TO: **New England Fishery Management Council**
John Pappalardo, Chairman
From: **Georges Bank Cod Hook Sector, Inc.**
C/O Eric O. Brazer, JR
Steven M. Tucker
P.O. Box #2, N. Chatham, MA 02650
Date: **April 30, 2007**

RE: Letter of Transmittal, Chatham/Harwichport Hook Sector Reauthorization.

Action Requested:
The Georges Bank Cod Hook Sector (Sector) and the Cape Cod Commercial Hook Fishermans Association request reauthorization of Sector operations following modification to the Sector Operations Plan described in the attached document.

About the Petitioner:
In 1991, a group of Cape Cod fishermen came together to discuss and deliberate the future of their industry and the ocean that had sustained their way of life. They formed an organization that would be an active voice for their interest in preserving a healthy ocean, balanced with a need to maintain the viability of local coastal fishing communities. Through careful growth of fiscal and human resources, membership, and volunteerism, the CCCHFA has evolved to have a prominent public presence. With seven staff and an active Board of fishermen and concerned coastal residents, the CCCHFA is working to secure a future for the threatened day boat fishery.

History of the Georges Bank Cod Hook Sector:
In 2003, the CCCHFA campaigned with local hook fishermen to establish the Georges Bank Cod Hook Sector (Hook Sector) under Amendment 13 to the Northeast Multispecies fishery management plan. The Hook Sector is an organization of 25 fishermen who have been granted local management authority over approximately 12% of the Georges Bank cod quota while advancing the conservation objectives of the Fishery Management Plan. Experience gained in the implementation of the Hook Sector in prior years serve as the basis for this petition to reauthorize the sector and revise the Sector Operations Plan.

Purposes of the proposed action:

1) End over fishing of Gulf of Maine Multispecies by establishing a catch-limit managed fishery to complement existing efforts by NMFS to protect these species throughout the region.
2) Reduce bycatch by implementing full retention of caught fish.
3) Ensure economic viability for fishermen and communities by increasing efficiency.
4) Tailor regulations to address disparate social impacts sustained by local communities.
5) Measure and minimize bycatch of juvenile or spawning fish through trip management, fleet communication, voluntary closures, or other management measures.
6) Provide incentive to retain shoreside infrastructure necessary to support local fishing industry.

Need for the proposed action:

The George's Bank Hook Sector (Sector) provides a viable alternative for local vessels that will suffer undue hardship and loss under provisions of the general regulations. The participants in the Sector generally initiate and terminate trips to the fishing grounds from the ports of Chatham and Harwichport, two communities where the cost of housing and other living expenses have skyrocketed even while constraints on fishing landings and effort have been tightened. The town of Chatham recognizes the challenges that this trend poses to long term residents, as evidenced by language included in the town's local comprehensive plan:

> **As land costs increased, inexpensive homes, primarily smaller year-round affordable houses, were sold, enlarged or totally replaced for retirement and/or second homes, depleting the affordable housing stock drastically. A substantial gap exists between mortgage costs and the price which typical area residents can pay. As of 1999, the maximum mortgage affordable by a household with the area's median income ($44,700) was $117,220 and for a moderate income household (one earning 80% of the median income), the maximum affordable mortgage was $89,400. With very few houses available for $200,000 or less, most people of median or lower income cannot afford to purchase.**

Escalating prices for real estate also heighten the burden on those who have already purchased a home, as assessed valuations (and subsequently the tax burden) are raised to match market conditions. Absent the Sector, the impacts of the sweeping regulations that are being applied across the entire management area, the difficulties inherent in small business ownership and administration in an industry dominated by larger interests, and the challenges faced by home-port communities on the Cape may have displaced fishermen out of their homes entirely, rather than reducing merely reducing fishing mortality to meet biological objectives.

More refined management measures that aptly address the ability of sector participants to distribute their allocation across both time and space, to optimize the economic return from available harvest and to plan for the timing of that harvest, allow fishermen to remain viable members of these changing communities. The careful construction of the Sector's management regime, including its participatory nature and transparent processes, ensures good faith among participants. This ensures high levels of compliance with monitoring and reporting requirements developed and adopted by the sector members themselves.

The proposed operations plan described in the attached document includes several tactics that will alleviate uncertainties that are inherent in various input-controls intended to distribute the collective effort of the general pool. This relief will result in increased efficiency within the sector, providing the commensurate benefits of strengthening the effectiveness and acceptance of such community based management strategies. Provisions are included that will allow fishermen to realize the greatest return on their time at sea, to minimize the interaction of their gear with non-target species and to optimize

reporting of trip results. These objectives will be accomplished by allowing members of the sector to fish at their discretion, without the artificial and arbitrary constraint of a designated fishing area. In addition, participants will have access to areas that are closed to the general pool (with the exception of spawning areas and restrictions in areas where Right whales have been observed). Further, because the sector is governed by a hard TAC, because the allocation represents a small component of the annual yield and because this small effort is dispersed across a large area, Sector participants will be granted relief from block restrictions. Such input-focused measures, in this case requiring the hauling of fishing apparatus for discreet periods of time during the season, are unlikely to provide relief to the target and non-target species being fished.

Rationale for a Community Based Management Approach through sectors:

The orchestrated execution of the various Sector management strategies provides greater certainty that mortality from fishing will be more accurately forecast, and that biological objectives for target species will be met. In addition, this regime affords fishermen the discretion to manage their effort and their allocation to yield sufficient returns to support their businesses. They have the latitude to fish when and where target species are most likely to be harvested, meeting the dual interests of minimizing trip duration and reducing impacts to non-target species. Captains will be able to respond to market fluctuations, maximizing the return on their efforts and foregoing dangerous voyages during unsettled weather. In so doing, the Sector ensures that the available allocation is managed to meet the economic needs of dedicated, knowledgeable fishermen, and advances the community's interest in the continued viability of the local fishing industry. This modest flexibility is possible because of the more stringent controls the Sector framework provides with regard to the final output of the Sector. Participants opt-in because this flexibility affords the opportunity increase efficiency resulting in greater economic return per unit effort, rather than racing for increased landings to add sufficient value to meet escalating costs.

Additional Value-added Benefits:

The Operations Plans of approved sectors ensure rigorous monitoring of effort and readily accessible data regarding landings with single-vessel resolution. The oversight responsibility normally incumbent on the Service is effectively delegated to the third party agent, operating under the stringent guidelines and requirements of the operations plan. Orchestration of a single monitoring scheme with similar degrees of accuracy and resolution across the industry would not be practicable for the Service. The demands of implementing and maintaining an adequate communications network and managing key data points for the industry -- or even for discreet portions thereof -- would place exorbitant demands on the current staff and resources of the Service. The Sector, however, has a demonstrated track record for meeting these standards. In addition, the Sector operates within a fixed benchmark in the form of a TAC, and delivers the means to track incremental progress toward this endpoint on an ongoing basis. Monthly reports to the Service ensure that agency needs for data to inform management decisions are met.

Efficiency will be further improved by the acceptance and implementation of electronic reporting mechanisms. Under the scrutiny of a sector manager, adequate safeguards and technology exist to allow for prompt reporting of data and information in an electronic format. A properly administered program would reduce the reporting burden placed on fishermen, ensure complete accountability for the data provided, and expedite analysis of the catch reports.

The Sector also alleviates costs associated with the enforcement of fishery regulations. The use of contractual obligations and third-party sureties yields superior results when compared with the more conventional, opportunistic methods employed to identify infractions when they occur. Use of near real-time and real-time monitoring mechanisms ensures that target TACs will not be exceeded, and provides the sector management and the Service with the ability to manage fishing activity of individual vessels.

Foster Community-Based Fisheries Management:

The Georges Bank Hook sector stands as a proven model for the positive results that properly constructed community based management (CBM) frameworks can deliver. The Sector is a participatory mechanism, a consensus product of open dialog, driven by fishermen's knowledge and directed toward the interests of the local community. Participants demonstrate that they can offer more detailed data with regard to timing, location and results of fishing effort. In return, sector management provides increased latitude to fisherman with regard to the administration of their profession (within biological targets). CBM provides an exceptional degree of voluntarily compliance with standards that otherwise demand inordinate amounts of agency resources.

The Georges Bank sector evolved as a creature of the community, and operates as an open forum that convenes for periodic updates and to deal with changes affecting the fishery. At Sector meetings fishermen engage in dialog and discourse, working together to craft a mechanism most likely to provide for their immediate and long term needs. The George Banks sector identified seemingly opposing needs for improved accountability and consistency and also for increased autonomy to manage fishing operations. The sector Operations Plan realizes both of these goals, allowing for individual management of fishing operations while requiring strict reporting and accountability to sector management.

As the administrator of the Georges Bank sector, the CCCHFA continues to educate fisherman in the area about the promise of community based management programs for fishermen that are currently active in the fishery—and for those that may follow.

For the first time in years there are some indications that continued vigilance and renewed efforts to promote improved management of stocks may preserve enough fish to sustain a fishery into the future. This outcome, so long presumed to be a certainty but recently thought to be lost, is a legacy that may be reclaimed if fishing effort is limited by TACs.

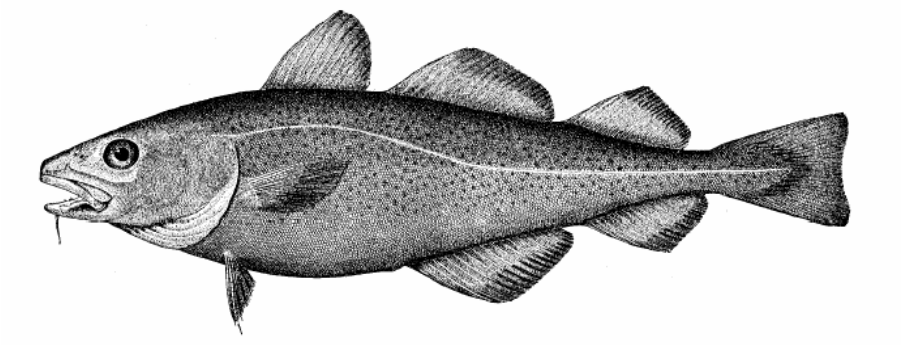
CCCHFA continues to monitor the level of effort brought to bear within the Georges Bank Hook sector, and to evaluate potential vehicles for managing capacity. Capacity is initially pegged to a historic baseline associated with individual permits enrolled in the sector. Other devices such as allowances for trading, for fishing on multiple permits, for the establishment of a repository for latent permits and other market based approaches are being assessed.

Likelihood of Success- Regulations Tailored to Local Needs:

Sector management affords the opportunity to tailor reporting mechanisms to take best advantage of the hook fleet's level of technological sophistication and its normal operating ranges. The development of regulations that are responsive to these key attributes enables the adoption of rules requiring strict adherence to reporting protocols. For example, captains fishing in the George's Bank sector are required to notify the sector manager at the beginning of each voyage, and to provide trip verification within 48 hours of their return to port. Community needs are necessarily safeguarded by provisions that ensure continuity in the event of bureaucratic, regulatory or other procedural, non-judicial delays. Finally, the inter-sector trading scheme helps safeguard the small boat fleet, providing opportunities for local vessels to capitalize on allocations that might otherwise be underutilized or consolidated to external interests.

Proposed Agency Action:
Approval of the Georges Bank Cod Hook Sector & Operations Plan

Type of statement: Draft Environmental Assessment



Lead Authors:
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&
Cape Cod Commercial Hook Fishermen's Association

In Consultation With the Lead Agency:
National Oceanic and Atmospheric Administration (NOAA)
National Marine Fisheries Service (NOAA Fisheries Service)

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April 30, 2007

Table of Contents

LIST OF TABLES AND FIGURES

TABLES

FIGURES

1.0 INTRODUCTION

The final rule implementing Amendment 13 to the Northeast Multispecies Fishery Management Plan (FMP) (69 CFR 22906, April 27, 2004) specified a process for the formation of sectors within the multispecies fishery and the allocation of total allowable catch (TAC) for a specific groundfish species (or Days-at-Sea), implemented restrictions that apply to all sectors, authorized and implemented the first Georges Bank cod Sector TAC in New England: the Georges Bank (GB) Cod Hook Sector (Hook Sector), and specified a formula for the allocation of GB cod TAC to future Sectors. As this Hook Gear Sector is the Sector in question, for GB cod to be allocated to the Sector and the Sector authorized to fish, the Sector must submit an Operations Plan (Ops Plan) and Sector Contract to the Regional Administrator

(RA) annually for approval. The Operations Plan and Sector Contract must contain certain elements, including a contract signed by all Sector participants and a plan containing the management rules that the Sector participants agree to abide by to avoid exceeding the allocated TAC. An analysis of the impacts of the Sector's proposed operation and harvesting rules is required to comply with the National Environmental Policy Act (NEPA).

1.1 Georges Bank Hook Sector Operations Plan Request

The Cape Cod Commercial Hook Fishermen's Association (CCCHFA) proposes to work with the existing Georges Bank Cod Hook Sector (Hook Sector) to revise and compliment the current Sector management plan. The Hook Sector expects to meet the following social, economic, and conservation objectives by improving on this community-based approach to fisheries management:

1) Ending overfishing by Sector members of all species managed under the Multispecies Fishery Management Plan (FMP), with the inclusion of monkfish, skates, and spiny dogfish, by allowing continued harvest pursuant to hard total allowable catch limits (TAC) to compound the benefits realized by the previously approved Georges Bank Cod Hook Sector;
2) Reduce bycatch by implementing full retention of all fish harvested by sector vessels;
3) Increase efficiency of effort deployed to harvest TAC, to reduce environmental impacts and promote viability of traditional day boat fishery;
4) Tailor regulations to meet community social and economic needs;
5) Measure and minimize bycatch of marine mammals through gear modifications, fleet communication, voluntary closures, or other management measures;
6) Secure viability of fishing industry and industry-related commerce, ensuring availability of shoreside infrastructure.

Local, hardworking hook fishermen established the Hook Sector in 2003 through Amendment 16 to the Northeast Multispecies FMP. Two years later, a group of gillnet fishermen established the Hook Sector through Framework 42 to the Northeast Multispecies FMP. Since then, both groups of fishermen have joined forces to develop more accountable, efficient, and effective Sector proposals for their respective ventures. Both existing Sectors, along with CCCHFA, request modification and renewal of existing sectors, and approval of proposals for additional locally managed, TAC-limited allocations through a Framework to the FMP, to be developed and implemented by the New England Fishery Management Council (NEFMC) by May 1, 2008.

The Sector is a group of self-selecting fishermen that have come together voluntarily and cooperatively for the purposes of efficiently harvesting annual allocations of Northeast Multispecies fishery stocks. Under the preferred alternative, the Sector would operate under hard Total Allowable Catches for all regulated groundfish species as well as monkfish, skates, and dogfish. In so doing, it would meet the Sustainable Fisheries Act (SFA) amendment to the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (Magnuson Act) mandates to curtail overfishing. Furthermore, the Sector would foster novel and highly adaptive means of local decision-making, self-monitoring, and enforcement that would serve as a portable model and proof-of-concept for one strategy to achieve sustainable fisheries management in New England. In addition, implementation of the Sector would mitigate harmful and disparate economic impacts that will result from Framework 42 to the NE Multispecies FMP by additional latitude to fisherman in exchange for increased accountability and an enforceable cap on harvested biomass. This approach is anticipated to result in environmental, social, and economic benefits to the Sector members themselves, to the businesses that depend on them and the surrounding community.

1.1.1 MEMBER REQUIREMENTS

To qualify for participation in the Sector, members must posses a valid limited-access NE multispecies permit and an allocation of days-at-sea (DAS) under Amendment 13. Under Amendment 13, the NEFMC established the Sector qualifying period for GB cod according to the baseline years 1996-2001 that were used to allocate DAS, and established the Sector qualifying period for all other regulated species as the previous five years before the Sector is formed. The Sector identifies a need for a fixed and permanent baseline for all current and future sector allocations. For the Hook Sector, all allocations will be based on landings between May 1, 1996 and April 30, 2006. The Sector's TAC is the cumulative sum of each Sector member's individual proportion of the landings taken during the qualifying period. Sector members will be required to declare their intention to join the Sector to the National Marine Fisheries Service (NMFS) Regional Administrator (RA) on an annual basis. Sector members will be legally bound by a Membership Agreement that outlines expectations of members as well as a schedule of penalties for violations of Sector rules.

The Sector is expected to include members primarily from Chatham and Harwichport, MA. The majority of vessels fish with gillnet gear; however, the vessels often outfit their vessels to fish with hook gear at various times throughout the year. The Sector members have worked together to shape fishery policy for nearly a decade under the auspices of CCCHFA. This group of permit owners is brought together by a common belief that they can improve both the stewardship of the fishery and their economic performance by holding themselves to a higher standard of accountability and taking greater responsibility for managing their own fishing activities under strict catch limits for the species they catch. Prosecution of the fishery under the provisions of the previously approved sector lends, which demonstrated a high level of compliance with sector regulations, corroborates their view.

1.1.2 SECTOR RULES for 2008-09 FISHING YEAR (FY)

The Sector Manager (Manager) would oversee day-to-day operations of the Sector. The Sector requests allocation of all regulated groundfish stocks as well as monkfish, skates, and dogfish. The stocks for which allocations are requested include the following 29 stocks: Gulf of Maine (GOM) and GB cod; GOM and GB haddock; GB, Cape Cod (CC), and Southern New England (SNE) yellowtail flounder; GOM, GB, and SNE/Massachusetts winter flounder; GOM/GB and SNE/Massachusetts windowpane flounder; witch flounder; American plaice; Acadian redfish; pollock; white hake; Atlantic halibut; ocean pout; Northern Fishery Management Area (NFMA) and Southern Fishery Management Area (SFMA) monkfish; clearnose, little, rosette, smooth, thorny, winter, and barndoor skate; and spiny dogfish shark. Furthermore, the Sector would operate within a minimum allocation amount of 2,000 pounds of TAC of any quota-manages species where fishing history is less than this minimum allocation amount. Inter-sector quota trading would be permissible, provided that both Sectors would be operating under allocations of the same species. Trading would be allowed only within the span of one FY, and would be accurately monitored and accounted for in real-time. Trading would not be allowed if it would result in a Sector exceeding its 20% quota cap on any species. Operating under a hard TAC of these species would assure that the Sector would not contribute to overfishing of these stocks. The Sector would land, and tally against the hard TAC allocation, all catch. All discards would be deducted from the hard TAC allocation. If/when the Sector achieves its hard TAC allocation on any specie, the Sector will cease operation with gear capable of catching these species for the balance of the fishing year (unless additional TAC, not to exceed the 20% cap, is approved). Future catch histories associated with the Sector are proposed to remain constant regardless of whether vessels land the fish, and Sectors will be credited with their actual TAC percentage, instead of the actual percentage of TAC achieved (unless the Sector achieves the TAC). Furthermore, Sectors will be credited with their maximum TAC amount (20%) rather than the actual amount of fish caught. Real-time landings data will be used to ensure compliance with the hard TAC. Exemption from federal and Sector paper reporting is requested in lieu of paper reporting. Proven electronic reporting techniques, such as the Electronic Vessel Trip Report developed by CCCHFA and NMFS, will be utilized.

Participants in the Sector are under contractual obligation to comply with constraints of the hard TAC for the above species. However, the Sector seeks exemption from the following: DAS controls; trip limits (while mandating full retention of all catch); rolling, seasonal, and mortality closures; non-spawning blocks; and hook and gillnet limits (number and size/mesh). Sector members will fish solely with hook gear and solely within the Sector Fishing Area, defined as the state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464 to 639). If the Sector experiences delays in operation resulting from procedural requirements encumbent on NMFS, the NEFMC, or other governing body, the Sector will be allowed to operate under the previous years' Harvesting Rules until it receives its Letters of Authorization (or facsimiles thereof) for the then-current FY. If any quota-managed species are harvested during this time, they will be measured and counted towards the Sector's then-current TACs. Sectors proposed prior to the 2006 FY will not be required to compensate NMFS for any administrative burden precipitating from continued operation from year-to-year.

Under these rules, the Hook Sector will build upon its existing record of success, serving as a model for the future of sustainable, viable, community- and quota- based management regimes in New England.

1.2 Purpose and Need for Proposed Action

This action is proposed in order to provide an opportunity to mitigate disparate adverse economic impacts to Sector member vessels resulting from effort controls implemented through Amendment 13 and subsequent framework adjustments to the NE Multispecies FMP. As described in Amendment 13, the ports of Chatham and Harwichport suffered a decline in groundfish permits of 53% in the years 2001-2004, the greatest loss among the eight primary groundfish ports. In addition to providing direct relief to artisinal fishermen, the proposed action will mitigate adverse impacts to fishery-dependant businesses in the affected area, and will preclude social impacts that would otherwise be sustained by historic fishing towns on Cape Cod. The implementation of the action will be realized through the initiation of a framework to authorize an evolved Georges Bank Hook Gear Sector, the process for which was specified and authorized as part of Amendment 13. The preferred action allows Sector members to curtail social and economic hardships while complying with biological objectives. This objective will be accomplished through the application of management rules, including stringent reporting requirements and enforceable catch limits, that the Sector participants agree to and are contractually bound to abide by.

The Chatham and Harwichport area is home to a fleet of small, day-boat fishermen who operate in much the same manner that New Englanders have fished for generations: in small boats that are owned and operated by independent businessmen. The fishery contributes to Cape Cod's charm, heritage, and tradition. This traditional fishing community contributes to the local, regional and state economy: thousands of people journey to the fish piers annually to see fish landed, and then to local eateries to taste the fresh, dayboat catch. Commercial fishing is one of the few remaining industries on Cape Cod that is not dependant on the service industry or on seasonal visitation, but it does enhance these elements of the economy as well. Finally, it provides one of the few opportunities for young people in the area to find high paying jobs and to pursue a resource-dependant profession that is also steeped in heritage. Without our small-boat family fishermen, Cape Cod would not be the same.

Unfortunately, our fisheries are currently suffering from a shorter, sadder heritage. Following decades of chronic mismanagement, fishery resources and the people and communities that depend on them are in a perilous state. The regulated multispecies, monkfish, skate, and spiny dogfish shark populations in the region appear to be in a state of decline. For years, New England managers have resisted calls to enact rigid catch limits and modern management strategies, preferring instead to stick with antiquated input controls, such as trip limits and DAS. As a result the availability of inshore stocks has continued to erode to the point where Chatham and Harwichport's small-boat fleet is placed at risk of elimination by the paucity of the diminished resource and by fiat. Modern management strategies that utilize catch limits, bycatch reduction measures, increased accountability, mandatory and real-time monitoring and

enforcement efforts, improved communication, gear modifications and other contemporary tools provide the best hope for our vaunted day-boat fleet's survival. Unfortunately, the diverse nature of the New England fleet and the complexities of existing management tactics, in concert with limitations on available resources render the wholesale conversion of the entirety of the New England fishery to a new and improved management rubric untenable in the immediate future, and our fishermen need relief *immediately* in order to survive.

Management and political decisions have been made, as well as those that are pending or may arise in coming months, may eliminate a portion of our local fleet. Elimination of a portion of the fleet would jeopardize the solvency of the shore side businesses that all Cape fishermen rely upon, and would have an adverse impact on the community. In response to this jeopardy, the Hook Gear Sector is coming forward with an evolved plan that will protect our local fishery and the existing fishermen, while keeping the industry alive for future generations who may wish to participate in this historic way of life. Our local fishermen are willing to safeguard the resource that sustains their profession, protecting the Multispecies biomass by voluntarily accepting --even promoting-- *more* restrictive management measures. They take these steps in order to ensure that ensure the greatest likelihood of a healthy resource and a viable fishing community into the future. Enabling those most dependant on the resource to have a hand in its preservation and in the continued welfare of their community, will ultimately provide the key to prudent conservation of the resource and sustainable use of the sea's bounty.

1.3 Goals of the Proposed Action

The NEFMC has established a set of goals and objectives for the purposes of developing Amendment 13; and the proposed Sector deliberately seeks consistency with the goals and objectives set forth in the Amendment. Some of the most applicable goals and objectives for both the Amendment and Sector are listed below. Goals and objectives of Amendment 13 are excerpted from the Amendment 13 Final Supplemental Environmental Impact Statement (FSEIS) Section 2.3:

Amendment 13 Goals:

- **Goal 1**: Consistent with the National Standards and other required provisions of the Magnuson Act and other applicable law, manage the northeast multispecies complex at sustainable levels.
- **Goal 2**: Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.
- **Goal 3**: Maintain a directed commercial and recreational fishery for northeast multispecies.
- **Goal 4**: Minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.
- **Goal 6**: To promote stewardship within the fishery.

Amendment 13 Objectives:

- **Objective 1**: Achieve, on a continuing basis, optimum yield (OY) for the U.S. fishing industry.
- **Objective 3**: Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the SFA.
- **Objective 4**: Implement rebuilding schedules for overfished stocks, and prevent overfishing.

Objective 7: To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.

Objective 9: Adopt measures consistent with the habitat provisions of the Magnuson Act, including identification of EFH and minimizing impacts on habitat to the extent practicable.

Objective 10: Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Sector Goals:

Goal 1: Contribute to ending overfishing and rebuilding of NE groundfish, and sustain a viable fishery on Georges Bank.

Goal 2: Sustain a viable commercial groundfish fleet in Chatham and Harwichport, Massachusetts.

Goal 3: Assure that the hook and line fleet will not overfish by implementing hard TACs, and reduce regulatory discards by implementing full retention of legal-size, marketable fish.

Goal 4: Create new opportunities for the GB fixed gear fleet, such as opportunities to pursue healthy or rebuilding Groundfish stocks instead of GB cod.

Goal 5: Promote safer fishing practices.

Goal 6: Retain access for small boat fishermen on GB.

Goal 7: Generate economic stability for fishing vessels and fishing communities, including shoreside businesses that support fishing.

Goal 8: Measure and minimize bycatch of juvenile or spawning fish through gear modifications, fleet communication, voluntary closures, or other management measures.

Goal 9: Promote stewardship of GB cod resource.

Goal 10: Promote accountability, through real-time, electronic monitoring and reporting.

Goal 11: Implement Community-Based Fisheries Management in New England.

Goal 12: Create a working model for future development, submission, and implementation of other sectors in New England.

1.3.1 END OVERFISHING

Implementation of the Sector Ops Plan will end overfishing of all quota-managed species by establishing a hard TAC limit that complements the general pool management tools and regulations utilized by the NMFS. Furthermore, approval of the Sector Ops Plan will facilitate a transition from the failing hybrid DAS-quota Sector management regime, to a more accountable system of concrete catch limits. Upon successful implementation, the Sector will be allocated a percentage of the aforementioned species based on past catch history as described earlier.

Reauthorization of the MSA requires catches of all federally-managed species to be confined below hard Annual Catch Limits (ACLs) in the near future. The Sector expects that whatever management regime NMFS implements under this reauthorization will steer all federal FMPs to incorporate accountable, hard TAC management. The Sector's voluntary acceptance of hard TACs is consistent with, and anticipates this future direction of fishery management and will assist fishery managers demonstrating progress toward the goal implementing hard ACLs.

1.3.2 MINIMIZE BYCATCH

The Sector will reduce bycatch by eliminating trip limits and increasing species selectivity and temporal efficiency. The daily trip limits that are designed to protect certain species often result in regulatory discards (bycatch) of these species, when individual vessels unexpectedly exceed the daily catch limit. The Sector will mandate full retention of all catch, and will be shut down if it achieves its quota of any given species. This level of accountability, when vested with the fishermen instead of regulators, will promote stewardship of this resource and require fishermen to fish in a responsible and conservation-minded way.

Currently, hook fishermen from Chatham and Harwichport fish most intensely from April until November when the weather allows for safe fishing practices. With Sector approval, it is expected that the fishermen from this area will choose a certain time to target each species based on knowledge of seasonal abundance that maximizes their businesses' economic returns. As such, the Sector will result in more- selective fishing practices that select for the greatest likelihood of landing high *quality* fish. Under DAS, on the other hand, the fleet is forced to fish on whatever they find and to maximize the *quantity* harvested in the shortest time possible (Wether of low or higher quality), due to the inherent DAS systemic time constraints. Freedom from DAS will provide the latitude for fishermen to engage in a more historic fishing model, employing more selective fishing practices that will have a positive impact on the resource.

1.3.3 MAXIMIZE ECONOMIC BENEFIT

The Sector will provide some economic stability and will facilitate increased efficiency. Currently, hook fishermen from the Cape predominantly fish for Multispecies, monkfish, skates, and dogfish from April to November. During this long season, there are typically peak periods during which catch rates exceed the daily limits. Without a hard TAC and exemption from a daily trip limit, the excess fish is discarded. Under the Sector, each vessel will know how much fish they can land annually. Each fisherman can then make their own informed decisions about how to catch that amount of fish. Operations under the previously approved Sector Ops Plan demonstrated that sector members are likely to target fish during short, discreet seasons when catch per unit effort (CPUE) is maximized. In addition, some vessel owners may even opt to harvest cooperatively with other vessels in order to further minimize overhead.

The proposed action meets dual needs, the Sector will facilitate efficient harvest of the resource that maximizes profitability and minimizes collateral environmental impacts.

1.3.4 TAILOR REGULATIONS TO SOCIAL NEEDS

The Sector will tailor regulations to meet local social needs. Past performance demonstrates the veracity of the adage that local fishermen are most knowledgeable about efficient collaborations and the development of regulations that meet local goals and objectives. Around the world, there is an increasing amount of attention being placed on the merits of community-based fisheries management (CBFM) because of the social, economic, and environmental benefits that such approaches produce.

The participants in the Hook Sector have worked together on the water for years, and they now unite in order to advance a management regime that accommodates the immediate needs of hook fishermen while also enabling progress toward stock rebuilding targets for the region. These fishers share common ports, common gear, a common understanding of the grounds they fish and a common vision for the future of their fleet. By securing approval to harvest speficic allocations (quota) from the federal fisheries managers (NMFS) under the rules described herein, these hook fishermen expect to enhance the local management authority while effectively implementing local fishery management plans that also answer regional needs.

