	50%

Table 41 Ports with 20 or more Northeast Monkfish Permits as Principal Port or Owner's Residence for 2008

4.5.2.2 Commercial Ports of Landing

There are a total of 92 individual ports where monkfish was landed in 2008. They include ports from all states in the Northeast plus North Carolina (see Table 42).

State	County	Port
CT	HARTFORD	WINDSOR LOCKS
CT	MIDDLESEX	PORTLAND
CT	NEW HAVEN	EAST HAVEN
CT	NEW LONDON	EAST LYME
CT	NEW LONDON	NEW LONDON
CT	NEW LONDON	OLD LYME
CT	NEW LONDON	STONINGTON
CT	NEW LONDON	WATERFORD
DE	SUSSEX	INDIAN RIVER
MA	BARNSTABLE	BARNSTABLE
MA	BARNSTABLE	BASS RIVER
MA	BARNSTABLE	CHATHAM
MA	BARNSTABLE	FALMOUTH
MA	BARNSTABLE	HARWICHPORT
MA	BARNSTABLE	PROVINCETOWN
MA	BARNSTABLE	SANDWICH
MA	BARNSTABLE	WELLFLEET
MA	BARNSTABLE	WOODS HOLE
MA	BRISTOL	FAIRHAVEN
MA	BRISTOL	FALL RIVER
MA	BRISTOL	NEW BEDFORD
MA	BRISTOL	WESTPORT
MA	DUKES	CHILMARK
MA	ESSEX	GLOUCESTER
MA	ESSEX	MARBLEHEAD
MA	ESSEX	NEWBURYPORT
MA	ESSEX	ROCKPORT
MA	ESSEX	SWAMPSCOTT
MA	MIDDLESEX	CAMBRIDGE
MA	NANTUCKET	NANTUCKET
MA	PLYMOUTH	MARSHFIELD
MA	PLYMOUTH	PLYMOUTH
MA	PLYMOUTH	SCITUATE
MA	SUFFOLK	BOSTON
MD	WORCESTER	OCEAN CITY
ME	CUMBERLAND	HARPSWELL CENTER
ME	CUMBERLAND	PORTLAND
ME	HANCOCK	BASS HARBOR
ME	HANCOCK	SOUTHWEST HARBOR
ME	KNOX	PORT CLYDE
ME	SAGADAHOC	PHIPPSBURG
ME	YORK	CAMP ELLIS
ME	YORK	YORK
ME	YORK	YORK HARBOR
NC	CARTERET	BEAUFORT
NC	DARE	HATTERAS
NC	DARE	WANCHESE

NC	HYDE	ENGELHARD
NC	PAMLICO	LOWLAND
NC	PAMLICO	ORIENTAL
NH	ROCKINGHAM	GREENLAND
NH	ROCKINGHAM	HAMPTON
NH	ROCKINGHAM	PORTSMOUTH
NH	ROCKINGHAM	RYE
NH	ROCKINGHAM	SEABROOK
NH	STRAFFORD	DOVER
NJ	ATLANTIC	ATLANTIC CITY
NJ	CAPE MAY	AVALON
NJ	CAPE MAY	CAPE MAY
NJ	CAPE MAY	OCEAN CITY
NJ	CAPE MAY	SEA ISLE CITY
NJ	CAPE MAY	WILDWOOD
NJ	MONMOUTH	BELFORD
NJ	OCEAN	BARNEGAT
NJ	OCEAN	BARNEGAT LIGHT/LONG BEACH
NJ	OCEAN	POINT PLEASANT
NJ	OCEAN	WARETOWN
NY	NASSAU	FREEPORT
NY	NASSAU	POINT LOOKOUT
NY	NEW YORK	NEW YORK CITY
NY	SUFFOLK	AMAGANSETT
NY	SUFFOLK	CENTER MORICHES
NY	SUFFOLK	EAST HAMPTON
NY	SUFFOLK	GREENPORT
NY	SUFFOLK	HAMPTON BAYS/SHINNECOCK
NY	SUFFOLK	ISLIP
NY	SUFFOLK	MONTAUK
NY	SUFFOLK	MORICHES
NY	SUFFOLK	RIVERHEAD
NY	SUFFOLK	SOUTHOLD
RI	NEWPORT	LITTLE COMPTON
RI	NEWPORT	NEWPORT
RI	NEWPORT	TIVERTON
RI	WASHINGTON	NEW SHOREHAM
RI	WASHINGTON	NORTH KINGSTOWN
RI	WASHINGTON	POINT JUDITH
VA	ACCOMACK	CHINCOTEAGUE
VA	ACCOMACK	GREENBACKVILLE
VA	ACCOMACK	WACHAPREAGUE
VA	CITY OF HAMPTON	HAMPTON
VA	CITY OF NEWPORT NEWS	NEWPORT NEWS
VA	YORK	SEAFORD

Table 42 All Ports Landing Monkfish in 2008

There are several ways to present landings data to show different kinds of importance of monkfish to communities. Two tables below illustrate importance due to total levels of revenue and landings versus importance due to percent of monkfish revenue and landings relative to all commercial revenue and landings by port. In 2008 there were 32 ports with at least $50,000 or 50,000 lbs of monkfish (see Table 43). But only 11 (shaded) had at least $500,000 or 500,000 lbs: New Bedford, Gloucester, Boston and Chatham, MA; Barnegat Light/Long Beach and Point Pleasant/Point Pleasant Beach, NJ; Point Judith and Little Compton, RI; Portland, ME; and Montauk and Hampton Bays/Shinnecock, NY.

Only 6 (in **bold**) had at least $1M or 1Mlbs: New Bedford, Gloucester and Boston, MA; Barnegat Light/Long Beach, NJ and Portland, ME.

ST	County	Port	Monk Value	Monk Lbs	Monk Vessels Landed
MA	**BRISTOL**	**NEW BEDFORD**	**$5,824,673**	**2,603,715**	**312**
MA	**ESSEX**	**GLOUCESTER**	**$3,284,774**	**1,168,124**	**154**
NJ	**OCEAN**	**BARNEGAT LIGHT/LONG BEACH**	**$2,656,969**	**1,737,896**	**65**
RI	**WASHINGTON**	**POINT JUDITH**	**$2,073,340**	**1,041,087**	**95**
MA	**SUFFOLK**	**BOSTON**	**$1,630,877**	**557,991**	**29**
ME	**CUMBERLAND**	**PORTLAND**	**$1,144,016**	**277,628**	**74**
MA	BARNSTABLE	CHATHAM	$945,515	620,362	38
NY	SUFFOLK	MONTAUK	$721,697	505,286	51
NJ	OCEAN	POINT PLEASANT/POINT PLEASANT BEACH	$717,633	503,513	79
NY	SUFFOLK	HAMPTON BAYS/SHINNECOCK	$769,716	312,085	57
RI	NEWPORT	LITTLE COMPTON	$560,902	443,655	23
VA	ACCOMACK	CHINCOTEAGUE	$487,195	417,365	38
RI	NEWPORT	NEWPORT	$305,335	204,221	25
MA	PLYMOUTH	SCITUATE	$263,690	81,879	22
NJ	CAPE MAY	CAPE MAY	$228,491	118,162	124
NJ	OCEAN	WARETOWN	$211,793	150,330	4
CT	NEW LONDON	STONINGTON	$191,801	61,479	26
MA	BRISTOL	WESTPORT	$180,197	138,245	7
NH	ROCKINGHAM	PORTSMOUTH	$161,162	101,369	15
NJ	MONMOUTH	BELFORD	$150,484	111,067	22
MD	WORCESTER	OCEAN CITY	$143,065	131,990	26
CT	NEW LONDON	NEW LONDON	$96,038	60,640	9
NY	SUFFOLK	ISLIP	$86,306	61,737	5
NH	ROCKINGHAM	RYE	$64,957	30,522	19
RI	NEWPORT	TIVERTON	$62,052	49,412	6
VA	NEWPORT NEWS	NEWPORT NEWS	$55,389	26,152	38
VA	YORK	SEAFORD	$54,086	26,341	13

* Additional ports with over $50,000 or 50,000 lbs but which cannot be listed in the table for reasons of confidentiality are: Waterford, CT. New Shoreham, RI; Riverhead, NY; Wanchese, NC; and Greenbackville, VA.

Table 43 Monkfish Ports with $50,000 in revenue or 50,000 lbs in landings in 2008

In terms of value dependence, a different picture emerges (see Table 44). Some of the ports with the highest levels of monkfish landings value also have very high levels landings of other species. Thus they are only minimally dependent on monkfish in percentage terms. New Bedford, MA is an example. It is only dependent on monkfish at a 2% level. And some ports will appear with high levels of percent dependence, even though they land much less monkfish, or sometimes little fish at all. Islip, NY and Tiverton, RI stand out here. In fact, of the 8 ports with at least 10% dependence (shaded) only 4 (in **bold**) landed at least $500,000 or 500,000 lbs of monkfish in 2008.

ST	County	Port	% value monkfish/All species	% lbs monkfish/All species
NJ	OCEAN	WARETOWN	47%	2%
RI	NEWPORT	**LITTLE COMPTON**	15%	22%
NY	SUFFOLK	ISLIP	13%	20%
VA	ACCOMACK	CHINCOTEAGUE	13%	26%
NY	SUFFOLK	**HAMPTON BAYS/SHINNECOCK**	12%	2%
MA	SUFFOLK	**BOSTON**	11%	9.2%
RI	NEWPORT	TIVERTON	11%	1%
NJ	OCEAN	**BARNEGAT LIGHT/LONG BEACH**	10%	9.7%
MA	PLYMOUTH	SCITUATE	6.9	4.2
MA	ESSEX	GLOUCESTER	6.5	1.1
MA	BARNSTABLE	CHATHAM	6.3	6.5
RI	WASHINGTON	POINT JUDITH	5.8	2.9
ME	CUMBERLAND	PORTLAND	5.3	0.9
RI	NEWPORT	NEWPORT	5	2.6
NJ	MONMOUTH	BELFORD	4.8	3.5
NY	SUFFOLK	MONTAUK	4.6	4.8
NJ	OCEAN	POINT PLEASANT	3.7	2.8
NH	ROCKINGHAM	PORTSMOUTH	3.3	5.4
CT	NEW LONDON	STONINGTON	2.8	3
MA	BRISTOL	NEW BEDFORD	2.5	1.9
CT	NEW LONDON	NEW LONDON	2.4	3.9
NH	ROCKINGHAM	RYE	2.1	1.5
NY	NASSAU	FREEPORT	2.1	1.3
NH	ROCKINGHAM	SEABROOK	1.6	0.6
MD	WORCESTER	OCEAN CITY	1.3	1.6
NJ	CAPE MAY	AVALON	1.2	2.6

* Additional ports with at least 10% dependence by value or pounds but which cannot be listed in the table for reasons of confidentiality are: Waterford, CT. New Shoreham, RI; Riverhead, NY; and Greenbackville, VA.

Table 44 Monkfish Percent Value and Pounds Dependence in 2008

4.5.2.3 The Importance of Counties

There are potential aggregate effects to a county when multiple small ports, which individually do not rise to the top of dependence lists, together constitute a potential source of high impact to a general area (see Table 45). Examples of this are Suffolk County, NY with 11 ports and nearly $2 million in revenue and Barnstable County, MA with 10 ports (including Chatham and Provincetown) and nearly $1 million in revenue. Barnstable County also has a processor (Table 46) and multiple dealers (Table 47). Suffolk County ports (e.g., Montauk and Hampton Bays/Shinnecock) have a large number of monkfish dealers. Bristol County, MA (which includes New Bedford) has only 4 monkfish ports, but a total value of $6 million, as well as multiple processors (Table 46) and dealers (Table 47).

ST	County	M value	M lbs	No. Ports	M val/ tot val	m lbs/ tot lbs
MA	BRISTOL	$6,040,374	2,755,370	4	2%	2%
NJ	OCEAN	$3,626,907	2,422,607	5	**8%**	**9%**
MA	ESSEX	$3,294,714	1,171,450	5	6%	1%
RI	WASHINGTON	$2,261,089	1,195,136	3	4%	2%
NY	SUFFOLK	$1,825,715	1,035,640	11	7%	6%
ME	CUMBERLAND	$1,144,058	277,642	2	5%	1%
RI	NEWPORT	$1,034,165	731,760	4	9%	6%
MA	BARNSTABLE	$959,914	625,176	10	3%	4%
VA	ACCOMACK	$546,811	458,443	3	**12%**	**9%**
CT	NEW LONDON	$395,487	204,418	5	3%	5%
MA	PLYMOUTH	$346,297	107,687	4	3%	3%
NJ	CAPE MAY	$280,587	136,131	6	0%	0%
NH	ROCKINGHAM	$277,763	148,950	6	2%	2%
NY	NASSAU	$40,407	15,203	2	1%	1%
NJ	ATLANTIC	$10,823	4,951	2	0%	0%
ME	YORK	$1,587	445	3	0%	0%

*Other counties landing monkfish that could not be reported in the table for confidentiality reasons are: Hartford, New Haven and Middlesex, CT; Sussex, DE: Dukes, Middlesex and Nantucket, MA; Hancock and Sagadahoc, ME; Carteret, Dare, Hyde and Pamlico, NC; Strafford, NH; New York, NY; Bristol, RI and Northampton, VA.

+ Also removed are counties with only one monkfish port, as these data would not differ from port level data.

Table 45 County Level Involvement in Monkfish Fishery*+

4.5.2.4 Monkfish Processors

Processor data are available only by county, due to confidentiality. Table 46 shows that monkfish processors are most concentrated in Massachusetts, especially in Bristol County. However, they are scattered up and down the coast from Maine through South Carolina. Also, three processors are located in California, but are likely not processing the same species of monkfish managed under this FMP. As such, these processors are less important with respect to the impacts associated with this action.

ST	County	No. Processors
CA	LOS ANGELES	2
	SAN LUIS OBISPO	1
ME	CUMBERLAND	1
MA	BARNSTABLE	1
	BRISTOL	**7**
	ESSEX	2
	SUFFOLK	**3**
NH	ROCKINGHAM	1
NY	KINGS	1
RI	WASHINGTON	2
SC	CHARLESTON	1

*Data for 2008 not yet available.

Table 46 2007 Data from the NMFS Processed Product Survey*.

4.5.2.5 Monkfish Dealers

There were 160 monkfish dealers in 2008. The majority (68%) depended on monkfish for only 0-5% of the ex-vessel value of all species they bought, 79% depending on monkish for 0-10%, and 90% of dealers depending on monkfish for 0-20% of ex-vessel value.

The absolute amount of this percentage varied widely, however, with the largest group of dealers (32%) reporting depending on monkfish for $1,000,000 to $5,000,000 of the ex-vessel value they buy, 13% reporting $500,000 to $1,000,000 for monkfish, and another 13% reporting $10,000 to $50,000.

Eight ports had 10 or more dealers (Table 47, shaded) and an additional fourteen had at least 5 dealers. Below is a state by state discussion for individual ports with 5 or more dealers. Here the total number of dealers may exceed 160, as some dealers buy in multiple ports. Any port with 10 or more dealers automatically meets vulnerability criteria. But a port which already has met one of the previous criteria gets a point for having as few as 5 dealers (**bold**).

ST	Port	No. Dealers
MA	**New Bedford**	**27**
NY	**Montauk**	**19**
RI	**Point Judith**	**19**
NJ	**Point Pleasant**	**17**
NY	**Hampton Bays/Shinnecock**	**15**
NJ	**Cape May**	**13**
MA	**Gloucester**	**12**
NH	**Portsmouth**	**12**
NJ	**Barnegat Light/Long Beach**	**9**
MA	**Chatham**	**8**
MA	Westport	7
MD	Ocean City	7
NC	Wanchese	6
NY	Point Lookout	6
CT	New London	5
CT	Stonington	5
MA	Provincetown	5
MA	**Scituate**	**5**
ME	**Portland**	**5**
RI	**Little Compton**	**5**
VA	**Chincoteague**	**5**
VA	Newport News	5

Table 47 All Ports with 5 or more monkfish dealers in 2008

CT has 15 monkfish dealers, with 5 each in New London and Stonington. Of the 15, 60% depend on monkfish for 0-5% of the ex-vessel value they buy, though 27% depend on monkfish for $1,000,000 to $5,000,000.

MA has 101 monkfish dealers, concentrated in New Bedford (27), Gloucester (12), Chatham (8), Westport (7), Provincetown and Scituate (5 each). Of the 101, 65% depend on monkfish for only 0-5% of ex-vessel value, and 71% depend on monkfish for only 0-15%. Of the 101 dealers however, 21% depend on monkfish for $1,000,000 to $5,000,000.

MD has 7 monkfish dealers, all in Ocean City. The vast majority depend on monkfish for only 0-5% of their business, but about half depend on it for $500,000 to $5,000,000.

ME has 14 monkfish dealers. Only Portland has at least 5. Of the 14, 36% depend on monkfish for 0-5% of the ex-vessel value they buy, and 76% for only 0-15%. For 31% absolute dependencies ranges from $50,000 to $500,000.

NC has 18 dealers, with 6 located in Wanchese – the only community with at least 5 dealers. None of the 15 depends on monkfish for more than 5% of the ex-vessel value it buys, though 11% depend on it for $1,000,000-$5,000,000.

NH has 20 monkfish dealers, with the only port having more than 5 being Portsmouth (12). Of the 20, 75% depend on monkfish for only 0-5% of ex-vessel value, though 30% depend on it for $500,000 to $5,000,000.

NJ has 62 monkfish dealers, concentrated in Point Pleasant (17), Cape May (13), and Barnegat Light/Long Beach (9). Eighty percent of dealers in NJ depend on monkfish for only 0-10% of their business. But 12% depend on monkfish for $1,000,000 to $5,000,000.

NY has 64 monkfish dealers, concentrated in Montauk (19), Hampton Bays/Shinnecock (15), and Point Lookout (6). Looking at Long Island as a whole, it should be noted that Freeport and Greenport also have 4 dealers each, making the region more vulnerable. Of the 64, 68% depend on monkfish for only 0-5% of ex-vessel value, and 79% for only 0-15%. Six percent however depend on it for $1,000,000 to $5,000,000.

RI has 38 monkfish dealers, concentrated in Point Judith (19), followed by Little Compton (5). There are also 3 each in North Kingstown, Tiverton and Newport; this proximity increases the general vulnerability of most of RI. Of the 38, 43% depend on monkfish for only 0-5% of ex-vessel value, and 63% depend on it for only 0-15%. But 5% depend on monkfish for $1,000,000 to 45,000,000.

VA has 17 monkfish dealers, with Newport News and Chincoteague having 5 each. Of the 17, 75% depend on monkfish for only 0-5% of ex-vessel value, though 27% depend on it for $5,000,000 to $10,000,000.

4.5.2.6 Census Data for Top Monkfish Ports

Ports meeting the fisheries vulnerability criteria are New Bedford, Gloucester, Boston and Chatham, MA; Barnegat Light/Long Beach, Point Pleasant/Point Pleasant Beach and Cape May, NJ; Point Judith, Little Compton and Tiverton, RI; Portland, ME; Montauk, Hampton Bays/Shinnecock, Waretown and Islip, NY; Chincoteague, VA and Portsmouth, NH.

Levels of occupations in fishing farming and forestry vary widely, as do levels of families in poverty and of education (Table 48). Communities with higher dependence on fishing, higher poverty and lower educational level are generally more at risk, though these factors must also be considered in relation to relative dependence specifically on monkfish.

These and other census data can be found in the port profiles in Appendix 5, where these data are placed in the context of individual port communities (also available at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/). (Islip, NY, however, does not have a profile. Communities were chosen for the Northeast Region profiling effort based on 7 different criteria related to all fishing, and Islip did not meet any of the criteria.) Below they are listed in descending percentage of occupations in farming, fishing and forestry relative to all occupations. It should be kept in mind, however, that fishermen may be undercounted due to being listed as self-employed. The top three communities for percent occupations in farming, fishing and forestry are Long Beach/Barnegat Light, NJ; Chincoteague, VA and Montauk, NY. Communities with 10% or more families in poverty are New Bedford and Boston, MA with Chincoteague, VA close behind at 9.7%.

The communities with the lowest total population (4,000 or fewer residents) are Chatham, MA; Waretown, NY; Little Compton and Point Judith/Narragansett, RI and Montauk, NY. The three communities with the lowest percentage of persons age 25 or over who have graduated at least high school (80% or under) are New Bedford, MA; Chincoteague, VA; and Boston, MA. The communities with the highest unemployment levels (5 % or more) are Montauk, NY and New Bedford, MA, followed closely by Boston, MA with 4.6%. Lower educational levels mean more difficulty in finding new jobs, as do high unemployment levels. Smaller communities have less alternative employment available.

Of the top three ports by revenues and pounds landed (New Bedford, Gloucester and Barnegat Light/Long Beach), Barnegat Light/Long Beach has the highest level of occupational dependence, while New Bedford has the highest poverty level and lowest level of education.

Ports with high median age (50 or over) may indicate an older fishing population (though this is the median for the whole town and not just the fishermen so may simply mean a large number of retirees). Older fishermen are less likely to be able to easily change fisheries or employment. Barnegat light/Long Beach, NJ and Chatham, MA are the only ports where this is so.

Port Community	Median cost of a home	Occupations in farming, fishing and forestry*	Median household income	Families in poverty	Total pop.	Median Age	Pop. (25 or over) High School Graduate or Higher	% Pop. Over 16 In Labor Force and Unemployed
LONG BEACH/ BARNEGAT LIGHT	**$334,400/ $299,400**	**None*/ 6.50%**	**$48,697/ $52,361**	**3.8%/ 2.60%**	**3,329/ 764**	**57.3/ 54.9**	**92.0%/ 92.10%**	**2.3%/ 1.20%**
CHINCOTEAGUE	**$105,600**	**6.50%**	**$28,514**	**9.70%**	**4,317**	**46.1**	**71.40%**	**4.10%**
MONTAUK	**$290,400**	**6.10%**	**$42,329**	**8.30%**	**3,851**	**39.3**	**84.00%**	**7.70%**
CHATHAM	**$372,900**	**3.60%**	**$47,037**	**0.90%**	**1,667**	**53.3**	**89.90%**	**2.00%**
POINT PLEASANT/ POINT PLEASANT BEACH	**$160,100/ $223,600**	**0.3%/ 2.60%**	**$55,987/ $51,105**	**2.00%/ 5.00%**	**19,366/ 5,112**	**39.4/ 42.6**	**88.50%/ 87.10%**	**2.50%/ 3.10%**
LITTLE COMPTON	**$228,200**	**2.10%**	**$55,368**	**3.70%**	**3,593**	**43.5**	**91.00%**	**2.00%**
GLOUCESTER	**$204,600**	**2.00%**	**$47,722**	**7.10%**	**30,273**	**40.2**	**85.70%**	**3.20%**
HAMPTON BAYS/ SHINNECOCK#	**$178,000**	**1.70%**	**$50,161**	**6.70%**	**12,236**	**38.8**	**86.60%**	**3.40%**
POINT JUDITH/ NARRAGANSETT#	**$195,500**	**1.60%**	**$39,918**	**8.80%**	**3,671**	**44.5**	**87.50%**	**2.20%**
NEW BEDFORD	**$113,500**	**1.00%**	**$27,569**	**17.30%**	**93,768**	**35.9**	**57.60%**	**5.00%**
SCITUATE	**$276,000**	**0.90%**	**$70,868**	**1.40%**	**17,863**	**40.7**	**95.80%**	**1.60%**
TIVERTON	**$144,400**	**0.60%**	**$49,977**	**2.90%**	**15,260**	**40.8**	**79.50%**	**3.40%**
PORTSMOUTH	**$168,600**	**0.40%**	**$45,195**	**6.40%**	**20,784**	**38.5**	**91.40%**	**2.00%**
CAPE MAY	**$212,900**	**0.40%**	**$33,462**	**7.70%**	**4,668**	**47.4**	**87.60%**	**3.80%**
PORTLAND	**$121,200**	**0.40%**	**$48,763**	**9.20%**	**64,257**	**35.7**	**88.30%**	**3.30%**
ISLIP	**$169,700**	**0.20%**	**$65,359**	**4.40%**	**322,612**	**35**	**83.00%**	**2.50%**
BOSTON	**$190,600**	**0.10%**	**$39,629**	**15.30%**	**589,141**	**31.1**	**78.90%**	**4.60%**
WARETOWN	**$109,400**	**0.00%**	**$44,410**	**1.70%**	**1,582**	**40.1**	**84.80%**	**0.60%**

***** The census is known to undercount those employed in fishing. Further, fishing data are unavailable as a unique category due to confidentiality issues. Finally, those who fish out of this community may not live there.

[+] These communities have two sets of census data, though socially and in terms of fishing they are best treated as a single community. For example, in some cases fish are landed in one area but fishermen live in the other, or sometimes one houses the majority of the recreational fishing and the other the majority of commercial fishing.

[#] These communities include a port of landing for which no census data are available plus census data for the smallest census unit which encompasses the port.

Table 48   Selected Census Variables for Profiled Communities

4.5.2.7   Combined Factors For Vulnerability

Some towns show up in multiple indices of vulnerability, others in only two. Communities with multiple elements of vulnerability are generally more at risk for potential negative impacts. Those with fewer are generally likely to have more neutral or positive outcomes. However, some factors have a stronger impact than others. One very strong impact factor may equal several smaller impacts. Nonetheless, by simple count, the ports in Table 49 are listed with most vulnerable ports at the top.

When considering geographic closeness Washington County, RI has 2 ports with vulnerabilities of 5 or higher. Barnstable County and Bristol County, MA, and Suffolk County, NY have multiple small monkfish ports that do not meet the vulnerability criteria. However, when considered at the county level the cumulative affect may put these ports at greater risk. Risks to individuals and families include job loss, family disruption and damage to long-standing social networks. On the industry side, there is the threat to fishermen, dealers and especially processors of losing workforce locally and market share abroad that may be difficult to regain at a later point in time, as other providers establish new relationships with buyers.

Communities with more than 5 vulnerability factors are New Bedford, MA (9), Long Beach/Barnegat Light, NJ (8), Montauk, NY (8), Chatham, MA (7), Boston, MA (7), Point Judith/Narragansett, RI (6) and Gloucester, MA (5).

ST	Port	Factors
MA	New Bedford	9
NJ	Long Beach/ Barnegat Light	8
NY	Montauk	8
MA	Chatham	7
MA	Boston	7
RI	Point Judith/Narragansett	6
MA	Gloucester	6
VA	Chincoteague	5
RI	Little Compton	5
NJ	Point Pleasant/ Point Pleasant Beach	4
ME	Portland	4
NY	Hampton Bays/Shinnecock	3
RI	Tiverton	2
NH	Portsmouth	2
NJ	Cape May	2
NY	Islip	2
NJ	Waretown	2
MA	Scituate	2

Table 49 Number of Combined Vulnerability Factors per Town Among Port Communities

4.5.2.8 Monkfish Management Areas

The Northern Fishery Management Area (NMA) covers the Gulf of Maine and the northern part of Georges Bank; the Southern Fishery Management Area (SMA) extends from the southern flank of Georges Bank through the Mid-Atlantic Bight to North Carolina.

Ports with the largest percentage of vessels fishing in both areas include New Bedford, Boston and Chatham, MA and Stonington, CT (Table 50).

ST	PORT	Monk value	vessels landing monk	% vessels fishing in both areas
MA	NEW BEDFORD	$5,388,828	291	83
MA	BOSTON	$1,630,877	29	76
MA	CHATHAM	$943,051	33	73
CT	STONINGTON	$191,638	25	72

Table 50 Ports Where Most Vessels Fished in Both FMAs in 2008

Ports with the largest percentage of vessels fishing only in the SMA include Point Lookout and Hampton Bays/Shinnecock, NY Belford/Middletown and Barnegat Light/Long Beach, NJ; Ocean City, MD; Little Compton, RI; and Hampton, Newport News, Chincoteague and Seaford, VA (Table 51).

ST	PORT	Monk value	vessels landing monk	% vessels fishing only in SMA
NY	POINT LOOKOUT	$18,084	10	100
NJ	BELFORD	$150,484	22	95
NJ	BARNEGAT LIGHT/LONG BEACH	$2,656,017	63	84
MD	OCEAN CITY	$142,982	24	79
RI	LITTLE COMPTON	$493,290	18	78
NY	HAMPTON BAYS/SHINNECOCK	382643	48	77
VA	HAMPTON	$37,898	27	74
VA	NEWPORT NEWS	$51,277	35	69
VA	CHINCOTEAGUE	$486,644	34	68
VA	SEAFORD	$49,107	11	64

Table 51 Ports Where Most Vessels Fished in the SMA in 2008

Table 52 shows ports with the largest percentage of vessels who fish only in the NMA: Port Clyde and Portland, ME; Provincetown, Scituate and Gloucester, MA and Seabrook and Rye, NH.