CBFM is a long-term investment, establishing confidence in the new connection between our ocean resources and the local individuals that harvest them required continued effort. If that connection is carefully revised to better meet the needs of the local fisherman and the region, it will generate improved social, economic, and environmental benefits. The Sector will allow the local hook fishing fleet to survive as stocks rebuild, and offers the promise of a more prosperous future. In addition, the Sector provides a model for other New England day boat fleets seeking community based management options. Fishermen traditionally and historically fought against more restrictive management prescriptions. The Sector, on the other hand, is an example of responsible fishermen demonstrating their shared commitment to sustainable stocks by voluntarily accepting multiple hard TACs and other intensive management measures. The Sector represents a unprecedented opportunity for fishermen to lead the way, promoting conservation and stewardship of the resources on which they depend.

1.4 Background

The following passages have been excerpted in part from Section 2.1 of the Amendment 13 FSEIS as prepared by the NEFMC:

> **Brief History of Prior Management Actions**
> The Northeast Multispecies FMP was adopted in 1986 to manage key groundfish stocks from Maine to Cape Hatteras. Management actions under this FMP were summarized in Amendment 5, adopted in 1994. The key actions leading to this action since Amendment 5 are summarized below.
>
> **Sustainable Fisheries Act (SFA)**
> Despite the efforts taken in Amendment 5 and the cutbacks made by the industry during the following years, new legislation in 1996 set the standards for effective management even higher. The Magnuson Act was amended with the adoption of the SFA in 1996. The SFA placed new demands on fishery management plans to reduce bycatch, identify and protect EFH, and minimize adverse effects of fishing on EFH to the extent practicable. It also initiated new National Standards in the Magnuson Act that emphasized minimizing impacts to fishing communities, improving safety at sea, significantly reducing bycatch and improving the collection and use of fishery and biological data.
>
> **Amendment 7**
> Amendment 7, implemented in 1996, sought to address the requirements of the SFA and newly amended Magnuson Act. The amendment accelerated the DAS effort reduction program established in Amendment 5, eliminated significant exemptions from the current effort control program, provided incentives to fish exclusively with mesh larger than the minimum required, broadened the area closures to protect juvenile and spawning fish, and increased the haddock possession limit to 1,000 pounds. It established a rebuilding program for GB and Southern New England (SNE) yellowtail flounder, GB and GOM cod, and GB haddock based primarily on DAS controls, area closures, and minimum mesh size. Additionally, the amendment changed existing permit categories and initiated several new ones, including an open access multispecies permit for limited access sea scallop vessels. Amendment 7 also created a program for reviewing the management measures annually and making changes to the regulations through the framework adjustment process to insure that plan goals would be met. Of all the major changes to the Northeast Multispecies FMP, Amendments 5 and 7 had the greatest impact on the fishery, both for stock rebuilding and in shaping the socio-economic conditions of the industry and fishing communities.

Amendment 9 and Essential Fish Habitat

Amendment 9 (1999) also had a significant impact on the fishery, establishing new status determination criteria (overfishing definitions) and setting the OY for twelve groundfish species to bring the plan into complete compliance with the SFA. However, according to a 2000 ruling in American Oceans Campaign et al. v. Daley et al. [Civil Action No. 99-982(GK)], EFH considerations continued to be inadequate in fishery management plans. The prosecution contested the adequacy of evaluations of fishing gear impacts on EFH and challenged NMFS' approval of amendments and management plans which did not fully address the impacts of fishing on habitat. The U.S. District Court for the District of Columbia found that the agency's decisions on the subject EFH amendments were in accordance with the Magnuson Act but found that the Environmental Assessments (EAs) for the Councils' amendments were inadequate and in violation of NEPA. The court ordered NMFS to complete a new and thorough NEPA analysis for each EFH amendment named in the suit. Amendments 11 and 12 addressed the SFA requirements for designating EFH for all managed species and for managing whiting (silver hake), red hake and offshore hake through a separate small-mesh multispecies management plan implemented in 2000.

Framework Adjustments

The Northeast Multispecies FMP has been subject to many additional changes since its inception. Besides the 11 amendments implemented prior to development of Amendment 13, the multispecies plan has been altered through framework adjustments 30 times since 1994.

The Council has held four annual reviews and made eight adjustments to the FMP to address Amendment 7 rebuilding needs (Frameworks 20, 24, 25, 26, 27, 30 and 33). In 1999, the Council submitted Framework 27 as the primary annual adjustment framework. At the final framework meeting on January 27-28, the Council focused on finalizing the severe restrictions necessary to achieve the plan objectives for Gulf of Maine (GOM) cod and was unable to complete development of the measures needed for GB cod. It followed immediately with the development of Framework 30 to address GB cod, which was submitted to NMFS on April 30. Both Frameworks 27 and 30 contained trip limits for GOM and GB cod. In both cases, the Regional Administrator was authorized to reduce the trip limit when 75 percent of the target TAC for each stock was reached. On May 28, 1999, the Regional Administrator reduced the GOM cod limit implemented on May 1, 1999, of 200 pounds per day to 30 pounds per day, just three weeks into the fishing year. However, even before the trip limit was reduced, fishermen reported excessive discards of cod as seasonal closures ended.

On May 28, 1999, responding to widespread reports from the industry about the levels of cod discards in the western Gulf of Maine, the Council requested that the Secretary of Commerce increase the trip limit under the emergency action authority provided in §305 of the Magnuson Act. On August 3, NMFS published an interim rule that increased the trip limit from 30 pounds per day to 100 pounds per day, with a maximum possession limit of 500 pounds and modifications to the running clock. The interim rule expired on January 30, 2000. NMFS announced on July 29, 1999, that it disapproved the 30-day closure on Georges Bank proposed in Framework 30, but it approved the trip limit, which took effect on August 15. Framework 30 established a GB cod trip limit of 2,000 pounds per day/20,000 pounds maximum possession. To address potential discarding in the GOM cod fishery upon expiration of the interim rule and to prevent repeating on Georges Bank the discarding situation that occurred in the Gulf of Maine when the trip limit was

reduced, the Council submitted Framework 31 on October 14, 1999. NMFS approved the increased GOM cod trip limit on January 5, 2000, but it disapproved the change to the GB cod trip limit program that would have eliminated the authority of the Regional Administrator to make mid-season adjustments to the trip limit when 75 percent of the target TAC is reached.

Framework 33 was implemented on June 1, 2000, to reduce or maintain fishing mortality rates for the five critical stocks below fishing mortality rebuilding targets established by Amendment 7. This framework continued the status quo seasonal closures for Gulf of Maine cod but incorporated a "trigger" for additional closures: if 50 percent of the target TAC was landed by July 31, the Cashes Ledge Closed Area would be closed in November and Blocks 124 and 125 would be closed in January. The western GOM (WGOM) closure was extended for an additional year, to April 30, 2002. GOM cod trip limits were held at 400 pounds per day with a maximum possession limit of ten times the daily limit. A GB cod trip limit of 2,000 pounds per day, not to exceed 20,000 pounds per tip, was also adopted. In addition, a closure of Blocks 109-114, 98, and 99 during May was implemented. The Multispecies Plan Development Team (PDT) reviewed stock status in November 2000 and concluded that Amendment 7 fishing mortality targets were likely being met for GB cod, GB haddock, GB yellowtail flounder, and SNE yellowtail flounder. The fishing mortality of GOM cod could not be determined with precision because of extensive discards that were believed to have occurred in 1999 because of the low trip limit. GB cod was assessed in June 2001, and fishing mortality was reported to be slightly above the Amendment 7 target; subsequent assessments have shown this report to be in error. GOM cod was assessed in June 2001, and fishing mortality was found to be significantly above the fishing mortality corresponding to maximum yield per recruit (FMAX) target for this stock. After receiving the information on GOM cod at the July 2001 Council meeting, the Council renewed efforts to develop Framework 36. Framework 36 was completed by December 2001, but the Council did not adopt the framework, and it was not submitted.

Conservation Law Foundation et al. v. Evans et al.

In December 2001, Conservation Law Foundation and other organizations successfully filed suit against NMFS alleging that the rebuilding plans the NMFS implemented were not consistent with Amendment 9 overfishing definitions (Conservation Law Foundation et al. v. Evans et al.). Additionally, they charged that there had been a consistent failure in management plans to assess bycatch reporting and establish measures to minimize bycatch and bycatch mortality (when bycatch is unavoidable). After a long series of negotiations among various parties, interim measures were adopted by the court, and NMFS was instructed to submit a management plan to comply with the law. The response to this is Amendment 13, which addressed stock rebuilding issues, greatly reduced fishing effort and capacity in the multispecies fishery and implemented additional measures to specifically address habitat protection (NEFMC, Am. 13 FSEIS Section 2.1).

The principal means of controlling mortality in the Groundfish FMP is the use of “input controls” designed to limit the distribution of fishing effort across time, in space, and against different species. Stated differently, these input controls promote – and even mandate-- inefficiency. These inefficiencies can have disparate effects on fisherman that operate at different scales. Large conglomerates may be able to distribute the economic costs of inefficiencies resulting from regulation across numerous vessels and permits. However, the small day-boat fishermen has a much smaller margin to accommodate these costs, and inefficiencies that inconvenience a large interest may prove catastrophic for a day boat fisherman. At

a certain point, input controls have the potential to drive the cost of catching the target species beyond the expected economic return of selling the fish. For hook fishermen on Georges Bank, Amendment 13 and Framework Adjustment 42 (FW42) impose input controls, such as trip limits, that would make it fishing with hook gear on Georges Bank too costly to maintain any expectation of profitability. Sector allocation was the only option included in FW42 that offered the promise of sustaining a hook fleet on fishing Georges Bank.

Excerpts from the Amendment 13 FSEIS prepared by the NEFMC describe the benefits of a sector allocation to the GB hook fleet:

> The creation of a voluntary sector for longline/hook and gillnet vessels on Georges Bank provides an opportunity for vessels to mitigate the impacts of the management alternatives. By organizing into a cooperative, vessels may be able to develop more efficient ways to harvest groundfish and minimize the inefficiencies that result from the regulations. While it is not possible to estimate the economic impacts of a sector until the actual members are known, the pool of members would probably be the vessels that have used longline or gillnet gear to fish on GB in the past. For fishing years 1996 through 2000, 182 vessels reported using longline gear to catch GB cod, and 294 vessels reported using gillnet gear. Some vessels used both gear – these two numbers represent 476 individual vessels. For fishing year 2001, there were 85 gillnet vessels in the GB cod fishery, and 32 vessels that used hook gear. Gillnet vessels landed 14 percent of the GB cod in fishing year 2001, and hook vessels landed 10 percent of the GB cod (see Appendix VI). Gillnet vessels harvested 19 percent of the GB cod landed in fishing year 2000, while hook vessels harvested 9 percent …. About 86 percent of the GB cod landed from 1996 though 2000 by these two gears was landed in Chatham/Harwichport, MA, suggesting that this community is the one most likely to benefit if vessels choose to participate in this sector. Another 10 percent of GB cod was landed in Gloucester, MA by these two gear types (NEFMC, Am 13 FSEIS Section 5.4.9.3.1).

Amendment 13 was developed over a four-year period to meet the Magnuson Act requirement to adopt rebuilding programs for stocks that are overfished, and to end overfishing. Amendment 13 also brought the FMP into compliance with other provisions of the Magnuson Act. Subsequent to the implementation of Amendment 13, framework adjustment (FW) 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expended the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock (NEFMC, FW 42 DEA Section 3.3.1).

Recent changes to the NE Multispecies FMP (Framework 40A) provided access (exclusive) to Closed Area I (CAI) for the GB Hook Sector in a directed haddock Special Access Program (SAP). This SAP will continue to provide a significant contribution to the Sector members' annual catch and the overall economic viability of hook fishing on Georges Bank. A paucity of cod will continue to require alternatives for the hook and line fishery on Georges Bank. Additionally, under FW 40B the eligibility criteria and allocation formula for the Sector changed. Amendment 13 established the Sector and allocates GB cod to the sector based on the history of the sector participants. As implemented, only permits with a past history of using hook gear can join the Sector, and only cod landed using hook gear is used to determine the Sector's cod allocation. FW 40B modified these requirements by allowing any vessel to join the Sector and all cod landings of Sector participants, regardless of gear, to be used to determine the Sector's allocation. Sector participants are required to use hook gear once in the Sector and the maximum share of the GB cod TAC that any Sector can be allocated is twenty percent.

Framework adjustment 41 (FW 41) allows access to the CA I SAP to non-Sector vessels. As a result, FW 41 resulted in the decline of catch and consequently revenue (approximately $2.9M in FY 2004 and approximately $2.2M in FY 2005) to the GB Hook Sector membership. In response to this decline, the Sector negotiated with common pool vessels in an attempt to maintain product value by eliminating a derby-style fishery. The two sides negotiated a split season. The TAC and season was split in two. Sector and non-Sector vessels will alternate seasons on an annual basis. As the TAC grows with the haddock resource, expansion of the area and the season may be considered.

Framework adjustment 42 (FW 42) was initiated following the recent (2005) assessment of groundfish stocks (see Section 3.0 for stock status information). Eight stocks were found to be experiencing overfishing (GB Yellowtail, CC/GOM Yellowtail, SNE/MA Yellowtail, White Hake, SNE winter, GB winter, GOM cod and GB cod) and as a result, the NEFMC prepared a range of alternatives to reduce fishing mortality on these stocks. The proposed rule for the chosen alternative implements an additional reduction in DAS and imposes 2-to-1 counting of DAS throughout much of the inshore GOM and part of SNE (primarily to reduce catches of GOM cod, and CC /SNE yellowtail flounder). It also changed trip limits on some species and imposed new trip limits on some species. This proposed rule does not change the Amendment 13 GOM cod trip limit (800 lb (362.9 kg) per DAS, up to 4,000 lb (1,818.2 kg) per trip). FW42 implemented new trip limits for white hake and GB winter flounder, modified the existing trip limits for the three yellowtail flounder stocks (CC/GOM, GB, and SNE/MA), and modified the haddock trip limit and the GOM cod trip limit exemption and cod overage regulations. Framework 42 renewed the DAS leasing program and amended rules for permanent transfers of DAS. Framework 42 also authorized the Georges Bank Cod Hook Sector, which is only the second groundfish sector to be authorized.

1.5 National Environmental Policy Act (NEPA)

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

2.0 NEED FOR THE PROPOSED ACTION (SECTOR ALLOCATION)

Amendment 13 to the Northeast Multispecies FMP is the culmination of years of hard work and collaboration among fishermen, scientists, environmentalists, and policy makers to meet the mandates of the SFA amendment to the Magnuson Act. Amendment 13 requires an end to overfishing and initiates rebuilding plans for stocks in the groundfish complex, as well as launching a mandate minimize bycatch and protect habitat. It will also bring about many positive environmental changes and increased revenue in the long-term. However, short-term actions taken to implement Amendment 13 may have dire consequences and social and economic costs for the New England groundfish fleet in the short-term.

Authorization of the revised GB Cod Hook Sector would provide a vehicle to mitigate many of the Amendment 13 impacts, particularly those that may visit disparate impacts on day boat fleets in Chatham and Harwichport. Full implementation of the GB Cod Hook Sector Ops Plan would establish additional means to generate social, economic, and environmental efficiencies. Authorization of the revised Sector Ops Plan will foster continued operation of a viable framework for GB hook vessels that will alleviate

social and economic hardships while meeting the biological objectives of Amendment 13. Implementation of the revised Ops Plan will enable members to maximize the potential for the Sector to construct a sustainable, traditional, day-boat hook fishery.

As such, authorization of the Sector and subsequent implementation of the Ops Plan will be the difference between financial viability and business failure for GB hook fishermen. Amendment 13 reduced the GB cod trip limit from 2,000 to 1,000 pounds per day, and fishermen face additional reductions mandated under FW 42. GB Hook fishermen are highly reliant on these traditional targets for their continued economic survival. Therefore, the Amendment 13 economic analysis predicted disproportionate impacts falling on certain homeports, with an excessive burden borne by vessels out of Chatham/Harwich in particular. The revised Ops Plan presents a vehicle to alleviate Sector vessels from general input control measures that would be rendered redundant and ineffective with the introduction of hard TACs to the Sector.

The following excerpt from the Amendment 13 FSEIS explains the need for the proposed action in terms of the potential economic ramifications for the Chatham /Harwichport fleets:

> **Impacts by Port Groups**
> Across all ports and port groups the largest reduction in annual fishing income would be in the port group of Chatham/Harwich with three-fourths of all vessels losing at least 29.7% of fishing revenue, and half of all vessels losing more than half of fishing income. The impacts on these ports are directly related to the reduction in the GB cod trip limit as this port group is a center for the Cape Cod hook and gillnet fleet that relies heavily on GB cod for fishing revenue. The Chatham/Harwich port group would still be the most impacted area under a TAC backstop with three-fourths of all vessels losing nearly 50% of annual fishing income. Among the most impacted vessels, the estimated revenue loss was at least 77%.
> (NEFMC, Am. 13 FSEIS Section 5.4.4.3.1, 2003)

AFFECTED ENVIRONMENT

This section contains information on the biological, habitat, social, and economic environments affected by the proposed action.

BIOLOGICAL ENVIRONMENT

The proposed action would affect the Northeast Multispecies Fishery and would be restricted to the stocks for all those component species thereof for which distinctions are made. Life history and habitat characteristics of the stocks managed by this FMP can be found in the Essential Fish Habitat source documents (series) published as NOAA Technical Memorandums and available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/. This section described stock status for the regulated groundfish stocks, monkfish, skates, and spiny dogfish, the species most likely to be affected by the proposed management measures.

DESCRIPTION OF MULTISPECIES STOCK ANALYSIS

Groundfish assessments are conducted on individual stocks and are usually prepared by the Stock Assessment Workshop (SAW) and reviewed by the Stock Assessment Review Committee (SARC). The NEFMC Multispecies Plan Development Team compiles assessment data, conducts projections if necessary, and reports their findings to the Council.

The 2005 Groundfish Assessment Review Meeting (NEFSC 2005) was held in August 2005 to update the status of nineteen New England groundfish stocks through 2004. This section summarizes the stock status in terms of biomass (B) and fishing mortality (F) as reported in NEFSC (2005), with the exception

of Gulf of Maine cod which includes a minor revision to the assessment made in October 2005. Note that, for the Georges Bank yellowtail flounder stock, results of two assessment models (Base Case and Major Change) are presented. Both Georges Bank yellowtail flounder models were put forward by the 2005 Transboundary Resource Assessment Committee (TRAC) to show the uncertainty in stock status under alternative model scenarios.

The GARM 2005 results show which groundfish stocks were overfished or experiencing overfishing in 2004 (Table 1). A total of 13 stocks were overfished (B less than ½ BMSY) while 6 stocks were not overfished. Similarly, a total of 8 stocks were experiencing overfishing (F greater than FMSY) while 10 stocks were not experiencing overfishing. Overfishing status of one stock, Atlantic halibut, was unknown. Overall, the majority of groundfish stocks were overfished (68%) in 2004 while most stocks were not experiencing overfishing (53%).

Retrospective changes in estimates of spawning biomass and fishing mortality were also evaluated in GARM 2005 for a total of 9 age-structured stock assessments. In this evaluation, assessment models were rerun after deleting the most recent year of data and corresponding estimates of the current year spawning biomass and fishing mortality were compared. The average of the one-year retrospective changes calculated for the five pairs of years 2004/2003, 2003/2002, 2002/2001, 2001/2000, and 2000/1999 was used to judge whether a retrospective pattern was apparent. Average changes of less than ±10% were considered to show no pattern. Average changes of ±10% to 20% were considered to exhibit a moderate retrospective pattern while changes over ±20% were considered to have a strong retrospective pattern. A positive retrospective pattern indicated that, on average, the estimated value of spawning biomass or fishing mortality increased when another year of data was added to the assessment. Last, note that the appearance of a retrospective pattern in the past provides no guarantee that the pattern will persist in the future.

Stock	Estimated F in 2004	Fmsy or proxy	Percent F Reduction to Fmsy	Biomass in 2004	Bmsy or Proxy	Percent Change in Biomass to achieve Bmsy	2004 Overfished Status	2004 Overfishing Status
Georges Bank cod	0.24	0.18	25%	22564	216800	861%	Overfished	Overfishing
Georges Bank haddock	0.24	0.26	none	116800	250300	114%	Overfished	No Overfishing
Georges bank Yellowtail	1.19 (Base Case)	0.25	376%	15700 (Base Case)	58800	275%	Overfished	Overfishing
	1.75 (Major Change)		600%	8500 (Major Change)		592%	Overfished	Overfishing
Southern New England-Mid Atlantic Yellowtail	0.99	0.26	74%	695	69500	9900%	Overfished	Overfishing
Cape Cod-Gulf of Maine yellowtail	0.75	0.17	77%	1100	12600	1045%	Overfished	Overfishing
Gulf of Maine cod	0.58	0.23	60%	20549	82800	303%	Overfished	Overfishing
Witch flounder	0.2	0.23	none	21200	25248	19%	Not Overfished	No Overfishing
American plaice	0.15	0.17	none	14149	28600	102%	Overfished	No Overfishing
Gulf of Maine winter flounder	0.13	0.43	none	3436	4100	19%	Not Overfished	No Overfishing
Southern New England-Mid-Atlantic winter flounder	0.38	0.32	16%	3938	30100	664%	Overfished	Overfishing
Georges Bank winter flounder (see note)	1.86	1	46%	6692	10100	51%	Not Overfished	Overfishing
white hake	1.18	0.55	53%	3.01	7.7	156%	Overfished	Overfishing
pollock	3.51	5.88	none	1.99	3.00	51%	Not Overfished	No Overfishing
Acadian redfish	0.002	0.04	none	175800	236700	35%	Not Overfished	No Overfishing
ocean pout	0.003	0.31	none	1.78	4.9	175%	Overfished	No Overfishing
northern windowpane	0.02	1.11	none	0.78	0.94	21%	Not Overfished	No Overfishing
southern windowpane	0.44	0.98	none	0.1	0.92	820%	Overfished	No Overfishing
Gulf of Maine haddock	0.18	0.23	none	5.79	22.17	283%	Overfished	No Overfishing
Atlantic halibut			no estimate	288	5400	1775%	Overfished	Unknown
Fmsy and Bmsy index values are listed for Gulf of Maine haddock,								
pollock, white hake, ocean pout, southern and northern windowpane,								
and Atlantic halibut. For GB winter flounder, values shown are ratio of F/Fmsy.								

Table 1 -Summary of groundfish stock status in 2004. Biomass values are in metric tons (with exception of index-based stocks noted above).

3.1.1 Target Species

The target species for the Sector are cod, haddock, and monkfish/goosefish.

Atlantic Cod *(Gadus morhua)*

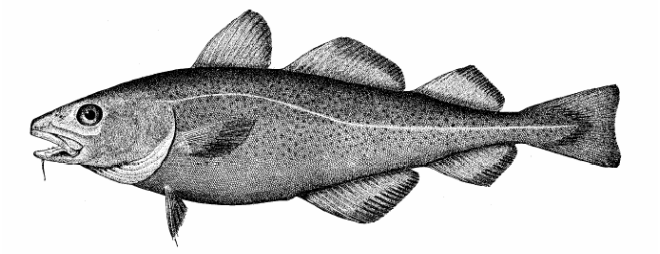


Figure 1 - The Atlantic Cod (*Gadus morhua*).
(Goode, 1884)

The following passages have been excerpted in part from Lough (2004):

> The Atlantic cod (Figure 1) is distributed in the northwest Atlantic Ocean from Greenland to Cape Hatteras, North Carolina. In U.S. waters, densities are highest on Georges Bank and in the western Gulf of Maine. It occurs from nearshore areas to depths exceeding 400 m (rarely). The greatest concentrations off the northeast coast of the U.S. are on rough bottoms in waters between 10 and 150 m and at temperatures between 0 and 10 degrees C.
>
> Atlantic cod attain ages of 20 years, although most enter fisheries at ages 2-5. They can grow to lengths of 130 cm and weights of 25-35 kg and average 26 cm by the end of their first year. Median age at sexual maturity is 1.7-2.3 years at lengths between 32 and 41 cm (NEFSC 2005). Fecundity is high and a large female may produce between 3 and 9 million eggs. Spawning occurs near bottom during winter and early spring, usually in water temperatures between 5 and 7 degrees C. Eggs are pelagic and drift for 2-3 weeks before hatching. The larvae are also pelagic until they reach 4-6 cm in about 3 months, whence they descend to the bottom.
> (Lough, 2004).

The Atlantic Cod (*Gadus morhua*) population is split into two distinct management units under the Northeast Multispecies FMP: Gulf of Maine Cod and Georges Bank Cod. Little interchange occurs between the two (Lough, 2004). As such, no changes are proposed in the management regime for Gulf of Maine Cod: while the proposed fishing area includes Gulf of Maine Cod, the primary target species is anticipated to remain Georges Bank Cod.

Haddock (*Melanogrammus aeglefinus)*

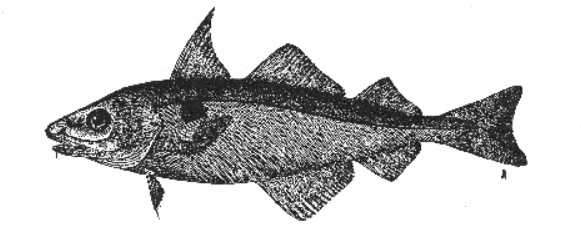


Figure 2- The Haddock (*Melanogrammus aeglefinus)*

(Goode, 1896)

Haddock (Figure 2) is a demersal gadoid species distributed on both sides of the North Atlantic. In the western North Atlantic, haddock range from Greenland to Cape Hatteras. "Highest concentrations off the U.S. coast are associated with the two major stocks located on Georges Bank and in the southwestern Gulf of Maine. Haddock are most common at depths of 45 to 135 m (25 to 75 fathoms) and temperatures of 2° to 10°C (36° to 50°F). Haddock exhibit age-dependent shifts in habitat use with juveniles occupying shallower water on bank and shoal areas, and larger adults associated with deeper water. Adult haddock do not undertake long migrations, but seasonal movements occur in the western Gulf of Maine, the Great South Channel and on the northeast peak of Georges Bank. Haddock prey primarily on small invertebrates, although adult haddock will occasionally consume fish" (NEFSC 2005).

Growth and maturation rates of haddock have changed significantly over the past 30 to 40 years. "During the early 1960s, all females age 4 and older were fully mature, and approximately 75% of age 3 females were mature. Presently, growth is more rapid, with haddock reaching 48 to 50 cm (19-20 in.) at age 3; and nearly all age 3 and 35% of age 2 females are mature. Although early maturing fish increase spawning stock biomass, the degree to which these younger fish contribute to reproductive success of the population is uncertain. Spawning occurs between January and June, with peak activity during late March and early April. An average sized (55 cm, 22-in.) female produces approximately 850,000 eggs, and larger females are capable of producing up to 3 million eggs annually" (NEFSC 2005). Spawning concentrations occur on eastern Georges Bank, to the east of Nantucket Shoals and along the Maine coast. Juvenile haddock remain pelagic for several months before settling to the bottom. (Brodziak 2005)

Monkfish/goosefish (Lophius americanus)

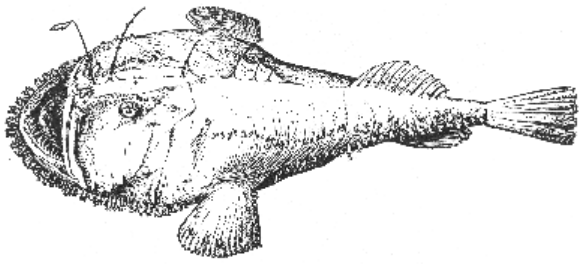


Figure 3 - The Monkfish (*Lophius americanus*).
(Bigelow and Welsh, 1837)

The following passages have been excerpted from Steimle (1999):

The goosefish (*Lophius americanus*; Valenciennes 1837), the common name recognized by the American Fisheries Society (Robins *et al*. 1991), or monkfish, the name used in commerce, is a large, slow-growing, bottom-dwelling anglerfish (Lophiiformes). "Angler" is an older common name for this fish. The goosefish occurs from the southern and eastern parts of the Grand Banks, (Newfoundland) and the northern side of the Gulf

of St. Lawrence, to the east coast of Florida (to about 29o N), but is common only north of Cape Hatteras (North Carolina).

The goosefish is a solitary ambush predator of invertebrates and fish. It grows to about 140 cm total length (TL), although few are found greater than 100 cm TL, and can weigh up to about 22 kg (Bigelow and Schroeder 1953). Females attain a larger size than males; males typically live about 9 years and females about 11 years (Armstrong *et al*. 1992; Hartley 1995).

North American and European *Lophius* were once considered to be a single species. However, *Lophius americanus* and *L. piscatorius* are now considered separate, although closely-related, species (Berrill 1929; Grant and Leslie 1993; Caruso, in prep.). There is no evidence of distinct North American stocks of *L. americanus*. For management purposes, the species is separated into a northern component, from the Gulf of Maine to northern Georges Bank, and a southern component from central Georges Bank to the Middle Atlantic Bight (Almeida *et al.* 1995).

3.1.1.2 STATUS OF THE TARGET AND NON-TARGET SPECIES

The Northeast Multispecies FMP manages 15 species and 24 stocks of finfish. These species are generally separated into "large-mesh species" and "small-mesh species" (Figure 4). The various components of the complex can be found throughout the affected area and except for those stocks managed according to regulations specific to the Gulf of Maine, together represent the Groundfish species subject to fishing effort described in the proposed action

The following excerpts from the Amendment 13 FSEIS, coupled with Figure X, describe the current biological environment as related to stocks in the Northeast Multispecies Groundfish Complex other than GB cod:

Since implementation of Amendment 5 in 1994, the management program has succeeded in increasing the biomass of most groundfish stocks and, in general, reduced fishing mortality on most stocks. Estimated biomass tripled from 1995 to 2001.

While overall biomass has increased rapidly, some stocks– such as GB cod, SNE/MA yellowtail flounder, and CC/GOM yellowtail flounder – have only shown gradual improvement. Progress has also been made in controlling fishing mortality for many stocks.

More dram[a]tic success is obvious on Georges Bank, where the mortality of all key stocks has declined significantly since 1990.