ST	PORT	Monk value	vessels landing monk	% vessels fishing only in NMA
ME	PORT CLYDE	$36,544	21	81
MA	PROVINCETOWN	$8,220	10	80
MA	SCITUATE	$229,971	18	78
NH	SEABROOK	$45,124	26	77
NH	RYE	$64,885	17	76
ME	PORTLAND	$1,132,564	70	67
MA	GLOUCESTER	$3,035,899	143	63

Table 52 Ports where most vessels fished in the NMA in 2008

Table 53 shows differences in area usage across permit categories. Greater than 80% of vessels with a permit category A, B. or H fished solely in the SMA. Between 50% and 80% of vessels with permit category C or D fished in both FMAs. Only 20% to 25% of vessels with either category D or H fished only in the NMA.

Permit Category	% vessels fishing in NMA only	% vessels fishing in SMA Only	% vessels fishing in both FMAs
A	0%	**87%**	13%
B	0%	**89%**	11%
C	6%	22%	**72%**
D	23%	23%	**54%**
E	21%	53%	27%
H	0%	**100%**	0%

*Calculated from data in the Economic Impacts section.

Table 53 Differences in fishery management area usage by Permit Category*

4.5.2.9 Monkfish Vessel Involvement in other Fisheries

Involvement in other fisheries can be measured either in terms of permits held or of fish caught. Given that limited access permits provide special privileges and usually indicate a larger dependence on the fishery, the permits discussion will focus on monkfish limited access permitted vessels only, and other limited access permits held by these vessels. For landings and revenue all vessels landing monkfish are included, because here the involvement is actual rather than potential.

In 2008 there were 758 vessels with a limited access Monkfish permit (Table 54). Of these, most held permits in a variety of other Northeast fisheries. This is a common pattern for all Northeast vessels, which tend to acquire and retain limited access permits even in fisheries in which they are not active in order to maintain as many options as possible. Fifty percent or more of vessels with a Monkfish limited access permit also held limited access permits for: lobster (68%), multispecies (73%), or summer flounder (62%). Other limited access permits held were for scup (42%), black sea bass (37%), squid/mackerel/butterfish (29%), or scallops (24%).

No. MF Permits	Lobster	Multi-species	Summer Flounder	Scup	Black Sea Bass	Squid/ Mackerel/ Butterfish	Scallop	Tilefish	Ocean Quahog	Red Crab
758	633	555	473	315	283	217	181	10	0	0
	84%	73%	62%	42%	37%	29%	24%	1%	0%	0%

Table 54 Number and Percent of Most Common Limited Access Permits Held by Limited Access Monkfish Permit Holders

There was also a pattern by type of limited access permits (see Section 4.5.1.1). Vessels with monkfish C or D permits were significantly more likely to hold another limited access permits than were those with monkfish A or B permits. (C and D permitted vessels also have a differential pattern of DAS usage (Table 55). (For more detail see Section 4.5.1.3)

Permit Category	Number of Active Vessels	DAS Allocated	Percent of allocated DAS that were Used
A	15	455	83%
B	36	1,091	79%
C	94	2,848	60%
D	124	3,757	61%
H	7	212	48%
TOTAL	**276**	**8,363**	**64%**

Table 55 DAS Allocation and Usage across Monkfish Permit Categories in 2008

When considering actual landings and revenue by all vessels landing monkfish (see Table 32 and Table 33), the most important species by revenue was scallops which are mostly caught by dredge. Next most common is a combined category of OTHER which includes a wide variety of species, including summer flounder, black sea bass, scup and squid/mackerel/butterfish. The third most common is multispecies, mostly caught by dragger and gillnet. The fourth most common is monkfish. This happens because these data are from ALL vessels that land any monkfish, not just monkfish limited access permit holders. There were 2,156 open access monkfish permit holders in 2008, although only 504 of these vessels landed some monkfish. There is a significant interrelationship between the monkfish, scallop and multispecies fisheries as shown in Section 4.5.1, and as such, regulatory changes in one FMP frequently affect the others.

5.0 Environmental Consequences of the Alternatives

5.1 Biological Impacts of Alternatives on Monkfish, Non-target Species and Protected Species

The following section describes the biological impact of alternatives under consideration for Amendment 5.

5.1.1 Impact of Biological and Management Reference Points

Biological and management reference points and associated control rules are the foundation of the management plan, but do not, in and of themselves have an impact on biological resources since they are administrative in nature. MSY, OFL, ABC and OY are goals, or reference points indirectly used as the basis for setting catch limits and targets, but do not directly affect fishing effort patterns in the way that DAS allocations, trip limits, gear restrictions and other management measures do. For this reason, both the no action alternative (which is not compliant with the MSRA and NS1 Guidelines) and the proposed reference points and control rules are neutral with respect to direct biological impacts on target, non-target and protected species. Indirectly, however, these reference points may impact those species in a positive way through improved management of the fishery at sustainable levels.

5.1.2 Impact of ACL and AMs

The ACLs are reference points that, in conjunction with the AMs, do have an impact on management measures. Exceeding the ACLs will trigger an automatic, reactive accountability measure. In that sense, ACLs could have a biological impact.

5.1.2.1 Alternative 1 – No Action

Under the no action alternative, there are no ACLs or accountability measures. This alternative would be out of compliance with the MSRA and NS1 Guidelines. Under the no action alternative, current target TACs, and the associated DAS and trip limits, would remain in effect. Since current target TACs are lower than ACTs proposed as proactive AMs, the no action alternative might be viewed as relatively more conservative than the ACT alternatives under consideration, at least for the target species. This perspective may not be entirely accurate, however, since there are no automatic adjustments or other accountability measures if the target TAC is exceeded. Thus, the current target TACs may have no positive biological impacts on monkfish, especially since the target TACs were exceeded in the SMA years in a row under existing measures.

Furthermore, since monkfish is above the biomass target, restricting effort unnecessarily may have indirect negative impacts on other fisheries as a result of effort shifting out of the monkfish fishery when DAS allocations are exhausted. If the effort shifts into other fisheries that have a greater interaction with protected species that is not fully mitigated by measures within those fisheries or by plans implemented under the ESA or MMPA, then there is a potential negative, but indirect, impact on protected resources under the no action alternative, if such circumstances exist currently or arise in the future.

5.1.2.2 Alternative 2 – Preferred Alternative - ACLs and AMs

5.1.2.2.1 ACLs

Being a reference point, not an actual management measure, the ACLs, *per se*, would not have a biological impact. Given that the proposed ACLs are set to prevent overfishing with consideration given to the scientific uncertainty in the estimate of the OFL and other scientific uncertainty, the ACLs would have a positive biological impact on monkfish, especially when viewed in the context of the AMs, which are management measures affecting fishing effort that are designed to prevent or react to exceeding the ACL. The impact of the ACL on non-target species and protected species is likely to be neutral or positive since it will provide a stricter control, in combination with the associated AMs, on monkfish fishing effort than the current system.

5.1.2.2.2 Reactive AM

The Councils propose that if the ACL in a management area is exceeded in a given year, the overage would be deducted on a pound-for-pound basis from the ACT, and adjustments to management measures would be developed either by the Councils or, if the Councils do not take appropriate action, by the NMFS Regional Administrator. These adjustments would be to either DAS allocations or trip limits based on the reduced ACT. Since the reactive AM is designed to respond to exceeding the ACL, if invoked, it will have a positive biological impact on monkfish in that it will prevent catches from exceeding the OFL in the future, if it results in permanent modifications to DAS and trip limits, or other modifications to management measures to avoid exceeding the ACL. The existence of such controls on monkfish fishing effort will likely be neutral or positive for non-target species and protected species.

5.1.2.2.3 Proactive AMs (ACT)

The ACT alternatives under consideration are the basis for setting trip limits and DAS allocations for the directed fishery, after accounting for discards and incidental monkfish catch. The Councils' intent is to provide a buffer so that the ACL is not exceeded due to management uncertainty. Management uncertainty results from a number of factors, principally that the assumptions on which the DAS and trip limit model are based would be violated in the future. These assumptions include, but are not limited to, that the incidental catch of monkfish by either limited access vessels not on a monkfish DAS or Category E vessels, state-only permitted vessels and unknown category vessels will be the same in FY2011-FY2013 as they were in FY2008 and FY 2007. The model also assumes that directed fishing effort patterns (on which the analysis is based) will be the same in the upcoming specifications period as they were in the most recent year.

5.1.2.2.3.1 NMA ACT Options

The Councils formally considered two ACT options for the NMA in the draft EA and public hearing process. The Councils identified Option 2 as the preferred alternative:

	TAL Increase	TAL (mt)	Discards (mt)	NMA ACT (mt)	Buffer ACL-ACT (mt)
ACT Option 1	50 %	7,500	563	8,063	9,980
ACT Option 2	**100 %**	**10,000**	**750**	**10,750**	**6,730**
ACL	**17,480 mt**				

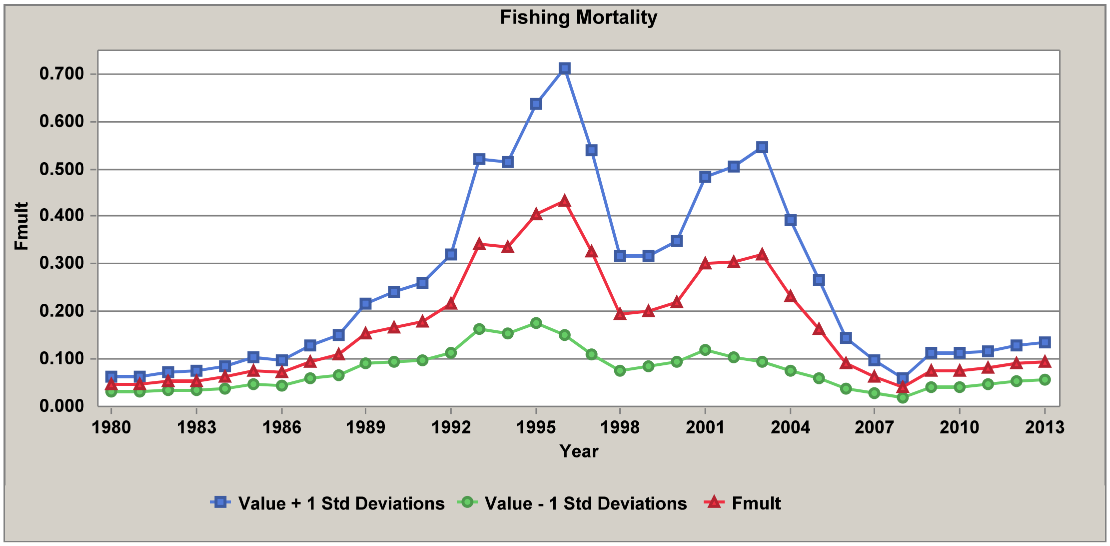
Option 1 provides a greater buffer between the ACT and ACL than Option 2. From a biological perspective, the lower the ACT, the more conservative or precautionary the management program would be for the target species, and the lower the risk would be that the ACL is exceeded. If the ACL is exceeded, the likelihood will be greater that overfishing may be occurring, depending on the degree of scientific uncertainty in the estimate of OFL. Option 1 and Option 2 are 35% and 47% of the point estimate of OFL, respectively. Since monkfish biomass is above the biomass target and fishing mortality is estimated to be substantially below the fishing mortality threshold, a greater degree of precaution may not be necessary, although these conclusions are based on a very uncertain assessment.

During the development of this amendment, the PDT conducted projections of the impact of catch at the two ACT options using the SCALE model that was used in the 2007 DPWG assessment. These results should be viewed with caution for several reasons. The model was first applied to monkfish in 2007 and was considered highly uncertain for reasons ranging from the relatively untested status of the model to the poor quality of some of the input data for monkfish. In addition, the model package was not configured to provide stochastic projections. The 'projections' shown here use the parameters estimated by the model in 2007 (from data through 2006) and assume a constant (average) recruitment for 2007-2013. The only updated data in the input set are the landings. Thus the model is not tuned to any conditions except landings since 2006.

The above caveats notwithstanding, the results shown in Figure 26 and Figure 27, for NMA Options 1 and 2, respectively, show rising fishing mortality rates and declining biomass under both options, with those changes being more pronounced under the higher Option 2. In both cases, however, biomass is projected to remain above the B_{target} of 92,200 mt, and the fishing mortality rate to be below $F_{threshold}$ of F=0.31.

Following the completion of a stock assessment in 2010, the PDT updated the projections of biomass growth and fishing mortality under the preferred ACT options. The PDT analysis uses a revised model (AGEPRO) and updated data (SCALE model) for the starting conditions, with landings and survey data through calendar year 2009. Since Amendment 5 will not take effect until 2011, the PDT assumed fishing mortality for 2010 to be equal to 2009, noting that the monkfish management measures have not changed.

As shown in Table 56 there is a zero probability that a catch of 10,750 mt will result in the biomass declining below the updated (2010) minimum biomass threshold, nor that overfishing will occur. The trend in biomass relative to the original (2007) and updated (2010) biomass reference points are shown in Figure 28 and Figure 29, respectively. Figure 30 shows the projected fishing mortality rate under the preferred alternative relative to the updated estimate of Fthreshold.



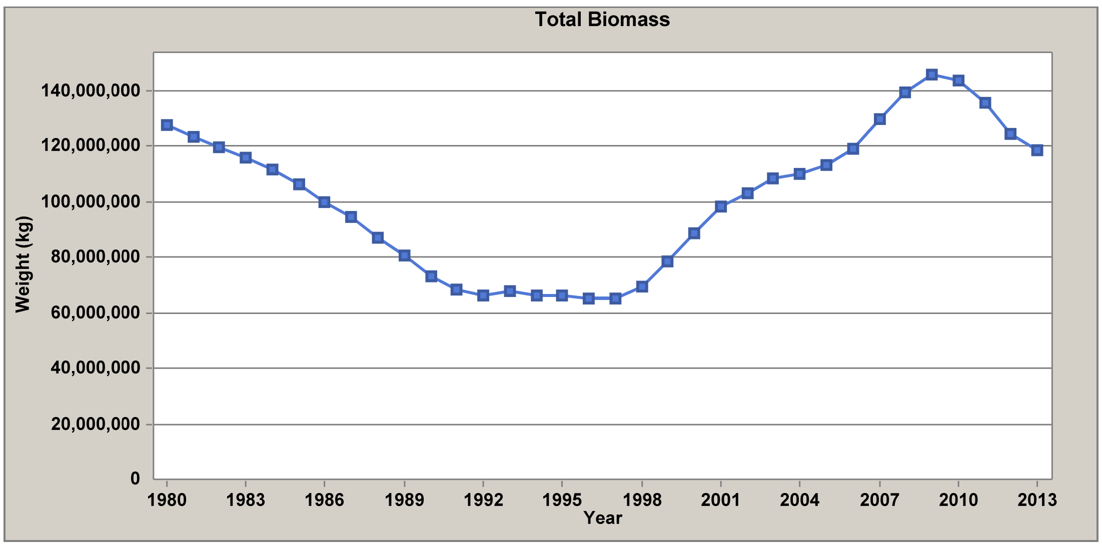


Figure 26 2007 SCALE model projection of NMA ACT Option 1, 8,063 mt, impact on fishing mortality rate and biomass through FY2013.

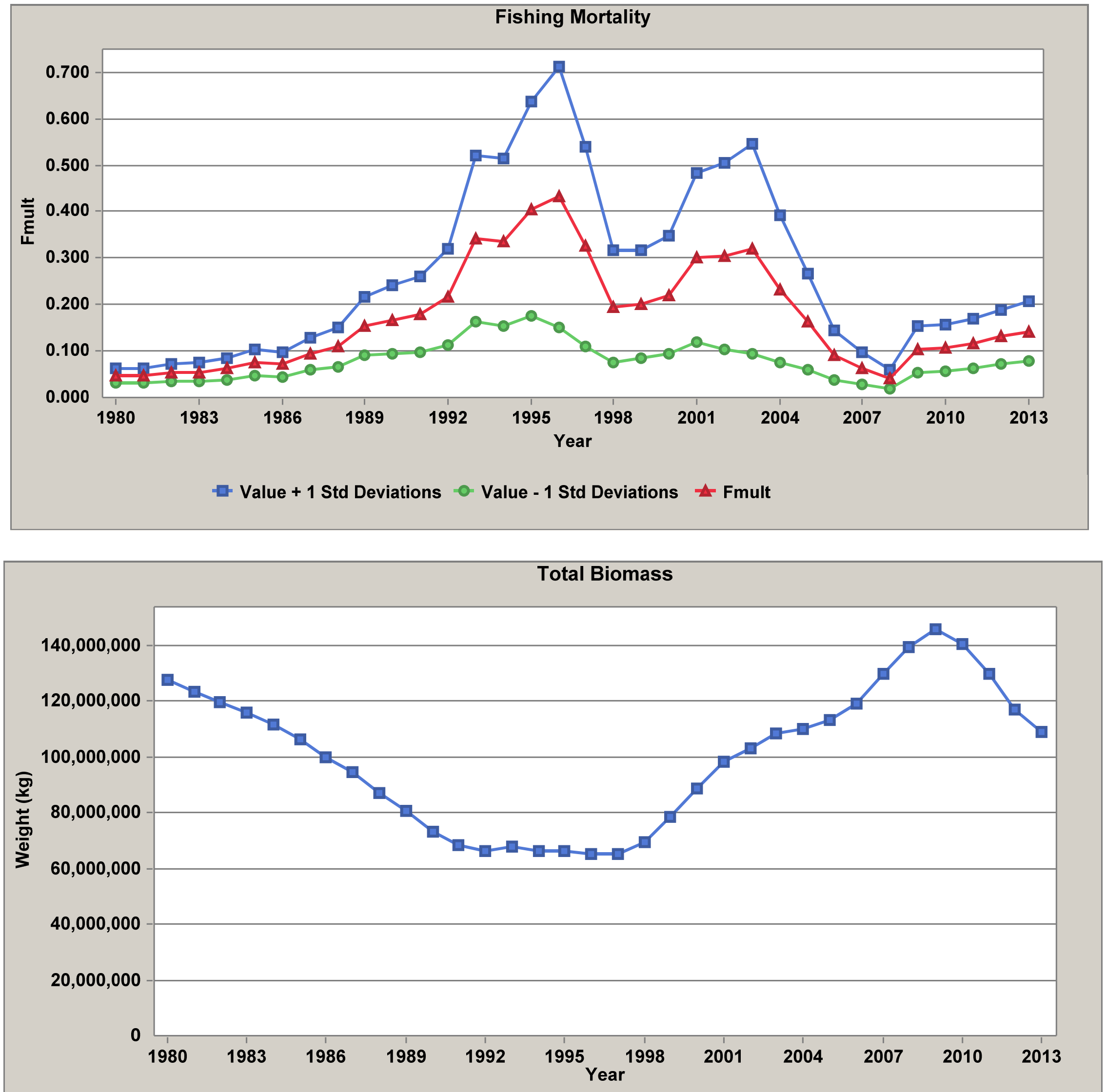


Figure 27 2007 SCALE model projection of NMA ACT Option 2, 10,750 mt, impact on fishing mortality rate and biomass through FY2013.

ACT Option 2

Year	F	Total Catch	Total Biomass	P < Bloss2006	P < Bloss2009	P > Fmax
2010	0.10	4,447	74,102	5%	0%	0%
2011	0.22	10,750	81,907	0%	0%	0%
2012	0.22	10,750	81,204	1%	0%	0%
2013	0.22	10,750	80,225	2%	0%	0%
2014	0.23	10,750	78,944	4%	0%	0%
2015	0.24	10,750	77,548	8%	0%	0%
2016	0.24	10,750	76,383	14%	0%	0%

Table 56 Updated Projection of NMA ACT Option 2, the preferred alternative, showing the probability of exceeding Fthreshold or biomass declining below Bthreshold, using both original 2006 values and updated 2009 Bloss values.

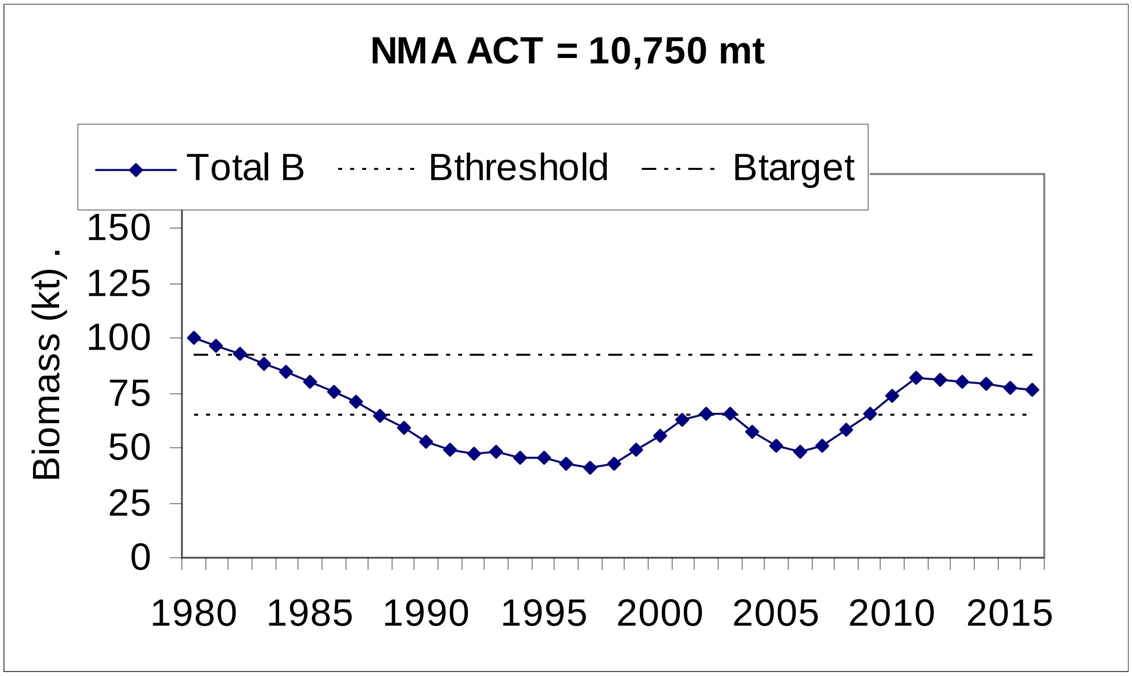


Figure 28 Updated Projection of NMA ACT Option 2, the preferred alternative, showing the trend in biomass through 2016, and 2007 biomass reference point values.

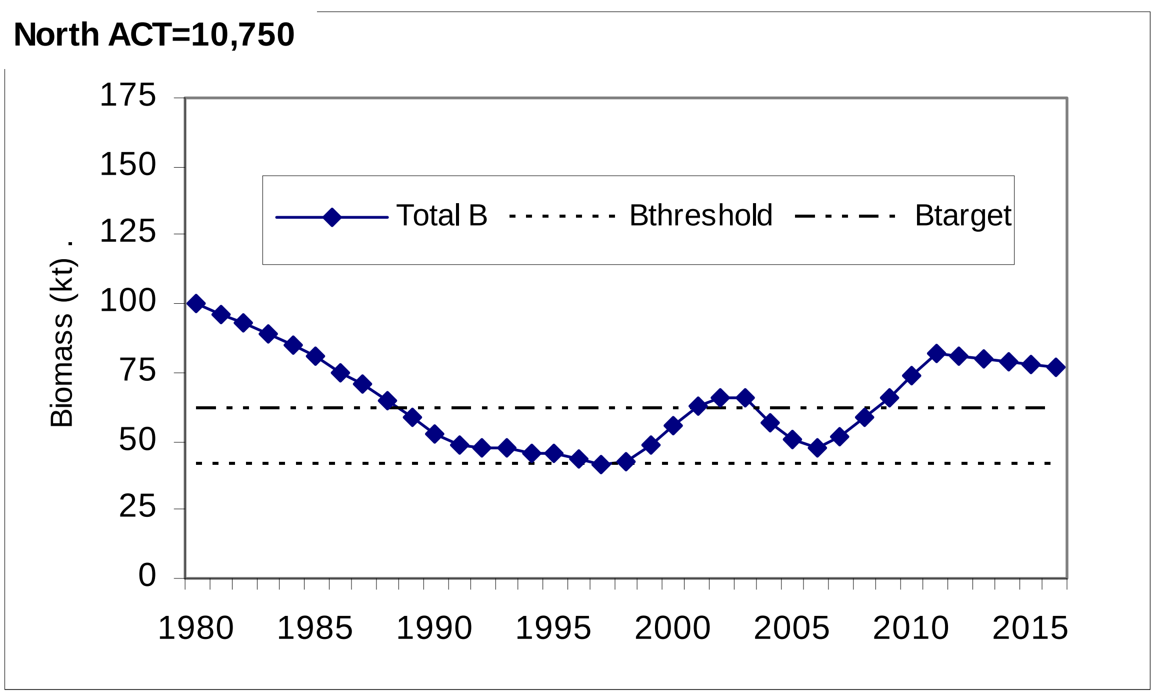


Figure 29 Updated Projection of NMA ACT Option 2, the preferred alternative, showing the trend in biomass through 2016, and biomass reference point values updated through 2009.

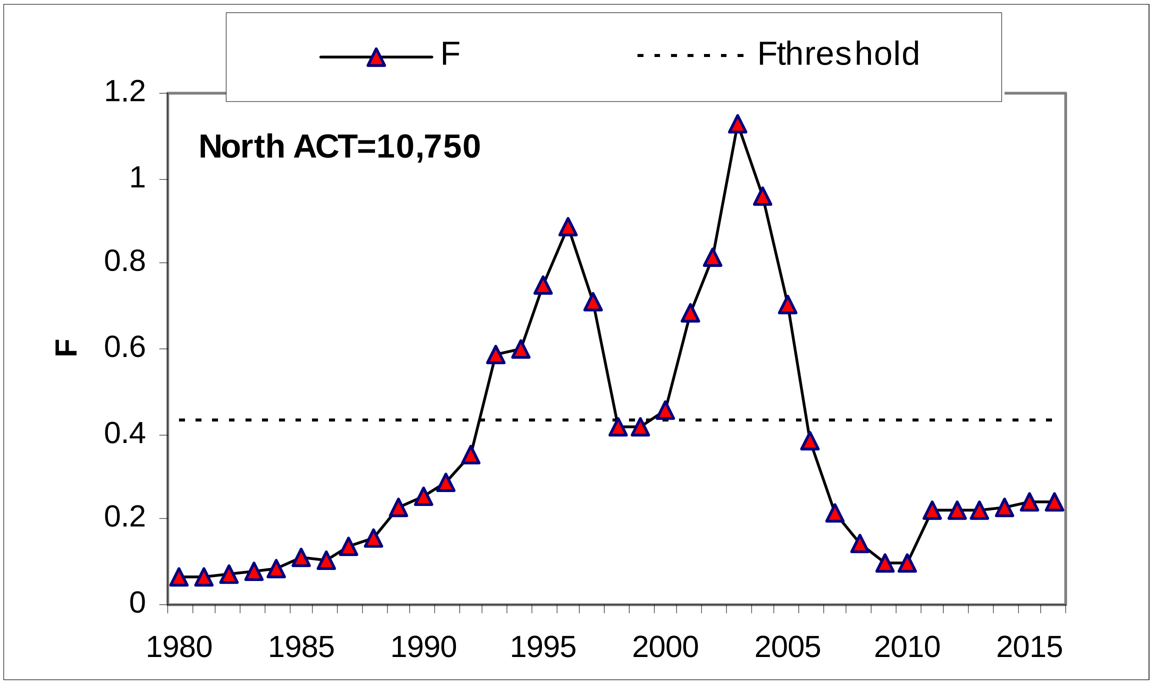


Figure 30 Updated projection of fishing mortality rates under NMA ACT Option 2, the preferred alternative, and the updated estimate of Fthreshold.

In terms of non-target species, a lower ACT would likely result in more effort shifting out of the monkfish fishery, with associated negative effects on other species, depending on the management measures in place to protect those species from overfishing, and the relative catch rates compared to the incidental catch of those non-target species in the monkfish fishery. In the NMA, the distinction between directed monkfish fishing with incidental catch of groundfish species such as grey sole, and directed groundfish fishing with incidental catch of monkfish is only made by the declaration of a monkfish DAS. In general, however, those two fisheries are otherwise indistinguishable, and a lower monkfish ACT may not materially impact groundfish fisheries through effort displacement.

Similarly, depending on the measures adopted in those other fisheries for minimizing protected species interactions and the gear types used in those fisheries, such effort shifts could result in either positive or negative protected species impacts. In the NMA, since the directed monkfish fishery is predominantly a trawl fishery, with relatively fewer protected species interactions, the higher ACT option could have a modestly positive effect on protected species if it results in an effort shift away from gillnet fisheries. If under the lower ACT option, effort shifts to other fisheries with higher rates of interactions such as the gillnet fishery, then this alternative could result in a negative, but indirect, impact to protected species.