In terms of stock determinations – whether a stock is overfished or overfishing is occurring – there have also been improvements since 1996. In 1996, only one groundfish stock was not overfished, and overfishing was not occurring on only six stocks. Based on projected estimates of mortality and biomass provided by the Northeast Fisheries Science Center, in 2002 eight stocks were not overfished, and overfishing was not occurring on ten stocks. The number of stocks that were both overfished and on which overfishing was occurring dropped from eleven in 1996 to six in 2002. In 1996, fishing mortality on eight stocks was more than twice the level of mortality (F) required to produce the maximum sustainable yield (MSY), or FMSY , while by 2002 only three stocks were

subject to fishing mortality rates that were twice this threshold. The overall complex has not only seen an increase in biomass, but has experienced a decline in fishing mortality. (NEFMC, Am 13 FSEIS, Section 9.2.1.1)

"Large-Mesh Species" = 12 Species, 19 Stocks	
Atlantic Cod:	two stocks; GOM cod and GB cod
Haddock:	two stocks; GOM haddock and GB haddock
Yellowtail Flounder:	three stocks; GB YT, CC YT, and SNE YT
Winter Flounder:	three stocks; GOM winter, GB winter, and SNE/MA winter
Windowpane Flounder:	two stocks; GOM/GB windowpane and SNE/MA windowpane
Witch Flounder:	one stock; distributed primarily in the GOM and on GB
American Plaice:	one stock; distributed primarily in the GOM
Redfish:	one stock; distributed primarily in the GOM and southern GB
Pollock:	one stock; distributed in the GOM, GB, and SNE
White Hake:	one stock; distributed primarily in the GOM and southern GB
Atlantic Halibut:	one stock; distributed primarily in the GOM and on GB
Ocean Pout:	one stock; distributed throughout region
"Small-Mesh Species" = 3 Species, 5 Stocks	
Silver Hake (Whiting):	two stocks; GOM/northern GB whiting, and southern GB/SNE whiting
Red Hake:	two stocks; GOM/northern GB red hake, and southern GB/SNE red hake
Offshore Hake:	one stock; distributed primarily offshore in SNE and MA

Figure 4 – The Northeast Multispecies Groundfish Complex.
(NEFMC Groundfish FAQ)

3.1.3(a) Georges Bank Cod

Georges Bank cod was overfished and was experiencing overfishing in 2004. Spawning biomass has been relatively low and stable since 1994. Fishing mortality has been decreasing since 1997. SSB estimates have no retrospective pattern; F estimates have a strong positive retrospective pattern.

Georges Bank Cod GARM 2005 Summary Stock Status

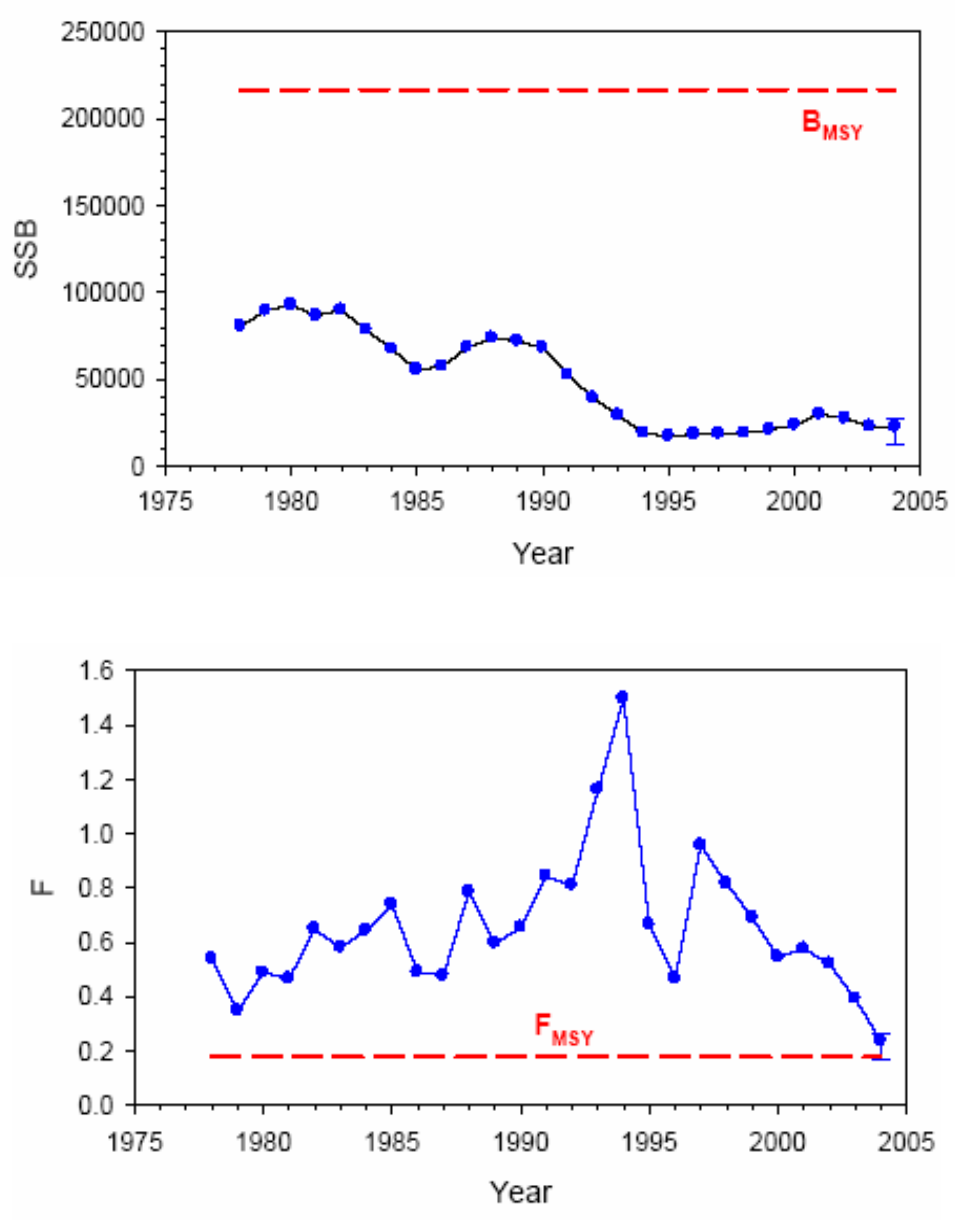


Figure 5 - Georges Bank cod spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1978-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(b) Georges Bank Haddock

Georges Bank haddock was overfished and was not experiencing overfishing in 2004. Spawning biomass has increased since 1993, with the exception of 2004. Fishing mortality has had an increasing trend since 1997. SSB and F estimates have no retrospective pattern.

Georges Bank Haddock GARM 2005 Summary Stock Status

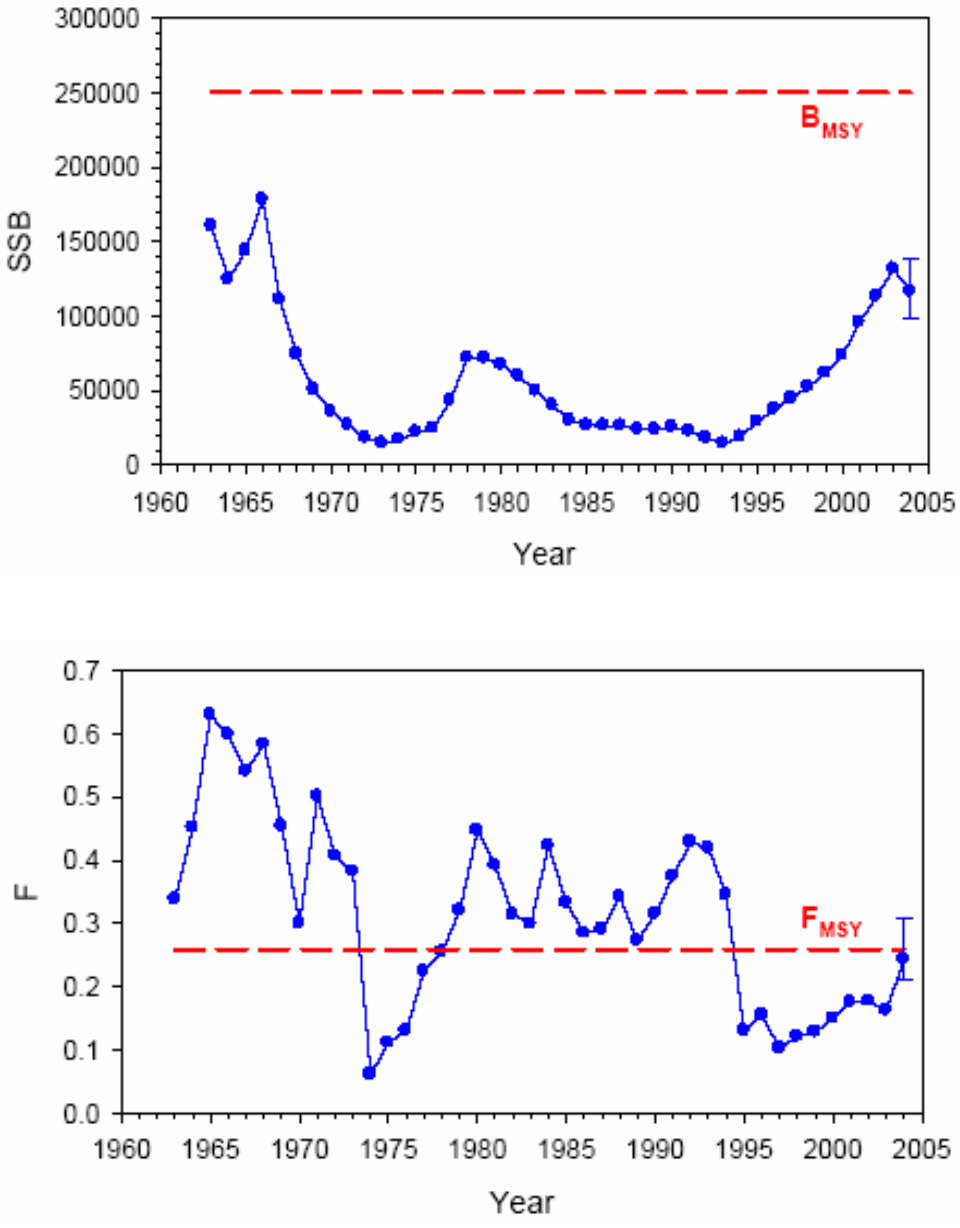


Figure 6 - Georges Bank haddock spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1963-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(c) Georges Bank Yellowtail Flounder

Georges Bank yellowtail flounder was overfished and was experiencing overfishing in 2004 under the Base Case Model. Spawning biomass has steadily increased since 1995. Fishing mortality has fluctuated above FMSY since 1996 with a substantial increase in 2004. SSB estimates have a strong negative retrospective pattern; F estimates have a strong positive retrospective pattern.

Georges Bank Yellowtail (Base Case Model) GARM 2005 Summary Stock Status

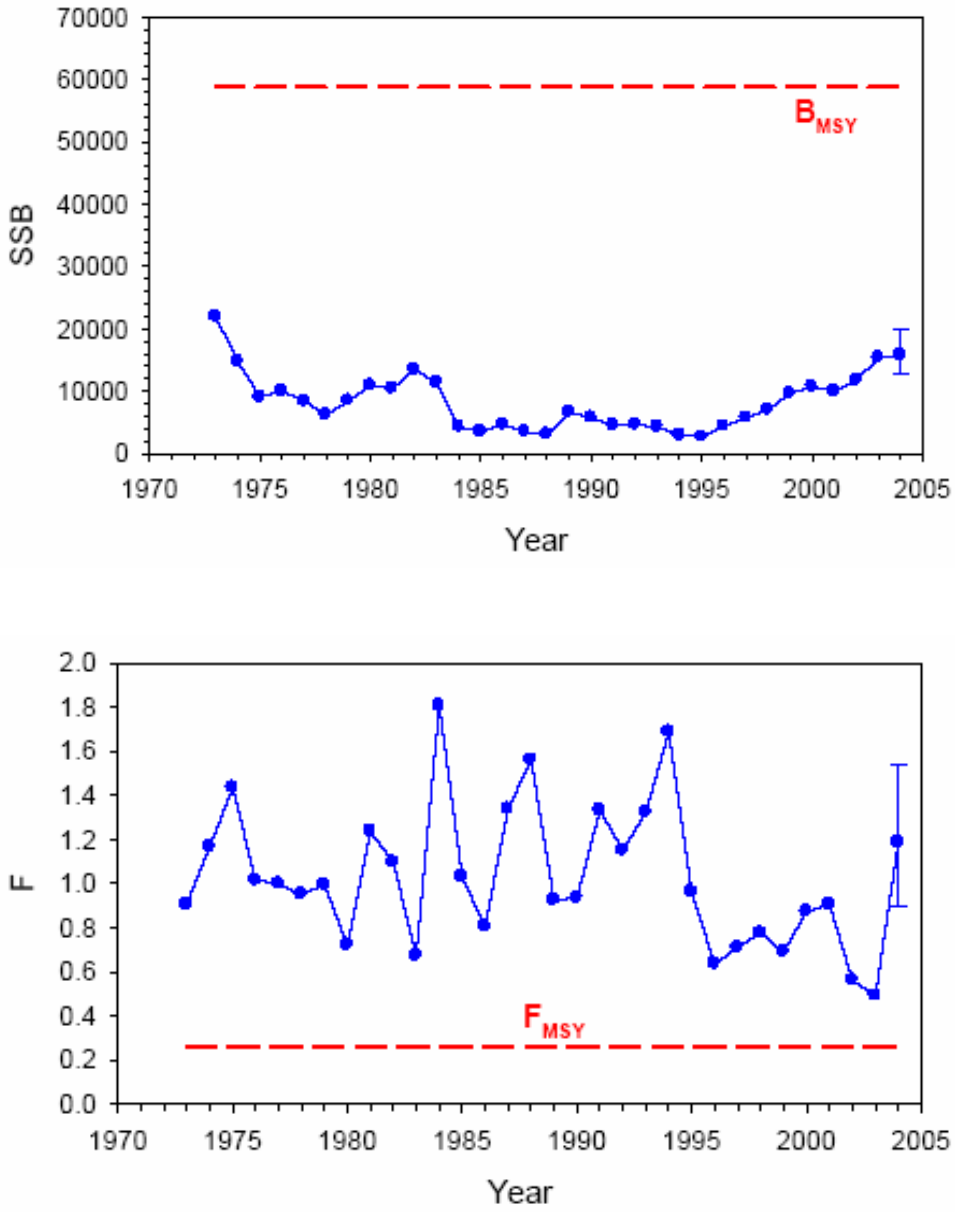


Figure 7 - Georges Bank yellowtail flounder Base Case Model spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1973-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

Georges Bank yellowtail flounder was overfished and was experiencing overfishing in 2004 under the Major Change Model. Spawning biomass increased from 1995 to 2000 and fluctuated since then. Fishing mortality has had a decreasing trend since 1994 with the exception of a substantial increase in 2004. SSB and F estimates have no retrospective pattern.

Georges Bank Yellowtail (Major Change Model) GARM 2005 Summary Stock Status

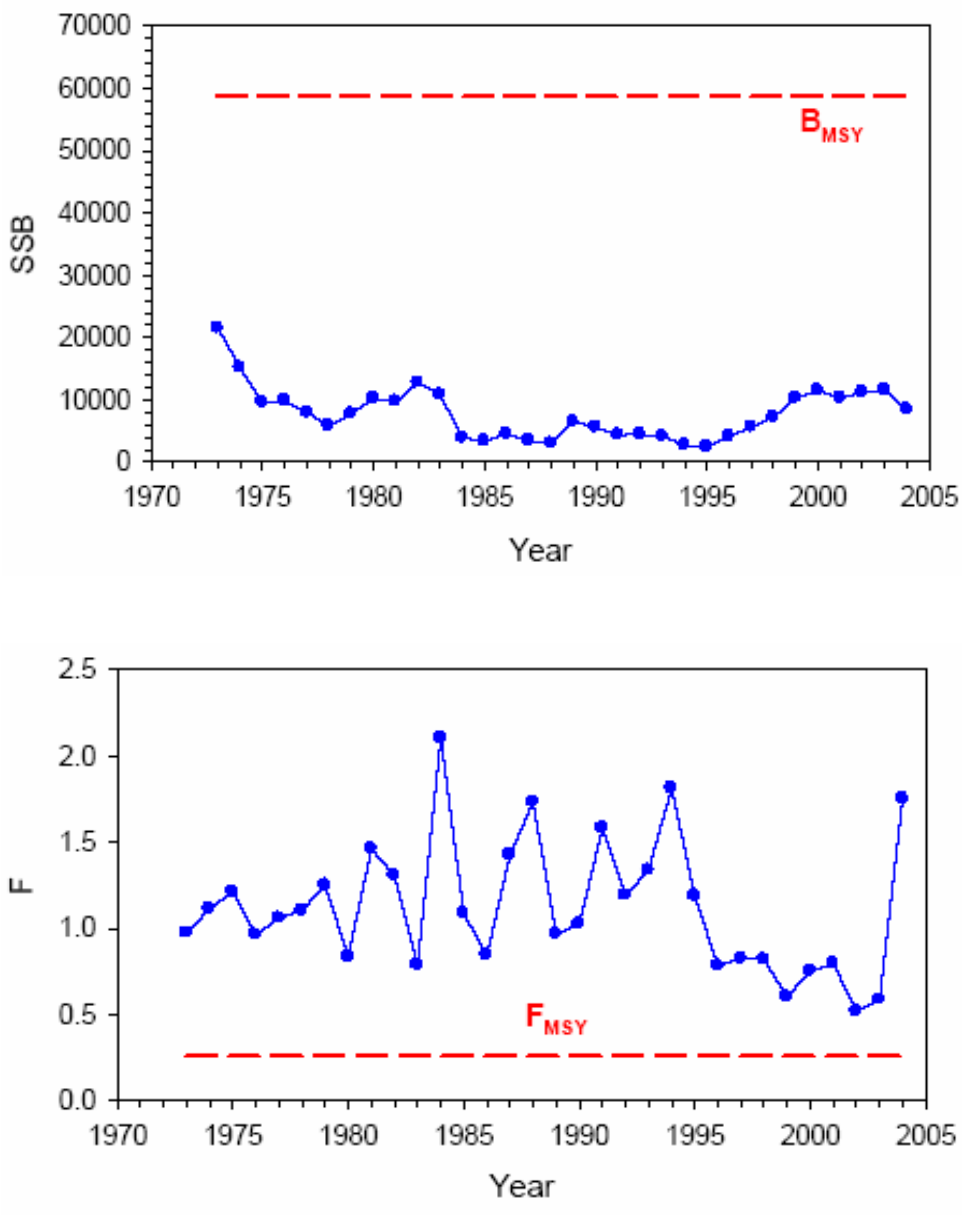


Figure 8 - Georges Bank yellowtail flounder Major Change Model spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1973-2004 reported in GARM 2005.

3.1.3 (d) SNE/MA Yellowtail Flounder

Southern New England/Mid-Atlantic yellowtail flounder was overfished and was experiencing overfishing in 2004. Spawning biomass has been low with no trend since 1992. Fishing mortality has had a decreasing trend since 1991 but remains well above FMSY. SSB estimates have a moderate negative retrospective pattern; F estimates have a strong positive retrospective pattern.

Southern New England Mid-Atlantic Yellowtail GARM 2005 Summary Stock Status

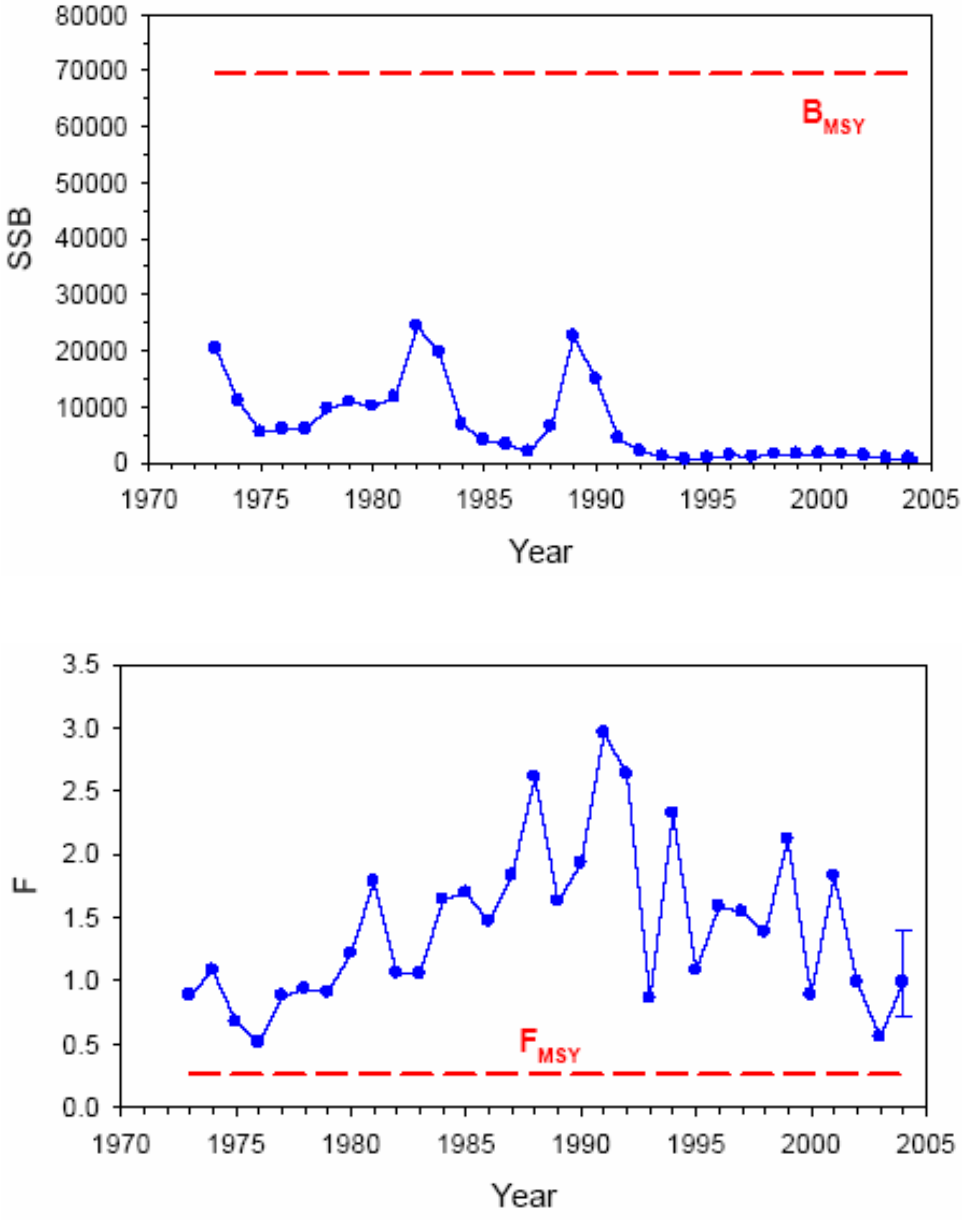


Figure 9 - Southern New England/Mid-Atlantic yellowtail flounder spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1973-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(e) CC/GOM Yellowtail Flounder

Cape Cod/Gulf of Maine yellowtail flounder was overfished and was experiencing overfishing in 2004. Spawning biomass has decreased since 2000. Fishing mortality has had an increasing trend since 1993, although F decreased in 2004. SSB estimates have a moderate negative retrospective pattern; F estimates have a moderate positive retrospective pattern.

Cape Cod Gulf of Maine Yellowtail GARM 2005 Summary Stock Status

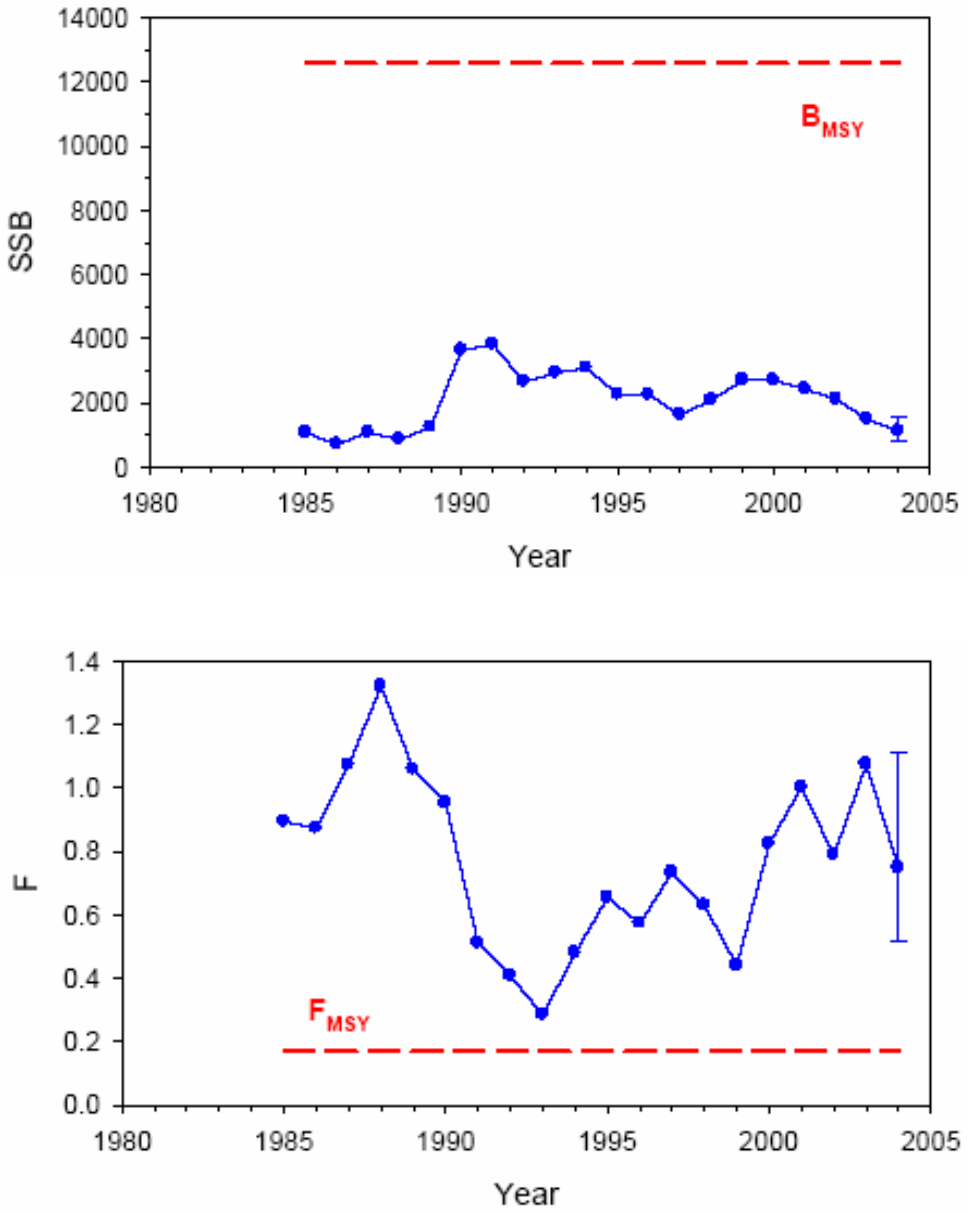


Figure 10 - Cape Cod/Gulf of Maine yellowtail flounder spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1985-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(f) GOM Cod

Gulf of Maine cod was overfished and was experiencing overfishing in 2004. Spawning biomass increased during 1998-2002 with a moderate decrease since 2002. Fishing mortality decreased from 1994 to 2002 but has increased since then. SSB and F estimates have no retrospective pattern.

Gulf of Maine Cod GARM 2005 Summary Stock Status Using Corrected 2004 Bycatch

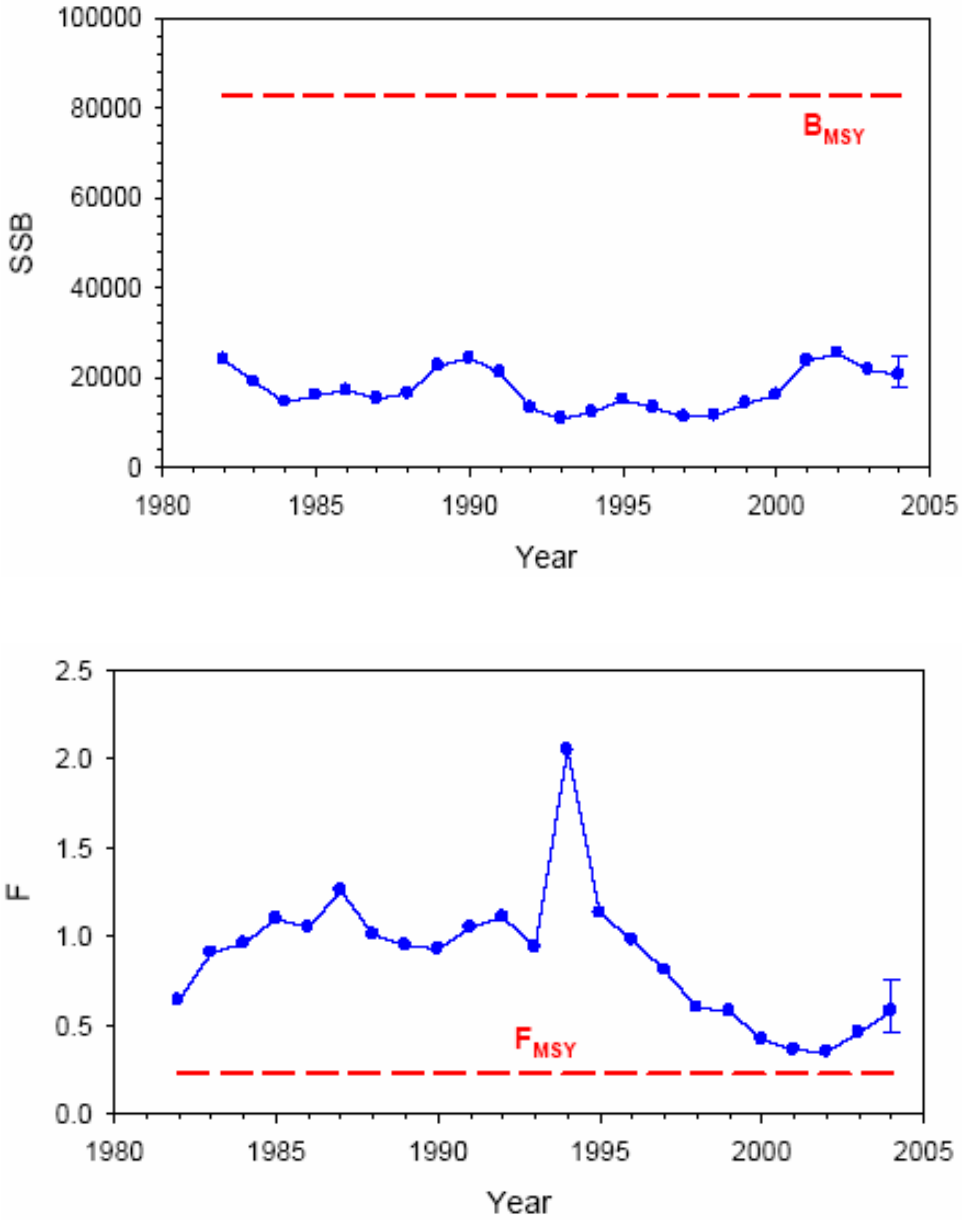


Figure 11 - Gulf of Maine cod spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1982-2004 using GARM 2005 data and corrected 2004 bycatch estimate along with 80% confidence intervals for 2004 estimates.

3.1.3(g) Witch Flounder

Witch flounder was not overfished and was not experiencing overfishing in 2004. Spawning biomass has increased since 1996 to a record high in 2004. Fishing mortality has decreased since 1996. SSB estimates have a moderate negative retrospective pattern; F estimates have a strong positive retrospective pattern.

Witch Flounder GARM 2005 Summary Stock Status

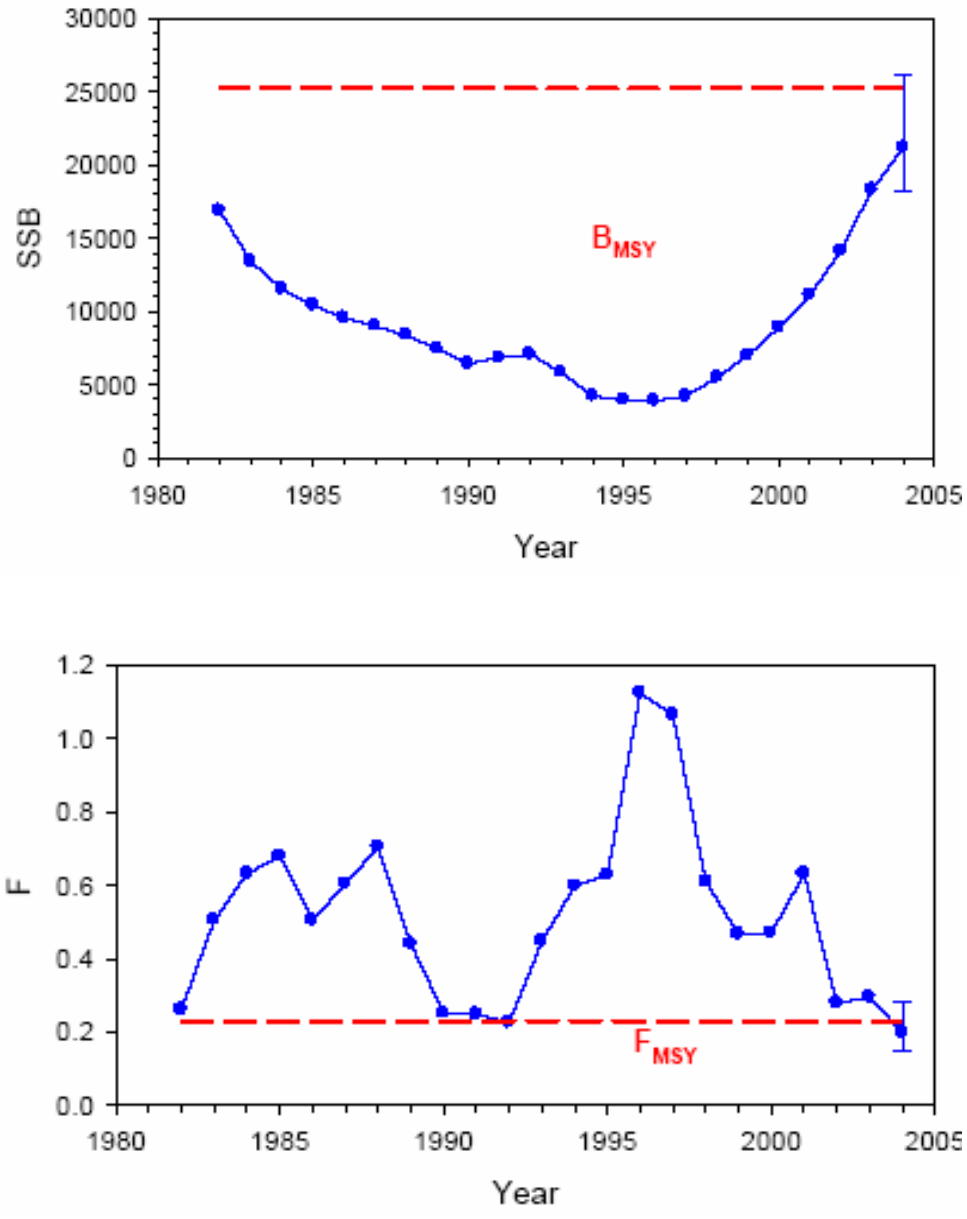


Figure 12- Witch yellowtail flounder spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1982-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(h) American Plaice

American plaice was overfished and was not experiencing overfishing in 2004. Spawning biomass has been low with no trend since 1998. Fishing mortality has had a decreasing trend since 1995. SSB and F estimates have no retrospective pattern.

Gulf of Maine/Georges Bank American Plaice GARM 2005 Summary Stock Status

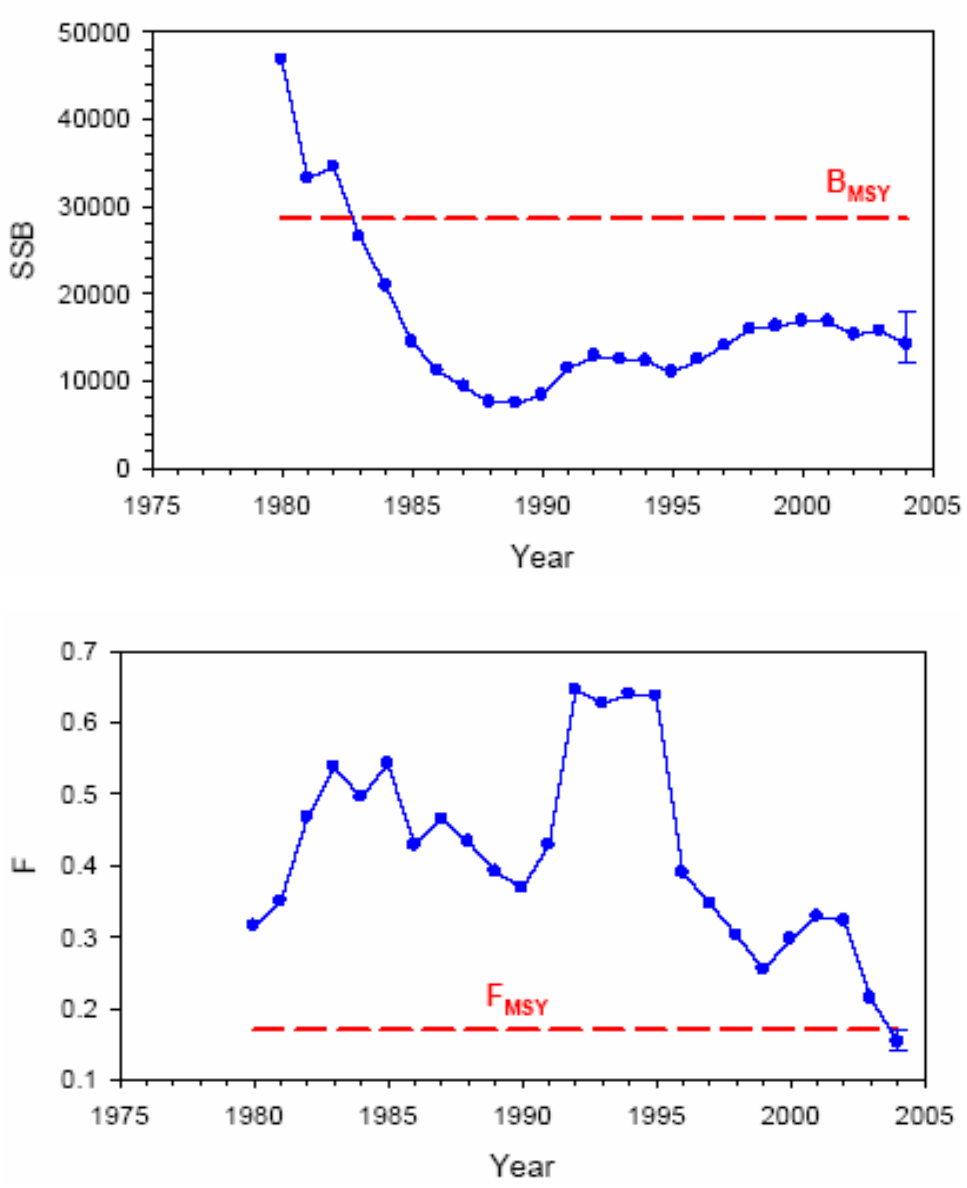


Figure 13 - American plaice spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1980-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(k) GOM Winter Flounder

Gulf of Maine winter flounder was not overfished and was not experiencing overfishing in 2004. Spawning biomass has increased since 1996 and is approaching BMSY. Fishing mortality has decreased since 2001. SSB estimates have a strong negative retrospective pattern; F estimates have a strong positive retrospective pattern.

Gulf of Maine Winter Flounder GARM 2005 Summary Stock Status

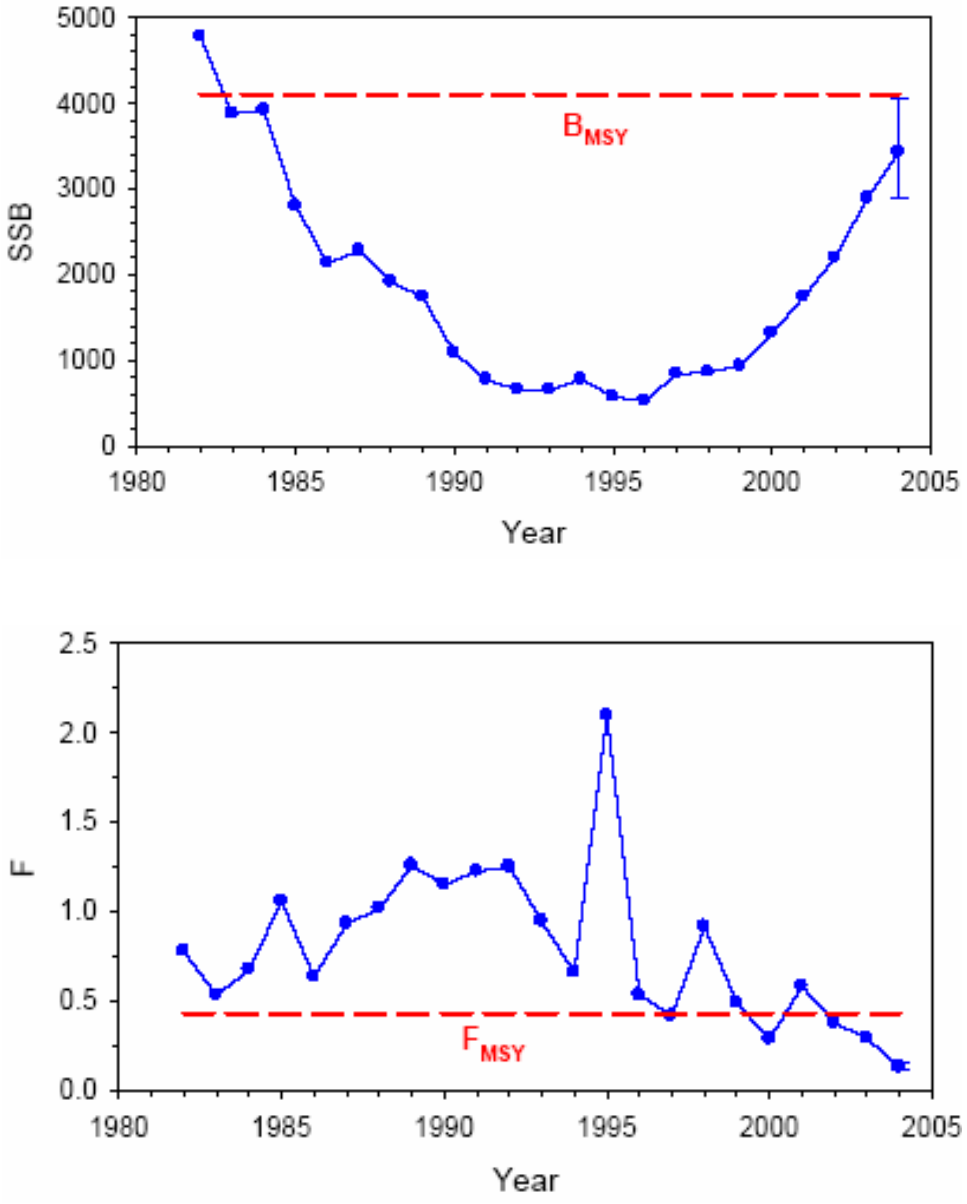


Figure 14 - Gulf of Maine winter flounder spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1982-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(q) SNE/MA Winter Flounder

Southern New England/Mid-Atlantic winter flounder was overfished and was experiencing overfishing in 2004. Spawning biomass has been low and stable since the late-1980s. Fishing mortality has had a decreasing trend since 1997. SSB estimates have a moderate negative retrospective pattern; F estimates have a strong positive retrospective pattern.

Southern New England Mid-Atlantic Winter Flounder GARM 2005 Summary Stock Status

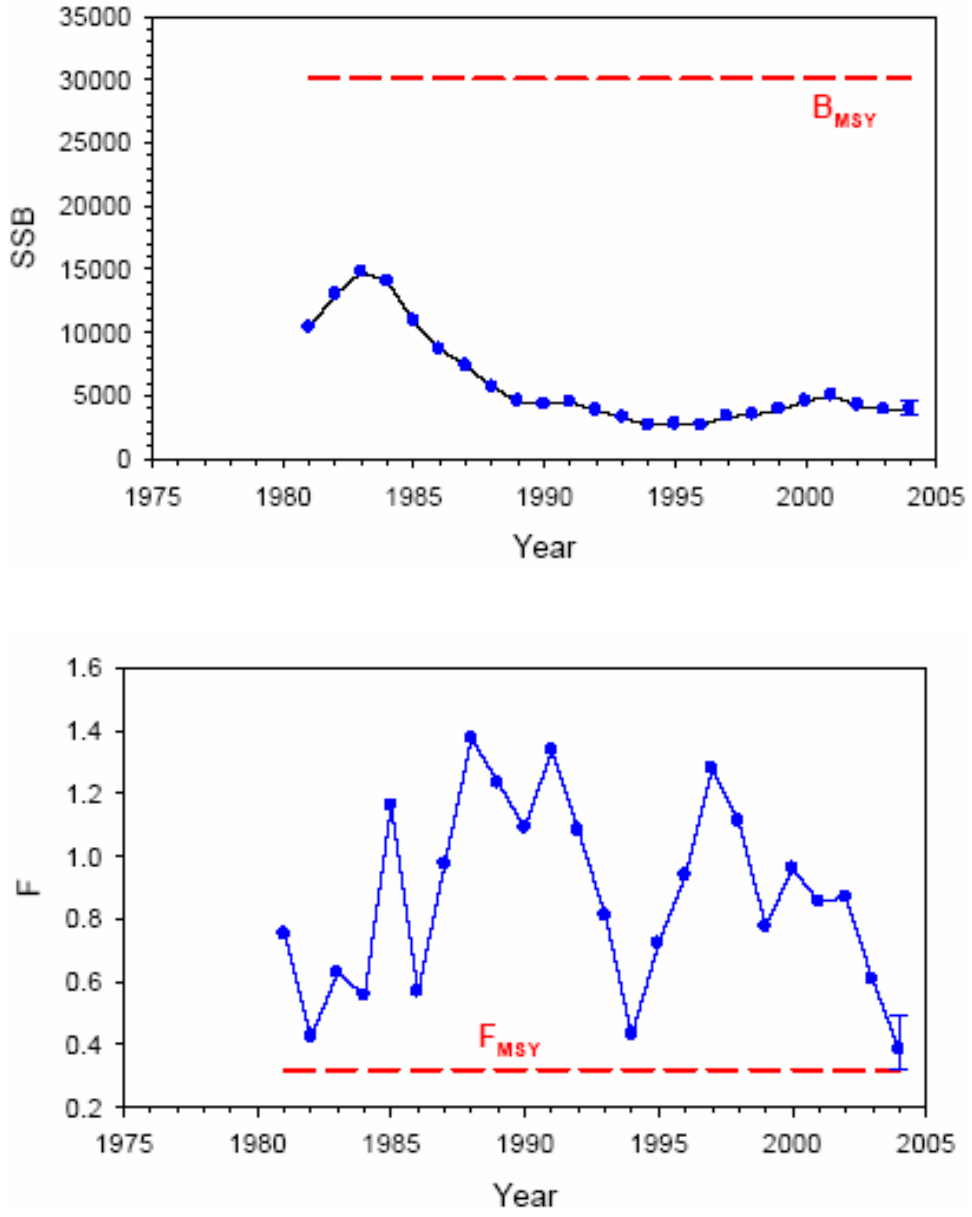


Figure 15- Southern New England/Mid-Atlantic winter flounder spawning stock biomass (SSB, mt) and fishing mortality (F) estimates during 1980-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(k) GB Winter Flounder

Georges Bank winter flounder was not overfished and was experiencing overfishing in 2004. Biomass has increased since 1994, with the exception of 2004. Fishing mortality has had an increasing trend since 1999. This figure shows fishing mortality as a numerical estimate rather than the ratio of F/Fmsy.

Georges Bank Winter Flounder GARM 2005 Summary Stock Status

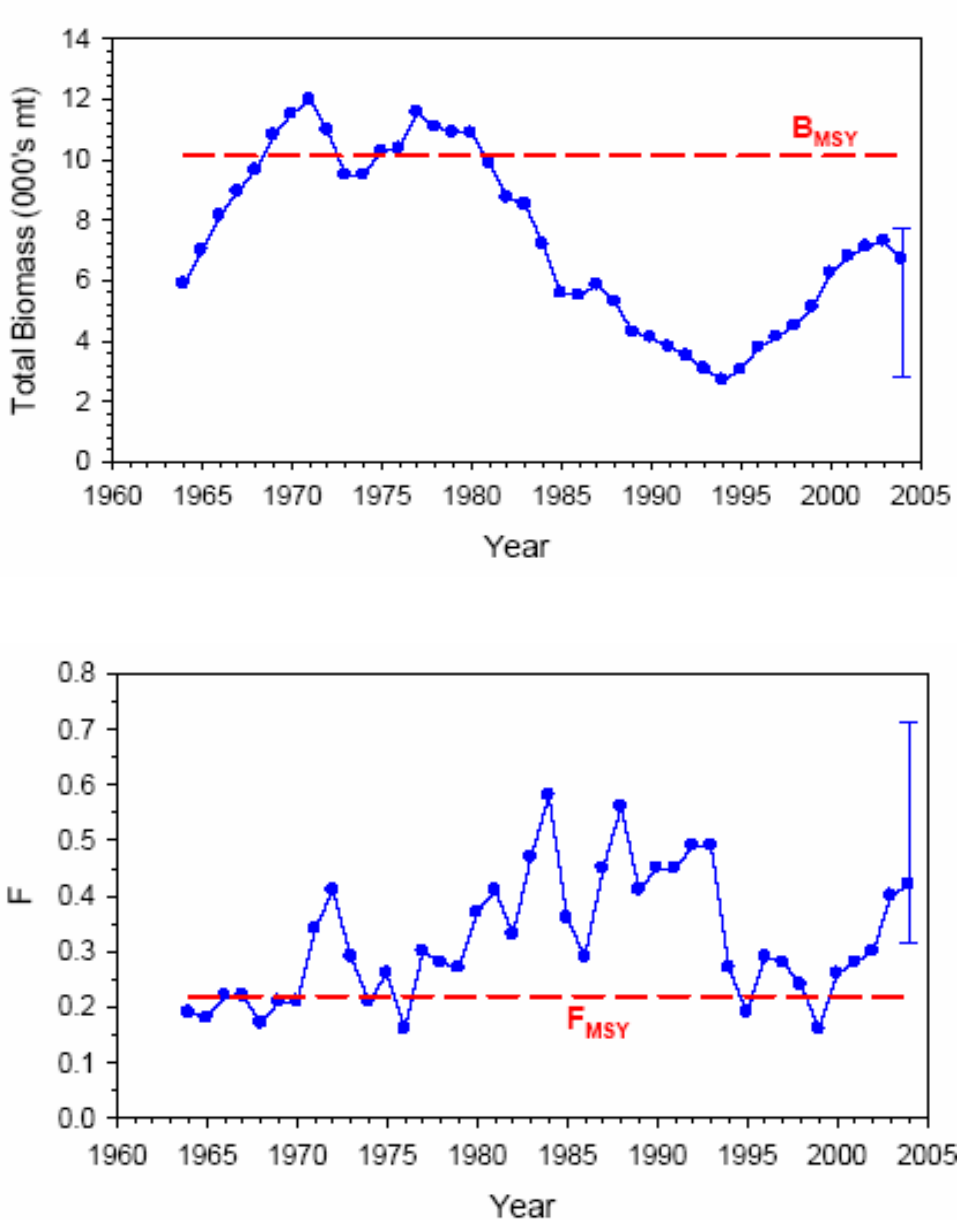


Figure 16- Georges Bank winter flounder total biomass (B, 1,000's mt) and fishing mortality (F) estimates during 1963-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates.

3.1.3(l) White Hake

White hake was overfished and was experiencing overfishing in 2004. Biomass increased during 1999-2002 and decreased slightly in 2003-2004. Fishing mortality has fluctuated above FMSY since 1982.

Gulf of Maine Georges Bank White Hake GARM 2005 Summary Stock Status

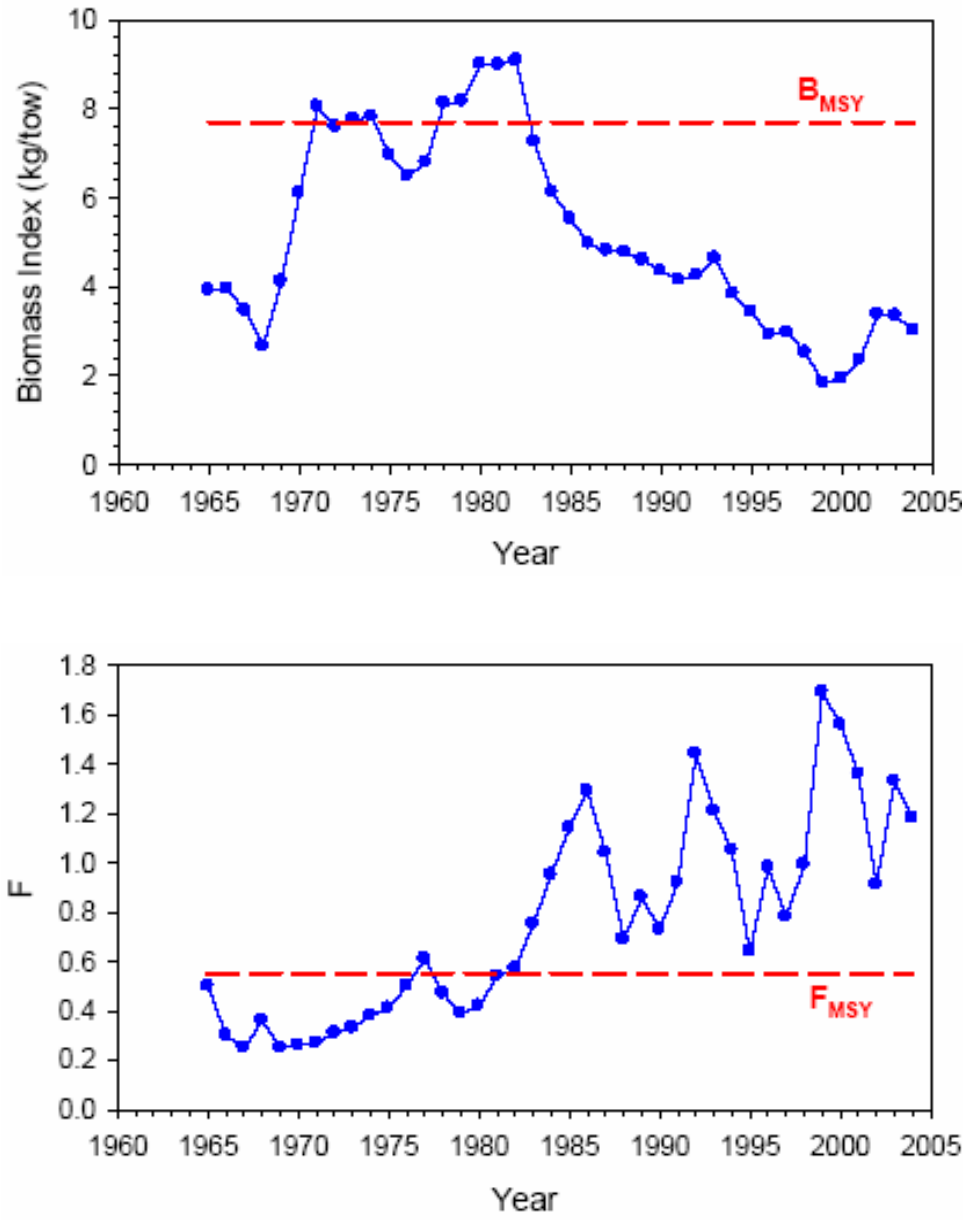


Figure 17- Georges Bank/Gulf of Maine white hake biomass (B, kg/tow) and exploitation rate (F) indices during 1963-2004 reported in GARM 2005.

3.1.3(m) Pollock

Pollock was not overfished and was not experiencing overfishing in 2004. Biomass has increased since 1995, with the exception of 2004. Fishing mortality has decreased since 1993, with the exception of 2004.

Georges Bank Gulf of Maine Pollock GARM 2005 Summary Stock Status

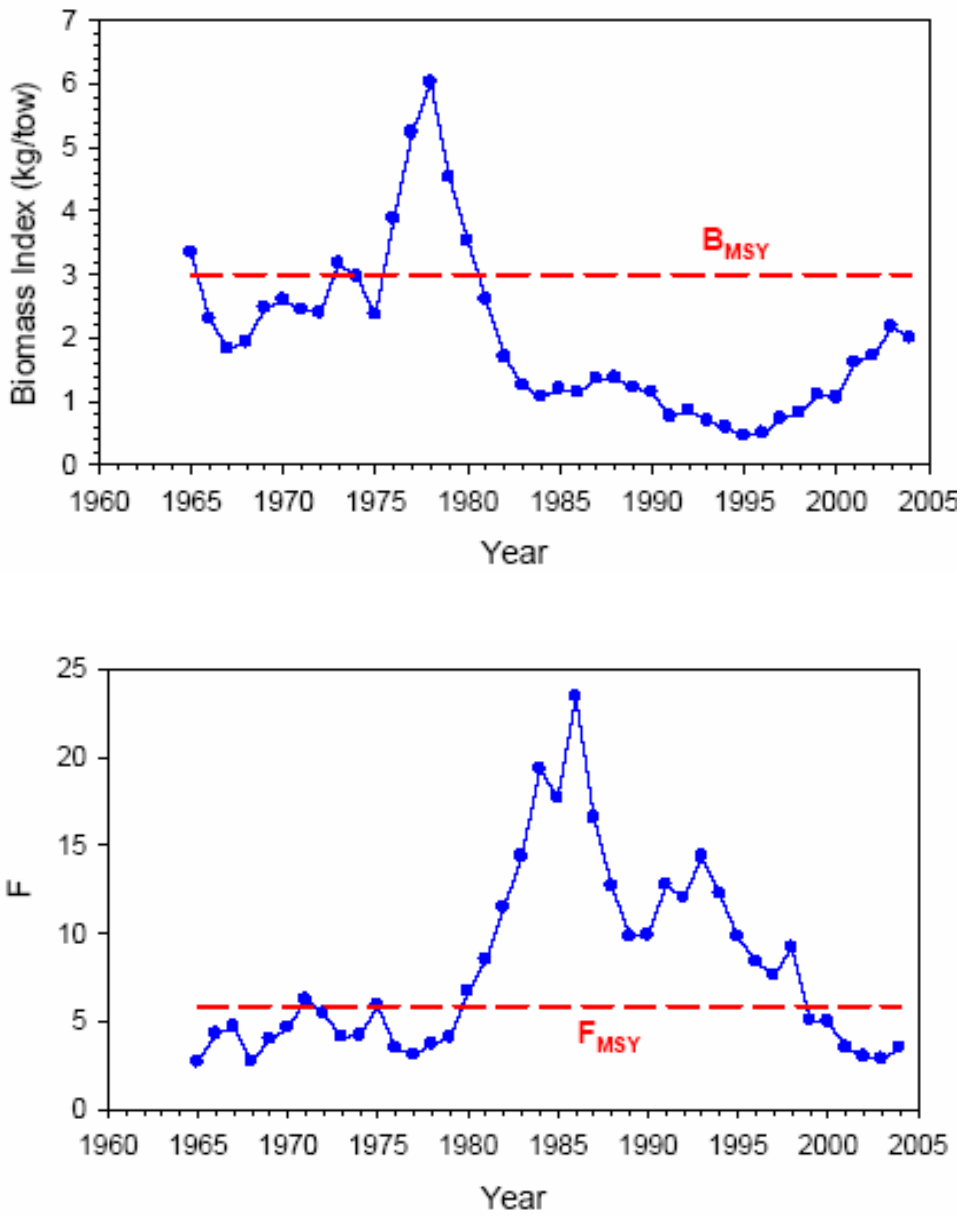


Figure 18- Georges Bank/Gulf of Maine pollock biomass (B, kg/tow) and exploitation rate (F) indices during 1963-2004 reported in GARM 2005.