5.1.2.2.3.2 SMA ACT Options

The Councils considered two ACT options for the SMA as shown below; Option 2 is the preferred alternative:

	TAL Increase	TAL (mt)	Discards (mt)	SMA ACT (mt)	Buffer ACL-ACT (mt)
ACT Option 1	40 %	7,140	2,071	9,211	3,346
ACT Option 2	**75 %**	**8,925**	**2,588**	**11,513**	**1,857**
ACL	**13,326 mt**				

As with the NMA ACT options, Option 1 provides a greater buffer between the ACT and ACL than Option 2. From a biological perspective, the lower the ACT, the more conservative or precautionary the management program would be for the target species, and the lower the risk would be that the ACL is exceeded. If the ACL is exceeded, the likelihood will be greater that overfishing may be occurring, depending on the degree of scientific uncertainty in the estimate of OFL. SMA Option 2 provides a very small buffer (219 mt, or 1.6% of the ACL) that increases the chances that the ACL would be exceeded, and, consequently, that overfishing could occur, even though the ACL is set well below the point estimate of OFL (53% of OFL). Option 1 and Option 2 are 32% and 46% of the point estimate of OFL, respectively, which is similar to the proportions in the NMA options.

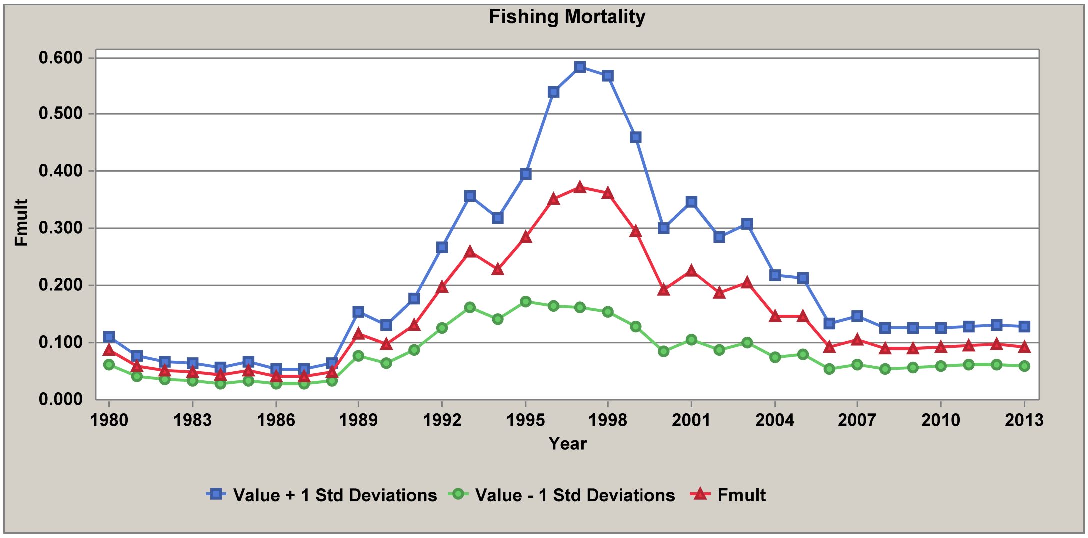
During the development of this amendment, the PDT conducted projections of the impact of catch at the two ACT options using the SCALE model that was used in the 2007 DPWG assessment. These results should be viewed with caution for several reasons. The model was first applied to monkfish in 2007 and was considered highly uncertain for reasons ranging from the relatively untested status of the model to the poor quality of some of the input data for monkfish. In addition, the model package was not configured to provide stochastic projections. The 'projections' shown here use the parameters estimated by the model in 2007 (from data through 2006) and assume a constant (average) recruitment for 2007-2013. The only updated data in the input set are the landings. Thus the model is not tuned to any conditions except landings since 2006.

The above caveats notwithstanding, the results shown in Figure 31 and Figure 32, for SMA Options 1 and 2, respectively, show fishing mortality rates essentially flat under Option 1 and rising moderately under Option 2. Under both options, biomass declines slightly for the first two years, and then increases slightly in the third year. In both cases, however, biomass is projected to remain above the B_{target} of 122,500 mt, and the fishing mortality rate to be below $F_{threshold}$ of F=0.40.

Following the completion of a stock assessment in 2010, the PDT updated the projections of biomass growth and fishing mortality under the preferred ACT options. The PDT analysis uses a revised model (AGEPRO) and updated data (SCALE model) for the starting conditions, with landings and survey data through calendar year 2009. Since

Amendment 5 will not take effect until 2011, the PDT assumed fishing mortality for 2010 to be equal to 2009, noting that the monkfish management measures have not changed.

As shown in Table 57 there is a slight (11 %) probability that a catch of 11,513 mt will result in the biomass declining below the updated (2010) minimum biomass threshold. Additionally, there is zero probability that overfishing will occur. The trend in biomass relative to the original (2007) and updated (2010) biomass reference points are shown in Figure 33 and Figure 34, respectively. Figure 35 shows the projected fishing mortality rate under the preferred alternative relative to the updated estimate of Fthreshold.



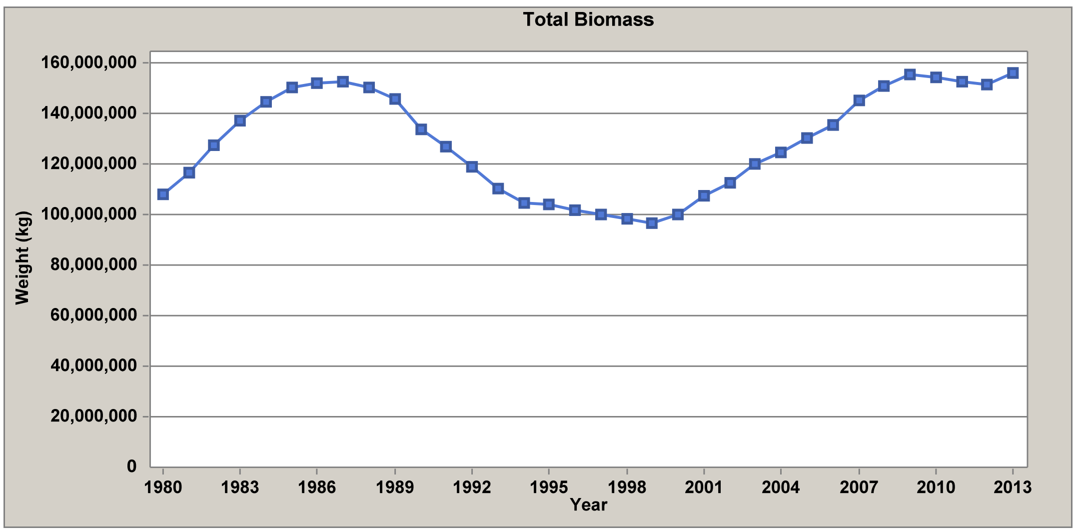
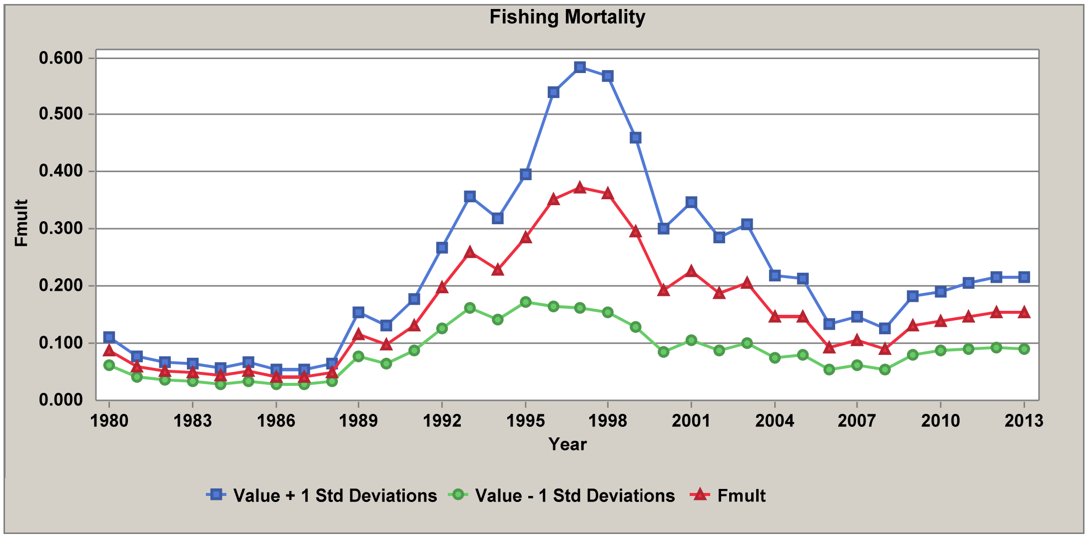


Figure 31 2007 SCALE model projection of SMA ACT Option 1, 9,211 mt, impact on fishing mortality rate and biomass through FY2013.



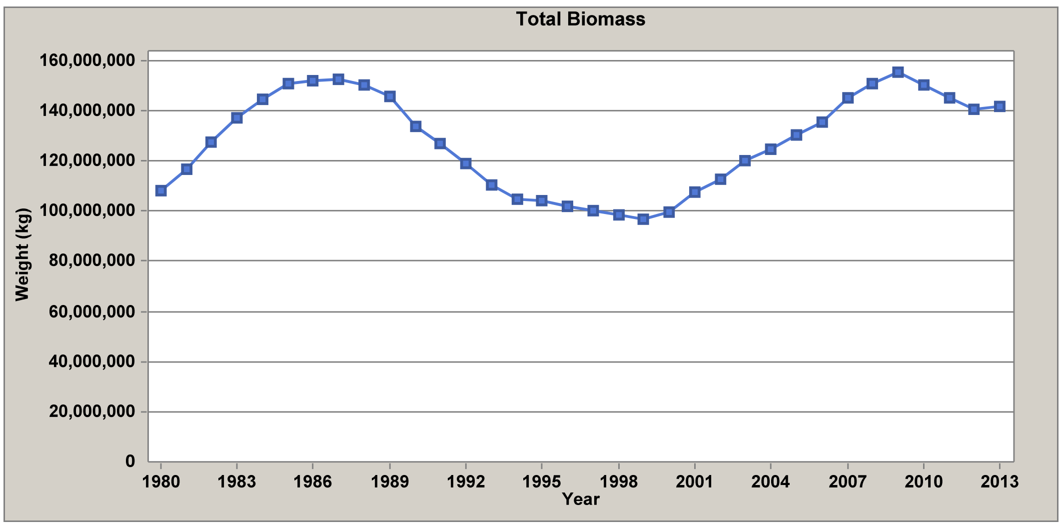


Figure 32 2007 SCALE model projection of SMA ACT Option 2, 11,513 mt, impact on fishing mortality rate and biomass through FY2013.

ACT

Year	F	Total Catch	Total Biomass	P < Bloss2006	P < Bloss2009	P > Fmax
2010	0.07	6,235	131,344	0%	0%	0%
2011	0.13	11,513	132,243	0%	0%	0%
2012	0.14	11,513	126,295	0%	0%	0%
2013	0.15	11,513	121,055	1%	1%	0%
2014	0.16	11,513	116,674	2%	4%	0%
2015	0.17	11,513	113,979	5%	8%	0%
2016	0.17	11,513	113,777	7%	11%	0%

Table 57 Updated Projection of SMA ACT Option 2, the preferred alternative, showing the probability of exceeding Fthreshold or biomass declining below Bthreshold, using both original 2006 values and updated 2009 Bloss values.

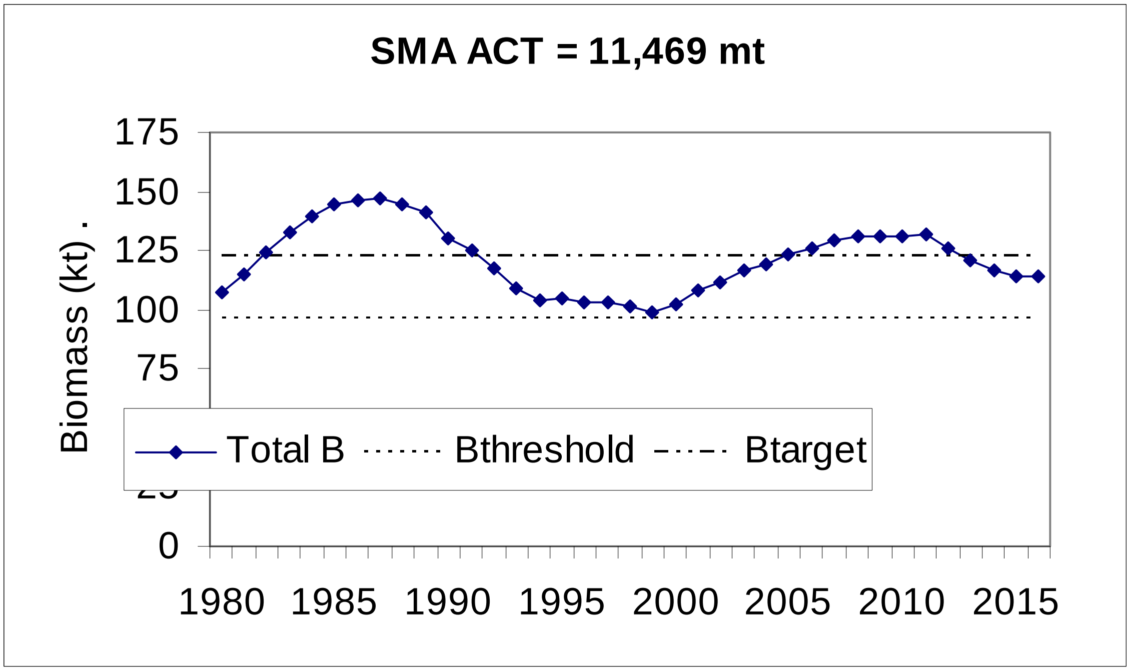


Figure 33 Updated Projection of SMA ACT Option 2, the preferred alternative, showing the trend in biomass through 2016, and 2007 biomass reference point values.

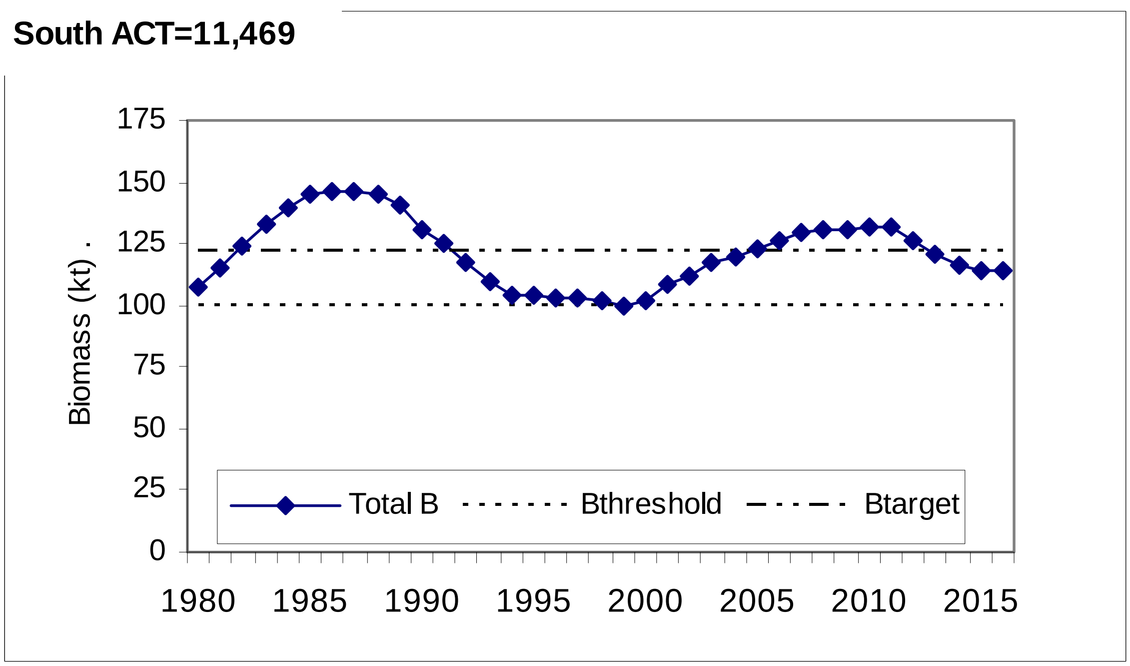


Figure 34 Updated Projection of SMA ACT Option 2, the preferred alternative, showing the trend in biomass through 2016, and biomass reference point values updated through 2009.

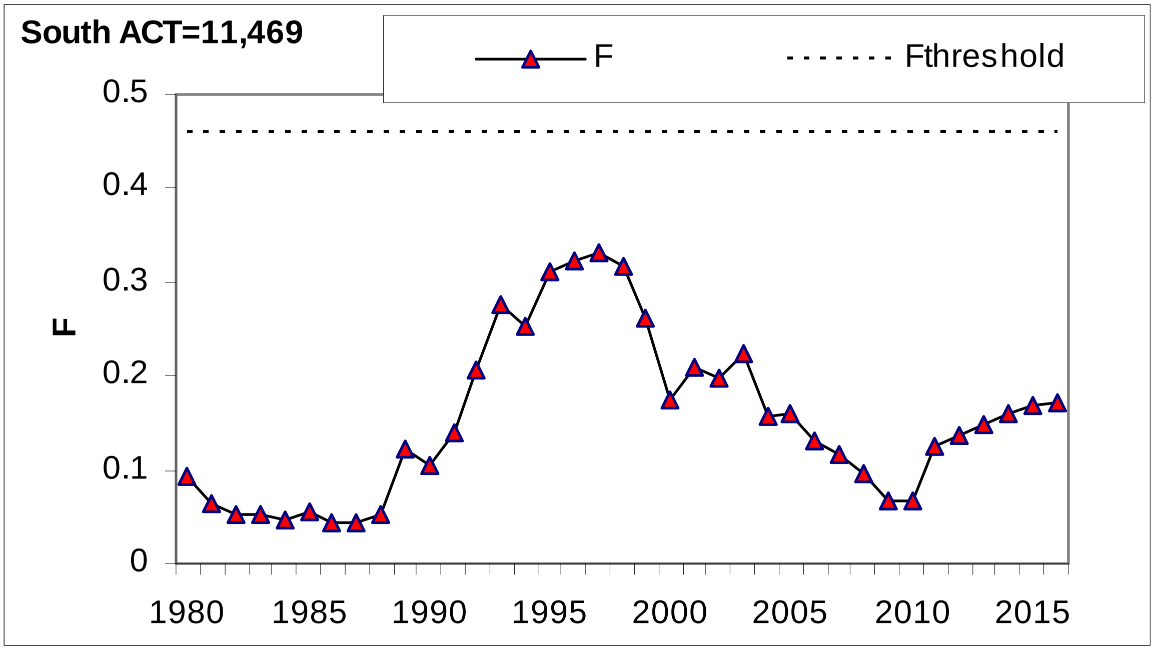


Figure 35 Updated projection of fishing mortality rates under SMA ACT Option 2, the preferred alternative, and the updated estimate of Fthreshold.

In terms of non-target species, the big difference between NMA and SMA fisheries is that in the SMA, the relationship between groundfish and monkfish fisheries is much less integrated. The directed monkfish fishery in the SMA has very little interaction with groundfish species, and it is clearly a directed fishery with incidental catch comprising mostly skates and dogfish. Therefore, a higher ACT option (and associated management measures) could likely result in increased incidental catch of those species, but, on the other hand, a lower ACT would likely result in vessels shifting effort into directed fisheries on those or other regional fisheries. Whether that effort shift has a net negative or positive effect depends on the species targeted and the management measures in place to prevent overfishing of those species in their respective FMPs. It should be noted that by 2012 all fisheries will be managed with ACLs to prevent overfishing and AMs, so the overall biological impact of effort shifts will be mitigated by those controls.

In terms of protected species, the same considerations exist as described in the impact discussion for the NMA ACT options. Given the higher ACT (Option 2) and increases in associated management measures, there is a good likelihood that gillnet effort could increase slightly having a moderately negative impact on protected species. Furthermore, the higher the ACT, the less effort will likely be displaced into other fisheries. Depending on the relative interaction of gear with protected species in those fisheries, compared to that in the directed monkfish fishery in the SMA, the impact on protected species could be negative or positive. Actions being proposed or taken to protect sea turtles, harbor porpoise and large whales will mitigate much of the impact of the fisheries (both the directed monkfish fishery and other fisheries in the region) on protected species.

5.1.3 Impact of DAS and Trip Limits Alternatives

5.1.3.1 NMA DAS and trip limit options

The Councils considered three DAS/trip limit options for each of the two NMA ACT options discussed above. The basis for these options is to maintain current DAS allocations (i.e., no action on DAS), and adjust the trip limit (to account for the increase TAL), maintain current trip limits (i.e., no action on trip limits) and increase DAS, or a combination. The DAS allocations range from 31 to 45 under ACT Option 1, and 31 to 51 under ACT Option 2. Trip limits for permit categories A&C are 1,250 lbs., tail wt. per DAS for all options (same as no action), since that is the highest observed average daily landings during the base year, and appears from the data to not constrain catches. Trip limits for permit categories B&D range from 470 lbs. tail wt. per DAS (same as no action), to 700 lbs., tail wt. per DAS, under ACT Option 1, and 470 lbs., tail wt. per DAS to 950 lbs., tail wt. per DAS under ACT Option 2. For the NMA, there are no options proposed that would result in the same trip limit/DAS combination currently in effect. The preferred NMA option is option 2c, with 40 DAS and trip limits of 1,250 lbs, and 800 lbs. (Categories AC and BD, respectively)

Since all of these options are designed to achieve the respective ACT option, they are probably equivalent with respect to impacts on monkfish, and are consistent with the preventing overfishing, as determined by the ACL. In some cases a higher trip limit may reduce discards, although this potential is somewhat mitigated by the proposal (see below) to allow vessels to land an overage of one-day’s limit and have the DAS account adjusted accordingly. Based on landings data for 2007 and 2008, however, even the lowest trip limits do not appear to be constraining on monkfish trips.

In terms of impacts on non-target species, the options to retain the existing 31 DAS allocation will likely have no effect. Those options that increase the DAS allocation imply a proportionally greater amount of bycatch resulting from the increased fishing effort, particularly of skates and dogfish, possibly resulting in negative biological impacts to these species. The magnitude of these potential impacts is uncertain but could be substantial given the 64 % increase in DAS under Option 2B. Under the MSRA mandate, for ACLs and AMs, both skates and dogfish catch will be monitored and accounted for under the provisions of their respective FMPs. Additionally, more opportunity to direct effort on monkfish reduces the incentive to fish in other fisheries (such as summer flounder, sea scallop, etc.), resulting in a potential positive biological impact to those fisheries.

Similarly, there are no anticipated impacts to protected species resulting from maintaining the existing DAS allocation under Options 1A and 2A. However, increases in fishing effort resulting from a higher DAS allocation under Options 1B, 1C, 2B, and 2C could have a negative impact on protected species as a result of increased potential for interactions, depending on the time of year and areas in which these additional DAS are utilized.

5.1.3.2 SMA DAS and trip limit options

As with the NMA options discussed above, the Councils are considering three DAS/trip limit options for each of the two SMA ACT options. The basis for these options is to maintain current DAS allocations (i.e., no action on DAS), and adjust the trip limit (to account for the increase TAL), maintain current trip limits (i.e., no action on trip limits) and increase DAS, or a combination. Current, no action, DAS are 23 in the SMA. The DAS allocation options range from 15 to 23 under ACT Option 1, and 23 to 28 under ACT Option 2. Trip limits for permit categories A&C are either 550 (i.e., no action) or 700 lbs. tail wt. per DAS under both ACT Options. Trip limits for permit categories B&D are either 450 (i.e., no action) or 600 lbs. tail wt. per DAS under both ACT Options. The preferred alternative is Option 2B, with no change to trip limits but an increase in DAS from 23 to 28.

Since all of these options are designed to achieve the respective ACT option, they are probably equivalent with respect to impacts on monkfish, and are consistent with the preventing overfishing, as determined by the ACL. In some cases a higher trip limit may reduce discards, although this potential is somewhat mitigated by the proposal (see below) to allow vessels to land an overage of one-day's limit and have the DAS account adjusted accordingly. Based on landings data for 2007 and 2008, however, even the lowest trip limits do not appear to be constraining on monkfish trips.

In terms of impacts on non-target species, those options with less DAS imply that the potential for interaction with other species will be lower; more DAS implies a greater amount of bycatch, particularly of skates and dogfish. Thus, this action may have a slightly positive or negative impact on non-target species depending on the option chosen. The options that do not change the DAS allocation are expected to have no effect compared to the no action alternative. However, more opportunity to direct effort on monkfish reduces the incentive to fish in other fisheries. Given that all managed fisheries will be governed by ACLs and AMs in the near future, such effort shifts are not likely to have a substantial biological impact on those other fisheries.

Similarly, if fewer monkfish DAS allocations results in effort shifting to other fisheries that have known interactions with protected species, the potential exists for a negative indirect impact of those options on protected species, to the extent protected species interactions are not fully mitigated by measures within those fisheries or by plans implemented under the ESA or MMPA, if such circumstances exist currently or arise in the future. Additionally, the SMA options that maintain the existing DAS allocation of 23 DAS (Options 1A, 1B, 2A and 2C) will likely be neutral with respect to impacts on protected species compared to the no action alternative, whereas the option to reduce the DAS allocation to 15 DAS (Option 1C), may have a slightly positive effect. Conversely, the option that increases the SMA DAS allocation to 28 DAS (Option 2B) could have a negative impact on protected species, depending on the time of year and areas in which these additional DAS are utilized.

5.1.4 Impact of other adjustments to the DAS and trip limit management program

5.1.4.1 Automatic DAS Adjustment for Trip Limit Overage

5.1.4.1.1 Alternative 1 - No Action

Under this alternative, vessels that exceed the trip limit applicable to the amount of time away from port may not return to port until sufficient time has elapsed or discard the overage. In the case of vessels fishing with gillnets, when a vessel reaches its trip limit, before hauling through all its gear, it may leave the remaining nets in the water without clearing them, resulting in product quality declines and subsequent discards. Not only does this circumstance cause unnecessary discards, but it also results in vessels fishing for a longer time over the course of the year to use up their DAS allocations. Besides the monkfish discards that occur, there is increased opportunity for incidental catch of other species, such as skates, dogfish, and, in the NMA in particular, some groundfish species. For vessels that use gillnets, the longer the gear is in the water, the greater the chance is that there will be protected species interactions, depending on the location and time of year. Overall, the magnitude of those impacts (monkfish discards, incidental catch and protected species interactions) depends on the frequency of overages, and how much more effort results from not "charging" vessels' DAS accounts for those overages. Based on landings data for 2007 and 2008, this problem occurs mostly in the SMA, where vessels are landing the trip limits, or very close, on most trips.

5.1.4.1.2 Alternative 2 – Preferred Alternative - Automatic DAS Adjustment for Trip Limit Overage

Under this proposal, a vessel may exceed the applicable trip limit in the amount equivalent to one day's trip limit. The vessel's DAS account balance would be adjusted accordingly under one of three options: charging either 30 hours (Option 1), 24 hours (Option 2, the preferred option), or one minute (Option 3) to the last day or partial day (counting the partial day as a full day) of the trip. All three options would have a positive effect on the target species compared to taking no action by reducing regulatory discards and better matching effort counted to actual catch (rather than landings), In other words, these options reduce monkfish effort by reducing allocated effort in the amount corresponding to the monkfish caught rather than monkfish landed (to the extent the trip limit causes the discards, rather than other factors such as small size or product quality). Option 2 is the most conservative and Option 3 is the least conservative with Option 1 in the middle.

In terms of non-target species and protected species, the net result depends on several factors. If the resulting monkfish effort "reduction" causes vessels to expand their efforts in other fisheries where the interaction with protected species is greater, then these options could have an indirect, but negative effect. On the other hand, if the interaction with protected species in those other fisheries is less than that in the directed monkfish fishery, the impact of these options would be positive. If those other directed fisheries target species that are already incidentally caught in the directed monkfish fishery, then there could be a net increase in catch of those species. Whether or not that impact will be negative depends on the status of those species and the management measures in place to control fishing effort, as well as the relative size of the directed catch compared to what would be caught incidentally in the monkfish fishery. To the extent that this proposal will reduce the amount of time that gear is in the water (since it will accelerate the rate at which DAS are used), it will likely have a moderately positive impact on protected species.