3.1.3(n) Acadian Redfish

Acadian redfish was not overfished and was not experiencing overfishing in 2004. Spawning biomass has increased substantially since the mid-1990s. Fishing mortality has been below FMSY since 1989.

Gulf of Maine Georges Bank Acadian Redfish GARM 2005 Summary Stock Status

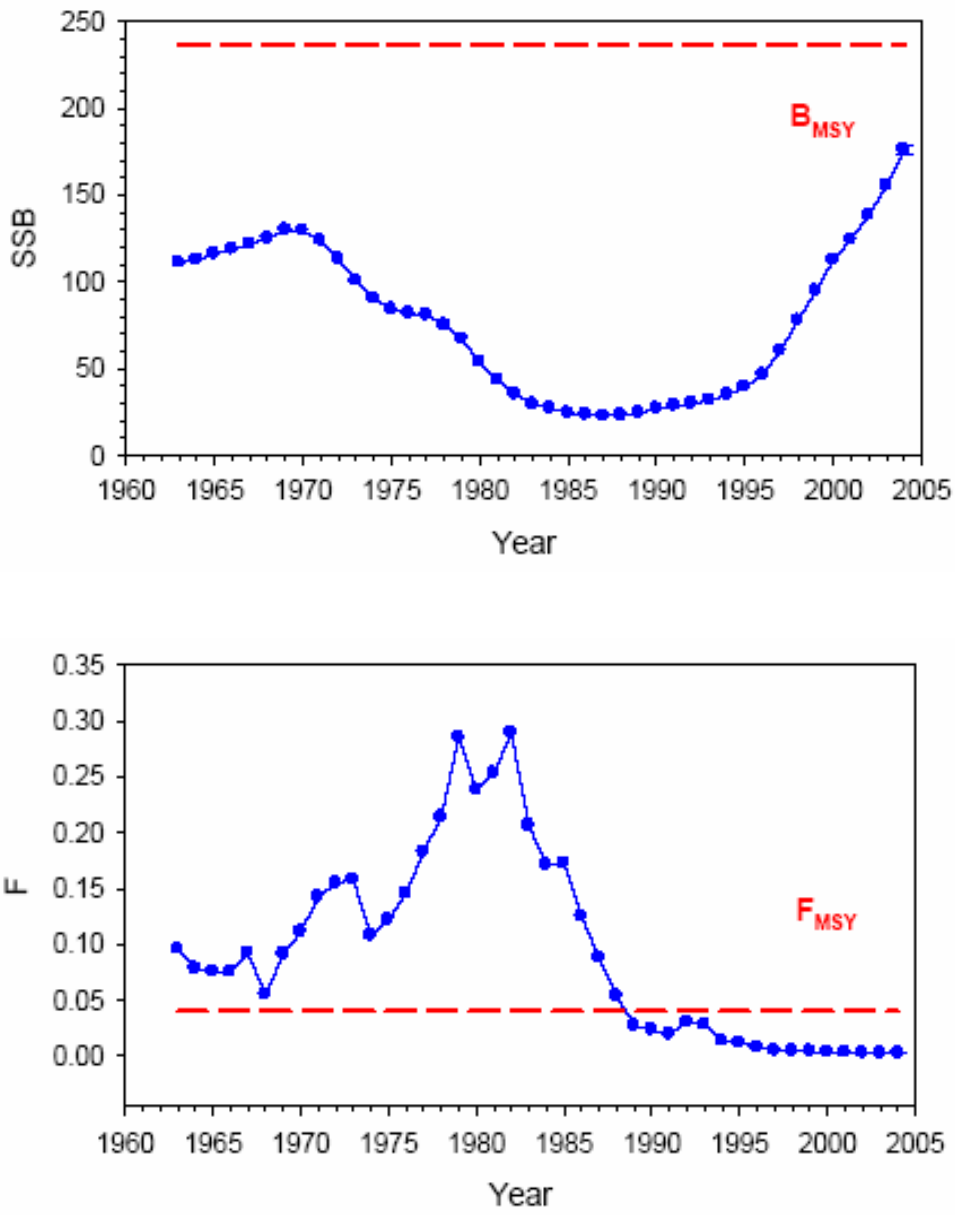


Figure 19- Gulf of Maine/Georges Bank Acadian redfish spawning stock biomass (SSB. 1,000's mt) and fishing mortality (F) estimates during 1963-2004 reported in GARM 2005 along with 80% confidence intervals for 2004 estimates..

3.1.3(o) Ocean Pout

Ocean pout was overfished and was not experiencing overfishing in 2004. Biomass has had a decreasing trend since 1986. Fishing mortality has been well below FMSY since 1992.

Ocean Pout GARM 2005 Summary Stock Status

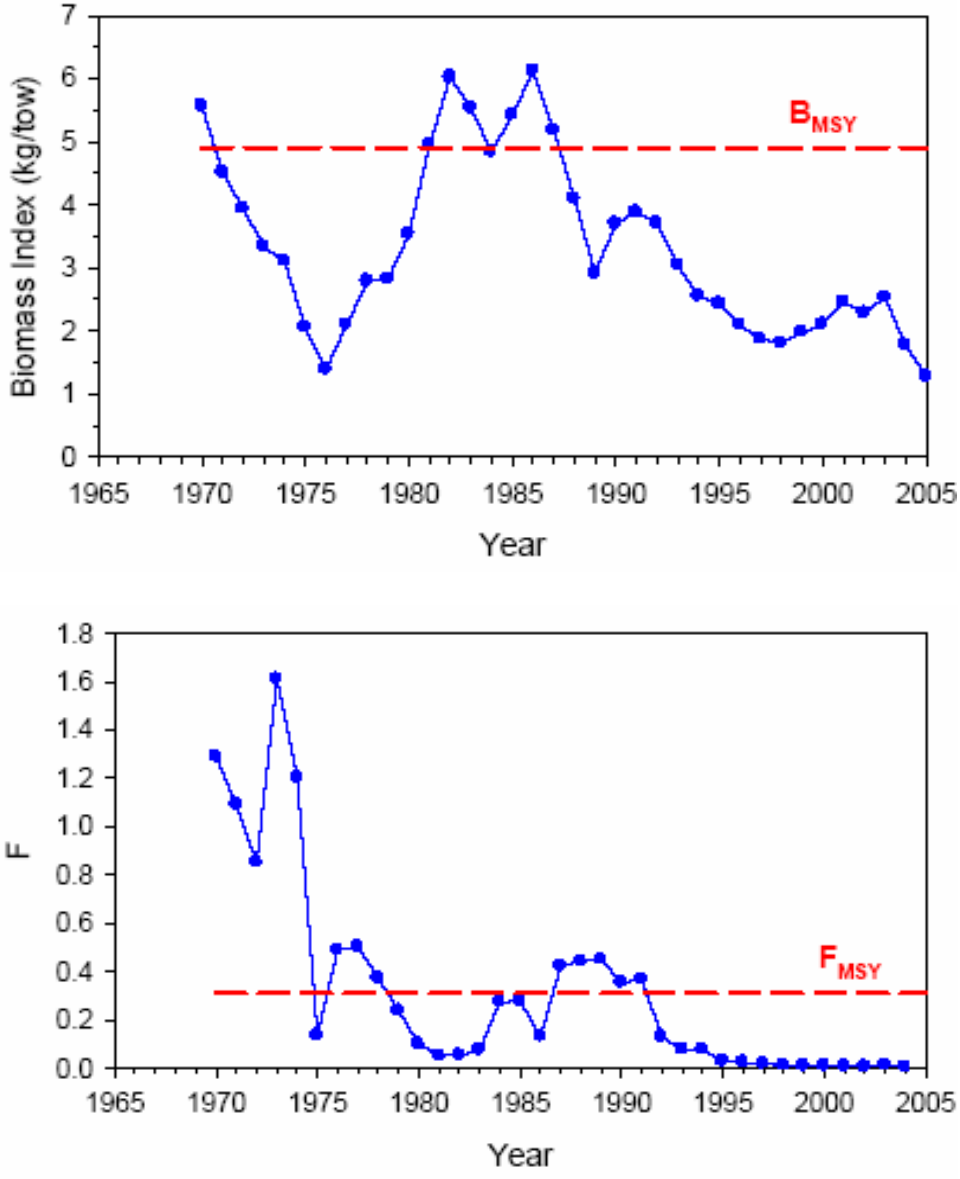


Figure 20- Ocean pout biomass (B, kg/tow) and exploitation rate (F) indices during 1968-2005 reported in GARM 2005.

3.1.3(p) GOM/GB Windowpane Flounder

Northern windowpane flounder was not overfished and was not experiencing overfishing in 2004. Biomass has decreased since 2001. Fishing mortality has been well below FMSY since 1998.

Gulf of Maine Georges Bank Windowpane Flounder GARM 2005 Summary Stock Status

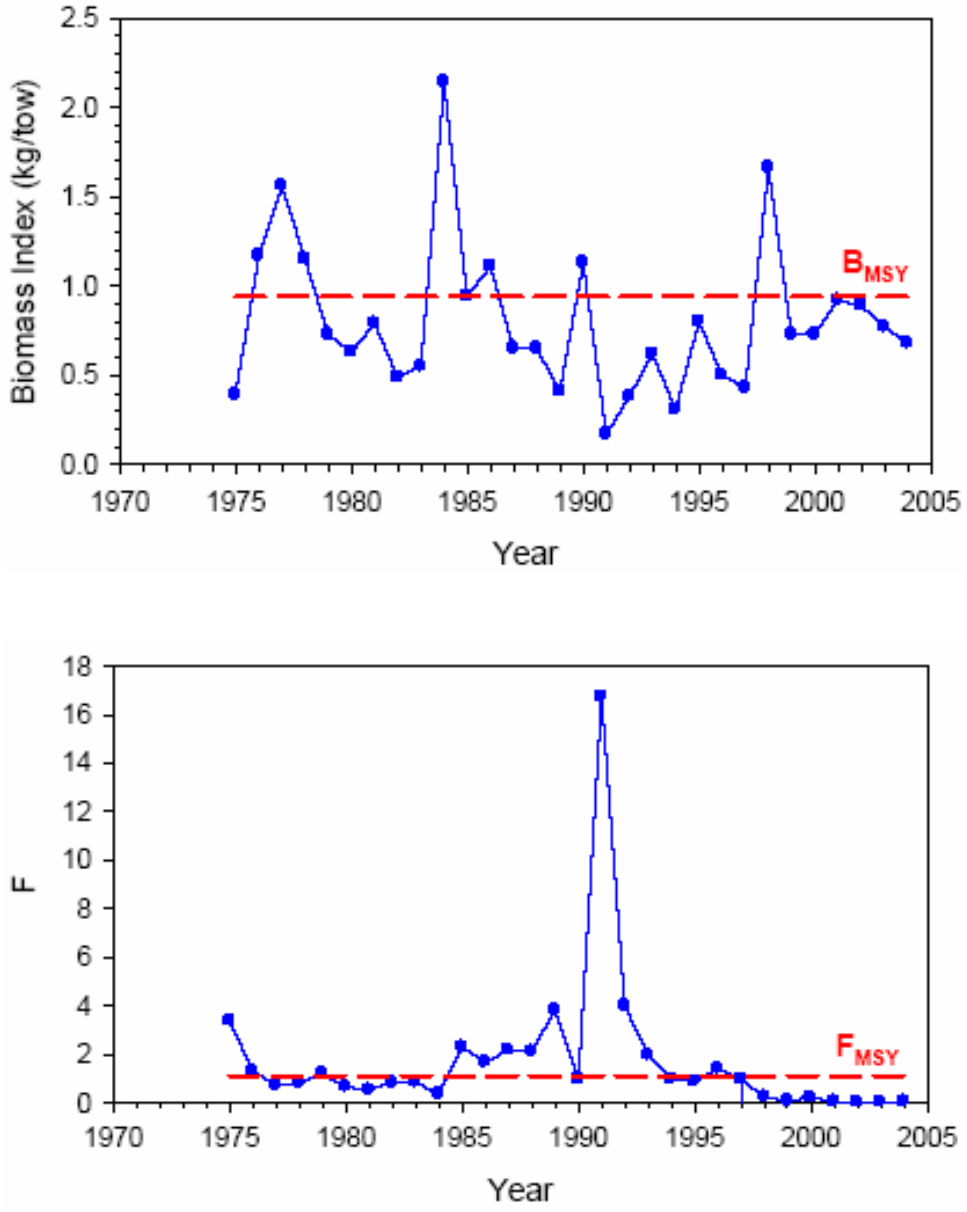


Figure 21- Gulf of Maine/Georges Bank windowpane flounder biomass (B, kg/tow) and exploitation rate (F) indices during 1975-2004 reported in GARM 2005.

3.1.3(q) SNE/MA Windowpane Flounder

Southern windowpane flounder was overfished and was not experiencing overfishing in 2004. Biomass has been low and fluctuated without trend since the late-1980s. Fishing mortality has been at or below FMSY since 1994.

Southern New England Mid-Atlantic Bight Windowpane Flounder GARM 2005 Summary Stock Status

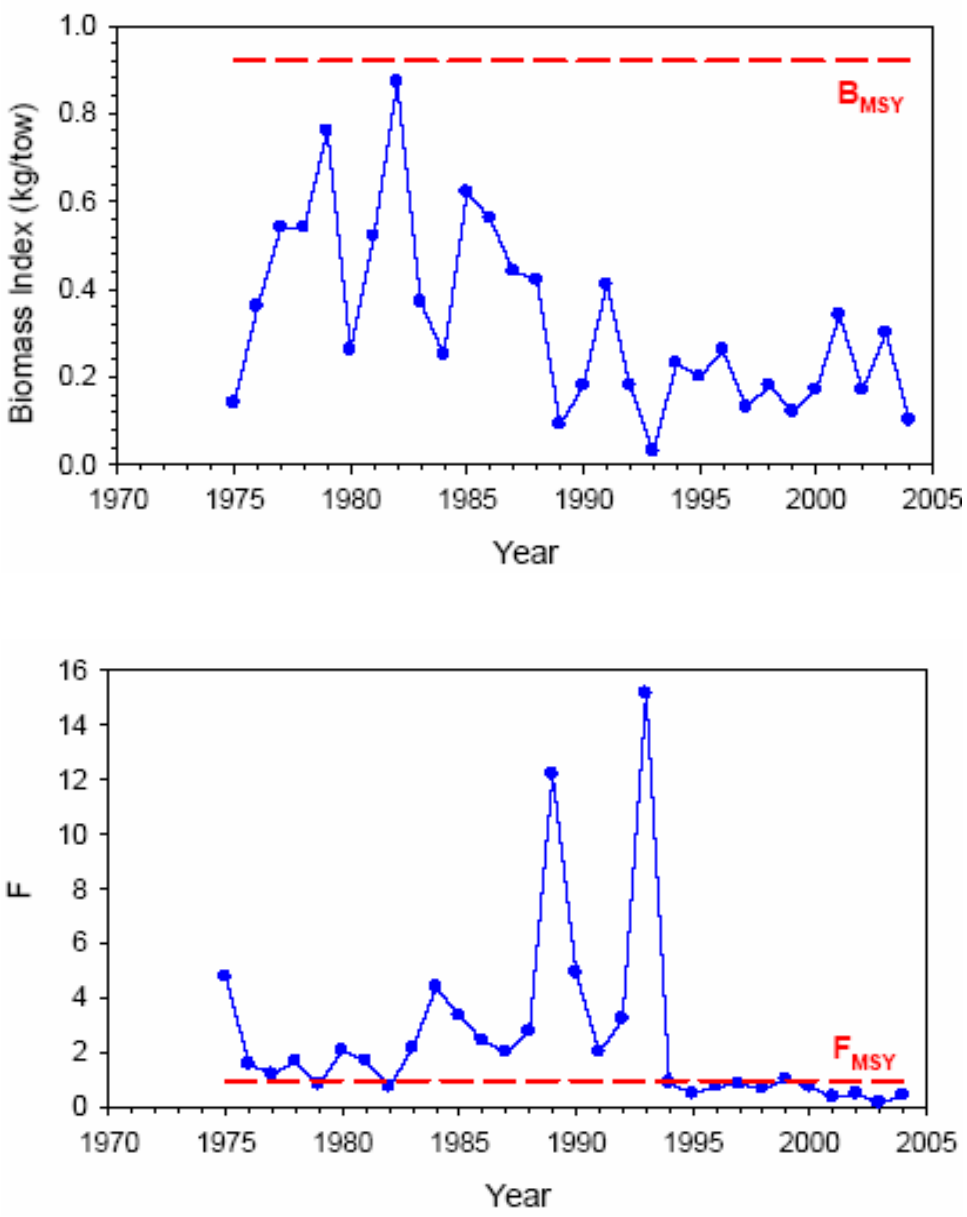


Figure 22- Southern New England/Mid-Atlantic windowpane flounder biomass (B, kg/tow) and exploitation rate (F) indices during 1975-2004 reported in GARM 2005.

3.1.3(r) GOM Haddock

Gulf of Maine haddock was overfished and was not experiencing overfishing in 2004. Biomass increased during 1994-2002 and has decreased since then. Fishing mortality decreased from 1992-2000 and has increased since then.

Gulf of Maine Haddock GARM 2005 Summary Stock Status

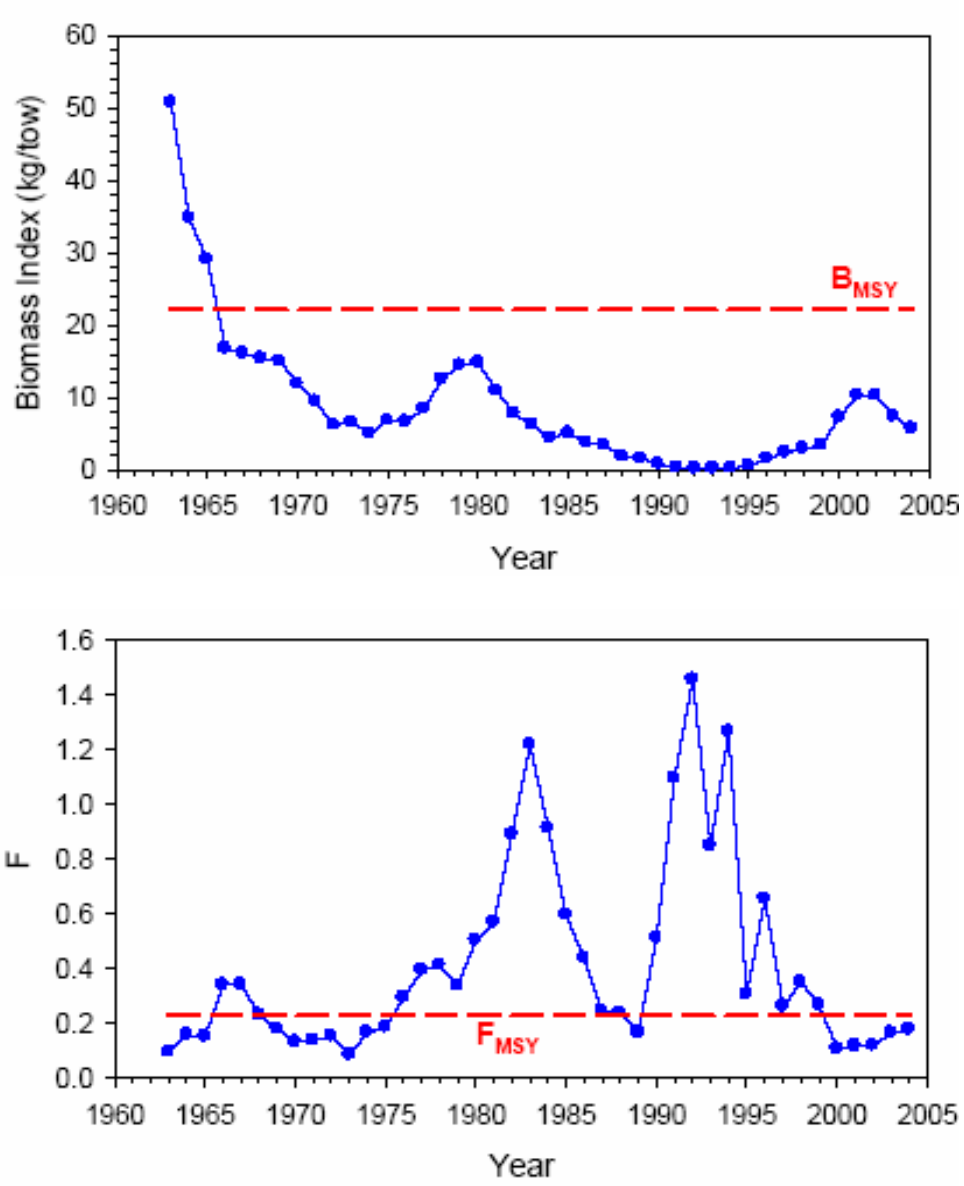


Figure 23- Gulf of Maine haddock biomass (B, kg/tow) and exploitation rate (F) indices during 19632004 reported in GARM 2005.

3.1.3(s) Atlantic Halibut

Atlantic halibut was overfished in 2004. It is unknown whether the stock was experiencing overfishing in 2004. Biomass has been stable and well below BMSY since 1963. Fishing mortality has had a decreasing trend since the early 1990s.

Atlantic Halibut GARM 2005 Summary Stock Status

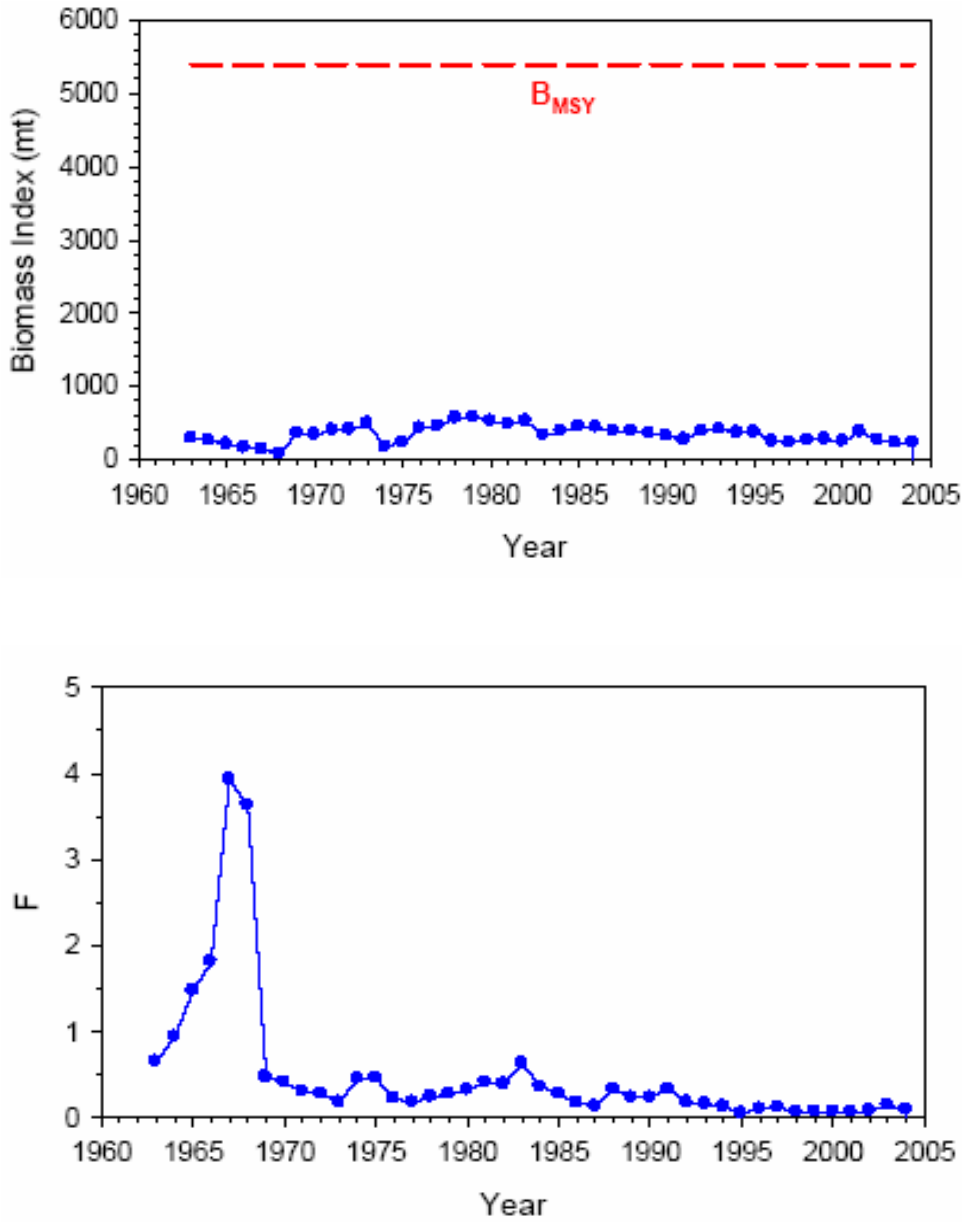


Figure 23- Atlantic halibut biomass (B, mt) and exploitation rate (F) indices during 1963-2004 reported in GARM 2005.

3.1.31 Estimates of Stock Status in 2005

Since GARM II (NEFSC 2005) provided estimates of fishing mortality for calendar year 2004, the results do not reflect the impacts of Amendment 13 management measures for a full year of implementation. The Groundfish PDT used the results of the GARM II and an estimate of catch in 2005 to determine fishing mortality for 2005.

Preliminary commercial landings were available for the first six months of the calendar year. Using this information, an estimate of calendar year catch was calculated for each stock based on the percentage of landings taken in the first six months in recent years. Since it is possible that Amendment 13 measures may affect the distribution of landings over the year, two percentages were used: an average over several years and the percentages in 2004. Using the two estimates, two estimates of landings for 2005 were developed. For stocks that include discards in the assessment results, these landings were increased by the discard to kept ratio reported in GARM II. For GOM cod and SNE/MA winter flounder the average recreational harvest over the last three years was added. The largest estimate of catch was then used in a short-term projection to estimate fishing mortality in CY 2005 for stocks that use an age-based assessment model. This approach is subject to the following uncertainties:

1. Estimates of calendar year catch may be inaccurate due to a change in the seasonal distribution of catch. In recent years the percentage of the annual catch taken in the first six months has shown little variation, but this could change as the result of numerous factors, including regulatory changes.
2. The GARM II annual discard to kept ratio reflects only eight months under Amendment 13 measures. Changes in the regulations may have increased or decreased discard ratios.
3. Short-term projections are subject to several sources of uncertainty, including errors in the estimates of 2004 stock size and fishing mortality. The assessment of some stocks exhibits a retrospective pattern – that is, terminal year estimates of stock size and mortality are in error. In many cases, the pattern tends to under-estimate mortality in the terminal year. If fishing mortality in 2004 is under-estimated, then mortality in 2005 as estimated here may also be under-estimated.

The derived catch estimates are shown in Table 2, with the resulting estimate of fishing mortality in the final column. Mortality estimates were not developed with this method for the stocks assessed through index methods, or for GB winter flounder (assessed by a surplus production model). An estimate was not calculated for GOM winter flounder because GARM II (NEFSC 2005) recommended against short-term projections due to assessment uncertainty.

	Prelim. Landings, Jan-Jun				Jan-Jun Prelim Landings, Percent of Total		CY 2005 Projected Catch		Maximum estimate		
Stock	2004	2005	Discards as % of Landings	Estimated Catch, Jan-Jun CY 2005	Average, 2002-2004 (Column A)	2004 (Column B)	(based on Column A)	(based Column B)	US Commercial Catch, CY 2005	Projected Total Catch, CY 2005	Predicted CY 2005 F
GB Cod	2,458	1,862		1,862	68%	70%	2,738	2,660	2,738	3,498	0.16
GB Haddock	4,274	4,447	8%	4,798	63%	59%	7,616	8,133	8,133	23,533	0.18
GB Yellowtail(1)	3,106	1,396	9%	1,522	67%	50%	2,271	3,043	3,043	3,543	0.20
SNE/MA Yellowtail	78	85	76%	150	68%	47%	220	318	318	318	0.58
CC/GOM Yellowtail	491	373	16%	433	50%	61%	865	709	865	865	0.48
GOM Cod	1,360	1,489	23%	1,824	43%	37%	4,242	4,930	4,930	6,430	0.34
Witch Flounder	1,388	1,429	8%	1,542	52%	48%	2,965	3,212	3,212	3,212	0.13
Plaice	705	654	25%	816	48%	41%	1,699	1,989	1,989	1,989	0.14
GOM Winter Flounder	266	152		152	46%	48%	330	317	330	330	
SNE/MA Winter Flounder	631	489	2%	499	36%	38%	1,386	1,313	1,386	1,636	0.27
GB Winter Flounder	1,261	1,054		1,054	50%	42%	2,108	2,510	2,510	2,510	
White Hake	1,760	1,359	5%	1,427	49%	51%	2,912	2,798	2,912	2,912	
Pollock	2,348	2,835		2,835	50%	47%	5,670	6,032	6,032	6,032	
Redfish	177	305		305	53%	44%	575	693	693	693	.004
Ocean Pout				0							
GOM/GB Windowpane				0							
SNE/MAB Windowpane				0							
GOM Haddock	556	495		495	53%	58%	934	853	934	934	

Table 2 – Derivation of estimated catch for CY 2005. Total catch incorporates Canadian and recreational catch, where appropriate.

3.1.3.2 Monkfish Stock Status

3.1.3.2.1 *Stock Assessment (SAW 40)*

The Northeast Fisheries Science Center (NEFSC) held a monkfish stock assessment in the fall of 2004 (SAW 40). The data used in the 2004 assessment included NEFSC research survey data, data from the 2001 and 2004 Cooperative Monkfish Surveys, commercial fishery data from vessel trip reports, dealer landings records, and observer data. In summary, the Stock Assessment Review Committee concluded:

> *Based on existing reference points, the resource is not overfished in either stock management area (north or south). Fishing mortality rates (F) estimated from NEFSC and Cooperative survey data are currently not sufficiently reliable for evaluation of F with respect to the reference points.*

With respect to recruitment, the report noted evidence of increased recruitment in the NFMA during the 1990s, particularly for the 1999 year class. Conversely, the SAW 40 report noted that in the SFMA, recruitment appears to have fluctuated without trend during the 1990s. However, there are some indications that the 2002 year class in the SFMA may be above average.