5.1.4.2 Category C and D permit GF DAS Usage

5.1.4.2.1 Alternative 1 – Preferred Alternative - No Action

Currently, monkfish Category C and D vessels with a multispecies permit are required to use a multispecies Category A (groundfish) DAS in conjunction with a monkfish DAS until all of the vessel's multispecies DAS allocation are used up, at which point the vessel can fish on a monkfish-only DAS. The original intent of this requirement was to restrict the ability of vessels to increase overall effort by fishing monkfish DAS separately from groundfish DAS while still having an incidental or component catch of groundfish. This no-action alternative does not change the amount of monkfish effort or groundfish effort allocated to each vessel, but it might indirectly reduce the amount of effort targeting monkfish since vessels fishing on a monkfish-only DAS in the NMA are required to fish in a groundfish exempted fishery. There is only one seasonal exempted monkfish fishery in the NMA, and it only applies to gillnets. Therefore, trawl vessels (which are the predominant gear in the NMA monkfish fishery) with fewer groundfish DAS than monkfish DAS would not be able to use their full allocation of monkfish DAS in the NMA. The full effect of this depends on whether the Councils adopt the proposal described below to eliminate the groundfish DAS usage requirement for vessels in groundfish sectors. If that proposal is adopted, then the impact (the indirect reduction on monkfish effort) would only apply to Category C and D vessels fishing in the common pool under the Multispecies FMP.

To the extent that groundfish species are not available to vessels at the time they begin to target monkfish, requiring the vessel to utilize a groundfish DAS in order to be able to fish for monkfish, under the no action alternative could be viewed as indirectly positive for groundfish species, since allocated groundfish DAS would be used up without being used to target groundfish. This impact on non-target species would be greater in the SMA, where the directed groundfish fishery is primarily a winter fishery, taking place after most vessels have utilized their groundfish DAS while fishing for monkfish during the spring and early summer. This indirect approach, however, is not the appropriate way to control groundfish effort. Furthermore, vessels could delay fishing on a monkfish DAS until groundfish are available, which would negate the effort reduction described above.

The impact of the no action alternative on protected species, and the proposed action are equivalent (neutral) since there is no overall change in the amount of monkfish or groundfish effort allocated.

5.1.4.2.2 Alternative 2 – Category C and D permit Groundfish DAS Usage

This alternative would allow vessels to choose when they declare a monkfish-only DAS or a combined monkfish/groundfish DAS. Since vessels are required to use the same mesh size (10-inch mesh or larger) whether they are under a monkfish-only DAS or a combined monkfish/groundfish DAS, this action would not likely change protected species impacts. Similarly, this action would not result in a change in overall allocated monkfish effort, so the alternative is neutral with respect to impacts of the fishery on target species and protected species. In terms of non-target species, if vessels are able to increase their catch of groundfish because they can elect to use their combined DAS when groundfish species are more available to them, rather than simply burn the DAS without being able to catch groundfish, then this alternative could be considered to have an indirect negative impact on groundfish species. This possible effect is somewhat mitigated, however, by the establishment of ACLs and AMs, as well as increased monitoring in the groundfish fishery. The real impact, however, depends on whether the multispecies FMP appropriately allocates DAS to the level that the groundfish fishery can sustain. If the allocations are appropriate, then the impact of enabling vessels to use those DAS to target groundfish would be neutral.

5.1.4.3 Monkfish Vessels in Groundfish Sectors - GF DAS usage requirement

5.1.4.3.1 Alternative 1 – Preferred Alternative - No Action

With no change to the current rules, monkfish category C and D vessels that enroll in groundfish sectors would be required to use a groundfish DAS when fishing on a monkfish DAS, even though the sector rules do not require member vessels to use groundfish DAS. If the sector operations plans do not require vessels to use groundfish DAS, then the requirement to use a groundfish DAS on a monkfish DAS is merely an administrative requirement under the Monkfish FMP, with no impact on fishing effort , and, thus, no impacts on target species, non-target species or protected species.

5.1.4.3.2 Alternative 2 – Eliminate Groundfish DAS usage requirement

Alternative 2 proposes to eliminate the groundfish DAS usage requirement for Category C and D vessels enrolled in a groundfish sector. As discussed under the no action alternative, when groundfish vessels are no longer required to use groundfish DAS, this change becomes a purely administrative one that will not have any effect on either groundfish effort or monkfish effort. Therefore, this alternative is neutral with respect to impacts on target species, non-target species and protected species.

5.1.5 Changes to the RSA Program

5.1.5.1 Carryover RSA DAS

When the Councils initiated this amendment, vessels were prohibited from carrying over allocated, but unused RSA DAS. On March 13, 2010, NMFS published a final rule for a technical amendment to the FMP that allowed vessels to carryover unused RSA DAS to the subsequent year, so the Councils terminated further consideration of this provision.

5.1.5.2 Allow Changes to RSA Program by Framework Adjustment

5.1.5.2.1 Alternative 1 – No Action

Currently changes to the RSA program must be done through a plan amendment. This is an administrative provision with no biological impact.

5.1.5.2.2 Alternative 2 – Preferred Alternative - Allow Changes to RSA Program by Framework Adjustment

The Councils propose allowing changes to the RSA program be done by framework adjustment. Whether such changes are done through a plan amendment (under no action) or through a framework adjustment, the impact of those changes would need to be analyzed and discussed in the accompanying environmental documents. Since this is purely an administrative change, it is neutral with respect to impacts on target species, non-target species and protected species.

5.1.6 Mandatory VMS

5.1.6.1 Alternative 1 – Preferred Alternative - No Action

Currently, monkfish limited access vessels are not required by the FMP to have a VMS. All category C and D vessels, in fact, are required to have a VMS under the terms of either the Northeast Multispecies FMP or Atlantic Sea Scallop FMP. There are approximately 65 vessels in categories A, C and H, out of a total of 758 limited access permits. VMS requirements are for administrative and enforcement purposes and, as such, do not have any direct biological impact on target species, non-target species or protected species.

5.1.6.2 Alternative 2 – Mandatory VMS

The Councils considered requiring all monkfish limited access vessels to have an operational VMS while on a monkfish DAS. As noted above in the discussion of the no-action alternative, this is an administrative change with no direct biological impact. To the extent VMS improves enforcement or precision in estimates of the distribution of effort, there could be a moderately positive indirect impact on monkfish, non-target species, or protected species compared to taking no action.

5.1.7 Allow landing of Monkfish Heads

5.1.7.1 Alternative 1 -1 No Action

Current regulations allow monkfish to be landed whole or as tails, with a provision for allowing and counting landings of monkfish livers. Conversion factors are used to scale up these product forms to live weight equivalents in the landings database. In recent years a market has developed for monkfish heads, but there is no provision for considering the landing of detached monkfish heads in the landings database. Vessels that want to land monkfish heads must leave them attached to the body. If a vessel lands monkfish as tails only, it must discard the heads. Since the fish are already dead and accounted for when the tails are retained, whether or not the head is landed, the impact on monkfish, non-target species, and protected species of the no-action alternative is neutral.

5.1.7.2 Alternative 2 – Preferred Alternative - Allow landing of Monkfish Heads

The Councils propose allowing vessels to land unattached monkfish heads provided the total weight of the heads does not exceed 2.32 times the total weight of tails on board. Since the proposal limits the amount of detached heads that can be landed to that which would correspond to the amount of tails that are already going to be landed, there is no new opportunity for vessels to increase fishing effort under this alternative. Those heads would otherwise simply be discarded. As a result, there is no direct impact to monkfish, non-target species, or protected species associated with this alternative.

5.2 Habitat Impacts

The overall effect of the fishery on EFH was analyzed and mitigated for in Amendment 2, and in Multispecies Amendment 13. Bottom trawling for monkfish was determined to adversely affect EFH for other demersal species managed by the NEFMC and MAFMC, but not monkfish EFH. The fishery must continue to respect the 2,811 square nautical miles of habitat closed areas established by the Multispecies Amendment 13 as well as the Oceanographer and Lydonia Canyon closures adopted in Monkfish Amendment 2. Monkfish fishing effort will continue to occur in areas that are already open to bottom tending mobile gears or by gears that have been determined to not adversely impact EFH in a manner that is more than minimal and less than temporary in nature.

Most of the alternatives under consideration in this action will not directly increase monkfish effort in either management area, since they are administrative in nature, or otherwise do not affect the magnitude or distribution of fishing effort. Specifically, the alternatives under consideration that are not likely to affect monkfish fishing effort and commensurate impacts of the fishery on EFH include:

- statement or establishment of the biological and management reference points under the MSRA mandate;
- establishment of ACLs and accountability measures;
- the automatic DAS adjustment for trip limit overages (may actually result in a reduction in effort for a given level of catch by reducing bycatch);
- allowing C and D permit category vessels with multispecies permits to choose when to use their groundfish DAS in conjunction with their monkfish DAS;
- groundfish DAS usage requirement for vessels in groundfish sectors;
- allowing for RSA DAS carryover;
- allowing for adjustments to the RSA program through a framework action;
- mandatory VMS;
- and, allowing vessels to land monkfish heads.

While the establishment of ACLs and AMs is an administrative action with no direct effect on fishing effort compared to taking no action, the specification of DAS and trip limits associated with the proactive AM ACT options will change the magnitude and, perhaps, distribution of effort spatially and temporally compared to current effort levels, or those discussed and analyzed in previous specification actions. The discussion of habitat impacts below examines changes in effort relative to the historical effort allocation of 40 DAS that was analyzed in the EIS's of the original FMP and Amendment 2. Changes that have occurred in annual DAS allocations have fluctuated from year-to-year below that allocation (e.g., 12, 23, & 31 DAS), but not above. Current DAS allocations are 31 (NMA) and 23 (SMA), but these levels could be adjusted under the no action alternative, depending on stock status and TAC overages. Therefore, in this discussion the 40 DAS allocation is being used as a proxy for the no action specifications alternative in the following discussion, since that is the maximum value analyzed in the DEIS for the FMP.

This amendment considers two ACT options for each area, and within each ACT option, there are three options with different combinations of DAS and trip limits. These combinations are based on maintaining current (FY2007-2010) DAS allocations, and adjusting the trip limits, maintaining the current trip limits and adjusting the DAS allocations, or adjusting both. Of all of these twelve options under consideration for the specification of DAS and trip limits only two could possibly result in an increase compared to the historical allocation of 40 DAS that was implemented in Amendment 2, and that is being used as a proxy for the no action alternative. Both of those are in the NMA: Option 1B would allocate 45 DAS, and Option 2B would allocate 51 DAS. In the SMA, only Option 2B would increase DAS over that which was allocated during the past three years, to 28 DAS from 23, but would still below the 40 DAS allocation. The options and qualitative habitat impact of all the options are shown in Table 58 (NMA) and Table 59 (SMA). The preferred alternatives are Option 2C (NMA) and Option 2B (SMA).

Vessels in the NMA are primarily groundfish vessels who would be either common pool or sector members, based on the measures proposed in Amendment 16 to the Multispecies FMP, currently under review. Common pool vessels' DAS will be severely curtailed by both a 50% reduction in allocated DAS and the 24-hour clock (where each part of a DAS would be counted as a full DAS against the allocation). Since there are no trawl exempted fisheries in the NMA, the constraining factor on monkfish effort will be the reduced groundfish DAS allocations, as those vessels will not likely be able to use all of their monkfish DAS.

The analysis of effort impacts of sector vessels is more complicated, and, depends on whether the alternative proposed in this amendment to remove the groundfish DAS requirement (when on a monkfish DAS) is adopted. The Councils are not taking action on this proposal, and, therefore, those vessels would most likely still be constrained for the foreseeable future by the reduced allocation of certain groundfish species that are caught coincidentally with monkfish, such as grey sole, since a vessel will need sector ACE to fish in an area when on a monkfish/groundfish DAS. The constraint imposed by reduced groundfish quota or DAS allocations will limit all sector vessels' ability to utilize their entire monkfish DAS allocations. As discussed in Section 4.5.1.3 vessels in the NMA are currently not using their entire monkfish DAS allocation or landing the full amount of the trip limit, suggesting that any increase in the DAS allocation or trip limits would not likely cause an increase in directed monkfish fishing effort.

In summary, for the reasons stated above, the actions proposed in this amendment would not have an adverse impact on EFH for any federally managed species in the region. Because the EFH Final Rule (50 CFR 600.920 (e)(1-5)) states that "federal agencies are not required to provide NMFS with assessments regarding actions that they have determined would not adversely affect EFH", no EFH Assessment is provided for this action.

TAC Increase (percent)	NMA TAC (mt)	NMA OPTION	AC trip limit (tail wt. per DAS)	BD trip limit (tail wt. per DAS)	DAS	Potential habitat impact compared to 40 DAS
50% (ACT Option 1)	8,063	1A	1250	700	31	Positive
		1B	1250	470	45	Negative
		1C	1250	600	40	Neutral
100% (ACT Option 2)	10,750	2A	1250	950	31	Positive
		2B	1250	470	51	Negative
		2C	1250	800	40	Neutral

Table 58 Specification Options (DAS and trip limits) for the NMA under two ACT options and relative habitat impacts

TAC Increase (percent)	SMA TAC (mt)	SMA OPTION	AC trip limit (tail wt. per DAS)	BD trip limit (tail wt. per DAS)	DAS	Potential habitat impact compared to 40 DAS
40% (ACT Option 1)	9,211	1A	550	450	23	Positive
		1B	550	450	23	Positive
		1C	700	600	15	Positive
75% (ACT Option 2)	11,513	2A	700	600	23	Positive
		2B	550	450	28	Positive
		2C	700	600	23	Positive

Table 59 Specification Options (DAS and trip limits) for the SMA under two ACT options and relative habitat impacts. The preferred options are 2C (NMA) and 2B (SMA).

5.3.Economic Impacts

The proposed management changes consist of a variety of measures that would impact vessels participating in monkfish fishery. The measures under consideration include creation of new biological reference points and control rules, setting ACL equal to ABC, using ACT as proactive and reactive AMs, allowing automatic DAS adjustment for trip limit overage, changing the requirements for groundfish DAS usage by limited access monkfish Category C or D permit holders, eliminating groundfish DAS usage for limited access monkfish Category C or D permit holders who are also enrolled in a ground fish sector, allowing changes to the RSA program through framework adjustment, a requirement for mandatory use of VMS, and allow landing of monkfish heads.

As of September, 2009 there are approximately 758 limited access monkfish permit holders and approximately 2,156 vessels holding an open access category E permit. Based on activity report of the fishing year 2008, 573 limited access permit holders participated in the monkfish fishery. Of these, 73 fished for monkfish only in the NMA, 167 fished only in the SMA and 333 vessels fished in both areas. At the same time, 504 incidental permit holders reported landing monkfish. Of these, 104 fished only in the NMA, 266 fished only in the SMA and 134 fished both in NMA and SMA. Table 60 shows the number of active monkfish vessels fishing in each area by permit category.

The proposed measures under Amendment 5 would affect at least 573 limited access vessels that fished for monkfish in NMA and/or SMA. The following section provides a discussion of the impacts for each measure. Where possible a quantitative assessment of the impacts is provided. If a quantitative assessment is not possible, an attempt is made to identify the types and number of vessels that may be reasonably expected to be affected.

Permit Category	Only NMA Trips	Only SMA Trips	NMA and SMA Trips
A	0	13	2
B	0	33	4
C	17	59	198
D	56	55	129
E	104	266	134
H	0	7	0

Table 60 Number of active monkfish vessels fishing by permit category and fishing area

5.3.1. Biological and Management Reference Points

The creation of a new set of biological and management reference points will not, of itself, have an immediate economic impact. Alternative 1 (no action), which would not create the new reference points, would not result in additional economic impacts beyond those identified in earlier actions. Alternative 2, the preferred alternative, which creates a series of reference points that should allow for better monitoring and management of the fishery, implicitly includes the potential for additional national benefits in the future from a sustainable, well managed fishery.

5.3.2. ACL and AMs

The purpose of the annual catch limits (ACLs) and accountability measures (AMs) is to prevent overfishing from occurring within the fishery. Alternative 1 (no action) would not create ACLs or AMs and thus would not comply with the MSRA. There is likely no direct economic impact of taking no action, but establishing these provisions to comply with the MSRA will help prevent overfishing from occurring in the future. Thus, the no action alternative could have a negative economic impact if it were to impact the long-term sustainability of the monkfish fishery. Alternative 2 consists of a series of actions which are discussed below.

5.3.2.1.ACLs

By setting the ACLs for the northern and southern management areas (NMA and SMA) equal to the acceptable biological catch (ABC) level, rather than below the ABC, additional economic opportunity for the fishery may exist in the future. The actual limit to fishing is determined by the annual catch target (ACT, discussed below), which is set relative to the ACL and takes into account management uncertainty. Assuming that the fishery remains sustainable, if management uncertainty can be reduced, maintaining the proposed ACL would allow for a higher ACT in the future. Similarly, if scientific uncertainty is reduced, this could lead to a higher ACL, and higher ACTs as a result. A higher ACT would result in greater revenue opportunities for fishing vessels.

5.3.2.2.Reactive AM

The proposal calls for a reduction in the annual catch target (ACT) for a management area in the second year following the year that catch exceeds the annual catch limit (ACL) in that management area. How Councils reduce the ACT is not prescribed, other than the reduction in the ACT would equal the overage in ACL on a pound-for-pound basis. Should the Councils not act, NMFS would reduce the ACT using reductions in DAS and trip limits.

Harvesting additional monkfish in excess of ACL would result in immediate short-term revenue increases for those fishing vessels that harvested more than they would have if the ACL had not been exceeded. With a positive interest rate, this gain would only be lost partly with a reduction in harvest and revenues two years later. If the reduction imposed affected all vessels equally then the negative impact will be less severe on those vessels that gained from the overage previously. Also, it is possible that by exceeding the ACL longer term impacts on the stock could lead to further future economic losses due to changes in the stock size.

5.3.2.3.Proactive AMs (ACT)

The purpose for setting the annual catch target (ACT) below the annual catch limit (ACL) is to account for uncertainty in the ability of management measures to limit catch to the prescribed level. The intention behind providing a buffer between the ACL and ACT is to prevent overfishing from occurring in the event the measures to limit catch are not fully successful. The ACT includes landings and discards of monkfish from all fisheries, including the directed monkfish fishery and fisheries where monkfish landed incidentally (e.g. scallops, multispecies, etc). Actions that reduce discards or reduce the uncertainty of the effectiveness of management actions would allow the ACT to be closer to the ACL.

In this action the ACT would be set relative to total allowable landings (TAL) prescribed in Framework Adjustment 4 (FW4) for monkfish. The TAL includes only landings, and thus the ACT had to be adjusted to account for discards. The TALs under FW4 were 5,000 metric tons for the NMA and 5,100 mt for the SMA. The Councils considered two alternatives for the ACT for each management area; all four include an increase over the FW4 TALs. The ACTs alternatives for the NMA are 46% and 62% of the ACL (=ABC= 17,485 mt), respectively (Section 3.2.2.3.1). In the SMA, the ACTs alternatives are 69% and 86% of the ACL (=ABC= 13,326 mt) (Section 3.2.2.3.2). The preferred alternatives would set the ACTs at the higher of the options for each area.

From an economic perspective, assuming that prices do not decrease due to higher landings, a higher ACT would result in higher monkfish revenues and thus additional benefits to vessels and the nation. However, this is only the case if the higher allocation is actually landed, as opposed to discarded or left uncaught. In the NMA historical landings have exceeded the level associated with both ACT options; however, in FY2008 landings were only 71% of the allocation suggesting a higher ACT may not result in higher monkfish revenues. Changes in the management of other fisheries, in particular the Multispecies FMP, could change this scenario.

In the SMA the ACT Option 1 corresponds to the level of landings in FY2007 when landings exceeded the TAL by 41%. In FY2008, monkfish landings exceeded the TAL by 32%. This suggests that additional benefits from monkfish revenues are already being realized in the SMA and thus option 1 would not yield additional benefits beyond those already realized. ACT Option 2, the preferred alternative, would result in allowed landings above current landings and thus should result in additional monkfish revenues for vessels and ports.

Quantification of the economic impacts of the proposed ACTs requires specification of the management actions used to achieve the proposed levels. The impact of alternative DAS and trip limit levels are discussed below.

5.3.3. Specification of DAS and Trip Limits Alternatives

5.3.3.1.DAS and Trip Limit Options

The trip limit and DAS alternatives would impact vessels fishing for monkfish in either area, to the extent that it impacts their normal fishing activity. As in previous annual adjustments, estimation of relative economic impacts was accomplished through the use of a trip limit model to estimate average changes in per-trip vessel returns net of operating costs and crew payments, as well as changes in monkfish revenue. The analysis uses data from observed trips to simulate outcomes under alternative trip limits and DAS allocations. The trip data is compiled from FY 2008 vessel trip reports and dealer weighout slips, with the former providing catch and location data and the latter providing average monthly prices, which are used to calculate revenue estimates.

The trip limit model was previously used to analyze changes in trip limits and DAS allocations while moving from higher to lower limits. The effect was evaluated based on a comparison of the expected return for alternative trip-taking strategies. A vessel may abandon a trip if the trip limit causes earnings to fall below zero, they may continue to fish while discarding any monkfish above the trip limit, or they may fish up to the trip limit and then return to port. Assuming that a trip is taken, vessels may choose to continue fishing while discarding monkfish over the trip limit so long as the revenue earned from other species offsets the costs of fishing. Trips where other species make up a relatively small portion of the trip revenue may lead to trips being discontinued when the trip limit is reached, since the cost of continued fishing would exceed the additional revenue.

Previous monkfish frameworks and amendments proposed to reduce the trip limits or kept them the same; therefore, the trip model could have been used to analyze the economic effects of the proposed changes. However, this amendment proposes to increase the trip limits and DAS allocations, making a straight forward application of the trip limit model challenging. An increase in DAS allocation allows a vessel to take additional trips beyond the ones it has taken under the previous DAS allocation, and an increase in trip limit would allow a vessel to retain more of their catch and reduce discards on a trip. The trip limit model has been modified to accommodate these possible additional revenue opportunities.

Under this modified trip limit model, first, each trip was evaluated as in the existing model but incorporating the possibility of higher retention under higher limit. Secondly, it is assumed that a vessel may take additional trips if DAS allocations are increased provided the vessel is in a directed fishery and it has used 75% or more of its DAS allocation. Further, it is assumed that the additional trips will be very similar to the trips the vessel has taken in the past. Accordingly, depending on the percentage of days absent and additional DAS allocation, a certain number of trips are chosen randomly from a vessel's past trips to augment the set of trips the vessels have taken previously.

For the purpose of this analysis, it is assumed that if vessels took trips in both the NMA and SMA, these vessels are indifferent between taking a trip in either area. Rather they will choose to take the trip that maximizes net trip revenue. To model this assumption, all trips taken by limited access monkfish permit holders landing monkfish in at least one trip were ordered by descending revenue for each vessel. Each trip is then analyzed as follows. A trip is unchanged if the total monkfish landed is less than the incidental trip limit or the relevant monkfish management area DAS limit and the trip limit.

If the DAS limit has been reached, then the monkfish catch is reduced to the relevant proposed incidental catch limit and the appropriate strategy for the vessel (i.e., ending the trip or continuing to fish while discarding any additional monkfish catch) is determined along with the return (in terms of revenue) from the strategy. If the DAS limit has not been reached and the monkfish catch is greater than the incidental limit and the current relevant trip limit, then the monkfish catch is reduced to the relevant trip limit and the vessel's revenue maximizing strategy and resulting return is determined. To take account of the increase in DAS allocation, vessels that might take additional trips are identified, and their trip sets are augmented by the following criteria: first, the number of additional trips the vessel might take is calculated based on the percentage of days absent given their previous level of DAS allocation and the proposed DAS allocation. Secondly, the number of trips determined in the first step is randomly selected from their full set of trips.

The relative change in net return to the vessel was estimated by calculating the average per-trip returns to the vessel owner using both the existing trip limits and the proposed FY2011 trip limits. These returns take into account operating costs, which were estimated using trip cost data collected on observer logs in FY 2008. Trips landing monkfish during FY 2008 in the NMA and SMA were identified, and the total trip cost was estimated as using a regression of the logarithm of trip cost against the logarithms of days absent, the number of crew, and a dummy variable indicating if the vessel gear type is gillnet. The parameters from this regression were then used to construct estimates of trip cost and cost per day absent for all trips landing monkfish during FY 2008. Returns to the vessel were calculated using a standard 60/40 lay system where 40 percent of the gross revenue goes to the vessel and 60 percent is shared among the crew, who pay for the operating expenses for the trip. Therefore, the net to the crew is the difference between the 60 percent share and the operating costs.

Since a necessary assumption of the trip limit model is that fishing location decisions are unchanged under new rules, an analysis of the impacts of the proposed measures is conducted separately for vessels fishing only in the NMA, vessels fishing only in the SMA, and vessels fishing in both areas. In reality, this is a simplification and a limitation of the model, since vessels could change their fishing location in order to mitigate some of the negative impacts or to access additional benefits from regulations. It should also be noted that the results are presented as the single year relative change from the FY 2008 baseline to each of the alternative combinations. In the absence of an ACL overage, the selected alternatives would remain in place until the end of the specifications period (FY2011-2013). Thus, there will be a cumulative effect of the measures over the entire three year period. However, the impacts may be mitigated by a possible fall in the monkfish prices due to the overall increase in monkfish landings. Due to the nature of the monkfish market, at this time, no model exists that can predict monkfish prices with a sufficient degree of accuracy to predict price changes due to changes in landings. In addition to these limitations, the modifications made to take account of the increase in DAS/trip limit are a simplified solution. With time and more supporting data, it is possible to identify more sophisticated methods that can predict vessel's behavior under DAS/trip limit increase more accurately.

5.3.3.1.1. Vessels only Fishing in NMA

The results from the trip limit model for NMA are presented in Table 61. The proposed options will lead to an increase in per trip average vessel return, crew payment and total monkfish revenue. All options provide an increase in the trip limit for at least one trip type, or an increase in DAS, or both. The model predicts that under the proposed regulations per trip average vessel return will increase from 0.2% to 2.2% whereas average crew payment will increase from 0.5% to 1.8% depending on different DAS allocations and trip limit alternatives. The increase in total monkfish revenue ranges from 0.8% to 24.5% under the proposed options. The results also show that the impacts from raising DAS allocation are higher than from increasing the trip limits. Accordingly, the largest impacts are seen when trip limits are same but DAS allocation is increased to 51. It should be noted that all of the NMA DAS and trip limit options represent an increase in DAS or trip limits, or both, in comparison to the DAS and trip limits currently in effect. Thus, none of these options are representative of taking no action with respect to DAS and trip limits.

Incidental Limit	TAC (mt) ACT Option	NMA Option	AC limit	BD limit	DAS	Change in Average Vessel Return	Change in Average crew Payment	Change in Monkfish Revenue
300	8,603 Option 1	1A	1250	700	31	0.2%	0.5%	0.8%
		1B	1250	470	45	1.7%	1.6%	16.1%
		1C	1250	600	40	0.5%	0.5%	10.0%
	10,750 Option 2	2A	1250	950	31	0.5%	1.2%	1.7%
		2B	1250	470	51	2.2%	1.8%	24.5%
		2C	**1250**	**800**	**40**	**0.8%**	**1.2%**	**11.0%**

Table 61 Changes from the no action alternative to proposed alternatives – Vessels only fishing in NMA. The preferred alternative row is in bold.

5.3.3.1.2. Vessels only Fishing in SMA

The trip limit model for the SMA indicates mixed impacts on average vessel return, average crew payment and monkfish revenue (Table 62). In the SMA, two out of six proposed options (1A and 1B) would not have changed the current trip limit/DAS allocations, and there would not have been any impact on average vessel return, crew payment and monkfish revenue. Option 2A, 2B and 2C would have resulted in increase in either trip limits or DAS, while option 1C would have increased trip limits but decreased the DAS allocation. As in the NMA, we see that changes in DAS allocations would have higher impacts than changes in trip limits only. Higher trip limits for all permit categories would have positive impact, but when the higher trip limit was combined with a lower DAS allocation, the overall impact would have been negative. Note, that an increase in DAS with same trip limits would have lead to a decrease in average vessel return but an increase in average crew payment and monkfish revenue. This is because, as explained in section 5.3.3.1, in our modified trip-limit model the impact of increased DAS allocation is captured by augmenting the trip set of a vessel with dummy trips created by randomly selecting trips from its existing trips. This process leads to higher total vessel return but may lead to lower average vessel return because the proportional increase in the number of trips may outweigh the proportional increase in revenue.