In regards to estimates of stock biomass, the SAW 40 report noted that the current 3-year moving average (2001-2003) of the survey index was above Bthreshold in the NFMA and equivalent to Bthreshold in the SFMA. Due to the timing of data availability, the assessment was not able to use 2004 cooperative survey trawl efficiency analysis to calculate swept area biomass estimates. Assuming intermediate trawl efficiencies from the 2001 cooperative survey, however, and 2004 nominal tow distances, swept area biomass estimates for the NFMA from the 2004 cooperative survey were 25-percent less than the 2001 cooperative swept area biomass estimates for this survey, while swept area biomass estimates for the SFMA from the 2004 cooperative survey were 66-percent higher than the 2001 estimates.

3.1.3.2.2 *2005 Fall Survey Results*

The Monkfish FMP uses the NMFS fall bottom trawl survey to determine monkfish stock status (biomass) relative to management reference points. To smooth out year-to-year variability in the survey, a three-year running average is used to evaluate the stock against the MSY proxy target, and minimum biomass reference points. As shown in Table 3 both northern and southern stock components are below the minimum biomass threshold, and are, therefore, overfished. This is a change of status from 2004 when both stocks were not overfished.

kg/tow	2000	2001	2002	2003	2004	2005	3-yr. Ave.	Bthreshold	Btarget
NFMA	2.495	2.052	2.103	1.925	0.638	1.078	1.214	1.25	2.5
SFMA	0.477	0.708	1.253	0.828	0.742	0.765	0.778	0.93	1.86

Table 3 2000 – 2005 NMFS autumn bottom trawl survey indices of monkfish abundance and biomass reference points.

Framework 2, adopted in 2003, established a method for evaluating on an annual basis the rebuilding progress of the fishery. That method compares the three-year running average of the biomass index to annual biomass targets which are ten equal increments between the 1999 observed value (at the start of the 10-year rebuilding program) and the 2009 target (Btarget). The relationship of the observed 3-year average to the annual target value is applied to the previous year's landings to set target TACs for the upcoming year. The annual targets and the 1999-2005 observed values are shown in Figure 25 and Figure 26 for the NFMA and SFMA, respectively. The northern and southern stocks are approximately 34% and 40% below their 2005 targets.

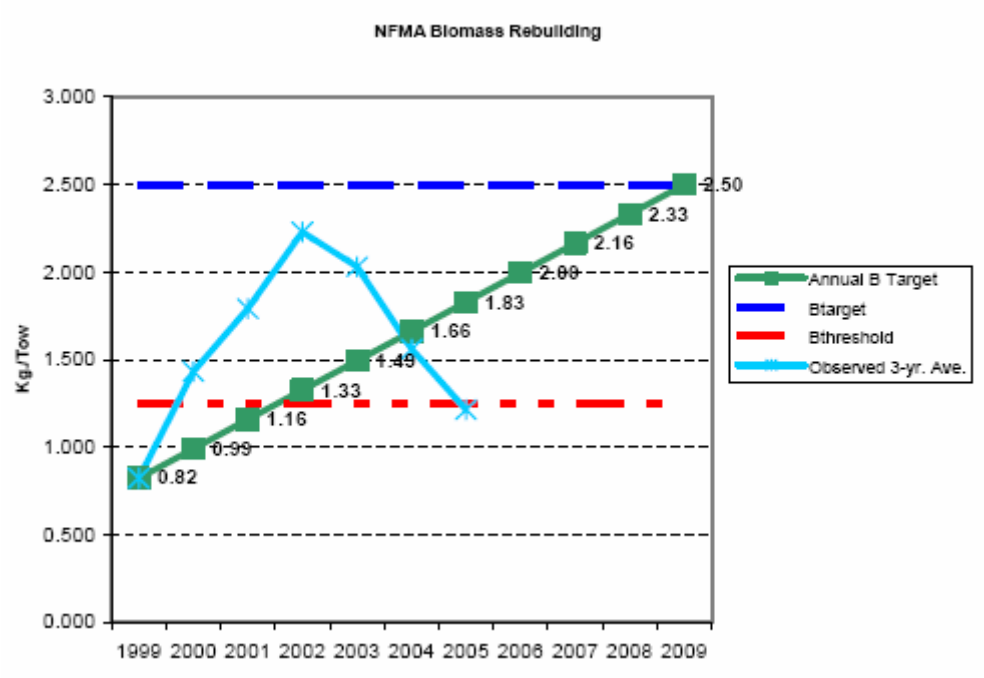


Figure 25- NFMA biomass index (2005 three-year running average) relative to annual rebuilding targets.

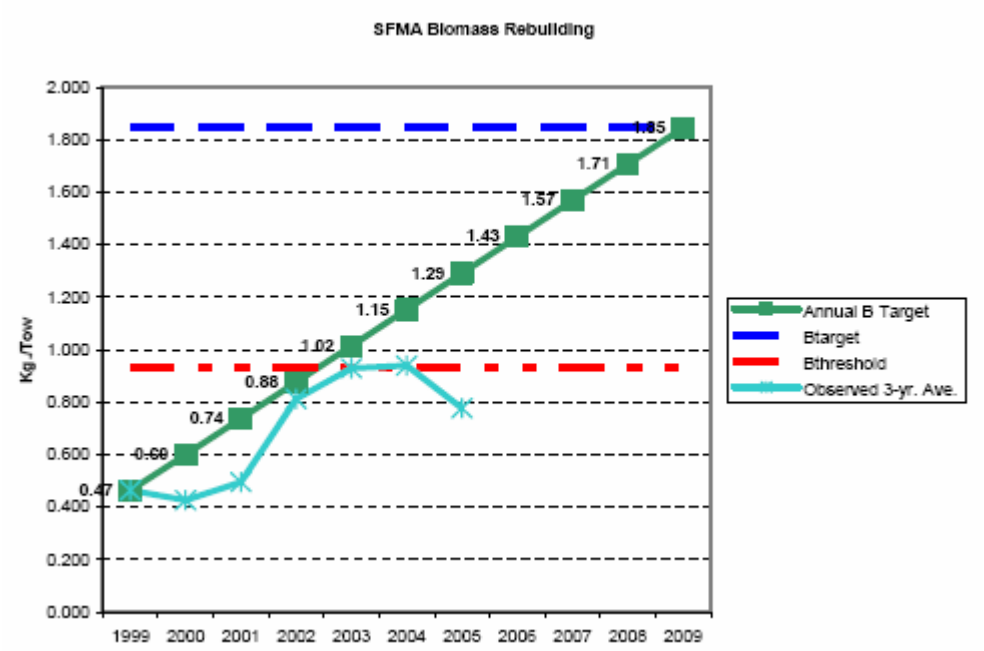


Figure 26- SFMA biomass index (2005 three-year running average) relative to annual rebuilding targets.

3.1.3.3 Skates Stock Status

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

Figure 27 summarizes the status of seven skate species. Prior to the implementation of the Skate FMP, skate landings and bycatch were not reported by species, and 99% of skates landed were reported as "unclassified". Furthermore, because skates were not formally incorporated into a federal FMP, the fishery information was incomplete. Therefore, the benchmark assessment completed in 1999 concluded that there were insufficient data on age and growth to determine fishing mortality rates or fishing mortality reference points for most of the seven skate species (excluding winter and little skate). Therefore, the Skate FMP established overfishing definitions based on a percentage decline in the NEFSC trawl survey. The overfishing definitions vary for each species, but in general they are based on the three-year moving average of the survey mean weight per tow. The horizontal line for each species that is shown in Figure 27 represents the minimum biomass threshold (a stock is overfished below this line).

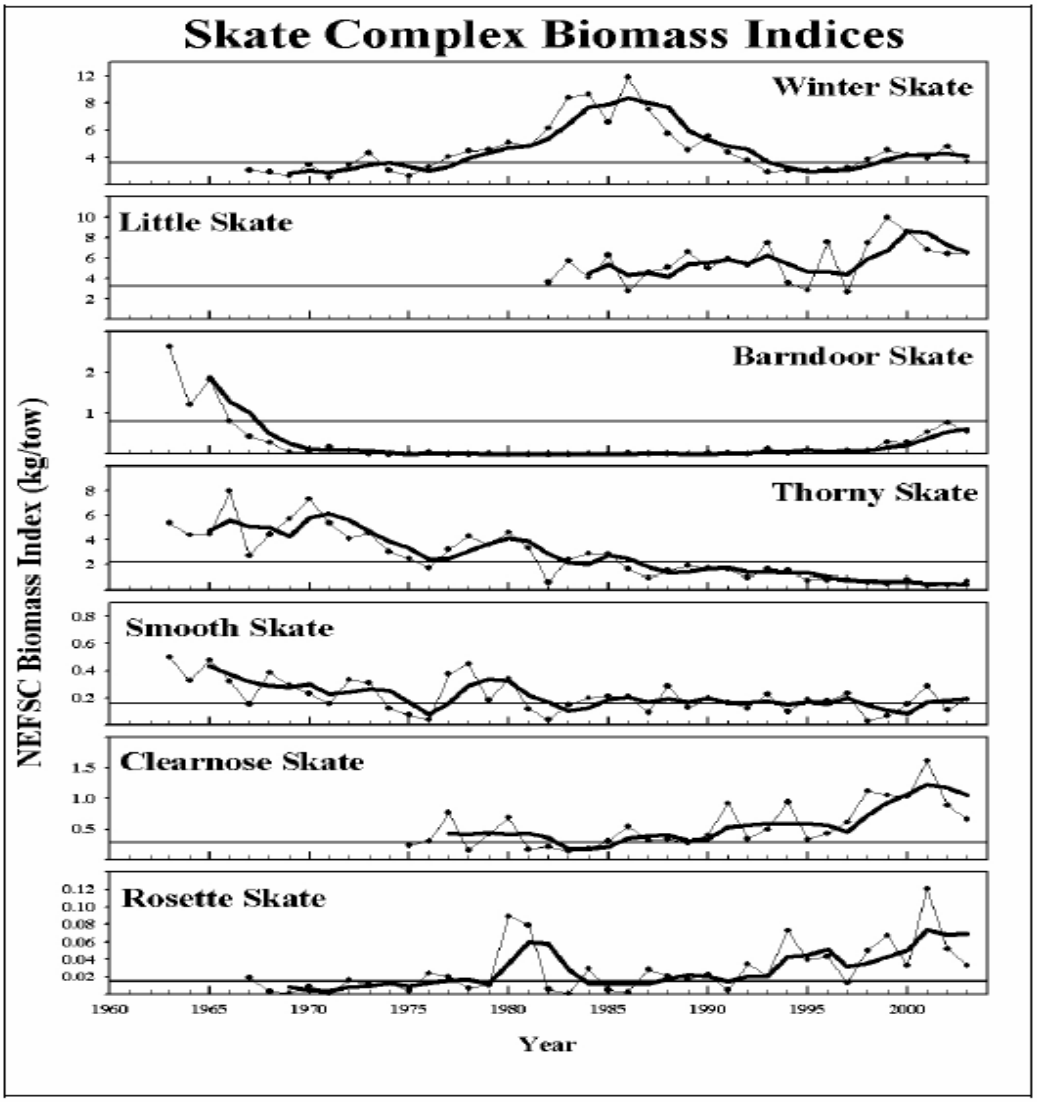


Figure 27 – Status of seven skate species.

3.1.3.4 Spiny Dogfish Stock Status

Spiny dogfish are caught by most gear used to target regulated groundfish, and as a result are an incidental catch and bycatch in this groundfish fishery. The Northwest Atlantic spiny dogfish stock continues to be classified as overfished; however, overfishing is not occurring. Recent population projections suggest a time span of 15 to 20 years before the stock will have fully recovered. An assessment of this stock is scheduled for spring, 2006.

3.1.4 PROTECTED SPECIES

For the purposes of this EA, protected species are assumed to be those species outside the Northeast Multispecies Groundfish Complex that are endangered, threatened, or candidate species under the Endangered Species Act (ESA), or protected under the Marine Mammal Protection Act (MMPA), or both, and that are known to exist in the area affected by the proposed action. Furthermore, this section includes certain Marine Mammal Critical Habitat Designations and bird species protected under the Migratory Bird Act of 1918 (NEFMC, Am 13 FSEIS, Section 9.2.2). Finally, it includes those skate species with prohibitions on possession in place under the Northeast Skate Complex FMP. Table X lists the protected species known to exist in the affected area.

Table 4 (below) excerpts the protected species that are known to likely interacted with benthic longline and/or sink gillnet fisheries in the proposed area. Further information on these species and the others in Table 4 can be found in Section 9.2.2 of the NEFMC Amendment 13 FSEIS.

Cetaceans	***Status***
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella* spp.)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected
Seals	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandica*)	Protected
Hooded seal (*Cystophora cristata*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Barndoor skate (*Dipturus laevis*)	Candidate Species/Possession Prohibition
Thorny skate (*Amblyraja radiata)*	Possession Prohibition
Critical Habitat Designations	
Right whale	Cape Cod Bay

	Great South Channel

Although all of the protected species listed above may be found in the general geographical area covered by the Multispecies FMP, not all are affected by the fishery for several reasons. Some protected species may inhabit more inshore or offshore areas than those utilized by the groundfish species, prefer a different depth or temperature zone than multispecies, or may migrate through the area at different times than the species regulated by the FMP. In addition, certain protected species may not be vulnerable to capture or entanglement in certain fishing gear used in the multispecies fishery.

It has been determined that multispecies fishing operations, as managed by Amendment 13 to the Multispecies FMP, are not expected to affect the shortnose sturgeon *(Acipenser brevirostrum*), the Gulf of Maine distinct population segment (DPS) of Atlantic salmon (*Salmo salar*), the roseate tern (*Sterna dougallii dougallii*), the piping plover (*Charadrius melodus*) or the hawksbill sea turtle (*Eretmochelys imbricata*), all of which are listed species under the ESA of 1973.

There are several cetaceans protected under the MMPA that are found in the waters fished by the multispecies fishery, namely the Risso's dolphin (*Grampus griseus*), spotted and striped dolphins (*Stenella* spp.), and coastal forms of Atlantic bottlenose dolphin (*Tursiops truncatus*). Although these species may occasionally become entangled or otherwise entrapped in certain fishing gear such as pelagic longline and mid-water trawls, these gear types are not used in the multispecies fishery (or allowed to operate within the Sector) (NEFMC, Am 13 FSEIS, Section 9.2.2).

Species in Table 4 (and more) that are known to have interacted with the longline and/or gillnet fisheries on Georges Bank are as follows: Bottlenose, Common, Risso's, and White-Sided dolphin; Fin, Humpback, Canadian East Coast Minke, Pilot, and North Atlantic Right whale; Harbor Porpoise; Gray, Hooded, Harbor, and Harp seal; Leatherback, Kemp's Ridley, Green, and Loggerhead turtle. Interactions most frequently include getting caught on hooks (longline gear), entanglement in mesh (gillnet fishery), entanglement in float line (gillnet fishery), entanglement in groundline (gillnet and longline fisheries), entanglement in anchor line (gillnet and longline fisheries), or entanglement in vertical lines that connect the gear to the surface (gillnet and longline fisheries).

3.1.4.1 STATUS OF PROTECTED SPECIES

The status information below is a summary of information provided in the Amendment 13 documents and describes the threatened and endangered species that are potentially affected by the Proposed Action, as well as those accorded protection by the Marine Mammal Protection Act. All have previously been discussed in more detail in the Amendment 13 Final Supplemental Environmental Impact Statement. That information is incorporated herein by reference. The following sections containing updated information on right whales, as well as loggerhead leatherback, Kemp's ridley and green sea turtles, were excerpted from draft Biological Opinions (Opinions) provided by NOAA Fisheries Northeast Regional Office.

3.1.4.1(a) ***Northern Right Whale***

Scientific literature on right whales has historically recognized distinct eastern and western populations or subpopulations in the North Atlantic Ocean (IWC 1986). Current information on the eastern stock is lacking and it is unclear whether a viable population in the eastern North Atlantic still exists (Brown 1986, NMFS 1991). Photo-identification work has shown that some of the whales observed in the eastern Atlantic were previously identified as western Atlantic right whales (Kenney 2002). The following will focus on the western North Atlantic subpopulation of right whales which occurs in the action area.

Habitat and Distribution

Northern right whales in the western North Atlantic (hereafter referred to as "right whales") generally occur from the southeast U.S. to Canada (*e.g.*, Bay of Fundy and Scotian Shelf) (Kenney 2002; Waring *et al.* 2002). Like other right whale species, they follow an annual pattern of migration between low latitude winter calving grounds and high latitude summer foraging grounds (Perry *et al.* 1999; Kenney 2002). Previous NOAA Fisheries Biological Opinions for the lobster fishery described right whale movements and habitat use as follows:

> They are most abundant in Cape Cod Bay between February and April (Hamilton and Mayo 1990; Schevill *et al.* 1986; Watkins and Schevill 1982) and in the Great South Channel in May and June (Kenney *et al.* 1986; Payne *et al.* 1990) where they have been observed feeding predominantly on copepods, largely of the genera *Calanus* and *Pseudocalanus* (Waring *et al.* 1999). Right whales also frequent Stellwagen Bank and Jeffrey's Ledge, as well as Canadian waters including the Bay of Fundy and Browns and Baccaro Banks in the spring through fall. The distribution of right whales in summer and fall seems linked to the distribution of their principal zooplankton prey (Winn *et al.* 1986). Calving occurs in the winter months in coastal waters off of Georgia and Florida (Kraus *et al.* 1988).
>
> While right whales are known to congregate in the aforementioned areas, the description is an oversimplification of right whale movements and habitats; much is still not known or understood. Telemetry data have shown lengthy and somewhat distant excursions into deep water off of the continental shelf (Mate *et al.* 1997) as well as extensive movements over the continental shelf during the summer foraging period (Mate *et al.* 1997; Baumgartner and Mate 2005). Photo-identification data have also indicated excursions of animals as far as Newfoundland, the Labrador Basin, southeast of Greenland (Knowlton *et al.* 1992), and Norway (Best *et al.* 2001). In the winter, only a portion of the known right whale population is seen on the calving grounds. The winter distribution of the remaining right whales remains uncertain (Waring *et al.* 2002). Results from winter surveys and passive acoustic studies suggest that animals may be dispersed in several areas including Cape Cod Bay (Brown *et al.* 2002) and offshore waters of the southeastern U.S. (Waring *et al.* 2002).

Other unknowns about right whale habitat also persist. For example, some female right whales have never been observed on the Georgia/Florida calving grounds but have been observed with a calf on the summer foraging grounds (Best *et al.* 2001). It is unknown whether these females are calving in an unidentified calving area or have just been missed during surveys off of Florida and Georgia (Best *et al.* 2001). The absence of some known (photo-identified) whales from identified habitats for months or years at a time suggests the presence of an unknown feeding ground (Kenney 2002). Finally, while behavior suggestive of mating is frequently observed on the foraging grounds, conception is not likely to occur at that time given the known length of gestation in other baleen whales. More likely, mating and conception occur in the winter (Kenney 2002). Based on genetics data, it has been suggested that two mating areas may exist with a somewhat different population composition (Best *et al.* 2001). The location of the mating area(s) is unknown.

Critical habitat for right whales has been designated in accordance with the ESA. Following a petition from the Right Whale Recovery Team, NMFS designated three critical habitat areas for right whales in 1994. These areas are: (1) portions of Cape Cod Bay and Stellwagen Bank, (2) the Great South Channel, and (3) coastal waters off of Georgia and Florida's east coast. Right whale critical habitat in Northeast waters were designated for their importance as right whale foraging sites while the southeast critical habitat area was identified for its importance as a calving and nursery area. In 2002, NMFS received a petition to revise designated critical habitat for right whales by combining and expanding the existing

Cape Cod Bay and Great South Channel critical habitats in the Northeast and by expanding the existing critical habitat in the Southeast. In response to the petition, NMFS recognized that there was new information on right whale distribution in areas outside of the designated critical habitat. However, the ESA requires that critical habitat be designated based on identification of specific habitat features essential to the conservation of the species rather than just known distribution. NMFS, therefore, concluded that more analyses of the sightings data and their environmental correlates are necessary to define and designate these areas as critical habitat.

Abundance Estimates and Trends

It is well known and documented that there are relatively few right whales remaining in the western North Atlantic. As is the case with most wild animals, an exact count cannot be obtained. However, abundance can be reasonably estimated as a result of the extensive study of this subpopulation. IWC participants from a 1999 workshop agreed that it was reasonable to state that the number of northern right whales in the western North Atlantic as of 1998 was probably around 300 (+/- 10%) (Best *et al.* 2001). This conclusion was principally based on a photo-identification catalog that, as of July 1999, was comprised of more than 14,000 photographed sightings of 396 individuals, 11 of which were known to be dead and 87 of which had not been seen in more than 6 years. In addition, it was noted that relatively few new non-calf whales (whales that were never sighted and counted in the population as calves) had been sighted in recent years (Best *et al.* 2001), which suggests that the 396 individuals was a close approximation of the entire population.

A total of 125 right whale calves has been observed since the 1999 workshop, including a record calving season in 2000/2001 with 31 right whale births (B. Pike, New England Aquarium, pers. comm.). Calving numbers have been sporadic, with large differences among years. The three calving years (1997-2000) prior to the record year in 2000/2001 provided low recruitment with only 10 calves born, while the last five calving seasons (2000-2005) have been remarkably better with 31, 21, 19, 16, and 28 births, respectively. The calf count of 28 animals for the calving season (2004/2005) is still preliminary (additional calves may be observed on the summer foraging grounds), as is the initial count of 19 calves for 2006 (B. Zoodsma, SERO, pers. comm.) with some mortalities already noted. However, the subpopulation has also continued to experience losses of calves, juveniles and adults. As of December 1, 2004, there were 459 individually identified right whales in the photo-identification catalog of which 18 were known to be dead, and 330 had been sighted during the previous six years (B. Pike pers. comm.). (Note these data do not include four known dead right whales reported during the time period of January 2005 through June 2005).

As is the case with other mammalian species, there is an interest in monitoring the number of females in this right whale subpopulation since their numbers will affect the subpopulation trend (whether declining, increasing or stable). Participants at the 1999 IWC workshop reviewed the sex composition of the right whale subpopulation based on sighting and genetics data (Best *et al.* 2001). Of the 385 right whales presumed alive at the end of 1998 (excludes the 11 known to have died but includes the 87 that had not been seen in at least 6 years), 157 were males, 153 were females, and 75 were of unknown sex (Best *et al.* 2001).

Sightings data were also used to determine the number of presumably mature females (females known to be at least 9 years old) in the subpopulation and the number of females who had been observed with a calf at least once. For the period 1980-1998, there were at least 90 (presumed live) females age 9 years or greater. Of these, 75 had produced a calf during that same period (Best *et al.* 2001; Kraus *et al.* 2001). As described above, the 2000/2001 - 2004/2005 calving seasons have had relatively high calf production (31, 21, 19, 16, and at least 28 calves, respectively) and have included additional first time mothers (*e.g.*, eight new mothers in 2000/2001). These potential "gains" have been offset, however, by continued losses to the subpopulation including the death of mature females as a result of anthropogenic mortality (Cole *et*

al. 2005). Eight additional mortalities were reported for the period 2004 through July 1, 2005 (Kraus *et al*. 2005).

Information on the 2004 mortalities is provided in Cole *et al*. (2006). Briefly, ship strikes were assigned as the primary cause of death for two adult female right whales in 2004, while the death of a third adult female is believed to be due to entanglement in fishing gear (Cole *et al*. 2006). The 2005 mortalities have been documented by NMFS; however, this information has not been fully examined and verified by the ASRG process. A determination of the total levels of anthropogenic mortality and serious injury for 2005 will be made following the ASRG's review of all of the available data and information.

Abundance estimates are an important part of assessing the status of the species. However, for Section 7 purposes, the population trend (*i.e.,* whether increasing or declining) provides better information for assessing the effects of a proposed action on the species. As described in previous NOAA Fisheries Opinions, data collected in the 1990s suggested that right whales were experiencing a slow but steady recovery (Knowlton *et al.* 1994). However, Caswell *et al.* (1999) used photo-identification data and modeling to estimate survival and concluded that right whale survival decreased from 1980 to 1994. Modified versions of the Caswell *et al.* (1999) model as well as several other models were reviewed at the 1999 IWC workshop (Best *et al.* 2001). Despite differences in approach, all of the models indicated a decline in right whale survival in the 1990s relative to the 1980s with female survival, in particular, apparently affected (Best *et al.* 2001; Waring *et al.* 2002). In 2002, NMFS' NEFSC hosted a workshop to review right whale population models to examine: (1) potential bias in the models and (2) changes in the subpopulation trend based on new information collected in the late 1990s (Clapham *et al.* 2002). Three different models were used to explore right whale survivability and to address potential sources of bias. Although biases were identified that could negatively affect the results, all three modeling techniques resulted in the same conclusion; survival has continued to decline and seems to be focused on females (Clapham *et al.* 2002).

Reproductive Fitness

While modeling work suggests a decline in right whale abundance as a result of reduced survival, particularly for females, some researchers have also suggested that the subpopulation is being affected by a decreased reproductive rate (Best *et al.* 2001; Kraus *et al.* 2001). Kraus *et al.* (2001) reviewed reproductive parameters for the period 1980-1998 and found that calving intervals increased from 3.67 years in 1992 to 5.8 years in 1998. In addition, as of 1999, only 70% of presumably mature females (females aged 9 years or older) were known to have given birth (Best *et al.* 2001).

Factors that have been suggested as affecting the right whale reproductive rate include reduced genetic diversity, pollutants, and nutritional stress. However, there is currently no evidence available to determine their potential effect, if any, on right whales. The subpopulation size of northern right whales in the western North Atlantic at the termination of whaling is unknown but is generally believed to have been very small. Such an event may have resulted in a loss of genetic diversity, which could affect the ability of the current population to successfully reproduce (*i.e.*, decreased conceptions, increased abortions, and increased neonate mortality). Studies by Schaeff *et al.* (1997) and Malik *et al.* (2000) indicate that northern right whales in the western North Atlantic are less genetically diverse than southern right whales. However, several apparently healthy populations of cetaceans, such as sperm whales and pilot whales, have even lower genetic diversity than observed for northern right whales in the western North Atlantic (IWC 2001).

Similarly, while contaminant studies have confirmed that right whales are exposed to and accumulate contaminants, researchers could not conclude that these contaminant loads were negatively affecting right whale reproductive success since concentrations were lower than those found in marine mammals proven to be affected by PCBs and DDT (Weisbrod *et al.* 2000). Finally, although northern right whales in the

western North Atlantic seem to have thinner blubber than southern right whales (Kenney 2000), there is no evidence at present to demonstrate that the decline in birth rate and increase in calving interval is related to a food shortage. Nevertheless, a connection among right whale reproduction and environmental factors may yet be found. Modeling work by Caswell *et al.* (1999) and Fujiwara and Caswell (2001) suggests that the North Atlantic Oscillation (NAO), a naturally occurring climactic event, does affect the survival of mothers and the reproductive rate of mature females, and it also seems to affect calf survival (Clapham *et al.* 2002).

Anthropogenic Mortality

There is general agreement that right whale recovery is negatively affected by anthropogenic mortality. Fifty-five right whale mortalities were reported from Florida to the Canadian Maritimes during the period of 1970-2003 (Moore *et al*. 2004; Cole *et al*. 2005). As described above, eight additional mortalities were reported for the period 2004 through July 1, 2005 (Kraus *et al*. 2005). This represents an absolute minimum number of the right whale mortalities for this period. Given the range and distribution of right whales in the North Atlantic, it is highly unlikely that all carcasses will be observed.

Considerable effort has been made to examine right whale carcasses for the cause of death (Moore *et al*. 2004), although it is often a very difficult undertaking. Some carcasses are discovered floating at sea and cannot be retrieved. Others are in such an advanced stage of decomposition when discovered that a complete examination is not possible. Wave action and post-mortem predation by sharks can also damage carcasses, and preclude a thorough examination of all body parts. Moore *et al.* (2004) provide information on the examination of 30 right whale carcasses during the period of 1970-2002. Cole *et al*. (2005) provides supporting information for some of these as well as for the right whale mortality documented in 2003. Briefly, of the 31 animals examined, ship strike was identified as the cause of death or probable cause of death for 15 (11 adults/juveniles; 4 calves) and entanglement in fishing gear was identified as the cause of death for 4 (all adults/juveniles) (Moore *et al*. 2004; Cole *et al*. 2005). A cause of death was undeterminable for 12 animals, 8 of which were calves (Moore *et al*. 2004). As described in Cole *et al*. (2006), ship strikes have been assigned as the primary cause of deaths for two adult female right whales in 2004 and fishing gear entanglement was assigned as the primary cause of death for a third adult female in 2004. Preliminary information on the right whale mortalities for 2005 has been released (Kraus *et al.* 2005; SEIT 2005). Ship strikes and entanglement in fishing gear are suggested as the primary cause of death for some of these (Kraus *et al.* 2005). However, the ASRG has not yet made a final determination for these mortalities.

Ship strikes and entanglements are not always fatal to right whales. Based on photographs of catalogued animals from 1935 through 1995, Hamilton *et al.* (1998) estimated that 61.6 percent of right whales exhibit injuries caused by entanglement, and 6.4 percent exhibit signs of injury from vessel strikes. In addition, several whales have apparently been entangled on more than one occasion. Right whales may suffer long-term effects of such interactions even when they survive the initial interaction. For example, some right whales that have been entangled were subsequently involved in ship strikes (Hamilton *et al*. 1998) suggesting that the animal may have become debilitated to such an extent that it was less able to avoid a ship.

3.1.4.1(b) Humpback Whale

Humpback whales calve and mate in the West Indies and migrate to feeding areas in the northwestern Atlantic during the summer months. Six separate feeding areas are utilized in northern waters (Waring et al. 2004). Only one of these feeding areas, the Gulf of Maine, lies within U.S. waters contained within the management unit of the FMP. Most of the humpbacks that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod Bays. Sightings are most frequent from mid-March through November between 41º N and 43º N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge (CeTAP 1982), and peak in May and

August. However, small numbers of individuals may be present in this area year-round. They feed on a number of species of small schooling fishes, particularly sand lance and Atlantic herring, by filtering large amounts of water through their baleen to capture prey (Wynne and Schwartz 1999).