Incidental Limit	TAC (mt) ACT Option	SMA Option	ACG limit	BDH limit	DAS	Change in Average Vessel Return	Change in Average Crew Payment	Change in Monkfish Revenue
50	9,211 option 1	1A	550	450	23	-	-	-
		1B	550	450	23	-	-	-
		1C	700	600	15	-1.0%	-1.4%	-20.0%
	11,513 option 2	2A	700	600	23	0.5%	0.7%	7.9%
		2B	**550**	**450**	**28**	**-0.0%**	**0.7%**	**32.0%**
		2C	700	600	23	0.5%	0.7%	7.9%

Table 62 Change from no action alternative to proposed alternatives – Vessels Fishing in SMA only. The preferred alternative row is in bold.

5.3.3.1.3. Vessels Fishing in Both NMA and SMA

Vessels fishing in both NMA and SMA will be simultaneously affected by DAS/trip limit alternatives chosen for NMA and SMA. While these vessels have a demonstrated capability to shift between areas and may be more likely to change fishing locations than vessels that have historically fished solely in one area, the trip model does not incorporate this possibility. Rather, it is assumed that vessels continue fishing in the same locations they did previously and results are calculated for each possible combinations of NMA and SMA alternatives.

There are no single DAS/trip alternative combinations for SMA and NMA which lead to a best outcome in terms of impact on average vessel return, average crew payment and total monkfish revenue. As can be seen in Table 63, the largest increase on monkfish revenue is realized under the alternative with the NMA levels of a 300 pound incidental limit, 1250 pound trip limit for A and C vessels, 470 pound trip limit for B and D vessels, and 51 DAS in the NMA, in combination with the SMA levels of a 50 pound incidental limit, 550 pound trip limit for A, C, and G vessels, 450 pound trip limit for B, D and H vessels, and 28 DAS in the SMA. This is consistent with the observation that an increase in DAS has a more favorable outcome on revenue than an increase in the trip limit.

NMA Alternatives				SMA Alternatives				Change in Vessel Return	Change in Crew payment	Change in Monkfish Revenue
Incidental limit	**AC limit**	**BD limit**	**DAS**	**Incidental limit**	**ACG limit**	**BDH limit**	**DAS**			
300	1250	470	31	**50**	550	450	23	-	-	-
					700	600	15	-0.4%	-0.7%	-6.1%
					700	600	23	0.2%	0.4%	2.7%
					550	450	28	-1.3%	-0.8%	7.0%
	1250	700	31		550	450	23	0.0%	0.1%	0.3%
					700	600	15	-0.4%	-0.6%	-5.7%
					700	600	23	0.2%	0.4%	3.0%
					550	450	28	-1.2%	-0.7%	7.3%
	1250	470	45		550	450	23	-0.6%	-0.5%	13.2%
					700	600	15	-0.7%	-1.4%	5.8%
					700	600	23	-0.4%	-0.1%	16.1%
					550	450	28	-1.1%	-0.7%	22.9%
	1250	600	40		550	450	23	-0.2%	-0.3%	8.1%
					700	600	15	-0.5%	-1.1%	1.3%
					700	600	23	0.0%	0.1%	10.9%
					550	450	28	-1.4%	-1.4%	17.4%
	1250	950	31		550	450	23	0.1%	0.2%	0.7%
					700	600	15	-0.3%	-0.5%	-5.2%
					700	600	23	0.2%	0.5%	3.4%
					550	450	28	-1.2%	-0.7%	7.7%
	1250	470	51		550	450	23	-0.4%	-1.0%	19.5%
					700	600	15	-0.9%	-1.9%	10.7%
					700	600	23	-0.2%	-0.7%	22.4%
					550	450	28	-1.0%	-0.9%	30.0%
	1250	**800**	**40**		550	450	23	-0.1%	-0.2%	8.6%
					700	600	15	-0.5%	-1.0%	1.8%
					700	600	23	0.0%	0.2%	11.4%
					550	**450**	**28**	**-1.3%**	**-1.3%**	**17.9%**

Table 63 Change from the no action alternative to proposed alternatives – Vessels Fishing in NMA and SMA. The preferred alternative row is in bold.

5.3.3.2.Other Adjustments to the DAS and Trip Limit Management Program

5.3.3.2.1. Automatic DAS Adjustment for Trip Limit Overage

The Councils proposed a modification to the DAS and trip limits management program that would allow vessels to exceed the daily trip limit by one day's amount, and to have the vessel's DAS accounting balance to be charged accordingly. Alternative 1 is the no action alternative. Alternative 2 has 3 options for additional DAS charges for over the trip limit trips, deducting 30 hours, 48 hours, or 24 hours and one minute (**preferred alternative**), respectively, for a trip with a one-day overage.

From the economic perspective any action that allows a vessel to retain more catch without either staying out at sea or returning to sea results in an increase in revenues without an increase in costs; thus, vessel profits are higher. For vessels that are constrained by their DAS allocation, the option with the smallest DAS charge (Option 3) provides the greatest benefits to vessel in comparison to taking no action as it allows the vessel to use fewer DAS to land a given amount of monkfish. However, this same option makes predictions under models of trip limits and DAS allocation more uncertain as a vessel would now be able to land a daily limit with only a 1 minute charge. Options 1 and 2 would be less problematic from a management perspective, while option 1 would result in greater vessel revenues per DAS then option 2 since it results in vessels using their monkfish DAS at a slower rate.

5.3.3.2.2. Category C and D Permit GF DAS Usage

Under this proposal, which was not adopted by the Councils, vessels that have a monkfish DAS allocation greater than their multispecies DAS allocation would have been allowed to choose when to fish their allocated monkfish only or combined monkfish/multispecies DAS until their monkfish DAS balance was equal to their multispecies DAS allocation.

Based on FY2008, there were 551 vessels which held a monkfish C or D permit as well as limited access multispecies permit. Of these 551 vessels, 98 had no multispecies DAS left after accounting for leasing and sanction options. Of the remaining vessels, only 162 vessels had monkfish DAS allocations greater than multispecies DAS allocations, and may have been impacted by the proposed regulations. The flexibility in choice of when to use a combined monkfish-multispecies DAS or a monkfish-only DAS would have allowed the vessels to plan their fishing pattern more efficiently which may have lead to higher profits in comparison to the no action alternative.

5.3.3.2.3. Monkfish Vessels in GF Sectors - GF DAS Usage Requirement

Under this proposal, which was not adopted by the Councils, monkfish DAS would no longer be linked to multispecies DAS for vessels that are participating in a groundfish sector. Had this been adopted, sector vessels fishing on a monkfish-only DAS would be required to fish in an exempted fishery, but would not be required to have sector ACE for that area. Option 1 limits this to vessels fishing only in the NMA, while option 2 includes vessels fishing in either area.

Any action that allows a vessel greater flexibility in choosing its fishing patterns allows the opportunity for greater economic efficiency. This has the potential to increase the utilization of monkfish DAS by vessels that are part of a groundfish sector as trips would no longer be constrained by multispecies trip limits, multispecies DAS or sector ACE. Since there is no trawl exempted fishery in the NMA, and only a limited gillnet exempted fishery, most of the monkfish directed effort could have shifted to the SMA since most of that area is part of an exempted fishery. Such an effort shift could potentially have a negative effect on vessels fishing in the SMA due to the increase risk that catch limits would be exceeded and the reactive AMs being proposed in this amendment invoked in future years.

5.3.4. Changes to the RSA Program

5.3.4.1.Carryover RSA DAS

When the Councils initiated this amendment, vessels were prohibited from carrying over allocated, but unused RSA DAS. On March 13, 2010, NMFS published a final rule for a technical amendment to the FMP that allowed vessels to carryover unused RSA DAS to the subsequent year, so the Councils terminated further consideration of this provision.

5.3.4.2.Allow Changes to RSA Program by Framework Adjustment

Overall, is an administrative change affecting only the procedures that may be used by the Councils to implement changes to the Monkfish RSA Program. As such, there are no costs to regulated entities associated with this provision. However, this action would provide increased flexibility, in comparison to taking no action, to the Council in terms of modifying the RSA program to address needs and issues as they arise. This has the potential to increase the utilization of the program by researchers and industry members.

5.3.5. Mandatory VMS

Under this proposal, which was not adopted by the Councils, limited access monkfish vessels would be required to have an operational VMS. As noted in Section 3.5, the Council considered 3 options for this proposed requirement: SMA only, NMA only, and both areas.

The majority of active limited access monkfish vessels that have used some of their DAS allocation have used VMS either in the monkfish fishery, or in some other fishery (Table 64). This data is based on the DAS Allocation Management System (AMS) database. Trip activity codes used to determine fishing location and trip source was used to determine if VMS or IVR was used. All trips for a limited access monkfish vessel, no matter the fishery, were used to determine if the vessel ever used VMS. As shown below, for vessels that fished only in the NMA, 100% of the vessels used VMS over the past two fishing years in some fishery. For these vessels all three options would have no impact from installation costs, although there may be additional use costs in comparison to taking no action. For vessels that fish only in the SMA, the majority have used VMS for some fishery although over 20% of the vessels would be need to install a VMS system should VMS become mandatory in the SMA resulting in increased costs in comparison to taking no action, either as a result of Option 1 or Option 3.

There are currently three vendors of VMS hardware and services. Installed costs range from $1,750 to $4,200. Monthly costs are based on usage rates, including messaging and position tracking, and are approximately $40 - $100+, depending on vendor and usage rates. With the power down provision proposed in this alternative, monthly charges would only be incurred when the units are operational.

As the number of active vessels fishing in both management areas has declined, so has percent of vessels without VMS. Approximately 40% of these vessels would need to install a VMS under all three options. This requirement will impose additional cost on the vessels without a VMS installed in comparison to taking no action.

Area		FY2007		FY2008	
		#	%	#	%
NMA					
	VMS	79	100%	63	100%
	No VMS	0	0%	0	0%
SMA					
	VMS	112	81%	115	77%
	No VMS	26	19%	35	23%
Both					
	VMS	41	55%	37	60%
	No VMS	34	45%	25	40%
Total					
	VMS	232	79%	215	78%
	No VMS	60	21%	60	22%

Table 64 VMS use by fishing year and area fished of the limited access monkfish vessels that used VMS in any DAS fishery they participated in

5.3.6. Allow Landing of Monkfish Heads

This action would allow the fishermen to land unattached monkfish heads up to 2.32 times the weight of tails on board. In comparison to taking no action, this would allow the conversion of a “waste” which was previously discarded to be converted to product that could either generate revenues or be used by the fisherman to offset costs from purchasing bait. Both are an economic benefit to the fisherman and allows for better use of the fishery resource.

5.3 Social Impacts Assessment (SIA)

5.3.1 Defining What Constitutes a Community

First, the context and requirements for what constitutes a community will be discussed. By National Standard 8 requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), a “fishing community” must be a geographic entity. In general, any geographic unit that the U.S. Census recognizes as a “place” is used. This includes cities, towns, and some townships, boroughs or other small administrative entities. However, it must be smaller than a county. Incorporated towns and other administrative units are automatically “places.” The Census Bureau has also surveyed some unincorporated towns and made them “Census Designated Places” or CDPs. However, there are still unincorporated towns that are not census places. For these, there are no available census data. Unless it appears as important in terms of landings or residence of permit holders, such an entity will be aggregated into the next smallest available census place. In this document the port/town is the most basic unit of analysis. Because in some cases there is a port which serves as the base for fishing activity but most fishermen do not reside directly in that port town, both owner’s home address and principal port for a vessel are discussed. Other sections of the MSA require analyses that need not be place-based. Because of this, some discussions will be about vessels by gear groups or usage of DAS allocations or about other groups such as processors or dealers.

5.3.2 Organization of the SIA

The discussion below focuses on social and cultural impacts of the FMP on communities and individuals. Because economic impacts also have social and cultural ramification, they are also included, though in a different form than seen in the economic impact section of the document. The SIA discusses some general features of importance within and across communities, which create different contexts for the various proposed conservation measures. Then, the discussion is divided into sections on each of the proposed conservation measures. It is important to remember that while some measures may have a short-term negative impact on some communities, this should be viewed in light of the potential long term benefits to all communities of a recovered monkfish fishery.

Additional relevant background data are provided in the SAFE Report section (Section 4.5, Affected Human Environment) of this document.

5.3.3 Summary of Factors Important to Assessing Vulnerability:

- Having 50 or more monkfish permits listing that place as homeport or owner’s residence in 2008
- Having at least 65% match of principal port to owner’s residence on 2008 monkfish permits
- Having landed at least 500,000 lbs of monkfish in 2008
- Having landed at least $500,000 worth of monkfish in 2008

- Having monkfish account for at least 10% of overall pounds landed in the port
- Having monkfish account for at least 10% of overall value landed in the port
- Having 5 or more monkfish dealers buying in that community if it qualifies by any of the above, or 10 or more otherwise
- Presence of a monkfish processor in the county gives a point to any community already listed for any of the above
- levels of key demographic variables from the 2000 US Census for the port communities which meet any of the above fisheries-related factors
    - Communities with highest percentage of occupations (6% or more) in the category of "fishing, farming and forestry"
    - Communities with the highest percentage (10% or more) of families in poverty
    - Communities with the lowest population levels (4,000 or below)
    - Median age of residents is 50 or over
    - Communities with the lowest percentage (80% or under) of persons age 25 or over who have graduated at least high school
    - Communities with highest percentage (5% or more) of the population 16 or over that is in the labor force but unemployed
    - Having the highest level of occupational dependence, the highest poverty level or lowest level of education among top three ports by landings and/or value

5.3.4 Social Impacts of Alternatives under Consideration

5.3.4.1 MSY control rule and specification

This alternative would establish the following proxy MSY control rule: MSY = $B_{target\ (exploitable)}$ x $F_{threshold}$. It should be noted that for the purpose of calculating MSY, exploitable biomass needs to be used. The establishment of an MSY control rule does not have any direct impact on the establishment of ACLs or AMs, the impacts of which are discussed below. Thus, the establishment of an MSY control rule does not have any direct impact on vessels, ports, and communities in comparison to no action.

5.3.4.2 OFL control rule and specification

The change resulting from this proposal is that it establishes a catch associated with the overfishing reference point ($F_{threshold}$) as applied to current estimates of exploitable biomass. Establishing a specific catch associated with overfishing will allow for real time determination of whether or not overfishing is occurring, rather than postponing such a determination until a stock assessment under no action alternative. This alternative would establish an OFL that is equivalent to $F_{threshold}$ multiplied by the most recent exploitable biomass estimate ($B_{current}$). Since the current biomass estimates for both FMAs are above MSY, the resulting OFL is above MSY. Thus, this OFL control rule enables vessels to take advantage of the additional biomass, in terms of landings, at times when current biomass is above MSY, providing additional benefits in comparison to taking no action.

5.3.4.3 ABC control rule

Since the most recent estimate of exploitable biomass of monkfish in the NMA is 33% greater than the B_{MSY} proxy, a slightly larger ABC is allowed for, providing greater flexibility for those in the northern area than they had previously, since it would lead to a higher ACL, which, in turn, reduces the likelihood of reactive AMs being invoked. Ports where at least 50% of vessels fished ONLY in the NMA are (in order of greater to lesser dependence) Port Clyde, ME; Provincetown, MA; Scituate, MA; Seabrook, NH; Rye, NH; Portland, ME and Gloucester, MA (Table 50). Ports with the largest percentage of vessels fishing in both areas include: New Bedford, Boston and Chatham, MA and Stonington, CT (Table 52). Vessels from these communities could benefit from the larger ABC in the NMA.

There are also differences in fishery management area fished by permit category (Table 53). No category fishes predominantly in the NMA, though about a quarter of D and E vessels fish primarily in the NMA, and category C and D permitted vessels are most likely to fish in both fishery management areas. This means that C, D, and E vessels have a greater likelihood of benefiting from the larger NMA ABC than do other vessel categories.

5.3.4.4 OY

This proposal would set OY for this fishery at the ACT, which is equivalent to the maximum yield from the fishery after taking into account scientific uncertainty in the overfishing limit in setting ABC, and management uncertainty in setting measures that will not exceed the ABC. In comparison to taking no action, this measure is not expected to have any significant direct impact on fishermen except in so far as OY=ACT and the setting of ACT is of importance to fishermen. Both options for setting the ACT include an increase in the TAL in both the NMA and SMA and are, therefore, likely to have positive benefits, with Option 2 involving the largest increase in TAL, and, therefore, the greater benefit.

5.3.4.5 ACLs

This measure to define ACLs is required by changes in the most recent authorization of the MSA. By making the ACL equal to the ABC no immediate impact should be expected in comparison to taking no action. However, the intent of establishing ACLs in the monkfish fishery is to prevent overfishing from occurring in the future. Thus, the no action alternative could have a negative social impact if it were to impact the long-term sustainability of the monkfish fishery.

5.3.4.6 Reactive Accountability Measures (AMs)

The MSRA requires AMs to account for any catch that exceeds the ACL. The proposed action establishes a procedure for accounting for any overages on a pound-for-pound basis. By implementing the corrective reduction in the 2nd year following the overage, fishermen are given time to plan ahead for the needed adjustment. Any reductions to DAS and trip limits resulting from such and overage are likely to be negative over the short-term, but result in long-term benefits by preventing overfishing from occurring in comparison to taking no action. The impacts of any reduction in DAS and trip limits resulting from an overage in the ACL would be analyzed at the time of the adjustment.

Similar to the establishment of ACLs, there is no direct social impact associated with not establishing reactive AMs (i.e., taking no action). However, by no taking action, there would be no mechanism in place to prevent overfishing from occurring, which could lead to future negative social impacts if the lack of such a mechanism leads to overfishing.

5.3.4.7 Proactive AMs (ACT)

The NS1 Guidelines provide for the use of ACTs as proactive AMs, to prevent catch from exceeding the ACL in consideration of management uncertainty. Two options are under consideration for each area. Both options include an increase in the TAL in both areas and are, therefore, likely to have positive social benefits, with Option 2 involving the largest increase, and, consequently, the greatest benefits in comparison to taking no action.

There is no direct social impact associated with not establishing ACTs for the monkfish fishery (i.e., taking no action). However, establishing ACTs helps prevent overfishing from occurring by creating a buffer between what is expected to be caught, and the upper limit of what should be caught to account for management uncertainty. Thus, taking no action could result in future negative social impacts if the lack of ACTs leads to overfishing occurring.

5.3.4.8 DAS and Trip Limit Options

The economic analysis (based on 2008 trips) looks at changes in trip limits and DAS allocations for alternative trip-taking strategies (e.g., the choice of when to end a trip). This assumes that each vessel continues to fish in the same area it did in 2008, even though vessels may change their behavior. Those fishing only in the NMA have "an increase in per trip average vessel return and crew payment and total monkfish revenue", according to the economic analysis.

Those vessels fishing only in the SMA have mixed impacts. Higher trip limits generally have positive impacts by reducing discards and allowing for greater revenue per trip. Fishermen have commented, however, that if the trip limit is too high, prices paid decline when more fish is landed at one time, and revenues can actually decline. When combined with lower DAS allocations the overall effect of higher trip limits is likely to be negative.

Vessels that fish in both areas have variable impacts according to the economic analysis (Table 46). If they fish in exactly the same location they fished in 2008, the largest increase (24.5%) on monkfish revenue is realized under the non-preferred NMA option 2B with a 1250 pound trip limit for A and C vessels, 470 pound trip limit for B and D vessels, and 51 DAS in the NMA (i.e., status quo trip limits but increased DAS). The preferred option 2C would still result in an 11% increase in vessel revenues, with an increase to 40 DAS and an increase in the B and D vessels' trip limit from 470 lbs. to 800 lbs., while there would be no change for A and C vessels' trip limit in comparison to the status quo.

In the SMA (Table 47), the preferred option 2B would result in the greatest relative increase (32%) in monkfish revenues under the 550 pound trip limit for A and C, vessels and 450 pound trip limit for B, D and H vessels, and 28 DAS in the SMA (i.e., status quo trip limits but increased DAS). The economic analysis does not account for the possibility that these vessels may change the pattern of their areas fished. However, this should be considered for individuals who usually fish both areas.

When looking at the fishing patterns of individual ports a great deal of variation is seen. Although the geographic location of the port to the fishery management area can influence the area fished, additional factors are also involved. Ports where at least 50% of vessels fished ONLY in the NMA are (in descending order of dependence) Port Clyde, ME; Provincetown, MA; Scituate, MA; Seabrook, NH; Rye, NH; Portland, ME and Gloucester, MA. Gloucester had by far the largest number of total vessels, of which 63% fished in the NMA only. Other ports had 75-80% of vessels fishing in the NMA but only 10-26 vessels total. The remaining vessels in these ports all fished in both areas. As all vessels fish in either exclusively in the NMA or in both fishery management areas, these ports are most likely to experience positive impacts from increases in the trip limits and DAS allocations.

Ports where 50% or more of vessels fished ONLY in the SMA are listed in descending order of dependence: Point Lookout, NY; Belford, NJ; Barnegat Light/Long Beach, NJ; Ocean City, MD, Little Compton, RI, Hampton Bays/Shinnecock, NY; Newport News, VA; Chincoteague, VA; Seaford, VA; Point Pleasant/Point Pleasant Beach, NJ; Montauk, NY and Newport, VA. In Point Lookout, Belford and Barnegat Light/Long Beach 84-100% of vessels fish in the SMA, while in Point Pleasant/Point Pleasant Beach, Montauk and Newport only 50-55% do so. The remaining vessels in these ports all fished in both areas. Therefore, all of these ports are likely to see positive impacts, if DAS are increased. Because of the heavy reliance on the SMA for Point Lookout, Belford and Barnegat Light/Long Beach, vessels from these ports will most likely be affected positively, if DAS are increased.

Ports where at least 50% of vessels fished in BOTH areas are listed in descending order of dependence: New Bedford, Boston and Chatham, MA; Stonington, CT; Portsmouth, NH, Cape May, NJ and Point Judith and Newport, RI. In Cape May, Point Judith, Newport and Portsmouth only 50-57% of vessels fished in both areas, with the rest in Portsmouth fishing in the NMA. The remaining vessels in the other three ports fished in the SMA. In New Bedford, Boston, Chatham, and Stonington 72-83% fished in both areas. The remaining vessels in New Bedford and Stonington all or mostly fished in the SMA, while the remaining vessels in Boston and Chatham fished in the NMA. Impacts vary based on whether the TAL option increases the trip limit and/or DAS and on the time spent in each area (see **Table 63** in the Economic Impacts Section). However, generally speaking, increases in DAS have more positive benefits than increases in the trip limit.

An additional factor to consider is that there are also differences in area fished by permit category, with Category A and B permitted vessels most likely to fish in the SMA and

Category C and D permitted vessels most likely to fish in both areas. No vessels fish predominantly in the NMA, though about a quarter of Category D and E vessels fished there in 2008. Category C and D vessels vessels fishing in the NMA would likely realize the greatest benefits under all 6 options, with some options potentially resulting in more positive effects than others Conversely, all limited access monkfish vessels fishing in the southern area, (Categories A, B, C, D, G and H) would be positively affected by the proposed action, or negatively affected by option 1C under this alternative.

5.3.4.9 Automatic DAS Adjustment for Trip Limit Overage

This alternative would allow vessels to exceed the daily trip limit by one day's amount, and to have the vessel's DAS accounting balance to be charged accordingly. The action (Alternative 2) includes 3 options for additional DAS charges for over the trip limit trips. Option 1 would deduct 30 hours; Option 2 would deduct 48 hours; and Option 3, the preferred alternative, would deduct 24 hours and one minute. This measure would create greater flexibility and efficiency, and, potentially higher profits compared to the no action alternative. Therefore, it is likely to be beneficial overall. Option 3 would likely provide the most flexibility since vessels would utilize their DAS at the lower rate. In addition, this action would have the greatest impact on vessels that use most or all of their monkfish DAS on an annual basis. However, it should be noted that current fishing patterns would determine which of the 3 alternatives would be best for individual vessels.

5.3.4.10 Category C and D permit GF DAS Usage

Currently, vessels holding a Category C or D permit and a Multispecies permit are charged a multispecies Category A DAS for every monkfish DAS used. If the vessel's allocation of multispecies Category A DAS is fewer than the monkfish DAS allocation, the vessel may fish the difference as a monkfish-only DAS but only after all multispecies Category A DAS have been used.

Under the non-preferred Alternative 2, vessels holding a limited access monkfish Category C or D permit and a limited access multispecies permit that have a higher monkfish DAS allocation than multispecies Category A DAS allocation could elect when to declare a combination multispecies/monkfish DAS. However, when the balance of monkfish DAS remaining equals the vessel's allocation of multispecies Category A DAS, the vessel will be automatically charged a multispecies Category A DAS for every monkfish DAS used.

While Alternative 2 would allow greater flexibility for vessels holding both a limited access monkfish Category C or D permit and a multispecies permit compared to no action, as they could elect when to declare a combination multispecies/monkfish DAS, the Councils did not adopt this proposal out of concern that overall fishing effort would increase on both monkfish and groundfish. In 2008 there were 551 vessels which held monkfish C or D permit as well as a limited access multispecies permit. Out of these 551 vessels, 98 had no multispecies DAS left after accounting for leasing and sanction options. Out of the remaining vessels (551-98), there were only 162 vessels with a monkfish DAS allocation greater than its multispecies DAS allocation (Table 65). The three ports with where the majority of these 162 vessels are located are Gloucester, MA

(29); New Bedford, MA (26); and Portland, ME (15). Ports with 10% or more of these vessels are: Portland, ME (20%); Boston (19%) and Gloucester (11%), MA.

STATE	PRINCIPAL PORT	GREATER MF DAS THAN GF DAS	STATE TOTAL
CT	State total	3	3
FL	State total	1	1
MA	BOSTON	8	76
	CHATHAM	6	
	GLOUCESTER	29	
	NEW BEDFORD	26	
	SCITUATE	3	
	All Other	4	
ME	FREEPORT	2	28
	HARPSWELL	2	
	PORTLAND	15	
	All Other	9	
NC	State total	3	3
NH	EXETER	2	4
	All Other	2	
NJ	BARNEGAT LIGHT/LONG BEACH	6	14
	POINT PLEASANT/POINT PLEASANT BEACH	5	
	All Other	3	
NY	HAMPTON BAYS/SHINNECOCK	4	15
	MONTAUK	8	
	POINT LOOKOUT	2	
	All Other	1	
RI	LITTLE COMPTON	2	16
	NEWPORT	4	
	POINT JUDITH	9	
	All Other	1	
VA	State total	2	2
		162	**162**

Table 65 Vessels by Port with MF DAS greater than GF DAS

5.3.4.11 Monkfish Vessels in GF Sectors - GF DAS usage requirement

The Councils considered, but did not adopt the proposal to eliminate the requirement for Category C and D vessels with multispecies permits who are also in a groundfish sector, to use a groundfish DAS when on a monkfish DAS. While this measure would have allowed greater flexibility, it also would very likely have resulted in a substantial shift in monkfish fishing effort to the SMA, where vessels could fish on a monkfish-only DAS in an exempted fishery, regardless of whether those vessels had any sector ACE for that area.

5.3.4.12 Allow Carryover of RSA DAS

When the Councils initiated this amendment, vessels were prohibited from carrying over allocated, but unused RSA DAS. On March 13, 2010, NMFS published a final rule for a technical amendment to the FMP that allowed vessels to carryover unused RSA DAS to the subsequent year, so the Councils terminated further consideration of this provision.

5.3.4.13 Allow Changes to RSA Program by Framework Adjustment

The proposed action would allow for modifications to the monkfish RSA Program to be made through a framework adjustment. The proposed action could provide greater flexibility for vessels involved in the Monkfish RSA Program since there is less time involved with making changes through a framework adjustment than through a plan amendment. However, the specific impacts of the proposed changes to the RSA program would be analyzed in the framework adjustment document implementing those changes.

5.3.4.14 Mandatory VMS

The Councils considered but are not proposing to require monkfish limited access vessels to use a VMS. Most Category C and D vessels are already required to have a VMS due to participation in either the multispecies or scallop fisheries, with the exception being those multispecies vessels that have no Category A DAS allocated to them. Therefore, this action would only have impacted Category A and B vessels, as well as those Category C and D vessels that have no allocation of multispecies Category A DAS.

In comparison to no action (the preferred alternative), requiring VMS would impose a cost on vessels, both for purchase and operation. There are currently three vendors of VMS hardware and services. Installed costs range from $1,750 to $4,200. Monthly costs are based on usage rates, including messaging and position tracking, and are approximately $40 - $100+, depending on vendor and usage rates. With the power down provision proposed in this alternative, monthly charges would only be incurred when the units are operational, thus, the power-down provision would lower the operational cost relative to other fisheries where the power-down provisions are more restrictive. On the other hand, there are some positive social impacts since VMS can serve as a safety/rescue device, and VMS can “level the playing field” among fishermen since it makes it more difficult to engage in some illicit behavior. Furthermore, more precise spatial information with regard to catch and effort may have some positive effects on reducing uncertainty, both scientific and management.