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

New information has become available on the status and trends of the humpback whale population in the North Atlantic that indicates the population is increasing. However, it has not yet been determined whether this increase is uniform across all six feeding stocks (Waring et al. 2004). For example, although the overall rate of increase has been estimated at 9.0% (CV=0.25) by Katona and Beard (1990), Barlow and Clapham (1997) reported a 6.5% rate through 1991 for the Gulf of Maine feeding group.

A variety of methods have been used to estimate the North Atlantic humpback whale population. However, the photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project gave a North Atlantic basin-wide estimate of 11,570 (CV= 0.069) is regarded as the best available estimate for that population, although caveat are associated with this estimate (Waring et al. 2004).

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

3.1.4.1(c) Fin Whale

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

In the North Atlantic today, fin whales are widespread and occur from the Gulf of Mexico and Mediterranean Sea northward to the edges of the arctic pack ice (NMFS 1998b). A number of researchers have suggested the existence of fin whale subpopulations in the North Atlantic. Mizroch et al. (1984) suggested that local depletions resulting from commercial over harvesting supported the existence of North Atlantic fin whale subpopulations. Others have used genetic information to support the existence of multiple subpopulations of fin whales in the North Atlantic and Mediterranean (Bérubé et al. 1998). Although the IWC's Scientific Committee proposed seven stocks for North Atlantic fin whales, it is uncertain whether these stock boundaries define biologically isolated units (Waring et al. 2004).

Various estimates have been provided to describe the current status of fin whales in western North Atlantic waters. The latest published SAR (Waring et al. 2004) gives a best estimate of abundance for fin whales of 2,814 (CV = 0.21). However, this is considered an underestimate, as too little is known about population structure, and the estimate is derived from surveys over a limited portion of the western North Atlantic. There is also not enough information to estimate population trends.

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

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

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

3.1.4.1(d) Sei Whale

Sei whales are a widespread species in the world's temperate, subpolar and subtropical and even tropical marine waters, although they appear to be more restricted to temperate waters than other balaenopterids (Perry et al. 1999). Mitchell and Chapman (1977) suggested that the sei whale population in the western North Atlantic consists of two stocks, a Nova Scotian Shelf stock and a Labrador Sea stock. The Nova Scotian Shelf stock includes the continental shelf waters of the Northeast Region, and extends northeastward to south of Newfoundland. The IWC boundaries for this stock are from the U.S. east coast to Cape Breton, Nova Scotia and east to 42°W longitude (Waring et al. 2004). This is the only sei whale stock within the management unit of this FMP.

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

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

There are insufficient data to determine trends of the sei whale population. Because there are no abundance estimates within the last 10 years, a minimum population estimate cannot be determined for management purposes (Waring et al. 2004). Abundance surveys are problematic because this species is

difficult to distinguish from the fin whale and too little is known of the sei whale's distribution, population structure and patterns of movement.

No instances of injury or mortality of sei whales due to entanglements in fishing gear have been recorded in U.S. waters, possibly because sei whales typically inhabit waters further offshore than most commercial fishing operations, or perhaps entanglements do occur but are less likely to be observed. However, due to the overlap of this species observed range with the multispecies fishery areas that use sink gillnet gear, the potential for entanglement does exist. As noted in Waring, et al. (2004), sei whale movements into inshore areas have occurred historically. Similar impacts noted above for other baleen whales may also occur. Due to the deep-water distribution of this species, interactions that do occur are less likely to be observed or reported than those involving right, humpback, and fin whales that often frequent areas within the continental shelf.

3.1.4.1(e) Blue Whale

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

NMFS recognizes a minimum population estimate of 308 blue whales within the Northeast Region (Waring et al. 2002). Blue whales are only occasional visitors to east coast U.S. waters. They are more commonly found in Canadian waters, particularly the Gulf of St. Lawrence where they are present for most of the year, and in other areas of the North Atlantic. It is assumed that blue whale distribution is governed largely by food requirements which, at least in the Gulf of St. Lawrence, appear to include predominantly copepod species (NMFS 1998b).

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

3.1.4.1(f) Sperm Whale

Sperm whales inhabit all ocean basins, from equatorial waters to the polar regions (Perry et al. 1999). In the western North Atlantic they range from Greenland to the Gulf of Mexico and the Caribbean. The sperm whales that occur in the western North Atlantic are believed to represent only a portion of the total stock (Blaylock et al. 1995). Total numbers of sperm whales off the USA or Canadian Atlantic coast are unknown, although eight estimates from selected regions of the habitat do exist for select time periods. The best estimate of abundance for the North Atlantic stock of sperm whales is 4,702 (CV=0.36) (Waring et al. 2002).

Sperm whales generally occur in waters greater than 180 meters in depth with a preference for continental margins, seamounts, and areas of upwelling, where food is abundant (Leatherwood and Reeves 1983). Sperm whales in both hemispheres migrate to higher latitudes in the summer for feeding and return to lower latitude waters in the winter where mating and calving occur. Mature males typically range to higher latitudes than mature females and immature animals but return to the lower latitudes in the winter to breed (Perry et al. 1999). Waring et al. (2002) suggest sperm whale distribution is closely correlated with the Gulf Stream edge with a migration to higher latitudes during summer months where they are concentrated east and northeast of Cape Hatteras. Distribution is described as extending further

northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the mid-Atlantic Bight (Waring et al. 2002).

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

Few instances of injury or mortality of sperm whales due to human impacts have been recorded in U.S. waters. Because of their generally more offshore distribution and their benthic feeding habits, sperm whales are less subject to entanglement than are right or humpback whales. However, the multispecies fishery is conducted near the shelf edge and utilizes hook and line gear that poses no demonstrated threat to sperm whales. Documented takes primarily involve offshore fisheries such as the offshore lobster pot fishery and pelagic driftnet and pelagic longline fisheries. Ships also strike sperm whales. Due to the offshore distribution interactions (both ship strikes and entanglements) that do occur are less likely to be reported than those involving right, humpback, and fin whales that more often occur in nearshore areas.

3.1.4.1(g) Minke Whale

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

Minke whales are known to be taken in sink gillnet gear that is also used to catch multispecies finfish. Takes have also been documented in trawl fisheries. Waring et al. (2004) has described the estimated total take of minkes in all fisheries to be below the PBR established for that species.

3.1.4.1(h) Harbor Porpoise

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

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

According to the most recent stock information available (Waring, 2005), the mean incidental mortality for harbor porpoise in U.S. waters for 1999-2003 was 417 animals. The best estimate of abundance is 89,700 (CV=0.22). The minimum population estimate for the Gulf of Maine/Bay of Fundy harbor porpoise is 74,695, and the potential biological removal (PBR) is set at 747. The stock assessment report further states that this is currently not a strategic stock because average annual fishery-related mortality and serious injury does not exceed PBR.

3.1.4.1(j) Atlantic White-Sided Dolphin

White-sided dolphins are found in the temperate and sub-polar waters of the North Atlantic, primarily on the continental shelf waters out to the 100-meter depth contour. The species is distributed from central

western Greenland to North Carolina, with the Gulf of Maine stock commonly found from Hudson Canyon to Georges Bank and into the Gulf of Maine to the Bay of Fundy. A minimum population estimate for the white-sided dolphin 37,904 has been derived for U.S. waters (Waring et al. 2004) from several survey estimates.

White-sided dolphins have been observed taken in sink gillnets, pelagic drift gillnets, and several mid-water and bottom trawl fisheries. Waring et al. (2004) described the estimated total take of white-sided dolphins in all fisheries (including those that catch multispecies) to be below the PBR established for that species.

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

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

3.1.4.1(k) Loggerhead Sea Turtle

Loggerhead sea turtles are a cosmopolitan species, found in temperate and subtropical waters and inhabiting pelagic waters, continental shelves, bays, estuaries and lagoons. They are the most abundant species of sea turtle in U.S. waters. Since the action area is a portion of the Northwest Atlantic, this and discussions of other sea turtles will focus only on Atlantic populations of leatherback, Kemp's ridley, and green sea turtles, and the Atlantic subpopulations of loggerhead sea turtles.

Loggerheads commonly occur throughout the inner continental shelf from Florida through Cape Cod, Massachusetts although their presence varies with the seasons due to changes in water temperature (Braun and Epperly 1996; Epperly *et al.* 1995a, Epperly *et al.* 1995b; Shoop and Kenney 1992). Aerial surveys of loggerhead turtles north of Cape Hatteras indicate that they are most common in waters from 22 to 49 meters deep although they range from the beach to waters beyond the continental shelf (Shoop and Kenney 1992). The presence of loggerhead turtles in an area is also influenced by water temperature. Loggerheads have been observed in waters with surface temperatures of 7-30^{o}C but water temperatures of <11^{o}C are more favorable to sea turtles (Epperly *et al.* 1995b; Shoop and Kenney 1992). Within the action area of this consultation, loggerhead sea turtles occur year round in offshore waters off of North Carolina where water temperature is influenced by the Gulf Stream. As coastal water temperatures warm in the spring, loggerheads begin to migrate to North Carolina inshore waters (*e.g.*, Pamlico and Core Sounds) and also move up the coast (Braun-McNeill and Epperly 2004; Epperly *et al.* 1995a; Epperly *et al.* 1995b; Epperly *et al.* 1995c), occurring in Virginia foraging areas as early as April and on the most northern foraging grounds in southern New England waters (around Cape Cod) in June. The trend is reversed in the fall as water temperatures cool. The large majority leave the northern foraging grounds by mid-September but some may remain in Mid-Atlantic and Northeast areas until late fall. By December loggerheads have migrated from inshore North Carolina waters and more northern coastal waters to waters offshore of North Carolina, particularly off of Cape Hatteras, and waters further south where the influence of the Gulf Stream provides temperatures favorable to sea turtles (Epperly *et al.* 1995b; Shoop and Kenney 1992).

In the western Atlantic, most loggerhead sea turtles nest from North Carolina to Florida and along the Gulf coast of Florida. There are at least five western Atlantic subpopulations, divided geographically as follows: (1) a northern nesting subpopulation, occurring from North Carolina to northeast Florida at about

29° N; (2) a south Florida nesting subpopulation, occurring from 29° N on the east coast to Sarasota on the west coast; (3) a Florida Panhandle nesting subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida; (4) a Yucatán nesting subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Márquez 1990; TEWG 2000); and (5) a Dry Tortugas nesting subpopulation, occurring in the islands of the Dry Tortugas, near Key West, Florida (NMFS SEFSC 2001). The fidelity of nesting females to their nesting beach is the reason these subpopulations can be differentiated from one another. Genetic analyses conducted at these nesting sites indicate that they are distinct subpopulations (TEWG 2000). Cohorts from three of these, the south Florida, Yucatán, and northern subpopulations, are known to occur within the action area of this consultation (Bass *et al.* 2004; Rankin-Baransky *et al.* 2001) and there is genetics evidence that cohorts from the other two also likely occur within the action area (Bass *et al*. 2004).

Loggerheads mate in late March-early June, and eggs are laid throughout the summer, with a mean clutch size of 100-126 eggs in the southeastern United States. Individual females nest multiple times during a nesting season, with a mean of 4.1 nests/individual (Murphy and Hopkins 1984). Nesting migrations for an individual female loggerhead are usually on an interval of 2-3 years, but can vary from 1-7 years (Dodd 1988).

A number of stock assessments (Heppell *et al.* 2003; NMFS SEFSC 2001; TEWG 1998; 2000) have examined the stock status of loggerheads in the waters of the United States, but have been unable to develop any reliable estimates of absolute population size. Due to the difficulty of conducting comprehensive population surveys away from nesting beaches, nesting beach survey data are used to index the status and trends of loggerheads (USFWS and NMFS 2003).

Between 1989 and 1998, the total number of nests laid along the U.S. Atlantic and Gulf coasts ranged from 53,014 to 92,182, annually with a mean of 73,751 (TEWG 2000). The south Florida nesting group is the largest known loggerhead nesting assemblage in the Atlantic and one of only two loggerhead nesting assemblages worldwide that has greater than 10,000 females nesting per year (USFWS and NMFS 2003; USFWS Fact Sheet). Annual nesting totals have ranged from 48,531 - 83,442 annually over the past decade (USFWS and NMFS 2003). South Florida nests make up the majority (90.7%) of all loggerhead nests counted along the U.S. Atlantic and Gulf coasts during the period 1989-1998.

The northern subpopulation is the second largest loggerhead nesting assemblage within the United States but much smaller than the south Florida nesting group. Of the total number of nests counted along the U.S. Atlantic and Gulf coasts during the period 1989-1998, 8.5% were attributed to the northern subpopulation. The number of nests for this subpopulation have ranged from 4,370 - 7,887 for the period 1989-1998, for an average of approximately 1,524 nesting females per year (USWFS and NMFS 2003). The remaining three subpopulations (the Dry Tortugas, Florida Panhandle, and Yucatán) are much smaller subpopulations. Annual nesting totals for the Florida Panhandle subpopulation ranged from 113-1,285 nests for the period 1989-2002 (USFWS and NMFS 2003). The Yucatán nesting group was reported to have had 1,052 nests in 1998 (TEWG 2000). Nest counts for the Dry Tortugas subpopulation ranged from 168-270 during the 9-year period from 1995-2003.

While nesting beach data can be a useful tool for assessing sea turtle populations, the detection of nesting trends requires consistent data collection methods over long periods of time (USFWS and NMFS 2003). In 1989, a statewide sea turtle Index Nesting Beach Survey (INBS) program was developed and implemented in Florida, and similar standardized daily survey programs have been implemented in Georgia, South Carolina, and North Carolina (USFWS and NMFS 2003). Although not part of the INBS program, nesting survey data are also available for the Yucatán Peninsula, Mexico (USFWS and NMFS 2003).

The currently available nesting data, however, is still too limited to indicate statistically reliable trends for these loggerhead subpopulations. To date, analysis of nesting data from the INBS program, indicate that there is no discernable trend for the south Florida, northern or Florida Panhandle subpopulations (website information from Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute, Statewide and Index Nesting Beach Survey Programs downloaded January 6, 2006; USFWS and NMFS 2003). Nesting surveys for the Dry Tortugas subpopulation are conducted as part of Florida's statewide survey program.

Survey effort has been relatively stable during the 9-year period from 1995-2003 (although the 2002 year was missed) but given the relatively short period of survey effort, no conclusion can be made at this time on the trend of this subpopulation (Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute, Statewide Nesting Beach Survey Data). Similarly, although Zurita *et al.* (2003) did find significant increases in loggerhead nesting on seven beaches at Quintana Roo, Mexico, nesting survey effort overall has been inconsistent among the Yucatán nesting beaches and no trend can be determined for this subpopulation given the currently available data.

More reliable nesting trend information is available from some south Florida and northern subpopulation nesting beaches that have been surveyed for longer periods of time. Using the information gathered from these select south Florida and northern subpopulation nesting beaches, the Turtle Expert Working Group (TEWG) concluded that the south Florida subpopulation was increasing based on nesting data over the last couple of decades, and that the northern subpopulation was stable or declining (TEWG 2000).

Sea turtle biologists are cautiously watching nest counts for the subpopulations. Loggerheads do exhibit a cyclical pattern to nesting such that in some years nest counts are high while in others they are low (*e.g.*, not all mature females nest in a year). Natural events, such as the hurricane seasons of 2004 and 2005, can also destroy many nests thereby influencing nesting trends since a majority of the nests are destroyed in any particular year. It is unknown at this time whether the nest counts over the past five years represent an actual decline in the loggerhead subpopulations or not.

In addition, since nest counts are a reflection of only one sex and age class in the subpopulation (mature females), using nesting trend data to make conclusions about the status of the entire subpopulation requires making certain assumptions. These are that the current impacts to mature females are experienced to the same degree amongst all age classes regardless of sex, and/or that the impacts that led to the current abundance of nesting females are affecting the current immature females to the same extent. While there is no current evidence to support or refute these assumptions, multiple management actions have been implemented in the United States that either directly or indirectly address the known sources of mortality for loggerhead sea turtles (*e.g.*, fishery interactions, power plant entrainment, destruction of nesting beaches, etc.).

One of the difficulties associated with using loggerhead nesting trend data as an indicator of subpopulation status is the late age to maturity for loggerhead sea turtles. Past literature gave an estimated age at maturity for loggerhead sea turtles of 21-35 years (Frazer and Ehrhart 1985; Frazer *et al.* 1994) with the benthic immature stage lasting at least 10-25 years. New data from tag returns, strandings, and nesting surveys suggested estimated ages of maturity ranging from 20-38 years and the benthic immature stage lasting from 14-32 years (NMFS SEFSC 2001). Caution must still be exercised, however, when defining the benthic immature stage. Like other sea turtles, loggerhead hatchlings enter the pelagic environment upon leaving the nesting beach.

It had previously been thought that after approximately 7-12 years in the pelagic environment, immature loggerheads entered the benthic environment and undertook seasonal north and south migrations along the coast. However, the use of pelagic and benthic environments by loggerhead sea turtles is now

suspected of being much more complex (Witzell 2002). Loggerheads may remain in the pelagic environment for longer periods of time or move back and forth between the pelagic and benthic environment (Witzell 2002). Captures of sea turtles in the U.S. pelagic longline fishery have shown that large loggerhead sea turtles (mature and/or immature) routinely inhabit offshore habitats during non-winter months in the northwest North Atlantic Ocean (Witzell 2002). It has been suggested that some of these turtles might be associated with warm water fronts and eddies and might form offshore feeding aggregations in areas of high productivity (Witzell 2002; 1999).

In 2001, NMFS SEFSC reviewed and updated the stock assessment for loggerhead sea turtles of the western Atlantic (NMFS SEFSC 2001). The assessment reviewed and updated information on nesting abundance and trends, estimation of vital rates (including age to maturity), evaluation of genetic relationships between populations, and evaluation of available data on other anthropogenic effects on these populations since the TEWG reports (2000; 1998). In addition, the assessment also looked at the impact of the U.S. pelagic longline fishery on loggerheads with and without the proposed changes in the Turtle Excluder Device (TED) regulations for the shrimp fishery using a modified population model from Heppell *et al*. (2003). NMFS SEFSC (2001) modified the model developed by Heppell *et al*. (2003) to include updated vital rate information (*e.g.*, new estimates of the duration of life stages and time to maturity) and, unlike Heppell *et al*. (2003), also considered sex ratios other than 1:1 (NMFS SEFSC 2001).

NMFS SEFSC (2001) constructed four different models that differed based on the duration of life stages. Each model was run using three different inputs for population growth, and three different sex ratios (35%, 50%, and 80% female) for a total of 36 model runs. The models also included a 30% decrease in small benthic juvenile mortality based on research findings of (existing) TED effectiveness (Crowder *et al*. 1995; NMFS SEFSC 2001; Heppell *et al*. 2003). The results of the modeling indicated that the proposed change in the TED regulations that would allow larger benthic immature loggerheads and sexually mature loggerheads to escape from shrimp trawl gear would have a positive or at least stabilizing influence on the subpopulation (depending on the estimated growth rate of the subpopulation and proportion of females) in nearly all scenarios.

Coupling the anticipated effect of the proposed TED changes with changes in the survival rate of pelagic immature loggerheads revealed that subpopulation status would be positive or at least stable when pelagic immature survival was changed by 0 to +10% in all but the most conservative model scenarios. As described below, measures to improve the effectiveness of TEDs in the shrimp trawl fishery and measures to improve the survival of immature loggerhead sea turtles affected by operation of the U.S. Atlantic longline fishery for swordfish have been implemented. However, given the late age at maturity for loggerhead sea turtles and the normal fluctuations in nesting, changes in populations size as a result of the larger TED requirements and pelagic longline measures are unlikely to be evident in loggerhead nesting beach censuses for many years to come.

Anthropogenic Effects to Loggerhead Sea Turtles

The diversity of a sea turtle's life history leaves them susceptible to many natural and human impacts, including impacts while they are on land, in the benthic environment, and in the pelagic environment. Hurricanes are particularly destructive to sea turtle nests. Sand accretion and rainfall that result from these storms as well as wave action can appreciably reduce hatchling success. For example, in 1992, all of the eggs over a 90-mile length of coastal Florida were destroyed by storm surges on beaches that were closest to the eye of Hurricane Andrew (Milton *et al.* 1994). Other sources of natural mortality include cold stunning and biotoxin exposure.

Anthropogenic factors that impact hatchlings and adult female turtles on land, or the success of nesting and hatching include: beach erosion, beach armoring and nourishment; artificial lighting; beach cleaning;

increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, feral hogs, dogs and an increased presence of native species (*e.g.*, raccoons, armadillos, and opossums) which raid and feed on turtle eggs. Although sea turtle nesting beaches are protected along large expanses of the northwest Atlantic coast (in areas like Merritt Island, Archie Carr, and Hobe Sound National Wildlife Refuges), other areas along these coasts have limited or no protection. Sea turtle nesting and hatching success on unprotected high density east Florida nesting beaches from Indian River to Broward County are affected by all of the above threats.

Sea turtles, including loggerhead sea turtles, are affected by a completely different set of anthropogenic threats in the marine environment. These include oil and gas exploration, coastal development, and transportation; marine pollution; underwater explosions; hopper dredging, offshore artificial lighting; power plant entrainment and/or impingement; entanglement in debris; ingestion of marine debris; marina and dock construction and operation; boat collisions; poaching, and fishery interactions. In the pelagic environment loggerheads are exposed to a series of longline fisheries that include the U.S. Atlantic tuna and swordfish longline fisheries, a Japanese longline fleet, Chinese longline fleet, an Azorean longline fleet, a Spanish longline fleet, and various fleets in the Mediterranean Sea (Aguilar *et al.* 1995; Bolten *et al.* 1994; Crouse 1999). Globally, the number of loggerhead sea turtles captured in pelagic longline fisheries is significant (Lewison *et al.* 2004). The effects of the U.S. tuna and swordfish longline fisheries on loggerhead sea turtles have been assessed through section 7 consultation on the Highly Migratory Species Fishery Management Plan (HMS FMP). In it, NMFS estimates that 1,869 loggerheads will be captured in the pelagic longline fishery (no more than 438 mortalities) for the 3-year period from 2004-2006. For each subsequent 3-year period, 1,905 loggerheads are expected to be taken with no more than 339 mortalities (NMFS 2004).

In the benthic environment in waters off the coastal U.S., loggerheads are exposed to a suite of fisheries in federal and state waters including trawl, purse seine, hook and line, gillnet, pound net, longline, and trap fisheries. Perhaps the most well documented U.S. fishery with respect to interactions with sea turtles, including loggerheads, is the U.S. shrimp fishery. NMFS continues to address the effects of this fishery on loggerheads as well as other sea turtle species. Turtle Excluder Devices (TEDs) have proven to be effective at excluding Kemp's ridley sea turtles and some age classes of loggerhead and green sea turtles from shrimp trawls. However, it was apparent that TEDs were not effective at excluding large benthic immature and sexually mature loggerheads (as well as large greens) from shrimp trawls (Epperly and Teas 2002). Therefore, on February 21, 2003, NMFS issued a final rule that required increasing the size of TED escape openings to allow larger loggerheads (and green sea turtles) to escape from shrimp trawl gear. As a result of the new rules, annual loggerhead mortality from capture in shrimp trawls is expected to decline from 62,294 to 3,947 turtles (Epperly *et al.* 2002).

Power plants can also pose a danger of injury and mortality for benthic loggerheads. In Florida, thousands of sea turtles have been entrained in the St. Lucie Nuclear Power Plant's intake canal over the past couple of decades (Bresette *et al*. 2003). From May 1976 - November 2001, 7,795 sea turtles were captured in the intake canal (Bresette *et al*. 2003). Approximately 57% of these were loggerheads (Bresette *et al*. 2003). Procedures are in place to capture the entrained turtles and release them. This has helped to keep mortality below 1% since 1990 (Bresette *et al*. 2003). The Oyster Creek Nuclear Generating Station in New Jersey is also known to capture sea turtles although the numbers are far less than those observed at St. Lucie, FL. As is the case at St. Lucie, procedures are in place for checking for the presence of sea turtles and rescuing sea turtles that are found within the intake canals.

Summary of Status for Loggerhead Sea Turtles

There are at least five western Atlantic loggerhead subpopulations (NMFS SEFSC 2001; TEWG 2000; Márquez 1990). Cohorts from all of these, are expected to occur within the action area of this consultation (Bass *et al*. 2004). The south Florida nesting group is the largest known loggerhead nesting assemblage in the Atlantic and one of only two loggerhead nesting assemblages worldwide that have greater than 10,000 females nesting per year (USFWS and NMFS 2003; USFWS Fact Sheet). The northern subpopulation is the second largest loggerhead nesting assemblage within the United States. The remaining three subpopulations (the Dry Tortugas, Florida Panhandle, and Yucatán) are much smaller subpopulations with nest counts ranging from roughly 100 - 1,000 nests per year.

Loggerheads are a long-lived species and reach sexual maturity relatively late; 20-38 years (NMFS SEFSC 2001). The INBS program helps to track loggerhead status through nesting beach surveys. However, given the cyclical nature of loggerhead nesting, and natural events that sometimes cause destruction of many nests in a nesting season, multiple years of nesting data are needed to detect relevant nesting trends in the population. The INBS program has not been in place long enough to provide statistically reliable information on the subpopulation trends for western Atlantic loggerheads. In addition, given the late age of maturity for loggerhead sea turtles, nesting data represents effects to female loggerheads that have occurred through the various life stages over the past couple of decades. Therefore, caution must be used when interpreting nesting trend data since they may not be reflective of the current subpopulation trend if effects to the various life stages have changed.

NMFS SEFSC (2001) took an alternative approach for looking at trends in loggerhead subpopulations. Using multiple model scenarios that varied based on differences in starting growth rates, sex ratios, and age to maturity, the model looked at the relative change in the subpopulation trend when mortality of pelagic immature, benthic immature, and mature loggerhead sea turtles was reduced as a result of changes to the U.S. shrimp trawl fishery and the U.S. Atlantic pelagic longline fishery for swordfish.

The modeling work suggests that western Atlantic loggerhead subpopulations should increase as a result of implementation of the new TED regulations that substantially reduce mortality of large, benthic immature and sexually mature loggerheads combined with a reduction in mortality of pelagic immature loggerheads resulting from implementation of new measures for the U.S. pelagic longline fishery. Even in the absence of a reduction in pelagic immature mortality from changes to the pelagic longline fishery, the model work supports the conclusion that the trend for western Atlantic loggerhead subpopulations will move from declining to stable (with an initial growth rate of 0.97, average age to maturity of 39 years, and a sex ratio of 35% females) or from declining to increasing (with an initial growth rate of 0.97, average age to maturity of 39 years, and female sex ratio of 50%) (NMFS SEFSC 2001) given the reduction in mortality of large benthic immature and mature loggerheads as a result of changes to the TED requirements for the shrimp trawl fishery.

3.1.4.1(l) Leatherback Sea Turtle

Leatherback sea turtles are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic and Pacific Oceans, the Caribbean Sea, and the Gulf of Mexico (Ernst and Barbour 1972). Leatherback sea turtles are the largest living turtles and range farther than any other sea turtle species. Their large size and tolerance of relatively low temperatures allows them to occur in northern waters such as off Labrador and in the Barents Sea (NMFS and USFWS 1995). In 1980, the global population of adult female leatherbacks was estimated at approximately 115,000 (Pritchard 1982). By 1995, this global population of adult females had declined to 34,500 (Spotila *et al.* 1996).

Evidence from tag returns and strandings in the western Atlantic suggests that adult leatherback sea turtles engage in routine migrations between boreal, temperate and tropical waters (NMFS and USFWS 1992). A 1979 aerial survey of the outer Continental Shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia showed leatherbacks to be present throughout the area with the most numerous

sightings made from the Gulf of Maine south to Long Island. Leatherbacks were sighted in water depths ranging from 1-4151 m but 84.4% of sightings were in waters less than 180 m (Shoop and Kenney 1992). Leatherbacks were sighted in waters within a sea surface temperature range similar to that observed for loggerheads; from 7-27 ^{o}C (Shoop and Kenney 1992). However, they appear to have a greater tolerance for colder waters in comparison to loggerhead sea turtles since more leatherbacks were found at the lower temperatures as compared to loggerheads (Shoop and Kenney 1992).

The aerial survey estimated the leatherback population for the northeastern U.S. at approximately 300600 animals (from near Nova Scotia, Canada to Cape Hatteras, North Carolina). However, the estimate was based on turtles visible at the surface and does not include those that were below the surface out of view. Therefore, it likely underestimates the leatherback population for the northeastern U.S. Estimates of leatherback abundance of 1,052 turtles (C.V.= 0.38) and 1,174 turtles (C.V.= 0.52) were obtained from surveys conducted from Virginia to the Gulf of St. Lawrence in 1995 and 1998, respectively (Palka 2000). However, since these estimates were also based on sightings of leatherbacks at the surface, the author considered the estimates to be negatively biased with true abundance of leatherbacks perhaps being 4.27 times the estimates (Palka 2000).

Leatherbacks are a long-lived species (> 30 years). They mature at a younger age than loggerhead turtles, with an estimated age at sexual maturity of about 13-14 years for females with 9 years reported as a likely minimum (Zug and Parham 1996) and 19 years as a likely maximum (NMFS SEFSC 2001). In the U.S. and Caribbean, female leatherbacks nest from March through July. They nest frequently (up to 7 nests per year) during a nesting season and nest about every 2-3 years. They produce 100 eggs or more in each clutch/nest (Schultz 1975). However, a significant portion (up to approximately 30%) of the eggs can be infertile. Thus, the actual proportion of eggs that can result in hatchlings is less than this seasonal estimate. As is the case with other sea turtle species, leatherback hatchlings enter the water soon after hatching. Based on a review of all sightings of leatherback sea turtles of <145 cm curved carapace length (CCL), Eckert (1999) found that leatherback juveniles remain in waters warmer than 26 ^{o}C until they exceed 100 cm CCL.