5.3.4.15 Allow landing of Monkfish Heads

This alternative would allow for monkfish heads to be landed separately from the whole monkfish, providing an appropriate conversion factor to assist with enforcement. As a result, this alternative would provide more flexibility and create additional opportunities for revenue in comparison to no action; thus, it is expected to be beneficial.

5.4 Cumulative Effects Analysis

5.4.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Amendment 5 together with past, present, and reasonably foreseeable future actions that affect the monkfish environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

Valued Ecosystem Components (VEC)

As noted in section 4.0 (Description of the Affected Environment), the VECs that exist within the monkfish fishery are identified, and the basis for their selection is established. Those VECs were identified as follows:

1. Monkfish stocks (target and non-target);
2. Non-monkfish species (incidental catch and bycatch);
3. Endangered and other protected species;
4. Habitat, including non-fishing effects; and
5. Human Communities (includes economic and social effects on the fishery and fishing communities).

Temporal Scope of the VECs

While the effects of historical fisheries are considered, the temporal scope of past and present actions for monkfish stocks, non-monkfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial Monkfish FMP in 1999. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ, and encompasses the pre-FMP as well as post-FMP circumstances. In terms of future actions, this analysis examines the three-year specifications period following implementation of this amendment (May 1, 2011). This date was chosen because the Councils will re-examine the FMP and its impacts during the next specifications-setting process.

Geographic Scope of the VECs

The geographic scope of the analysis of impacts to monkfish stocks, non-monkfish species and habitat for this action is the total range of these VECs in the Western Atlantic

Ocean, as described in the Affected Environment section of the document. However, the analyses of impacts presented in this amendment focuses primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species (section 4.1.4).

Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the monkfish fishery from the U.S.-Canada border to, and including, North Carolina.

Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; PLUS (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); PLUS (3) impacts from the Proposed Action and alternatives.

A description of past, present and reasonably foreseeable future actions is presented immediately below in Table 66 and more thoroughly in Appendix VI. The baseline conditions of the resources and human community are subsequently summarized although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this amendment is included. The culmination of all these factors is considered when making the cumulative effects assessment.

5.4.2 Past, Present and Reasonably Foreseeable Future Actions

Table 66 summarizes the combined effects of other past, present and reasonably foreseeable future actions that affect the VECs, i.e., actions other than those alternatives under development in this document (a summary of the primary past, present and reasonably foreseeable future actions effecting this amendment can be found in Appendix VI).

Note that most of the actions effecting this amendment and considered in Table 66 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management - the re-authorized Magnuson-Stevens

Act. That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the act stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then positively impact human communities.

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Monkfish Stocks	**Positive** Combined effects of past actions have controlled effort, rebuilt stocks and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks	**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks	**Positive** Stocks are being managed to achieve optimum yield and prevent overfishing
Non-monkfish Species	**Positive** Combined effects of past actions have decreased effort and bycatch and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species	**Positive** Future actions are anticipated to continue control effort and minimize bycatch	**Positive** Continued management of directed stocks will also control incidental catch/bycatch
Endangered and Other Protected Species	**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Mixed** Current regulations continue to control effort, but may result in some increases, thus increasing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but may result in some effort increase, possibly increasing interactions	**Positive** Continued effort controls along with protected species regulations will likely help stabilize or reduce protected species interactions
Habitat	**Mixed** Combined effects of effort reductions, closed areas, and better control of non-fishing activities have been positive but some fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and thus habitat impacts but may allow some effort increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Human Communities	**Positive** Fishery management has resulted in rebuilt stocks and controlled, sustainable fishery which supports profitable industries and communities	**Positive** Fishery resources continue to support communities at a sustainable level	**Mixed** Continued management at sustainable levels will provide a stable, profitable fishery, benefitting affected communities; changes to the management program may result in redistribution of the benefits among communities	**Positive** Sustainable fisheries should support viable communities and economies

Impact Definitions:
-Monkfish Stocks, Non-monkfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size
-Habitat: positive=actions that improve or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat
-Human Communities: positive=actions that increase revenue and well being of fishermen and/or associated businesses
negative=actions that decrease revenue and well being of fishermen and/or associated businesses

Table 66 Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Amendment 5.

5.4.3 Baseline Conditions for Resources and Human Communities

For the purposes of a cumulative effects assessment, the baseline conditions for resources and human communities is considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. The following table (Table 67) summarizes the added effects of the condition of the VECs and the sum effect of the past, present and reasonably foreseeable future actions (from Table 66 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straight-forward quantitative metrics of the baseline conditions are only available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECS are complex and varied. As such, the reader should refer to the characterizations given in Sections 4.4 and 4.5, respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions below in Table 67.

<u>Impact Definitions for Table 67 below:</u>

Monkfish Stocks, Non-monkfish species, Endangered and Other Protected Species	Positive = actions that maintain or increase stock size
	Negative = actions that decrease stock size
Habitat	Positive = actions that improve or reduce disturbance of habitat
	Negative = actions that degrade or increase disturbance of habitat
Human Communities	Positive = actions that maintain or increase revenue and well being of fishermen and/or associated businesses
	Negative = actions that decrease revenue and well being of fishermen and/or associated businesses
All VECs	Mixed=both positive and negative

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 66)	Combined CEA Baseline Conditions
Monkfish Stocks	**NMA**	Not overfished (rebuilt) and overfishing is not occurring.	**Positive** –Stocks have achieved rebuilt status and are being managed at sustainable levels.	**Negative** – Short term overharvesting in the past contributed to several stocks being overfished or overfishing occurring. **Positive –** Long term regulatory actions taken over time have ended overfishing and rebuilt stocks.
	SMA	Not overfished (rebuilt) and overfishing is not occurring.		
Non-monkfish Species	**Groundfish stocks**	4 stocks are not overfished and overfishing is not occurring; 11 stocks are overfished and overfishing is occurring; 5 stocks are either overfished, overfishing is occurring, or status unknown	**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.	**Positive** – Effort reductions in the monkfish fishery have likely reduced impacts on non-target species.
	Dogfish	Not overfished and overfishing is not occurring.		
	Skates	Winter, thorny and smooth skates are overfished and thorny is also subject to overfishing. Barndoor skate is not overfished and is rebuilding toward biomass target. Little skate is not overfished, although it is close to the overfished biomass threshold. Clearnose and rosette skates are not overfished and overfishing is not occurring.		
Habitat		Fishing impacts are complex and variable and typically neutral or adverse; Non-fishing activities had historically negative but site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks maintain rebuilt status, effort reductions are unlikely.	**Mixed** - Reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as global warming, could increase and have a negative impact.
Protected Resources	Sea Turtles	Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened.	**Positive** – reduced gear encounters through management actions to control effort taken under the FMP, as well as those under the ESA and MMPA have had a positive impact	**Positive** - Reduced gear encounters through management actions to control effort taken under the FMP, as well as those the ESA and MMPA.
	Large Cetaceans	Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MMPA and with the exception of minke whales, all are listed as endangered under the ESA.		
	Small Cetaceans	Pilot whales, dolphins and harbor porpoise are all protected under the MMPA. The most recent stock assessment for harbor porpoise shows that takes are increasing and above PBR.		
	Pinnipeds	All pinnepeds are protected under the MMPA.		
Human Communities		Complex and variable (see Section 5.6). Generally monkfish landings and revenues have decreased since implementation of the FMP in 1999, but from unsustainably high levels.	**Positive** – Management at long-term sustainable levels should support viable communities and economies	**Positive** - Management at long-term sustainable levels should support viable communities and economies.

Table 67 Cumulative effects assessment baseline conditions of the VECs

5.4.4 Summary Effects of Amendment 5 Actions

The alternatives contained in Amendment 5 can be divided into three broad categories. First, this action adopts management reference points in compliance with the MSRA and National Standard 1 Guidelines that are designed to prevent overfishing and achieve long-term sustainability in the fishery. Second, Amendment 5 adopts specifications (catch targets and associated DAS and trip limits) for the fishery for FY 2011 - FY 2013. Third, the action adopts additional management measures to improve the overall functioning of the management program, including minimizing bycatch.

The MSRA requirement to adopt ACLs and AMS is expected to provide the foundation for long-term sustainability and, more specifically, the prevention of overfishing. Since these requirements are applied to all FMPs, they should have an overall positive cumulative effect on target and non-target species and communities, and have mixed effects on protected species and habitat. In the case of monkfish, since overfishing is not occurring, and the fishery is rebuilt and managed at sustainable levels, effort reductions are not warranted, which means that the long-term impact of the fishery on protected species and habitat will not change under the FMP as it comes into compliance with the MSRA, except for changes that occur as a result of measures taken under the ESA and MMPA.

The adoption of fishery specifications for FY 2011 – FY 2013 will provide for ongoing achievement of optimum yield, prevention of overfishing and stability in the fishery. The specification of ACT to include monkfish discards will further enhance the FMP's ability to prevent overfishing, since all catch will be accounted for. Since the ACTs and associated management measures represent an increase from current levels, there may be some direct negative impact on non-target species that are caught while vessels target monkfish, such as skates and dogfish, but some indirect positive effect, as vessels shift effort away from other fisheries to take advantage of the increased opportunities in the monkfish fishery. The same type of impact may occur with regards to protected species, depending on the relative effect of the monkfish fishery compared to the interactions in other fisheries. The cumulative habitat effects are mixed, since the effect of increased fishing effort may have adverse effects on habitat, which is offset by the fact that effort under the FMP is being controlled and vessels must continue to respect the habitat closed areas established in Multispecies Amendment 13, and the offshore canyon closures established in Monkfish Amendment 2. The effect on communities is likely to be positive in both the short and long term as a result of the increased opportunity to target monkfish at sustainable levels, and the relative stability of a 3-year specification program.

The third broad category of measures includes three modifications to the management plan: Allowing vessels to land a one-day overage of the trip limit and have the appropriate time deducted from their DAS allocation; allowing vessels to land monkfish heads; and, allow the Councils to make changes to the cooperative RSA program through a framework adjustment. The latter measure is purely administrative and has no effect on any of the VECs. The other two measures are neutral or slightly positive with respect to monkfish stocks and non-target species, because they simply allow vessels to land, rather than discard fish or fish parts that have already been caught. To the extent this means that vessels will use their DAS allocations at a slightly higher rate may have positive effects, no only on target and non-target species, but habitat and protected species as well. These two changes will also have a positive effect on communities through minimizing bycatch, promoting efficiency and reducing costs.

5.4.5 Cumulative Effects Summary

The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the MSRA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive, and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.

Table 68 below is provided as a summary of likely cumulative effects found in the various groups of management alternatives contained in Amendment 5. Impacts are listed as no impact/neutral, positive, negative, or mixed. Impacts listed as no impact/neutral include those alternatives that have no impact or have a neutral impact (neither positive nor negative). Impacts listed as mixed contain both positive and negative impacts. The resultant cumulative effect is the CEA baseline that, as described above in Table 67, represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the "other" actions. The resultant positive and negative cumulative effects are described below for each VEC and are exhibited in Table 68.

Managed Resources

Past actions implemented under the Monkfish FMP have served to rebuild the fishery and neither the stocks in the northern or southern fishery management areas are overfished, nor is overfishing occurring. This management trend should continue through adoption of the proposed biological and management reference points which will be neutral or positive for monkfish stocks since, while not directly affecting fishing effort, provide the basis for monitoring stock status and achieving optimum yield from the fishery while preventing overfishing. ACLs and AMs, as well as the specification of associated DAS and trip limits will have a positive effect because they will prevent overfishing while achieving optimum yield. Allowing vessels to land a trip limit overage and have the time deducted from their DAS allocation will minimize bycatch of monkfish and improve catch accounting. These proposed actions, along with protections afforded through other management plans, such as Amendment 16 to the NE Multispecies FMP and Atlantic Sea Scallop FMP actions, as well as actions under development to protect habitat and EFH via the Omnibus Habitat FMP should afford sustainable management of the monkfish fishery. The proposal to allow changes to the RSA program through a framework adjustment is administrative and, therefore, neutral for monkfish. Allowing vessels to land monkfish heads is also neutral because it does not alter fishing effort.

Non-Target Species

Effort control measures implemented under the Monkfish FMP over the past decade have reduced overall fishing effort with its associated incidental catch of non-target species, particularly skates and dogfish. This trend is likely to continue under the proposed action, notwithstanding the year-over-year increase in allocated effort proposed in this amendment, as discussed here. Proposed biological and management reference points will not have an effect on non-target species because they do not directly affect fishing effort, while ACLs and AMs may have an indirect positive effect since they provide the basis for controlling fishing effort. The proposed specification of DAS and trip limits may have both positive and negative effect. While the increased opportunity to target monkfish through an increased DAS allocation will allow for effort to shift from other fisheries, there may be increased incidental catch of some species, particularly skates and dogfish. The impact of the automatic adjustment to DAS for trip limit overages is mixed for converse reasons: Increased efficiency reduces the time that gear needs to be in the water, reducing the chance of incidental catch, while increases in the rate at which DAS allocations are used up may cause vessels to shift to other fisheries, increasing effort in those fisheries. Both changes to the RSA program and allowing the landing of monkfish heads are neutral with respect to their effect on non-target species. Under the MSRA, all FMPs must adopt ACLs and AMs to end/prevent overfishing, which, in concert with the actions proposed in this amendment, will likely have a positive cumulative effect on non-target species.

Protected Resources

As with target and non-target species, past effort controls and other actions developed under the Monkfish FMP have reduced the potential for interaction with protected species. However, despite these measures, bycatch of harbor porpoise has been increasing in recent years (Waring *et al.*, 2009). As a result, the cumulative impact of the proposed action on protected species is expected to be mixed. Proposed biological and management reference points will not have an effect on protected species because they do not directly affect fishing effort, while ACLs and AMs may have an indirect positive effect since they provide the basis for controlling fishing effort. The overall impact of the proposed specification of DAS and trip limits may be neutral or negative with respect to protected species interactions depending on the time and area where the increase effort allocation is applied. If, for example, vessels utilize their increased allocation during the winter months when bycatch of sea turtles is minimal, then the increased allocation will not have an impact on these species. However, it could have negative impact on Harbor porpoise and White-sided and common dolphins since bycatch mortality of these species is highest during the winter months (see Orphanides 2009, 2010; Rossman 2010). The automatic adjustment to DAS for trip limit overages may have positive effect on protected species since increased efficiency reduces the time that gear needs to be in the water and reduces the chance of interaction. The impacts of both changes to the RSA program and allowing the landing of monkfish heads are neutral with respect to their effect on protected species.

Habitat, Including EFH

Past actions taken under the Monkfish FMP, particularly the controls on fishing effort and the closure of three offshore canyon areas in Amendment 2, have had a positive effect on protecting habitat, including EFH. The adoption of biological and management reference points will have no impact on habitat because they do not directly affect fishing effort, while ACLs and AMs may have an indirect positive effect since they provide the basis for controlling fishing effort. The impact of the proposed specification of DAS and trip limits may be neutral or negative with respect to habitat depending on the time and area where the increased effort allocation is applied. A negative effect might occur if, for example, vessels expand the area where they fish as a result of the increased DAS allocation. The automatic adjustment to DAS for trip limit overages may have a positive effect on habitat since increased efficiency reduces the time that gear needs to be in the water and in contact with the bottom. The impacts of the proposals to allow changes to the RSA program through a framework adjustment, and allowing vessels to land monkfish heads are both neutral because they do not alter fishing effort. These proposed actions, along with protections afforded through other management plans, such as Amendment 16 to the NE Multispecies FMP and Atlantic Sea Scallop FMP actions, as well as actions under development designed specifically to protect habitat and EFH via the Omnibus Habitat FMP should afford ongoing minimization, to the extent practicable, of adverse impacts of the fishery on habitat.

As discussed in Section 5.4.2, the impact of non-fishing activities on EFH tend to be concentrated in near shore areas. A list of such activities and their impact on VECs is provided in Appendix 6, in the last sections of the table. Such activities may work additively to decrease habitat quality and, as such the sustainability of managed resources, non-target species, and protected resources, but their location at only the edges of the managed fishing activity will likely diminish their cumulative effect on the VECs, including EFH.

Human Communities

The rebuilding of the monkfish resource over the past decade, along with the stability afforded by the multi-year specifications-setting process have had an overall positive effect on the affected human communities. This trend is likely to continue under the proposed action, which allows for increased fishing opportunities, as well as bycatch reduction and other efficiencies. All of the proposed measures are expected to have a positive impact on communities. The reference points, ACLs and AMs will control fishing effort at a level that achieves optimum yield while preventing overfishing. The increase specification of DAS represents increased economic opportunity. The automatic adjustment to DAS for trip limit overages increases efficiency, reduces costs and minimizes bycatch, all of which have positive effects on communities. The proposal to allow changes to the RSA program through a framework adjustment is positive because it allows the management system to be more responsive to changing needs as they arise with respect to the RSA program. And, allowing vessels to land monkfish heads will enable vessels to increase revenues without increasing fishing effort. The cumulative effect of the ongoing management of the monkfish fishery at sustainable levels, as well as actions taken under other FMPs as they meet MSRA mandates, will likely be positive over the long term.

Management Measure	VECs				
	Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
Biological and Management Reference Points Control Rules	**Neutral or Positive** – objective and measurable reference points, while not directly affecting fishing effort, provide the basis for monitoring stock status and achieving optimum yield while preventing overfishing	**No Impact/ Neutral** – reference points have no direct effect on catch of non-target species	**No Impact/ Neutral** – reference points have no direct effect on interaction with protected species	**No Impact/ Neutral** – reference points have no direct effect on fishing effort or habitat	**Neutral or Positive** – objective and measurable reference points, while not directly affecting fishing effort, provide the basis for monitoring stock status and achieving optimum yield while preventing overfishing
ACLs and AMs	**Positive** – the basis for setting specifications to prevent overfishing and achieve optimum yield	**Neutral or Positive** – management based on ACLs and AMs will control fishing effort	**Neutral or Positive** – management based on ACLs and AMs will control fishing effort	**Neutral or Positive** – management based on ACLs and AMs will control fishing effort	**Neutral or Positive** – management based on ACLs and AMs will control fishing effort
Specification of DAS and Trip Limits	**Positive** – Effort controls to prevent overfishing and achieve optimum yield	**Mixed** – Increased opportunity to target monkfish shifts effort from other fisheries but may increase incidental catch in the directed fishery	**Neutral or negative** – Increased effort allocations may result in greater interaction with PS, depending on where and when such effort is applied	**Neutral or negative** – Increased effort allocations may result in greater habitat impact, depending on where and when such effort is applied	**Positive** – Effort controls to prevent overfishing and achieve optimum yield; increased allocation improves fishery economy
Automatic DAS Adjustment for Trip Limit Overage	**Positive** – Minimizes bycatch and improves catch accounting	**Mixed** – Increased efficiency reduces incidental catch of non-target species but may result in effort shifting to other fisheries as DAS allocations are exhausted more quickly	**Positive** – May reduce time that gear is in the water	**Positive** – May reduce time that gear is in the water and in contact with the bottom	**Positive** – Minimizes bycatch and improves catch accounting; reduces cost and improves efficiency
Changes to the Research Set-Aside (RSA) Program	**Neutral** – Administrative measure with no effort impact	**Neutral** – Administrative measure with no effort impact	**Neutral** – Administrative measure with no effort impact	**Neutral** – Administrative measure with no effort impact	**Positive** – May result in more efficient adjustment process if changes to RSA are needed
Landing of Monkfish Heads	**Neutral** – Does not change fishing effort	**Neutral** – Does not change fishing effort	**Neutral** – Does not change fishing effort	**Neutral** – Does not change fishing effort	**Positive** – Allows for increased revenue with no increase in fishing effort

Table 68 Summary of Cumulative Effects of proposed action

6.0 Consistency with Applicable Laws

6.1 Magnuson-Stevens Act (MSA)

6.1.1 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 (NS). 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.

Based on the most recent stock assessment (SARC 50, 2010), overfishing is not occurring in either management area, and both stock components are not overfished, and above the biomass target. The assessment contains numerous cautionary statements as a result of scientific uncertainty about monkfish populations and biology. The proposed action incorporates MSRA requirements to set acceptable biological catch at a level that takes into account scientific uncertainty in the estimate of the overfishing level of catch, and also incorporates proactive measures to ensure accountability by setting catch targets (ACTs) at a level that is expected to prevent catches from exceeding the ACL. The Councils, therefore, are setting optimum yield equal to the ACTs, which is the highest level of catch that is expected to prevent overfishing while accounting for both scientific and management uncertainty.

(2) Conservation and management measures shall be based upon the best scientific information available.

The scientific information used in the development of the proposed action includes NMFS fishery data available through FY2008, and a stock assessment completed in August 2007. Subsequent to completion of the amendment development process, another stock assessment was conducted in June 2010. The results of that assessment re-affirmed the stock status with respect to overfishing and overfished condition, and data from this assessment was used in the final analysis of the proposed alternatives. These are the best and most recent scientific information available, and are compliant with the Infomration Quality Act (see Section 6.8). As noted in the discussion of NS 1 above, the Councils considered the cautionary and uncertain nature of the 2007 stock assessment in the development of the proposed action.

(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. At that time, and up to the present, scientific information is equivocal with respect to the single-stock or two-stock theories. Ongoing cooperative research is being done to attempt to resolve this issue. Nonetheless, the monkfish resource in the US EEZ is managed throughout its range, from the Gulf of Maine to waters off the coast of North Carolina, as a two stock unit.

(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 (gear or area fished) 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, with the exception of Category H permits, may fish in either management area, subject to the rules that apply in each. In Amendment 2, the Councils qualified a group of vessels for a limited access permit (Category H permits), that had not qualified under the original FMP, on the condition that on those vessels would be restricted to fishing only in their historical area, at the southernmost range of the fishery.

(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 Councils propose several measures to improve efficiency, such as the provision to allow vessels to land a one-day overage of the trip limit (rather than discard the overage) and have the vessels' DAS accounts adjusted accordingly, and the provision to allow vessels to land monkfish heads. While the FMP generally, and the proposed action specifically, may have differential impacts on various fishery groups, economic allocation is not one of the goals or objectives, nor does the action proposed in this framework to directly allocate the fishery resource.

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

The two-area management approach of the FMP is specifically 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 differences among various fisheries that catch monkfish either as a target or incidental catch species. These considerations are not changed under the proposed action.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

This FMP does not duplicate measures or regulations implemented under other FMPs, but coordinates with them. The inclusion of monkfish incidental catch limits for all fisheries enables those fisheries to operate with minimal restriction under the monkfish FMP. In addition, measures that improve efficiency of the fishery, such as those discussed under NS5 above, minimize the costs associated with discarding. To the extent the current plan and measures proposed in this amendment impose costs on vessels and processors, principally through gear requirements and/or reporting requirements, those costs are necessary for the successful management of the fishery.

(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 by utilizing economic and social data that meet the requirements of paragraph (2), 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 actions proposed in this amendment are not expected to have significant adverse effects on fishing communities (see Section 5.4), and some measures are likely to have positive effects, particularly those measures that increase allowable catch levels and minimize bycatch.

(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 FMP contains numerous measures to minimize bycatch and bycatch mortality, including large-mesh regulations, and incidental catch allowances for all fisheries. This amendment specifically includes an additional provision (allowing the landing of a trip limit overage) that further enhances the bycatch minimization aspects of the FMP by potentially reducing the amount of time gear is in the water.

(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 since this action does not contain any management measures that would affect safety at sea. However, the trip limit overage provision may encourage safer fishing practices since it enables a vessel to retain up to an additional day's worth of monkfish catch when landing, but be charged the applicable number of DAS.

6.1.2 Required Provisions

Section 303 of the MSFCMA contains fifteen 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;

The Monkfish FMP comprises conservation and management measures designed to achieve optimum yield from the fishery and prevent overfishing. Based on the results of the most recent stock assessment, monkfish is not overfished in either management area and overfishing is not occurring. The action proposed in this amendment would enable the fishery to continue to achieve optimum yield from the fishery while not causing overfishing, and promote stability in the fishery by setting 3-year catch targets that are designed to prevent catches from exceeding the ACL.

(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 for the original FMP, as well as in subsequent environmental documents accompanying plan amendments and framework adjustments, and updated in Section 4.0 of this document. There is no foreign fishing for monkfish, and there are no known Indian treaty fishing rights pertaining to monkfish.

(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;

The most recent stock assessment (SARC 50, 2010) contains the best estimate of the present condition of the monkfish resource, as well as estimates of future stock growth under the proposed annual catch targets (see Section 5.1.2.2.3).

(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;

There is sufficient capacity for United States' vessels to harvest the optimum yield from the monkfish resource, as evident by the fact that, even though the fishery is under a limited access program, vessels are restricted in the number of DAS and the amount of monkfish they can land per DAS to stay within the catch targets. Thus, there is no amount of optimum yield available for foreign fishing. Furthermore, sufficient domestic processing capacity exists to utilize all monkfish harvested by United States vessels.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing 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, economic information necessary to meet the requirements of this Act, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

The Monkfish FMP specifies pertinent data for the commercial fishery that shall be submitted to NMFS (e.g., IVR data, dealer data, etc.) Utilizing this information, the Monkfish Plan Development Team (PDT) compiles and publishes annually a description of the fishery, including affected communities, as part of the Stock Assessment and Fishery Evaluation (SAFE) Report. Section 4.5 of this document, Human Environment, updates, to the extent possible, the information contained in Framework 5. 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. The DAS carryover provision in the current FMP is specifically intended to enable vessels that are unable to use their allocation of DAS before the end of the year due to unforeseen circumstances, including weather, and this carryover provision now extends to unused DAS distributed to vessels engaged in cooperative research under the RSA program.

(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 4.4 contains the description of monkfish essential fish habitat, and Section 5.2 contains the analysis of impacts of the proposed action and alternatives on essential fish habitat.

(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 which is used to monitor the fishery and the progress of the FMP. Section 4.0 of this document contains the information and data for the 2007 and 2008 fishing years. Furthermore, Section 6.8 discusses this FMP's consistency with the Information Quality Act.

(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 analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for—(A) participants in the fisheries and fishing communities affected by the plan or amendment; (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; and (C) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery

The impacts of the proposed action and alternatives, including cumulative impacts, impacts on the physical and human environments are discussed in Section 5.0 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;

Based on the recommendations of the 2007 DPWG stock assessment, the Councils revised the reference point used to identify when the resource is overfished. Based on that assessment and the more recent SARC 50, including current and recommended revised reference points, the stock is not overfished in either management area, and overfishing is not occurring.

(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 reporting requirements for all vessels participating in the Federal monkfish fishery, including requirements to report all bycatch on the Vessel Trip Reports (VTR), and maintains, to the extent the budget allows, a fishery observer program on board vessels. Additionally, VMS is mandatory on the majority of limited access monkfish vessels through the requirements of the Atlantic Sea Scallop and

Northeast Multispecies FMPs. Since VMS allows the tracking of fishing locations, coordination of this information with observer coverage may allow for more accurate bycatch assessment and projection. Also, the emerging Study Fleet Program can provide another source of bycatch information for the different gear types and areas. The Study Fleet Program is designed to enhance fishery-dependent data necessary for management decisions through the development of electronic reporting technology.

The establishment of a Standardized Bycatch Reporting Methodology (SBRM) is required pursuant to section 303(a)(11) of the Magnuson-Stevens Act. In January 2006, development began on the Northeast Region Omnibus SBRM Amendment. This amendment covers 13 FMPs, 39 managed species, and 14 types of fishing gear. The purpose of the amendment is to: Explain the methods and processes by which bycatch is currently monitored and assessed for Northeast Region fisheries; determine whether these methods and processes need to be modified and/or supplemented; establish standards of precision for bycatch estimation for all Northeast Region fisheries; and document the SBRM established for all fisheries managed through the FMPs of the Northeast Region. The SBRM Amendment was approved on October 22, 2007, and a final rule became effective on February 27. 2008.

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 amendments to the FMP. Therefore, no additional specific bycatch monitoring alternatives are being recommended in this action.

(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, including its economic impact, 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 for the FMP, as well as in subsequent environmental documents (Amendment 2 and Frameworks 2 - 6), and updated in Section 4.0 of this document.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery

benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery;

The monkfish fishery does not have a recreational component. As a result, the FMP only addresses the commercial fishery. As noted under the discussion of National Standard 4 in the previous section, while conservation measures may have a differential impact on different sectors of the industry, that differential impact is not the purpose of the regulations, and is done in a manner that is intended to achieve the conservation and management goals of the FMP. The two-area management program is based on differences in the fisheries between the two areas, and not based on allocating fishing privileges differently among sectors of the industry.

(15) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

MSA Section 303 note states that this required provision does not take effect until fishing year 2010 for stocks that are subject to overfishing, and 2011 for all other stocks. Based on the most 2007 assessment overfishing is not occurring in either management area. Consequently, this amendment, which implements ACLs and AMs for the monkfish fishery is scheduled to take effect at the start of the 2011 fishing year.

6.1.3 EFH Assessment

According to the EFH Final Rule, “federal agencies are not required to provide NMFS with assessments regarding actions that they have determined would not adversely affect EFH.” The action proposed under this framework will not have an adverse effect on EFH of federally managed species, and, therefore, no EFH Assessment is required or provided.

6.2 National Environmental Policy Act (NEPA)

This section evaluates the proposed action in the context of NEPA, for determining the significance of Federal actions, in this case the setting of annual monkfish fishery specifications., and other adjustments to the FMP.

6.2.1 Finding of No Significant Impact (FONSI Statement)

NOAA has provided guidance for the determination of significance under NEPA in Section 6.01(b) of NOAA Administrative Order NAO 216-6, May 20, 1999, as well as in NMFS Instruction 3-124-1, July 22, 2005. NOAA Administrative Order 216-6 contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 CFR 1508.27 state that the significance of an action should be analyzed both in terms of “context” and “intensity”. The analysis of significance of this action is, therefore, based on both the NAO 216-6 criteria and CEQ’s context and intensity criteria. Each criterion listed in the sixteen questions below is relevant in making a finding of no significant impact, and have been considered individually, as well as in combination with the others. The sixteen criteria to be considered are addressed below:

1. *Can the proposed action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action?*

Based on the analysis and conclusions of the DPWG assessment (Appendix I) and, more recently, SARC 50, the catch targets proposed in this amendment will not jeopardize the sustainability of monkfish. Both assessments also concluded that overfishing is not occurring and monkfish is rebuilt in both management areas. The proposed action, to the extent the measures modify the management program, is designed to provide additional assurance that the catch will not exceed the ACL, and, if an overage should occur, that automatic adjustments will take place.

2. *Can the proposed action be reasonably expected to jeopardize the sustainability of any non-target species?*

As noted in Section 5.1, the proposed action is not expected to jeopardize the sustainability of any non-target species. The level of fishing effort resulting from the proposed action is the same as, or moderately below the levels analyzed in previous management actions, including the original FMP. Although information about bycatch is limited and inconclusive with respect to fishery-wide impacts, the impact of the monkfish fishery on non-target species is not significant, primarily as a result of the large-mesh gear requirements and low level of effort allocated. Additionally, this amendment contains a trip limit overage provision that may help reduce fishing effort, as noted in Section 5.1.

3. *Can the proposed action be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Fishery Conservation and Management Act and identified in FMPs?*

The alternatives under consideration in this action will not increase monkfish effort in either management area over the baseline effort level established in the original FMP and subsequent actions. The overall effect of the fishery on EFH was discussed and mitigated for in Amendment 2, and in Multispecies Amendment 13, and the alternatives under consideration do not change those findings. As discussed in Section 5.2, the action proposed in this amendment would not have an adverse impact on EFH for any federally managed species in the region.

4. *Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?*

None of the actions proposed in this amendment would create a safety or public health concern.

5. *Can the proposed action be reasonably expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

The activities and fishing effort levels conducted under the proposed action are within the scope of the original FMP, and do not change the basis for the determinations made in previous consultations, as noted in Section 5.1. The controlling of fishing effort, through the management measures in the FMP, in combination with NMFS' actions being proposed or taken to protect sea turtles, harbor porpoise and large whales will mitigate much of the impact of the fisheries (both the directed monkfish fishery and other fisheries in the region) on protected species, and keep such interactions within acceptable limits.

6. *Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships)?*

The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. While the role of monkfish within the ecosystem is not well understood, SARC 50 observed that "monkfish is one of the dominant piscivores in the ecosystem, …accounting for 2-6% of the total consumption by all finfish in the ecosystem." The maintenance of this predator and opportunistic feeder at historical and sustainable levels is likely to promote biodiversity and ecosystem function over the long term.

7. *Are significant social or economic impacts interrelated with significant natural or physical environmental effects?*

There are no significant social or economic impacts, nor are there any significant natural or physical environmental effects expected to result from the proposed action (Section 5.0, Environmental Consequences). Under the proposed action, some vessels and communities may experience an increase in revenues from monkfish fishing over the recent levels. There are no significant natural or physical environmental effects resulting from the proposed action that may have an impact on communities or the human environment in the context of NEPA. Furthermore, the proposed action is expected continue the long-term benefits of a stable and sustainable fishery through the achievement of optimum yield and prevention of overfishing.

8. *Are the effects on the quality of human environment likely to be highly controversial?*

The effects of the proposed action on the human environment are not expected to be highly controversial, as they are based on the best and most recent scientific information available and generally involve neutral or positive effects.

9. *Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?*

Other than the Stellwagen Bank National Marine Sanctuary (SBNMS), the proposed action does not affect areas of historic or cultural resources, park land, farmland, wetlands wild and scenic rivers or ecologically critical areas that are not already under protection (essential fish habitat areas and marine mammal protection zones). The effect on SBNMS is not likely to be substantial since the area is not a major monkfish fishing ground. Fishing vessels intentionally avoid shipwrecks, such as the SS “Portland” which is located within the SBNMS and is listed on the National Register of Historic Places (see question 12).

10. *Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

The analysis of the effects on the human environment of the proposed adjustment is consistent with the analyses done for prior adjustments and a broad range of fishery management actions taken by the Councils. While these analyses have some inherent uncertainty because they involve predicting future impacts that depend on a wide range of variables, such as the response of the target species to the management measures and the short-term range of alternative fisheries for affected vessels, the effects are not considered highly uncertain. Thus, while the risks inherent in analyses of the effects on the human environment are due to some uncertainty, those risks are not unique or unknown.

11. *Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?*

The proposed action is related to other recent management actions beginning with the implementation of the Monkfish FMP in 1999 which put in place most of the management measures that are currently in effect. While the FMP and the associated monkfish rebuilding program resulted in some significant impacts to the human environment, the framework actions and Amendment 2 which followed and which refined the original FMP measures were found to not result in significant impacts. Thus, while the proposed action is related to a recent past action that was found to have significant impacts (the rebuilding plan under the FMP), as discussed and analyzed in the cumulative effects assessment (CEA), this action when combined with other past, present and RFFAs would not result in significant cumulative impacts (see the CEA in Section 5.4).

12. *Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historic resources?*

The proposed action is not likely to directly or indirectly affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cultural or historical resources due to the spatial remoteness of the regulated activity relative to listed sites. The only object in the management area listed on the National Register of Historic Places is the wreck of the steamship “Portland”, within the Stellwagen Bank National Marine Sanctuary. The current regulations allow fishing within the Sanctuary, however, vessels typically avoid fishing near shipwrecks or bottom obstructions in order to avoid tangling and losing expensive fishing gear. Therefore, this action would not result in any adverse affects to the wreck of the “Portland”.

13. Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Although the proposed action would result in an increase in fishing effort in comparison to the status quo, it is not expected to result in the introduction or spread of a non-indigenous species. In 2002, an invasive colonial sea squirt (*Didemnum sp)* was observed on Georges Bank. The tunicate occurs on pebble gravel habitat, and does not occur on moving sand. NMFS has surveyed the area and is monitoring the growth. At this time, there is no evidence that fishing spreads this species more than it would spread naturally, however, the role of fishing gear in the spread of invasive tunicates should be regularly evaluated and monitored.

14. Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

No, the proposed action is not likely to establish a precedent for future action with significant effects, and it does not represent a decision in principle about future consideration. This action is taken under an existing fishery management program. The future management regime for the monkfish fishery, should changes become necessary, has not been defined, and will depend on the advancements made in the scientific understanding of the species and its population dynamics, or shifts in management philosophy. The impact of any future changes will be analyzed as to their significance in the process of developing and implementing them.

15. Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

No, the proposed action is not reasonably expected to threaten a violation of Federal, State or local laws or requirements imposed for the protection of the environment. This action does not propose any changes that would provide incentives for environmental laws to be broken.

16. Can the proposed action be reasonably expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Cumulative effects on target and non-target species, including protected species, related to the proposed action are discussed in Section 5.4 of this document. Based on that discussion, cumulative effects are not expected to be significant, and there is no change from the original analysis of cumulative impacts as assessed in the FMP and in the EIS for Amendment 2. This conclusion is based on the premise that controlling fishing effort at sustainable levels, while addressing issues such as bycatch and protected species interactions, will have a long-term positive effect on all components of the human environment.

FONSI Statement

In view of the analysis presented in this document, the EA/RIR/RFA for Amendment 5 to the Monkfish FMP, the proposed action will not have a significant effect on the human environment, with specific reference to the criteria contained in Section 6.02 of NOAA Administrative Order NAO 216-6, Environmental Review events for Implementing the National Environmental Policy Act, May 20, 1999. The impacts and alternatives in this document were analyzed with regard to both context and intensity, and are deemed not to be significant. Accordingly, the preparation of an Environmental Impact Statement for the proposed action is not necessary.

NMFS, Northeast Regional Administrator **Date**

6.3 Regulatory Impact Review and Initial Regulatory Flexibility Analysis (EO 12866 and IRFA)

6.3.1 Determination of significance under E.O. 12866

National Marine Fisheries Service guidelines provide criteria to be used to evaluate whether a proposed action is significant. A "significant regulatory action" means any regulatory action that is likely to result in a rule that may:

1. *Have an annual effect on the economy of $100 million or more, or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities.*

This action will have neither an annual effect on the economy of $100 million, nor adversely effect in a material way the economy, a sector of the economy, productivity, competition, the environment, public health or safety, or State, local, tribal governments or communities. During fishing years 1998 through 2004, gross monkfish revenues averaged approximately $41.4 million per fishing year. Monkfish revenues were $37.5 million in fishing year 2005. Since 2005, monkfish revenue had a decreasing trend, which declined to $25.2 million in fishing year 2006 and to $24.2 million in fishing year 2007. Under the current regulations, the total value of monkfish landings would be $12.3 million at the 2008 average price. The value under the proposed regulation would be $15.1 million at the same price. Thus, there would be an impact on the National economy of $2.8 million in additional revenues from monkfish landings relative to previous fishing year.

2. *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.*

The proposed action does not create an inconsistency or otherwise interfere with an action taken or planned by another agency. The activity that would be allowed under this action involves commercial fishing for monkfish in Federal waters of the EEZ, for which the National Marine Fisheries Service is the sole agency responsible for regulation. Therefore, there is no interference with actions taken by another agency. Furthermore, this action would create no inconsistencies in the management and regulation of commercial fisheries in the Northeast.

3. *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.*

The proposed action includes measures that would change biological reference points; establish target ACLs and AMs for fishing year 2011-2013, which adjusts the trip limits and the portion of the total monkfish DAS allocation that may be used in the NMA and SMA; allow modifications to the FMP to improve the RSA program via a framework adjustment; adjust DAS to account for trip limit overages to to minimize bycatch and cost; and allow landing of monkfish heads. This action is unrelated to any entitlements, grants, user fees, or loan programs, and, therefore, cannot be considered significant under the third criterion specified in E.O. 12866.

4. *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.*

The proposed action is being taken to implement the MSRA mandated ACLs and measures to ensure accountability. Therefore, the proposed action would not be considered significant under the fourth criterion specified in E.O. 12866.

Because none of these criteria apply, the National Marine Fisheries Service has determined that the proposed action in the monkfish fishery to change the biological reference points, establish target ACLs and AMs, adjust the trip limits and DAS allocations that may be used in the NMA and SMA, adjust DAS to account for trip limit overages, allow or adjustments to the RSA program by framework adjustment, and retain monkfish heads is not significant for the purpose of E.O. 12866.

6.3.2 Initial Regulatory Flexibility Analysis (IRFA)

The following sections contain analyses of the effect of the proposed action on small entities in accordance with Section 603(b) of the Regulatory Flexibility Act.

6.3.2.1 Reasons for Considering the Action

In 2007, the Magnuson-Stevens Fishery Conservation and Management Act was reauthorized, and revised to include, among other things, the requirement that all FMPs establish ACLs and measures to ensure accountability (AMs). For stocks not subject to overfishing, such as monkfish, the Act set a deadline of 2011 for the implementation of ACLs and AMs. The primary reason for this amendment is to implement the MSRA mandated ACLs and AMs to prevent overfishing.

The objective is also to define and adopt management reference points in accordance with the revised NS1 Guidelines published on January 16th, 2009. The other objective of this amendment is to set the specifications of DAS, trip limits and other management measures to replace those adopted in Framework 4 for period 2011-2013 and beyond if necessary. The Councils are also proposing to make modifications to the FMP to improve the Research Set Aside (RSA) Program, to minimize bycatch resulting from trip limit overages, and to allow vessels to land monkfish heads.

6.3.2.2 Objectives and legal basis for the action

The regulations implementing the FMP, found at 50 CFR Part 648, authorize the Council to adjust management measures as needed to achieve the FMP goals. As was noted earlier (see Section 2.2), the objective of this action is to achieve the goals of the FMP through implementing ACL and AMs, adjusting biological and management reference points consistent with NS1 Guidelines, and updating catch targets, trip limits and monkfish DAS allocations. Thus, the proposed action is consistent with the goals of the FMP and its implementing regulations.

6.3.2.3 Description and number of small entities to which the rule applies

All of the entities (fishing vessels) affected by this action are considered small entities under the SBA size standards for small fishing businesses ($4.0 million in gross sales). As of September 2009, there were 758 limited access monkfish permit holders and 2,156 open access permit holders. Out of these, 573 limited access permit holders (76 percent) actively participated in the monkfish fishery in 2008, whereas this number was 504 for the open access permit holders (23 percent). Table 69 shows the number of vessels in each permit category. The proposed measures can potentially affect all the monkfish vessels actively participating in the NMA, SMA or both regions.

Permit Category	Only NMA Trips	Only SMA Trips	NMA and SMA Trips
A	0	13	2
B	0	33	4
C	17	59	198
D	56	55	129
E	104	266	134
H	0	7	0

Table 69 Number of active monkfish vessels fishing by permit category and fishing area (FY 2008 data)

6.3.2.4 Reporting, recordkeeping and other compliance requirements

This action proposes one measure that adds a reporting requirement but it does not change the total reporting burden associated with an activity because it reduces the reporting burden under another existing requirement. Under the proposed measure to allow vessels to land a one-day's overage of the trip limit, those vessels must report via the VMA or IVR their intent to land an overage prior to returning to port. While this is a new reporting requirement, for each such instance that a vessel is landing such an overage, the number of annual reporting events will be reduced as the vessel's DAS allocation is reduced to account for the overage. Thus, although this action modifies an existing reporting burden, it does not change the overall reporting burden..

6.3.2.5 Duplication, overlap or conflict with other Federal rules

The proposed rule does not duplicate, overlap or conflict with other Federal rules.

6.3.2.6 Economic impacts on small entities resulting from the proposed action

The proposed management changes encompass a variety of measures that would impact vessels participating in the monkfish fishery. The following sections provide a discussion of the impacts for each alternative. Where possible, a quantitative assessment of the impacts is provided. If a quantitative assessment is not possible, an attempt is made to identify the types and number of vessels that may be reasonably expected to be affected.

6.3.2.6.1 Biological and Management Reference Points (BRP) Alternatives

The proposed change in BRP does not immediately affect any vessels because it does not change any management measures or otherwise modify vessel-level aspects of the management program.

6.3.2.6.2 Annual Catch Limits and Accountability Measures

The proposed alternative consists of series of actions.

6.3.2.6.2.1 ACL

The councils proposed to set ACLs for the NMA and SMA equal to the ABC, rather than below it. The actual limit to fishing is determined by the ACT, which is set relative to the ACL and takes into account management uncertainty. Assuming that the fishery remains sustainable, if management uncertainty can be reduced, maintaining the proposed ACL would allow for a higher ACT in the future. Similarly, if scientific uncertainty is reduced, this could lead to a higher ACL, and higher ACTs as a result. A higher ACT would result in greater revenue opportunities for fishing vessels.

6.3.2.6.2.2 Reactive AM

The proposed action calls for a reduction in the annual catch target (ACT) for a management area in the second year following the year that catch exceeds the annual catch limit (ACL) in that management area. How Councils reduce the ACT is not prescribed, other than the reduction in the ACT would equal the overage in ACL on a pound-for-pound basis. Should the Councils not act, NMFS would reduce the ACT and adjust DAS and trip limits accordingly.

Harvesting additional monkfish in excess of ACL would result in immediate short-term revenue increases for those fishing vessels that harvested more than they would have if the ACL had not been exceeded. With a positive interest rate, this gain would only be lost partly with a reduction in harvest and revenues two years later. If the reduction imposed affected all vessels equally then the negative impact will be less severe on those vessels that gained from the overage previously. Also, it is possible that by exceeding the ACL longer term impacts on the stock could lead to further future economic losses due to changes in the stock size resulting in more restrictive management measures. Therefore, reactive AMs will prevent such long-term losses that may potentially occur from unforeseen overages.

6.3.2.6.2.3 Proactive AMs (ACT)

The purpose for setting the ACT below the ACL is to account for uncertainty in the ability of management measures to limit catch to the prescribed level. The intention behind providing a buffer between the ACL and ACT is to prevent overfishing from occurring in the event the measures to limit catch are not fully successful. The ACT includes landings and discards of monkfish from all fisheries, including the directed monkfish fishery and fisheries where monkfish landed incidentally (e.g. scallops, multispecies, etc). Actions that reduce discards or reduce the uncertainty of the effectiveness of management actions would allow the ACT to be closer to the ACL.

From an economic perspective, assuming that prices do not decrease due to higher landings, a higher ACT would result in higher monkfish revenues and thus additional benefits to vessels and the nation. However, this is only the case if the higher allocation is actually landed, as opposed to discarded or left uncaught.

The preferred alternative would set the ACT at 11,513 mt (86% of ACL) in the SMA. In FY2008, monkfish landings exceeded the TAL by 32%. This suggests that some of the additional benefits from monkfish revenues under the preferred alternative are already being realized in the SMA. The proposed ACT under option 2 would increase landings by an additional 40 percent while option 1 would essentially maintain landings at current levels. Thus the preferred alternative should result in additional monkfish revenues for vessels and ports beyond those already being realized, while under option 1, revenues would be retained at or marginally above current levels.

In the NMA historical landings have exceeded the level associated with both ACT options; however, in FY2008 landings were only 71% of the allocation suggesting a higher ACT may not result in higher monkfish revenues. Thus, although the preferred alternative may result in higher landings and revenues than option 1 in theory, these landings may not be realized, and resulting changes to revenues may not substantially differ between the two options. Changes in the management of other fisheries, in particular the Multispecies FMP, could change this scenario.

Quantification of the economic impacts of the proposed ACTs requires specification of the management actions used to achieve the proposed levels. The impact of alternative DAS and trip limit levels are discussed below.

6.3.2.6.3 Specification of DAS and Trip Limits Alternatives

6.3.2.6.3.1 Das and Trip Limit Options

The trip limit and DAS alternatives would impact vessels fishing for monkfish in either area, to the extent that it impacts their normal fishing activity. As in previous annual adjustments, estimation of relative economic impacts was accomplished through the use of a trip limit model to estimate average changes in per-trip vessel returns net of operating costs and crew payments, as well as changes in monkfish revenue. The analysis uses data from observed trips to simulate outcomes under alternative trip limits and DAS allocations. The trip data is compiled from FY 2008 vessel trip reports and dealer weigh-out slips, with the former providing catch and location data and the latter providing average monthly prices, which are used to calculate revenue estimates.

The trip limit model was previously used to analyze changes in trip limits and DAS allocations while moving from higher to lower limits. The effect was evaluated based on a comparison of the expected return for alternative trip-taking strategies. A vessel may abandon a trip if the trip limit causes earnings to fall below zero, they may continue to fish while discarding any monkfish above the trip limit, or they may fish up to the trip limit and then return to port. Assuming that a trip is taken, vessels may choose to continue fishing while discarding monkfish over the trip limit so long as the revenue earned from other species offsets the costs of fishing. Trips where other species make up a relatively small portion of the trip revenue may lead to trips being discontinued when the trip limit is reached, since the cost of continued fishing would exceed the additional revenue.

Previous monkfish frameworks and amendments proposed to reduce the trip limits or kept them the same; therefore, the trip model could have been used to analyze the economic effects of the proposed changes. However, this amendment proposes to increase the trip limits and DAS allocations, making a straight forward application of the trip limit model challenging. An increase in DAS allocation allows a vessel to take additional trips beyond the ones it has taken under the previous DAS allocation, and an increase in trip limit would allow a vessel to retain more of their catch and reduce discards on a trip. The trip limit model has been modified to accommodate these possible additional revenue opportunities.

Under this modified trip limit model, first, each trip was evaluated as in the existing model but incorporating the possibility of higher retention under the higher limit. Secondly, it is assumed that a vessel may take additional trips if DAS allocations are increased provided the vessel is in a directed fishery and it has used 75% or more of its DAS allocation. Further, it is assumed that the additional trips will be very similar to the trips the vessel has taken in the past. Accordingly, depending on the percentage of days absent and additional DAS allocation, a certain number of trips are chosen randomly from a vessel's past trips to augment the set of trips the vessels have taken previously.

For the purpose of this analysis, it is assumed that if vessels took trips in both the NMA and SMA, these vessels are indifferent between taking a trip in either area. Rather they will choose to take the trip that maximizes net trip revenue. To model this assumption, all trips taken by limited access monkfish permit holders landing monkfish in at least one trip were ordered by descending revenue for each vessel. Each trip is then analyzed as follows. A trip is unchanged if the total monkfish landed is less than the incidental trip limit or the relevant monkfish management area DAS limit and the trip limit.

If the DAS limit has been reached, then the monkfish catch is reduced to the relevant proposed incidental catch limit and the appropriate strategy for the vessel (i.e., ending the trip or continuing to fish while discarding any additional monkfish catch) is determined along with the return (in terms of revenue) from the strategy. If the DAS limit has not been reached and the monkfish catch is greater than the incidental limit and the current relevant trip limit, then the monkfish catch is reduced to the relevant trip limit and the vessel's revenue maximizing strategy and resulting return is determined.   To take account of the increase in DAS allocation, we identify the vessels which might take addition trips and then augment their trip sets by the following criterion: first, we calculate the number of additional trips the vessel might take based on the percentage of days absent given their previous level of DAS allocation and the proposed DAS allocation. Secondly, we randomly pick the number of trips determined in the first step from their set of trips.

The relative change in net return to the vessel was estimated by calculating the average per-trip returns to the vessel owner using both the existing trip limits and the proposed FY2011 trip limits. These returns take into account operating costs, which were estimated using trip cost data collected on observer logs in FY 2008. Trips landing monkfish during FY 2008 in the NMA and SMA were identified, and the total trip cost was estimated as using a regression of the logarithm of trip cost against the logarithms of days absent, the number of crew, and a dummy variable indicating if the vessel gear type is gillnet. The parameters from this regression were then used to construct estimates of trip cost and cost per day absent for all trips landing monkfish during FY 2008. Returns to the vessel were calculated using a standard 60/40 lay system where 40 percent of the gross revenue goes to the vessel and 60 percent is shared among the crew, who pay for the operating expenses for the trip. Therefore, the net to the crew is the difference between the 60 percent share and the operating costs.

Since a necessary assumption of the trip limit model is that fishing location decisions are unchanged under new rules, an analysis of the impacts of the proposed measures is conducted separately for vessels fishing only in the NMA, vessels fishing only in the SMA, and vessels fishing in both areas. In reality, this is a simplification and a limitation of the model, since vessels could change their fishing location in order to mitigate some of the negative impacts or to access additional benefits from regulations. It should also be noted that the results are presented as the single year relative change from the FY 2008 baseline to each of the alternative combinations. In the absence of an ACL overage, the selected alternatives would remain in place until the end of the specifications period (FY2011-2013). Thus, there will be a cumulative effect of the measures over the entire three year period. However, the impacts may be mitigated by a possible fall in the monkfish prices due to the overall increase in monkfish landings. Due to the nature of the monkfish market, at this time, no model exists that can predict monkfish prices with a sufficient degree of accuracy to predict price changes due to changes in landings. In light of these limitations, the modifications made to take account of the increase in DAS/trip limit is considered to be a simplified solution. With time and more supporting data, it is possible to identify more sophisticated methods that can predict vessel's behavior under DAS/trip limit increase more accurately.

6.3.2.6.3.1.1 Vessels Fishing only in NMA

The impacts of the trip limit model on the vessels fishing only in the North are presented Table 70. The model predicts that under the proposed regulations per trip average vessel return will increase from 0.2% to 2.2% whereas average crew payment will increase from 0.5% to 1.8% depending on different DAS allocations and trip limit alternatives. The increase in total monkfish revenue ranges from 0.8% to 24.5% under the proposed options. The council voted on keeping the trip limits same for the AC permit holders at 1250 lbs and increasing it to 800 lbs for the BD permit holders as well as increasing DAS to 40. The proposed option will lead to a 0.8% increase in per trip average vessel return, 1.2% percent increase in crew payment and 11.0% increase in total monkfish revenue. Although, the maximum benefit in terms of percentage increase in average vessel return, average crew payment and monkfish revenue is expected to result from option 2B, council adopted option 2C which is a combination of increase in trip limit for BD permit holder and in DAS.

Incidental Limit	TAC (mt) ACT Option	NMA Option	AC limit	BD limit	DAS	Change in Average Vessel Return	Change in Average crew Payment	Change in Monkfish Revenue
300	8,063 Option 1	1A	1250	700	31	0.2%	0.5%	0.8%
		1B	1250	470	45	1.7%	1.6%	16.1%
		1C	1250	600	40	0.5%	0.5%	10.0%
	10,750 Option 2	2A	1250	950	31	0.5%	1.2%	1.7%
		2B	1250	470	51	2.2%	1.8%	24.5%
		2C	**1250**	**800**	**40**	**0.8%**	**1.2%**	**11.0%**

Table 70 Changes from the no action alternative to proposed alternatives – vessels fishing only in NMA. The preferred alternative row is in bold.

6.3.2.6.3.1.2 Vessels Fishing only in SMA

The trip limit model for the SMA indicates mixed impacts on average vessel return, average crew payment and monkfish revenue (Table 71). The Council kept the trip limits of 550 pounds for the permit categories A, C and G, and of 450 pounds for permit categories B, D and H same at previous level. However, the Councils increased DAS to 28 from 23. As can be seen from the table, the proposed option leads to a maximum positive impact on Monkfish revenue compared to the other options considered for this amendment. Increasing DAS, as under the proposed alternative, has a more favorable impact on monkfish revenue, crew payment and average vessel return than increasing trip limits.

Incidental Limit	TAC (mt) ACT Option	SMA Option	ACG limit	BDH limit	DAS	Change in Average Vessel Return	Change in Average Crew Payment	Change in Monkfish Revenue
50	9,211 option 1	1A	550	450	23	-	-	-
		1B	550	450	23	-	-	-
		1C	700	600	15	-1.0%	-1.4%	-20.0%
	11,513 option 2	2A	700	600	23	0.5%	0.7%	7.9%
		2B	**550**	**450**	**28**	**-0.0%**	**0.7%**	**32.0%**
		2C	700	600	23	0.5%	0.7%	7.9%

Table 71 Change from current alternative to proposed alternatives – vessels fishing only in SMA. The preferred alternative row is in bold.

6.3.2.6.3.1.3. Vessels Fishing in Both NMA and SMA

Vessels fishing in both NMA and SMA will be simultaneously affected by DAS/trip limit alternatives chosen for NMA and SMA. While these vessels have a demonstrated capability to shift between areas and may be more likely to change fishing locations than vessels that have historically fished solely in one area, the trip model does not incorporate this possibility. Rather, it is assumed that vessels continue fishing in the same locations they did previously and results are calculated for each possible combinations of NMA and SMA alternatives.

There are no single DAS/trip alternative combinations for SMA and NMA which lead to a best outcome in terms of impact on average vessel return, average crew payment and total monkfish revenue. As can be seen Table 72, the largest increase on monkfish revenue is realized under the alternative with an incidental limit of a 300 pound, 1250 pound trip limit for A and C vessels, 470 pound trip limit for B and D vessels, and 51 DAS in the NMA, in combination with the SMA levels of a 50 pound incidental limit, 550 pound trip limit for A, C, and G vessels, 450 pound trip limit for B, D and H vessels, and 28 DAS in the SMA. However these combinations of measures lead to a slight decrease in average vessel return and crew payment. Under the preferred alternatives for NMA and SMA, the monkfish revenue will increase by 17.9% with -1.3% decrease in both vessel return and crew payment.

NMA Alternatives				SMA Alternatives				Change in Average Vessel Return	Change in Average Crew payment	Change in Monkfish Revenue
Incidental limit	AC limit	BD limit	DAS	Incidental limit	ACG limit	BDH limit	DAS			
300	1250	470	31	**50**	550	450	23	-	-	-
					700	600	15	-0.4%	-0.7%	-6.1%
					700	600	23	0.2%	0.4%	2.7%
					550	450	28	-1.3%	-0.8%	7.0%
	1250	700	31		550	450	23	0.0%	0.1%	0.3%
					700	600	15	-0.4%	-0.6%	-5.7%
					700	600	23	0.2%	0.4%	3.0%
					550	450	28	-1.2%	-0.7%	7.3%
	1250	470	45		550	450	23	-0.6%	-0.5%	13.2%
					700	600	15	-0.7%	-1.4%	5.8%
					700	600	23	-0.4%	-0.1%	16.1%
					550	450	28	-1.1%	-0.7%	22.9%
	1250	600	40		550	450	23	-0.2%	-0.3%	8.1%
					700	600	15	-0.5%	-1.1%	1.3%
					700	600	23	0.0%	0.1%	10.9%
					550	450	28	-1.4%	-1.4%	17.4%
	1250	950	31		550	450	23	0.1%	0.2%	0.7%
					700	600	15	-0.3%	-0.5%	-5.2%
					700	600	23	0.2%	0.5%	3.4%
					550	450	28	-1.2%	-0.7%	7.7%
	1250	470	51		550	450	23	-0.4%	-1.0%	19.5%
					700	600	15	-0.9%	-1.9%	10.7%
					700	600	23	-0.2%	-0.7%	22.4%
					550	450	28	-1.0%	-0.9%	30.0%
	1250	**800**	**40**		550	450	23	-0.1%	-0.2%	8.6%
					700	600	15	-0.5%	-1.0%	1.8%
					700	600	23	0.0%	0.2%	11.4%
					550	**450**	**28**	**-1.3%**	**-1.3%**	**17.9%**

Table 72 Change from the no action alternative to proposed alternatives – vessels fishing in NMA and SMA. The preferred alternative row is in bold.

6.3.2.6.4 Other Adjustments to the DAS and Trip Limit Management Program

6.3.2.6.4.1 Automatic DAS adjustments for Trip Limit Overage

The Council chose option 3 under alternative 2, which would allow vessels to exceed the daily trip limit by one day’s amount and have 24 hours and one minute deducted from their DAS account. From economic perspective any action that allows a vessel to retain more catch without staying out at sea or returning to sea results in an increase in revenues without an increase in costs, thus; vessel profits are higher. The preferred option provides the greatest benefit to vessels in comparison to taking no action, and in comparison to the other DAS charging options, since it allows vessels to make fewer trips to retain the same amount of monkfish that they would under the current fishing practice, and utilize the same amount of DAS.

6.3.2.6.4.2 Permit Category C and D Groundfish DAS Usage

The preferred "No action" alternative will maintain the current regulation of vessels holding monkfish category C and D permit and a multispecies permit charge a multispecies A DAS for every monkfish DAS used. The Council did not vote for alternative 2 which would allow flexibility of choice when to use combined monkfish-multispecies DAS or a monkfish-only DAS which might have helped vessels plan their fishing pattern more efficiently and consequently realize more revenue. The proposed alternative will neither introduce new revenue opportunities nor eliminate existing revenue sources.

6.3.2.6.4.3 Monkfish Vessels in GF Sectors – GF DAS usage requirement

The Councils voted for the "No action" alternative which would continue to require vessels holding a monkfish category C and D permit and a multispecies permit be charged a multispecies category A DAS for every monkfish DAS used. Since vessels would not be able to take advantage of higher flexibility offered under alternative 2, there would be no potential to increase revenues as a result of this additional flexibility.

6.3.2.6.4.4 Carryover RSA DAS

When the Councils initiated this amendment, vessels were prohibited from carrying over allocated, but unused RSA DAS. On March 13, 2010, NMFS published a final rule for a technical amendment to the FMP that allowed vessels to carryover unused RSA DAS to the subsequent year, so the Councils terminated further consideration of this provision.

6.3.2.6.4.5 Allow Changes to RSA Program by Framework Adjustment

The Councils voted for the action that would allow changes in RSA program by framework adjustment. Overall, is an administrative change affecting only the procedures that may be used by the Councils to implement changes to the Monkfish RSA Program. As such, there are no costs to regulated entities associated with this provision. However, the preferred alternative would provide increased flexibility, in comparison to taking no action, to the Councils in terms of modifying RSA program to address needs and issues as they arise. This has the potential to increase the utilization of the program by researchers and industry members, potentially increasing revenues to vessels that participate in this program in the future.

6.3.2.6.4.6 Mandatory VMS

The preferred "No action" will not require limited access vessels to use mandatory VMS. The majority of active limited access monkfish vessels that have used some of their DAS allocation have used VMS either in the monkfish fishery, or in some other fishery (Table 64). This data is based on the DAS Allocation Management System (AMS) database. Trip activity codes were used to determine fishing location and trip source was used to determine if VMS or IVR was used. All trips for a limited access monkfish vessel, no matter the fishery, were used to determine if the vessel ever used VMS.

All vessels that fished in the NMA used VMS over the past two fishing years in some fishery. For vessels that fish only in the SMA, about 23% of the vessels did not have a VMS system installed and approximately 40% of the active vessels fishing in both areas did not have a VMS system installed. Under alternative 1, these vessels would not have to incur any additional cost of installing and operating VMS in this amendment, while under alternative 2 these vessels would incur such additional costs (see Section 5.3.5).

6.3.2.6.4.7 Allow Landing of Monkfish Heads

The preferred alternative would allow the fishermen to land unattached monkfish heads up to 2.32 times the weight of tails on board. In comparison to taking no action, this alternative would allow the conversion of "waste" that was previously discarded to be converted to a product that could either generate additional revenues or be used by fishermen to offset costs from purchasing bait. Both of these scenarios would provide an economic benefit to monkfish fishermen while allowing for better utilization of the resource.

6.4 Endangered Species Act (ESA)

Section 7 of the ESA requires Federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The Councils have concluded that the proposed action in Amendment 5 is not likely to result in jeopardy to any ESA-listed species under NMFS jurisdiction, or alter or modify any critical habitat, based on the analyses and discussions in this document. For further information on the potential impacts of the fishery and proposed management action, see Section 5.1 of this document. When the Councils submit this document to NMFS, it is anticipated that the agency will initiate an informal consultation on this action under Section 7 of the ESA.

6.5 Marine Mammal Protection Act (MMPA)

The Councils have reviewed the impacts of Amendment 5 on marine mammals, and concluded that the proposed actions are consistent with the provisions of the MMPA, and would not alter existing measures to protect the species likely to inhabit the management unit of the monkfish fishery. For further information on the potential impacts of the fishery and the proposed management action, see Section 5.1 of this document.

6.6 Paperwork Reduction Act (PRA)

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. This action proposes one measure that adds a reporting requirement but it does not change the total reporting burden associated with an activity because it reduces the reporting burden under another existing requirement. Under the proposed measure to allow vessels to land a one-day's overage of the trip limit, those vessels must report via the VMA or IVR their intent to land an overage prior to returning to port. While this is a new reporting requirement, for each such instance that a vessel is landing such an overage, the number of annual reporting events will be reduced as the vessel's DAS allocation is reduced to account for the overage. Thus, although this action modifies an existing reporting burden, it does not change the overall burden estimate. If NMFS concurs with this determination, it will submit the PRA package in support of this action and the information collection identified above, including required forms and supporting statements, following final submission of this amendment.

6.7 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The NEFMC reviewed the approved coastal zone management plans of the following states to determine the consistency of the actions proposed in Amendment 5 to the Monkfish FMP with the enforceable policies of the state programs: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The NEFMC has determined that the proposed action is consistent to the maximum extent possible with the enforceable policies of the coastal zone management programs of these states. If NMFS agrees with the NEFMC's determination, it will notify the affected states of this determination in writing, and request concurrence in accordance with the provisions of 15 CFR 930 *et seq.*

6.8 Information Quality Act (IQA)

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

Utility

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document include individuals involved in the monkfish fishery, (e.g., fishing vessels, fish processors, fish processors, fishery managers), and other individuals interested in the management of the monkfish fishery. The information contained in this document will be helpful and beneficial to owners of vessels holding limited access monkfish permits since it will notify these individuals of the measures contained in this amendment. This information will enable these individuals to adjust their management practices and make appropriate business decisions based upon this revision to the FMP.

Until a proposed rule is prepared and published, this EA/RIR/IRFA is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The information contained in this document includes detailed, and relatively recent information on the monkfish resource and, therefore, represents an improvement over previously available information. For example, the Affected Human Environment section of the EA includes the most recent (FY2007 and 2008) Stock Assessment and Fishery Evaluation Reports (SAFE Report) for the monkfish fishery. In addition, this document includes applicable information from the most recent monkfish stock assessment (July 2010), even though this information was not available during the development of this amendment. This EA/RIR/IRFA will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

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

Integrity

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

Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Several sources of data were used in the development of Amendment 5. These data sources included, but were not limited to, historical and current landings data from the Commercial Dealer Weighout database, vessel trip report (VTR) data, effort data collected through the monkfish DAS program, fisheries independent data collected through the NMFS bottom trawl surveys, and the July 2007 monkfish stock assessment. Subsequent to the Councils' final decisions on this action, another stock assessment was completed, and this information is included in this final submission document and available for public review. Therefore, the analyses contained in this document were prepared using data from accepted sources. Furthermore, these analyses have been reviewed by members of the Monkfish Plan Development Team.

The amendment has been reviewed for compliance with all the applicable National Standards of the Magnuson-Stevens Act, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the proposed action were conducted using information from the most recent fishing years through FY2008. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the monkfish fishery. In addition, this action utilizes information from the July 2007 monkfish stock assessment, which was considered the best and most recent scientific information available concerning the status of the monkfish resource. As noted above, updated information from the July 2010 assessment has been added to this final submission document.

The policy choices are clearly articulated, in Section 3.0 of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section 5.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council (the NEFMC), the Northeast Fisheries Science Center (Center), the Northeast Regional Office (NERO), and NMFS Service Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of any proposed regulatory action, including any implementing regulations, is conducted by staff at NMFS Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. In addition, the information contained in this document concerning monkfish stock status (Northeast "Data Poor" Stocks Working Group: Monkfish 2007, and Stock Assessment Review Committee, SARC 50, 2010) was peer reviewed according to standard methodology.

6.9 Executive Order 13132 (Federalism)

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in Amendment 5. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

6.10 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each Federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs Federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

6.11 Administrative Procedures Act (APA)

Section 553 of the APA establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the NEFMC is not requesting any abridgement of the rulemaking process for this action.

7.0 References

Abernathy, A., ed. 1989. Description of the Mid-Atlantic environment. U.S. Dep. Interior, Minerals Manage. Ser., Herndon, VA. 167 p. + appendices.

Almeida, F., L. Arlen, P. Auster, J. Cross, J. Lindholm, J. Link, D. Packer, A, Paulson, R. Reid, and P. Valentine. 2000. The effects of marine protected areas on fish and benthic fauna: the Georges Bank closed area II example. Poster presented at Am. Fish. Soc. 130th Ann. Meet. St. Louis, MO, August 20-24, 2000.

Backus, R.H. 1987. Georges Bank. Massachusetts Inst. Tech. Press, Cambridge, MA. 593 p.

Beardsley, R.C., B. Butman, W.R. Geyer, and P. Smith. 1996. Physical oceanography of the Gulf of Maine: an update. *In* G.T Wallace and E.F. Braasch, eds. Proceedings of the Gulf of Maine ecosystem dynamics scientific symposium and workshop. p. 39-52. Reg. Assn. for Res. on the Gulf of Maine (RARGOM), Rep. 97-1.

Best, P.B., J. L. Bannister, R.L. Brownell, Jr., and G.P. Donovan (eds.). 2001. Right whales: worldwide status. *J. Cetacean Res. Manage.* (Special Issue). 2. 309pp.

Boesch, D.F. 1979. Benthic ecological studies: macrobenthos. Chapter 6 in Middle Atlantic outer continental shelf environmental studies. Conducted by Virginia Inst. Mar. Stud. under contract AA550-CT6062 with U.S. Dep. Interior, Bur. Land Manage. 301 p.

Braun-McNeill, J., and S.P. Epperly. 2004. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). Mar. Fish. Rev. 64(4):50-56.

Brooks, D.A. 1996. Physical oceanography of the shelf and slope seas from Cape Hatteras to Georges Bank: A brief overview. *In* K. Sherman, N.A. Jaworski, and T.J. Smayda, eds. The northeast shelf ecosystem – assessment, sustainability, and management. p. 47-75. Blackwell Science, Cambridge, MA. 564 p.

Brown, M.W., O.C. Nichols, M.K. Marx, and J.N. Ciano. 2002. Surveillence, monitoring, and management of North Atlantic Right Whales in Cape Cod Bay and adjacent waters – 2002. Final report submitted to the MA Div. of Mar. Fisheries. Center for Coastal Studies; Provincetown, MA.

Butman, V., M. Noble and J. Moody. 1982. Observations of near-bottom currents at the shelf break near Wilmington Canyon in the Mid-Atlantic outer continental shelf area: results of 1978-1979 field seasons. U.S. Geol. Surv. Final Rep. to U.S. Dep. Interior, Bur. Land Manage: 3-1-3-58.

Clapham, P.J., S.B. Young, R.L. Brownell, Jr. 1999. Baleen whales: conservation issues and the status of the most endangered populations. Mammal Review 29(1): 35-60.

Colvocoresses, J.A. and J.A. Musick. 1984. Species associations and community composition of Middle Atlantic Bight continental shelf demersal fishes. Fish. Bull. (U.S.) 82: 295-313.

Cook, S.K. 1988. Physical oceanography of the Middle Atlantic Bight. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 1-50. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Cooper, R.A., P.C. Valentine, J.R. Uzmann, and R.A. Slater. 1987. Submarine canyons. *In* R.H. Backus and D.W. Bourne, eds. Georges Bank. p. 52-63. MIT Press, Cambridge, MA.

Dorsey, E.M. 1998. Geological overview of the sea floor of New England. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 8-14. MIT Sea Grant Pub. 98-4.

Gabriel, W. 1992. Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, northwest Atlantic. J. Northwest Atl. Fish. Sci. 14: 29-46.

Haring, P., and Maguire, J-J. 2008. The Monkfish Fishery and its Management in the Northeastern USA. ICES Journal of Marine Science. 65: 1370-1379.

Hecker, B. 1990. Variation in megafaunal assemblages on the continental margin south of New England. Deep-Sea Res. 37: 37-57.

Hecker, B. 2001. Polygons BH1–4 (Veatch, Hydrographer, Oceanographer and Lydonia Canyons). *In* S. Azimi, ed. Priority ocean areas for protection in the Mid-Atlantic. p. 32-36. Natural Resources Defense Council, Washington, DC. 59 p.

Hecker, B. and G. Blechschmidt. 1979. Epifauna of the northeastern U.S. continental margin. *In* B. Hecker, G. Blechschmidt, and P. Gibson, eds. Epifaunal zonation and community structure in three mid- and North Atlantic canyons. Appendix A. Final Rep. Canyon Assess. Stud. in the Mid- and North Atlantic Areas of the U.S. Outer Continental Shelf. U.S. Dep. Interior, Bur. Land Manage., Washington, DC, January 11, 1980.

Hecker, B., D.T. Logan, F.E. Gandarillas, and P.R. Gibson. 1983. Megafaunal assemblages in canyon and slope habitats. Vol. III: Chapter I. Canyon and slope processes study. Final Rep. prepared for U.S. Dep. Interior, Minerals Manage. Ser., Washington, D.C.

Hirth, H.F. 1997. Synopsis of the biological data of the green turtle, *Chelonia mydas* (Linnaeus 1758). USFWS Biological Report 97(1). 120pp.

ICES. International Council for the Exploration of the Sea. 2000. Report of the ICES Advisory Committee on the Marine Environment (ACME) 2000. Cooperative Research Report No. 241, 27 pp.

James, M.C., R.A. Myers, and C.A. Ottenmeyer. 2005. Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. Proc. R. Soc. B, 272: 1547-1555.

Katona, S.K., V. Rough, and D.T. Richardson. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution Press: Washington, DC, 316 pp.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginias sea turtles: 1979-1986. Virginia J. Sci. 38(4): 329-336.

Kelley, J.T. 1998. Mapping the surficial geology of the western Gulf of Maine. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 15-19. MIT Sea Grant Pub. 98-4.

Kenney, R.D. 2002. North Atlantic, North Pacific and Southern Right Whales. pp. 806-813, *In*: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.). Encyclopedia of Marine Mammals. Academic Press, San Diego, CA.

Lindeboom, H.J., and S.J. de Groot. 1998. Impact II. The effects of different types of fisheries on the North Sea and Irish Sea benthic ecosystems. NIOZ Rapport 1998-1. 404 p.

Mahon, R., S.K. Brown, K.C.T. Zwanenburg, D.B. Atkinson, K.R. Buja, L. Claflin, G.D. Howell, M.E. Monaco, R.N. O'Boyle, and M. Sinclair. 1998. Assemblages and biogeography of demersal fishes of the east coast of North America. Can. J. Fish. Aquat. Sci. 55: 1704-1738.

Morgan, L.E. and R. Chuenpagdee. 2003. Shifting gears: assessing the collateral impacts of fishing methods in U.S. waters. Pew Science Series on Conservation and the Environment, 42 p.

Morreale, S. J., and E.A. Standora. 2005. Western North Atlantic waters: crucial development habitat for Kemp's ridley and loggerhead sea turtles. Chelonian Conservation and Biology. 04(4): 872-882.

Morreale, S.J. and E.A. Standora. 1998. Early life stage ecology of sea turtles in northeastern U.S. waters. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-413, 49 pp.

Mountain, D.G., R.W. Langton, and L. Watling. 1994. Oceanic processes and benthic substrates: influences on demersal fish habitats and benthic communities. *In* R.W. Langton, J.B. Pearce, and J.A. Gibson, eds. Selected living resources, habitat conditions, and human perturbations of the Gulf of Maine: environmental and ecological considerations for fishery management. p. 20-25. NOAA Tech. Mem. NMFS-NE-106. 70 p.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pp. 137-164 In: Lutz, P.L., and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

NEFMC. New England Fishery Management Council. 1998. Final Amendment #11 to the Northeast Multispecies Fishery Management Plan, #9 to the Atlantic Sea Scallop Fishery Management Plan, Amendment #1 to the Monkfish Fishery Management Plan, Amendment #1 to the Atlantic Salmon Fishery Management Plan, and components of the proposed Atlantic Herring Fishery Management Plan for Essential Fish Habitat, incorporating the environmental assessment. October 7, 1998.

NEFMC. New England Fishery Management Council. 2003. Amendment 13 to the Northeast Multispecies Fishery Management Plan, including a Final Supplemental Environmental Impact Statement and an Initial Regulatory Flexibility Analysis. Vols I and II, submitted Dec 1 2003.

NEFSC. Northeast Fisheries Science Center. 2002. Workshop on the effects of fishing gear on marine habitats off the northeastern United States, October 23-25, 2001, Boston, Massachusetts. U.S. Natl. Mar. Fish. Serv. Northeast Fish. Cent. Woods Hole Lab. Ref. Doc. 02-01. 86 p.

NMFS and U.S. Fish and Wildlife Service (USFWS). 1991a. Recovery plan for U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.

NMFS and USFWS. 1991b. Recovery plan for U.S. population of Atlantic green turtle. National Marine Fisheries Service, Washington, D.C. 58 pp.

NMFS and USFWS. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

NMFS and USFWS. 2007a. Loggerhead sea turtle (*Caretta caretta*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 65 pp.

NMFS and USFWS. 2007b. Leatherback sea turtle (*Dermochelys coriacea*) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 79 pp.

NMFS and USFWS. 2007c. Kemp's ridley sea turtle *(Lepidochelys kempii*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 50 pp.

NMFS and USFWS. 2007d. Green sea turtle (*Chelonia mydas*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 102 pp.

NMFS. 2005. Recovery Plan for the North Atlantic Right Whale (*Eubalaena glacialis*). National Marine Fisheries Service, Silver Spring, MD.

NMFS. 1991. Final recovery plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the national Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

NMFS. 1998. Unpublished. Draft recovery plans for the fin whale (*Balaenoptera physalus*) and sei whale (*Balaenoptera borealis*). Prepared by R.R. Reeves, G.K. Silber, and P.M. Payne for the National Marine Fisheries Service, Silver Spring, Maryland. July 1998.

NRC. National Research Council. 2002. Effects of trawling and dredging on seafloor habitat. Ocean Studies Board, Division on Earth and Life Studies, National Research Council. National Academy Press, Washington, D.C. 126 p.

Orphanides, C.D. 2009. Protected species bycatch estimating approaches: estimating harbor porpoise bycatch in U. S. northwestern Atlantic gillnet fisheries. J . Northw. Atl. Fish. Sci.,42: 55 -76.

Orphanides, C.D. 2010. Estimates of Cetacean and Pinniped Bycatch in the 2007 and 2008 Northeast Sink Gillnet and Mid-Atlantic Gillnet Fisheries. U S Dept Commerce, Northeast Fish Sci Cent Ref Doc. 10-10; 45 p.

Overholtz, W.J. and A.V. Tyler. 1985. Long-term responses of the demersal fish assemblages of Georges Bank. Fish. Bull. (U.S.) 83: 507-520.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.

Poppe, L.J., J.S. Schlee, B. Butman, and C.M. Lane. 1989a. Map showing distribution of surficial sediment, Gulf of Maine and Georges Bank. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-1986-A, scale 1:1,000,000.

Poppe, L.J., J.S. Schlee,. Knebel H.J. 1989b. Map showing distribution of surficial sediment on the mid-Atlantic continental margin, Cape Cod to Albemarle sound. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-1987-D, scale 1:1,000,000.

Pratt, S. 1973. Benthic fauna. *In* Coastal and offshore environmental inventory, Cape Hatteras to Nantucket Shoals. p. 5-1 to 5-70. Univ. Rhode Island, Mar. Pub. Ser. No. 2. Kingston, RI.

Reid, R.N. and F.W. Steimle, Jr. 1988. Benthic macrofauna of the middle Atlantic continental shelf. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 125-160. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Richards, R. A., Nitschke, P.C. and Sosebee, K.A. 2008. Population Biology of monkfish *Lophius americanus*. ICES Journal of Marine Science. 65.

Rossman, M.C. 2010. Estimated bycatch of small cetaceans in northeast US bottom trawl fishing gear during 2000-2005. J . Northw. Atl. Fish. Sci., 42: 77-101.

Schmitz, W.J., W.R. Wright, and N.G. Hogg. 1987. Physical oceanography. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 27-56. Jones and Bartlett Publishers Inc., Boston, MA.

Shepard, F.P., N.F. Marshall, P.A. McLonghlin, and F.G. Sullivan. 1979. Currents in submarine canyons and other sea valleys. Am. Assn. Petrol. Geol., Studies in Geol. No. 8.

Sherman, K., N.A. Jaworski, T.J. Smayda, eds. 1996. The northeast shelf ecosystem – assessment, sustainability, and management. Blackwell Science, Cambridge, MA. 564 p.

Shoop, C.R. and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6: 43-67.

Steimle, F.W. and C. Zetlin. 2000. Reef habitats in the middle Atlantic bight: abundance, distribution, associated biological communities, and fishery resource use. Mar. Fish. Rev. 62: 24-42.

Steimle, F.W., C.A. Zetlin, P.L. Berrien, D.L. Johnson and S. Chang. 1999. Essential fish habitat source document: tilefish, *Lopholatilus chamaeleonticeps*, life history and habitat characteristics. NOAA Tech. Mem. NMFS-NE-152. 30 p.

Stevenson, D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, and M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. NOAA Tech. Memo. NMFS-NE-181. 179 p.

Stumpf, R.P. and R.B. Biggs. 1988. Surficial morphology and sediments of the continental shelf of the middle Atlantic bight. *In* A.L. Pacheco, ed. Characterization of the middle Atlantic water management unit of the northeast regional action plan. p. 51-72. NOAA Tech. Mem. NMFS-F/NEC-56. 322 p.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mamm. Sci. 9: 309-315.

Theroux, R.B. and M.D. Grosslein. 1987. Benthic fauna. *In* R.H. Backus and D.W. Bourne, eds. Georges Bank. p. 283-295. MIT Press, Cambridge, MA.

Theroux, R.B. and R.L. Wigley. 1998. Quantitative composition and distribution of the macrobenthic invertebrate fauna of the continental shelf ecosystems of the northeastern United States. NOAA Tech. Rep. NMFS 140. 240 p.

Townsend, D.W. 1992. An overview of the oceanography and biological productivity of the Gulf of Maine. *In* D.W. Townsend and P.F. Larsen, eds. The Gulf of Maine. p. 5-26. NOAA Coast. Ocean Prog. Reg. Synthesis Ser. No. 1. Silver Spring, MD. 135 p.

Tucholke, B.E. 1987. Submarine geology. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 56-113. Jones and Bartlett Publishers Inc., Boston, MA.

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

Turtle Expert Working Group (TEWG). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the wester North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-444, 115 pp.

Turtle Expert Working Group (TEWG). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555, 116 pp.

Turtle Expert Working Group (TEWG). 2009. An assessment of the loggerhead turtle population in the Western North Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-575:1-131.

USFWS and NMFS. 1992. Recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). NMFS, St. Petersburg, Florida.

USFWS. 1997. Synopsis of the biological data on the green turtle, *Chelonia mydas* (Linnaeus 1758). Biological Report 97(1). U.S. Fish and Wildlife Service, Washington, D.C. 120 pp.

Valentine, P.C. and R.G. Lough. 1991. The sea floor environment and the fishery of eastern Georges bank. U.S. Dep. Interior, U.S. Geol. Sur. Open File Rep. 91-439. 25 p.

Valentine, P.C., E.W. Strom, R.G. Lough, and C.L. Brown. 1993. Maps showing the sedimentary environment of eastern Georges bank. U.S. Dep. Interior, U.S. Geol. Sur. Misc. Invest. Ser., Map I-2279-B, scale 1:250,000.

Waring G.T., Josephson E, Fairfield CP, Maze-Foley K, editors. 2006. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2005. NOAA Tech Memo NMFS NE 194.

Waring GT, Josephson E, Fairfield CP, Maze-Foley K, editors. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2006. NOAA Tech Memo NMFS NE 201; 378 p.

Waring, G.T., D.L. Palka, P.J. Clapham, S. Swartz, M. Rossman, T. Cole, L.J. Hansen, K.D. Bisack, K. Mullin, R.S. Wells, D.K. Odell, and N.B. Barros. 1999. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 1999. NOAA Technical Memorandum NOAA Fisheries-NE-153.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2006, 2nd edition, US Department of Commerce, NOAA Technical Memorandum NMFS -NE -201.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley (eds). 2008. US Atlantic and Gulf of Mexico marine mammal stock assessments -- 2007. NOAA Tech Memo NMFS NE 205; 415 p.

Waring, G.T., Josephson E, Maze-Foley K, and Rosel PE, editors. 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2009. NOAA Tech Memo NMFS NE 213; 528 p.

Watling, L. 1998. Benthic fauna of soft substrates in the Gulf of Maine. *In* E.M. Dorsey and J. Pederson, eds. Effects of fishing gear on the sea floor of New England. p. 20-29. MIT Sea Grant Pub. 98-4.

Wiebe, P.H., E.H. Backus, R.H. Backus, D.A. Caron, P.M. Glibert, J.F. Grassle, K. Powers, and J.B. Waterbury. 1987. Biological oceanography. *In* J.D. Milliman and W.R. Wright, eds. The marine environment of the U.S. Atlantic continental slope and rise. p. 140-201. Jones and Bartlett Publishers Inc., Boston, MA.

Wigley, R.L. and R.B. Theroux. 1981. Atlantic continental shelf and slope of the United States – macrobenthic invertebrate fauna of the middle Atlantic bight region – faunal composition and quantitative distribution. Geol. Surv. Prof. Pap. 529-N. 198 p.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, Megaptera novaeangliae, in the mid-Atlantic and southeast United States, 1985-1992. Fishery Bulletin 93(1):196-205.

Worthington, L.V. 1976. On the North Atlantic circulation. Johns Hopkins Ocean. Stud. No. 6. Johns Hopkins Univ. Press, Baltimore, MD. 110 p.

Wright, W.R. and L.V. Worthington. 1970. The water masses of the North Atlantic Ocean: a volumetric census of temperature and salinity. Ser. Atlas Mar. Environ., Am. Geol. Soc. Folio No. 19.

Wynne, K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant, Narragansett. 115pp.

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