Leatherbacks are predominantly a pelagic species and feed on jellyfish (*i.e.*, *Stomolophus, Chryaora*, and *Aurelia* (Rebel 1974)), and tunicates (salps, pyrosomas). Leatherbacks may come into shallow waters if there is an abundance of jellyfish nearshore. For example, leatherbacks occur annually in Cape Cod Bay and Vineyard and Nantucket Sounds during the summer and fall months.

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

Tag return data emphasize the link between these South American nesters and animals found in U.S. waters. For example, a nesting female tagged May 29, 1990, in French Guiana was later recovered and released alive from the York River, VA. Another nester tagged in French Guiana on June 21, 1990, was later found dead in Palm Beach, Florida (STSSN). Many other examples also exist. For example,

leatherbacks tagged at nesting beaches in Costa Rica have been found in Texas, Florida, South Carolina, Delaware, and New York (STSSN database). Leatherback turtles tagged in Puerto Rico, Trinidad, and the Virgin Islands have also been subsequently found on U.S. beaches of southern, Mid-Atlantic and northern states (STSSN database).

Of the Atlantic turtle species, leatherbacks seem to be the most vulnerable to entanglement in fishing gear. This susceptibility may be the result of their body type (large size, long pectoral flippers, and lack of a hard shell), and their attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface, and perhaps to the lightsticks used to attract target species in longline fisheries. They are also susceptible to entanglement in gillnets (used in various fisheries) and capture in trawl gear (*e.g.*, shrimp trawls). Sea turtles entangled in fishing gear generally have a reduced ability to feed, dive, surface to breathe or perform any other behavior essential to survival (Balazs 1985). They may be more susceptible to boat strikes if forced to remain at the surface, and entangling lines can constrict blood flow resulting in tissue necrosis.

Leatherbacks are exposed to pelagic longline fisheries in many areas of their range. According to observer records, an estimated 6,363 leatherback sea turtles were caught by the U.S. Atlantic tuna and swordfish longline fisheries between 1992-1999, of which 88 were released dead (NMFS SEFSC 2001). Since the U.S. fleet accounts for only 5-8% of the hooks fished in the Atlantic Ocean, adding up the under-represented observed takes of the other 23 countries actively fishing in the area would likely result in annual take estimates of thousands of leatherbacks over different life stages (NMFS SEFSC 2001). Leatherbacks are susceptible to entanglement in the lines associated with trap/pot gear used in several fisheries. From 1990-2000, 92 entangled leatherbacks were reported from New York through Maine (Dwyer *et al.* 2002). Additional leatherbacks stranded wrapped in line of unknown origin or with evidence of a past entanglement (Dwyer *et al.* 2002). A review of leatherback mortality documented by the STSSN in Massachusetts suggests that vessel strikes and entanglement in fixed gear (primarily lobster pots and whelk pots) are the principal sources of this mortality (Dwyer *et al.* 2002). Fixed gear fisheries in the Mid-Atlantic have also contributed to leatherback entanglements. For example, in North Carolina, two leatherback sea turtles were reported entangled in a crab pot buoy inside Hatteras Inlet (D. Fletcher, pers. comm. to Sheryan Epperly, NMFS SEFSC 2001). A third leatherback was reported entangled in a crab pot buoy in Pamlico Sound off of Ocracoke. This turtle was disentangled and released alive (D. Fletcher, pers. comm. to Sheryan Epperly, NMFS SEFSC 2001). However, lacerations on the front flippers from the lines were evident (D. Fletcher, pers. comm. to Sheryan Epperly, NMFS SEFSC 2001). In the Southeast, leatherbacks are vulnerable to entanglement in Florida's lobster pot and stone crab fisheries as documented on stranding forms. In the U.S. Virgin Islands, where one of five leatherback strandings from 1982 to 1997 were due to entanglement (Boulon 2000), leatherbacks have been observed with their flippers wrapped in the line of West Indian fish traps (R. Boulon, pers. comm. to Joanne Braun-McNeill, NMFS SEFSC 2001). Since many entanglements of this typically pelagic species likely go unnoticed, entanglements in fishing gear may be much higher.

Leatherback interactions with the southeast shrimp fishery, which operates from North Carolina through southeast Florida (NMFS 2002), are also common. The National Research Council (NRC) Committee on Sea Turtle Conservation identified incidental capture in shrimp trawls as the major anthropogenic cause of sea turtle mortality (NRC 1990). Leatherbacks are likely to encounter shrimp trawls working in the coastal waters off the Atlantic coast (from Cape Canaveral, Florida through North Carolina) as they make their annual spring migration north. For many years, TEDs that were required for use in the southeast shrimp fishery were less effective for leatherbacks as compared to the smaller, hard-shelled turtle species, because the TED openings were too small to allow leatherbacks to escape. To address this problem, on February 21, 2003, NMFS issued a final rule to amend the TED regulations. Modifications to the design of TEDs are now required in order to exclude leatherbacks as well as large benthic immature and sexually mature loggerhead and green turtles.

Other trawl fisheries are also known to interact with leatherback sea turtles although on a much smaller scale. In October 2001, for example, a fisheries observer documented the take of a leatherback in a bottom otter trawl fishing for *Loligo* squid off of Delaware. TEDs are not required in this fishery.

Gillnet fisheries operating in the nearshore waters of the Mid-Atlantic states are also suspected of capturing, injuring and/or killing leatherbacks when these fisheries and leatherbacks co-occur. Data collected by the NEFSC Fisheries Observer Program from 1994 through 1998 (excluding 1997) indicate that a total of 37 leatherbacks were incidentally captured (16 lethally) in drift gillnets set in offshore waters from Maine to Florida during this period. Observer coverage for this period ranged from 54% to 92%. In North Carolina, a leatherback was reported captured in a gillnet set in Pamlico Sound in the spring of 1990 (D. Fletcher, pers.comm. to Sheryan Epperly, NMFS SEFSC 2001). It was released alive by the fishermen after much effort. Five other leatherbacks were released alive from nets set in North Carolina during the spring months: one was from a net (unknown gear) set in the nearshore waters near the North Carolina/Virginia border (1985); two others had been caught in gillnets set off of Beaufort Inlet (1990); a fourth was caught in a gillnet set off of Hatteras Island (1993), and a fifth was caught in a sink net set in New River Inlet (1993). In addition to these, in September 1995 two dead leatherbacks were removed from a large (11-inch) monofilament shark gillnet set in the nearshore waters off of Cape Hatteras, North Carolina (STSSN unpublished data reported in NMFS SEFSC 2001).

Poaching is not known to be a problem for nesting populations in the continental U.S. However, the NMFS SEFSC (2001) noted that poaching of juveniles and adults was still occurring in the U.S. Virgin Islands. In all, four of the five strandings in St. Croix were the result of poaching (Boulon 2000). A few cases of fishermen poaching leatherbacks have been reported from Puerto Rico, but most of the poaching is on eggs.

Leatherback sea turtles may be more susceptible to marine debris ingestion than other species due to their pelagic existence and the tendency of floating debris to concentrate in convergence zones that adults and juveniles use for feeding areas and migratory routes (Lutcavage *et al.* 1997; Shoop and Kenney 1992). Investigations of the stomach contents of leatherback sea turtles revealed that a substantial percentage (44% of the 16 cases examined) contained plastic (Mrosovsky 1981). Along the coast of Peru, intestinal contents of 19 of 140 (13%) leatherback carcasses were found to contain plastic bags and film (Fritts 1982). The presence of plastic debris in the digestive tract suggests that leatherbacks might not be able to distinguish between prey items and plastic debris (Mrosovsky 1981). Balazs (1985) speculated that the object may resemble a food item by its shape, color, size or even movement as it drifts about, and induce a feeding response in leatherbacks.

It is important to note that, like marine debris, fishing gear interactions and poaching are problems for leatherbacks throughout their range. Entanglements are common in Canadian waters where Goff and Lien (1988) reported that 14 of 20 leatherbacks encountered off the coast of Newfoundland/Labrador were entangled in fishing gear including salmon net, herring net, gillnet, trawl line and crab pot line. Leatherbacks are known to drown in fish nets set in coastal waters of Sao Tome, West Africa (Castroviejo *et al.* 1994; Graff 1995). Gillnets are one of the suspected causes for the decline in the leatherback sea turtle population in French Guiana (Chevalier *et al.* 1999), and gillnets targeting green and hawksbill turtles in the waters of coastal Nicaragua also incidentally catch leatherback turtles (Lagueux *et al.* 1998). Observers on shrimp trawlers operating in the northeastern region of Venezuela documented the capture of six leatherbacks from 13,600 trawls (Marcano and Alio 2000). An estimated 1,000 mature female leatherback sea turtles are caught annually in fishing nets off of Trinidad and Tobago with mortality estimated to be between 50-95% (Eckert and Lien 1999). However, many of the turtles do not die as a result of drowning, but rather because the fishermen butcher them in order to get them out of their nets (NMFS SEFSC 2001).

Summary of Leatherback Status
The largest leatherback rookery in the western Atlantic remains along the northern coast of South America in French Guiana and Suriname. More than half the present world leatherback population is estimated to be nesting on the beaches in and close to the Marowijne River Estuary in Suriname and French Guiana (Hilterman and Goverse 2004). Nest numbers in Suriname have shown an increase and the long-term trend for the Suriname and French Guiana nesting group seems to show an increase (Hilterman and Goverse 2004). In 2001, the number of nests for Suriname and French Guiana combined was 60,000, one of the highest numbers observed for this region in 35 years (Hilterman and Goverse 2004). Studies by Girondot *et al*. (in press) also suggest that the trend for the Suriname - French Guiana nesting population over the last 36 years is stable or slightly increasing.

Some of the same factors that led to precipitous declines of leatherbacks in the Pacific also affect leatherbacks in the Atlantic. Leatherbacks are captured and killed in many kinds of fishing gear and interact with fisheries in U.S. state and federal waters as well as in international waters. Poaching is a problem and affects leatherbacks that occur in U.S. waters. Leatherbacks also appear to be more susceptible to death or injury from ingesting marine debris than other turtle species.

3.1.4.1(m) Kemp's Ridley Sea Turtle
The Kemp's ridley is one of the most endangered of the worlds sea turtle species. The only major nesting site for ridleys is a single stretch of beach near Rancho Nuevo, Tamaulipas, Mexico (Carr 1963). Estimates of the adult female nesting population reached a low of 300 in 1985. Conservation efforts by Mexican and U.S. agencies have aided this species by eliminating egg harvest, protecting eggs and hatchlings, and reducing at-sea mortality through fishing regulations. From 1985 to 1999, the number of nests observed at Rancho Nuevo, and nearby beaches increased at a mean rate of 11.3% (95% C.I. slope = 0.096-0.130) per year. Current totals exceed 3000 nests per year, allowing cautious optimism that the population is on its way to recovery (TEWG 2000). Nevertheless, the estimated 2,000 nesting females in the current population is still far below historical numbers (Stephens and Alvarado-Bremer 2003).

Kemp's ridley nesting occurs from April through July each year. Little is known about mating but it is believed to occur at or before the nesting season in the vicinity of the nesting beach. Hatchlings emerge after 45-58 days. Once they leave the beach, neonates presumably enter the Gulf of Mexico where they feed on available sargassum and associated infauna or other epipelagic species (USFWS and NMFS 1992). The presence of juvenile turtles along both the Atlantic and Gulf of Mexico coasts of the U.S., where they are recruited to the coastal benthic environment, indicates that post-hatchlings are distributed in both the Gulf of Mexico and Atlantic Ocean (TEWG 2000). The location and size classes of dead turtles recovered by the STSSN suggests that benthic immature developmental areas occur in many areas along the U.S. coast and that these areas may change given resource quality and quantity (TEWG 2000).

Next to loggerheads, Kemp's ridleys are the second most abundant sea turtle in Virginia and Maryland waters, arriving in these areas during May and June (Keinath *et al.* 1987; Musick and Limpus 1997). In the Chesapeake Bay, where the juvenile population of Kemp's ridley sea turtles is estimated to be 211 to 1,083 turtles (Musick and Limpus 1997), ridleys frequently forage in submerged aquatic grass beds for crabs (Musick and Limpus 1997). Kemp's ridley's consume a variety of crab species, including *Callinectes* sp., *Ovalipes* sp., *Libinia* sp., and *Cancer* sp. Mollusks, shrimp, and fish are consumed less frequently (Bjorndal 1997). Upon leaving Chesapeake Bay in autumn, juvenile ridleys migrate down the coast, passing Cape Hatteras in December and January (Musick and Limpus 1997). These larger juveniles are joined there by juveniles of the same size from North Carolina sounds and smaller juveniles from New York and New England to form one of the densest concentrations of Kemp's ridleys outside of the Gulf of Mexico (Musick and Limpus 1997; Epperly *et al.* 1995a; Epperly *et al.* 1995b).

Kemp's ridleys face many of the same natural threats as loggerheads, including destruction of nesting habitat from storm events, natural predators at sea, and oceanic events such as cold-stunning. Although cold-stunning can occur throughout the range of the species, it may be a greater risk for sea turtles that utilize the more northern habitats of Cape Cod Bay and Long Island Sound. For example, in the winter of 1999/2000, there was a major cold-stunning event where 218 Kemp's ridleys, 54 loggerheads, and 5 green turtles were found on Cape Cod beaches (R. Prescott, pers. comm.). Annual cold stun events do not always occur at this magnitude; the extent of episodic major cold stun events may be associated with numbers of turtles utilizing Northeast waters in a given year, oceanographic conditions and the occurrence of storm events in the late fall. Although many cold-stun turtles can survive if found early enough, cold-stunning events can represent a significant cause of natural mortality.

Like other turtle species, the severe decline in the Kemp's ridley population appears to have been heavily influenced by a combination of exploitation of eggs and impacts from fishery interactions. From the 1940s through the early 1960s, nests from Ranch Nuevo were heavily exploited (USFWS and NMFS 1992), but beach protection in 1966 helped to curtail this activity (USFWS and NMFS 1992). Following World War II, there was a substantial increase in the number of trawl vessels, particularly shrimp trawlers, in the Gulf of Mexico where the adult Kemp's ridley turtles occur. Information from fishers helped to demonstrate the high number of turtles taken in these shrimp trawls (USFWS and NMFS 1992). Subsequently, NMFS has worked with the industry to reduce turtle takes in shrimp trawls and other trawl fisheries, including the development and use of TEDs.

Although changes in the use of shrimp trawls and other trawl gear has helped to reduce mortality of Kemp's ridleys, this species is also affected by other sources of anthropogenic impacts similar to those discussed above. For example, in the spring of 2000, a total of five Kemp's ridley carcasses were recovered from the same North Carolina beaches where 275 loggerhead carcasses were found. Cause of death for most of the turtles recovered was unknown, but the mass mortality event was suspected to have been from a large-mesh gillnet fishery operating offshore in the preceding weeks. The five ridley carcasses that were found are likely to have been only a minimum count of the number of Kemp's ridleys that were killed or seriously injured as a result of the fishery interaction since it is unlikely that all of the carcasses washed ashore.

Summary of Kemp's Ridley Status

The only major nesting site for ridleys is a single stretch of beach near Rancho Nuevo, Tamaulipas, Mexico (Carr 1963). From 1985 to 1999, the number of nests observed at Rancho Nuevo, and nearby beaches increased at a mean rate of 11.3% per year. Current totals exceed 3000 nests per year (TEWG 2000). Kemp's ridleys mature at an earlier age (7 - 15 years) than other chelonids, thus 'lag effects' as a result of unknown impacts to the non breeding life stages would likely have been seen in the increasing nest trend beginning in 1985 (USFWS and NMFS 1992). While there is cautious optimism that the Kemp's ridley sea turtle population is increasing, the estimated 2,000 nesting females in the current population is still far below historical numbers (Stephens and Alvarado-Bremer 2003). Anthropogenic impacts to the Kemp's ridley population are similar to those discussed above for loggerhead sea turtles.

3.1.4.1(n) Green Sea Turtles

Green turtles are distributed circumglobally in tropical and subtropical waters (NMFS and USFWS 1998b). Juveniles are also known to occur seasonally in temperate waters (Musick and Limpus 1997; Morreale and Standora 1998). Juvenile green sea turtles occupy pelagic habitats after leaving the nesting beach. At approximately 20 to 25 cm carapace length, juveniles leave pelagic habitats and enter benthic foraging areas, shifting to a chiefly herbivorous diet but may also consume jellyfish, salps, and sponges (Bjorndal 1997).

Green sea turtle populations have declined in many areas. A review of 32 Index Sites (all the major known nesting areas and some lesser areas for which quantitative data is available) distributed globally revealed a 48% to 67% decline in the number of mature females nesting annually over the last 3-generations (Seminoff 2004).

In the western Atlantic, green sea turtles range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean (Wynne and Schwartz 1999). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and directed fisheries in the United States and throughout the Caribbean are largely to blame for the decline of the species. In the Gulf of Mexico, green turtles were once abundant enough in the shallow bays and lagoons to support a commercial fishery. In 1890, over one million pounds of green turtles were taken in the Gulf of Mexico green sea turtle fishery (Doughty 1984). However, declines in the turtle fishery throughout the Gulf of Mexico were evident by 1902 (Doughty 1984).

In the continental United States, green turtle nesting occurs on the Atlantic coast of Florida (Ehrhart 1979). Occasional nesting has been documented along the Gulf coast of Florida, at southwest Florida beaches, as well as the beaches on the Florida Panhandle (Meylan *et al.* 1995). More recently, green turtle nesting occurred on Bald Head Island, North Carolina just east of the mouth of the Cape Fear River, on Onslow Island, and on Cape Hatteras National Seashore. Increased nesting has also been observed along the Atlantic Coast of Florida, on beaches where only loggerhead nesting was observed in the past (Pritchard 1997). Certain Florida nesting beaches have been designated index beaches. Index beaches were established to standardize data collection methods and effort on key nesting beaches. The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring since establishment of the index beaches in 1989, perhaps due to increased protective legislation throughout the Caribbean (Meylan *et al.* 1995). Seminoff (2004) reviewed the population estimates for green sea turtles at five western Atlantic nesting sites. All of these showed increased nesting compared to prior estimates with the exception of nesting at Aves Island, Venezuela (Seminoff 2004).

Some of the principal green sea turtle foraging areas in the western Atlantic Ocean include the upper west coast of Florida and the northwestern coast of the Yucatán Peninsula. Additional important foraging areas in the western Atlantic include the Mosquito and Indian River Lagoon systems and nearshore wormrock reefs between Sebastian and Ft. Pierce Inlets in Florida, Florida Bay, the Culebra archipelago and other Puerto Rico coastal waters, the south coast of Cuba, the Mosquito Coast of Nicaragua, the Caribbean Coast of Panama, and scattered areas along Colombia and Brazil (Hirth 1971). In North Carolina, green turtles are known to occur in estuarine and oceanic waters and to nest in low numbers along the entire coast. The summer developmental habitat for green turtles also encompasses estuarine and coastal waters of Chesapeake Bay and as far north as Long Island Sound (Musick and Limpus 1997). Green turtles face many of the same natural threats as loggerhead and Kemp's ridley sea turtles. In addition, green turtles appear to be susceptible to fibropapillomatosis, an epizootic disease producing lobe-shaped tumors on the soft portion of a turtles body. Juveniles are most commonly affected. The occurrence of fibropapilloma tumors may result in impaired foraging, breathing, or swimming ability, leading potentially to death. Stranding reports indicate that between 200-400 green turtles strand annually along the Eastern U.S. coast from a variety of causes most of which are unknown (STSSN database).

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

Summary of Green Sea Turtle Status
Green sea turtle populations have declined in many areas; as much as a 48% to 67% decline in the number of mature females nesting annually over the last 3-generations (Seminoff 2004). Seminoff (2004) concluded that declines in green turtle nesting were evident for many of the Indian Ocean Index Sites. While several of these had not demonstrated further declines in the more recent past, only the Comoros Island Index Site in the Western Indian Ocean showed evidence of increased nesting (Seminoff 2004).

In the Pacific, green turtles continue to be affected by poaching, fishing gear interactions, habitat degradation, and disease (notably fibropappillomatosis) (NMFS and USFWS 1998b; NMFS 2004). Green turtles face many of the same threats in the Atlantic. In the western Atlantic, green turtles range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean (Wynne and Schwartz 1999) and are exposed to many of the same anthropogenic threats as loggerhead and Kemp's ridley sea turtles. In addition, Atlantic green turtles are also susceptible to fibropapillomatosis which can result in death. In the continental United States, green turtle nesting occurs on the Atlantic coast of Florida (Ehrhart 1979). The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring since establishment of index beaches in 1989. However, age at sexual maturity is estimated to be between 20 to 50 years (Balazs 1982; Frazer and Ehrhart 1985). Thus, caution is warranted about over interpreting nesting trend data collected for less than 15 years.

3.1.4.1(o) Harbor Seal
Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine, and occur seasonally along the southern New England and New York coasts from September through late-May. However, breeding and pupping normally occur only in waters north of the New Hampshire/Maine border. Since passage of the MMPA in 1972, the number of seals found along the New England coast has increased nearly five-fold with the number of pups seen along the Maine coast increasing at an annual rate of 12.9 percent during the 1981-1997 period (Gilbert and Guldager 1998). The minimum population estimate for the harbor seal is 30,990 based on uncorrected total counts along the Maine coast in 1997 (Waring et al. 2004).

Harbor seals are taken in sink gillnet gear used in the groundfish fishery. Waring et al. (2004) has described the estimated total take of harbor seals in all fisheries (972) to be below the PBR of 5,493 established for that species.

3.1.4.1(p) Gray Seal
The gray seal is found on both sides of the North Atlantic, with the western North Atlantic population occurring from New England to Labrador. There are two breeding concentrations in eastern Canada; one at Sable Island and one that breeds on the pack ice in the Gulf of St. Lawrence. There are several small breeding colonies on isolated islands along the coast of Maine and on outer Cape Cod and Nantucket Island in Massachusetts (Waring et al. 2004). The population estimates for the Sable Island and Gulf of St Lawrence breeding groups was 143,000 in 1993. The gray seal population in Massachusetts has increased from 2,010 in 1994 to 5,611 in 1999, although it is not clear how much of this increase may be due to animals emigrating from northern areas. Approximately 150 gray seals have been observed on isolated islands off Maine.

Gray seals are taken in sink gillnet gear. Waring et al. (2004) has described the estimated total fishery-related takes of gray seals in U.S. waters relative to population size as unknown, but likely very low.

3.1.4.1(q) Harp Seal

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans, and has been increasing off the East Coast of the United States from Maine to New Jersey. Harp seals are usually found off the U.S. from January to May when the western stock of harp seals is at their most southern point of migration (Waring et al. 2004). This species congregates on the edge of the pack ice in February through April when breeding and pupping takes place. The harp seal is highly migratory, moving north and south with the edge of the pack ice. Non-breeding juveniles will migrate the farthest south in the winter, but the entire population moves north toward the Artic in the summer. The minimum population estimate for the western North Atlantic is 5.2 million seals.

A large number of harp seals are killed in Canada, Greenland and the Artic. The Canadian kill is controlled by DFO who set the allowed kill at 275,000 in 1997. Mortality in Greenland and the Artic may exceed 100,000 (Waring et al. 2004). Harp seals are also taken in sink gillnet gear used to catch multispecies. Waring et al. (2004) has described the estimated total take of harp seals from 1959 to 1999 in all fisheries to range between 78 and 694 animals depending on the location of the pack ice edge which drives the seals farther south into the range of the sink gillnet fishery. Even with the highest takes observed, the take is well below the PBR of 156,000 established for that species.

3.1.4.2 Actions to Minimize Interactions with Protected Species

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

3.1.4.2.1 *Harbor Porpoise Take Reduction Plan* (HPTRP)

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

3.1.4.2.2 *Atlantic Large Whale Take Reduction Plan* (ALWTRP)

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

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

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

3.1.4.2.3 *NMFS Rule to Conserve Sea Turtles*

NMFS published a final rule (67 *FR* 71895, December 3, 2002), effective January 2, 2003, that enacted a series of seasonal closures to the use of large mesh gillnets in the EEZ off the coast of Virginia and North Carolina. The purpose of the closures is to reduce the impact of the monkfish fishery on endangered and threatened species of sea turtles. This final rule followed several temporary actions taken by NMFS since 2000 in response to sea turtle strandings. Federal waters between Oregon Inlet and the North Carolina/South Carolina border are closed year round, while three other areas to the north (up to Chincoteague, VA) are closed from March 16, April 1, and April 16, respectively, to January 14 each year.

NMFS is currently reviewing a proposed rule that would require that the gillnet gear restrictions from the North Carolina/South Carolina border to Chincoteague be extended into state waters that are seaward of the COLREGS lines. It also proposes to make the gillnet gear restriction applicable to gillnets with 7" or greater stretched mesh (rather than the current larger than 8-inch stretched mesh). The proposed rule can be found at http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.

3.1.4.2.4 *Atlantic Trawl Take Reduction Team*

On April 29, 2003, the Center for Biological Diversity (CBD) and the National Marine Fisheries Service entered into a settlement agreement concerning claims that NMFS violated section 118 of the Marine Mammal Protection Act (MMPA). CBD's claim focused on two distinct fisheries – the pelagic longline and Atlantic squid, mackerel and butterfish fisheries. As part of the settlement agreement, NMFS agreed to convene a TRT for the Atlantic pelagic longline fishery with regard to incidental mortality and serious injury of pilot whales no later than June 30, 2005. NMFS also agreed to convene a TRT for the Atlantic squid, mackerel, butterfish trawl fishery with regard to incidental mortality and serious injury of pilot whales and common dolphins no later than September 30, 2006. The Southeast Region was designated the lead for the Atlantic pelagic longline TRT and the Northeast Region (NER) was designated the lead for the Atlantic squid, mackerel, butterfish trawl TRT.

The final makeup of the TRT will be determined after the appropriate observer and stock assessment information has been completed and analyzed as outlined in the settlement agreement. Since sea turtles have documented takes in many of the trawl gear configurations being considered for the new TRT, the NER and Northeast Fisheries Science Center intend to work with sea turtle managers to incorporate the sea turtle management strategy into the new trawl TRT process. Consequently, the NER and NEFSC will be implementing a broader based TRT that encompasses several configurations of trawl gear that have known incidental moralities and serious injuries of sea turtles as well as marine mammals.

3.1.4.3 STATUS OF BARNDOOR SKATE (*DIPTURUS LAEVIS*)

Barndoor skates are classified as a "large skate" under the Northeast Skate Complex FMP and are one of the largest skate species in New England waters. They are found throughout the affected area and are considered abundant on Georges Bank and Nantucket Shoals (Collette and Klein-MacPhee, 2002). Barndoor skates have been considered for listing under the ESA, and although the petition for listing was determined to be not warranted as of September 2002, they were left on the candidate list at that time because of concerns about status and population structure (NEFMC, 2003). There is currently a possession prohibition on barndoor skates under the Northeast Skate Complex FMP.

3.2 HABITAT ENVIRONMENT

Amendment 13 included a thorough description of the physical environment of the Northeast multispecies fishery, including oceanographic and physical habitat conditions in the Gulf of Maine – Georges Bank region and the area south of New England. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a). The Northeast Shelf Ecosystem (Figure 28) has been described as including the area from the Gulf of Maine south to North Carolina, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The continental slope of this region includes the area east of the shelf, out to a depth of 2000 m. A number of distinct sub-systems comprise the region, including the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another subsystem, Southern New England, is described; however, Amendment 13 incorporated the distinctive features of this region into the descriptions of Georges Bank and the Mid-Atlantic Bight. The following summary highlights the major elements of the physical environment discussed in Amendment 13.

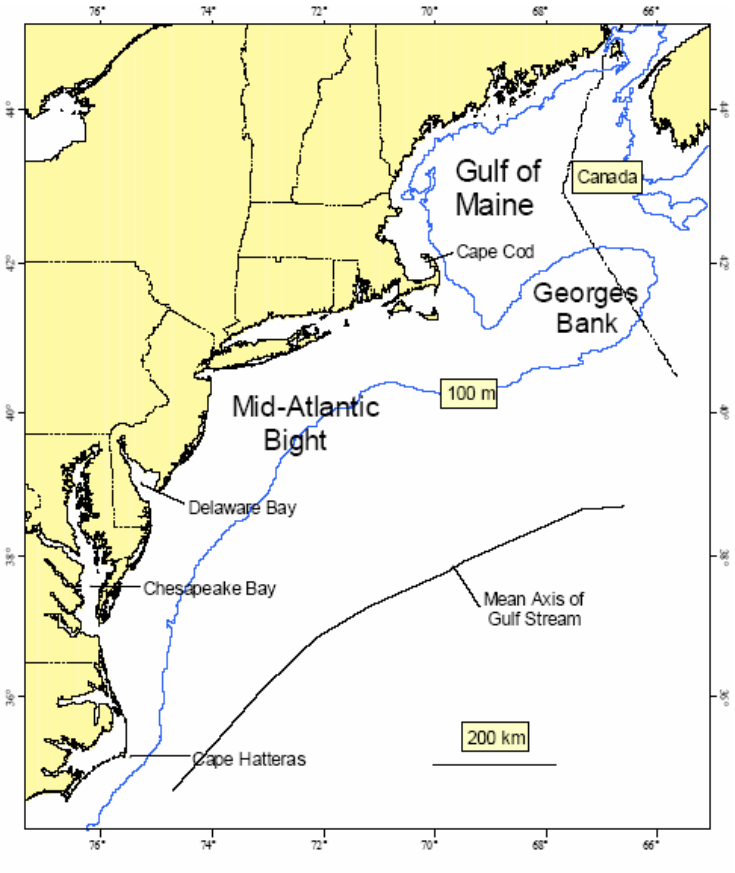


Figure 28- The Affected Ecosystem
(NEFMC, Am. 13 FSEIS, Section 9.1.1)

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

with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley and in areas of glacially rafted hard bottom.

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

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

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

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

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

The Eastern U.S./CA Area Haddock SAP takes place in and near CAII. Only a small portion of the SAP – 45 sq. nm., only four percent of the total SAP area – is actually inside CAII (total area 2,650 sq. nm). Depths in the area of the SAP range from under ten fathoms on several ridges to the west of CAII, to over 110 fathoms at the northern end of the area. Much of the sediment in the area is sand. There are,

however, a series of gravel and/or gravelly sand ridges that run northwest to southeast in the middle of the area west of CAII. There is also an area of mud in the deep water at the northwestern corner.

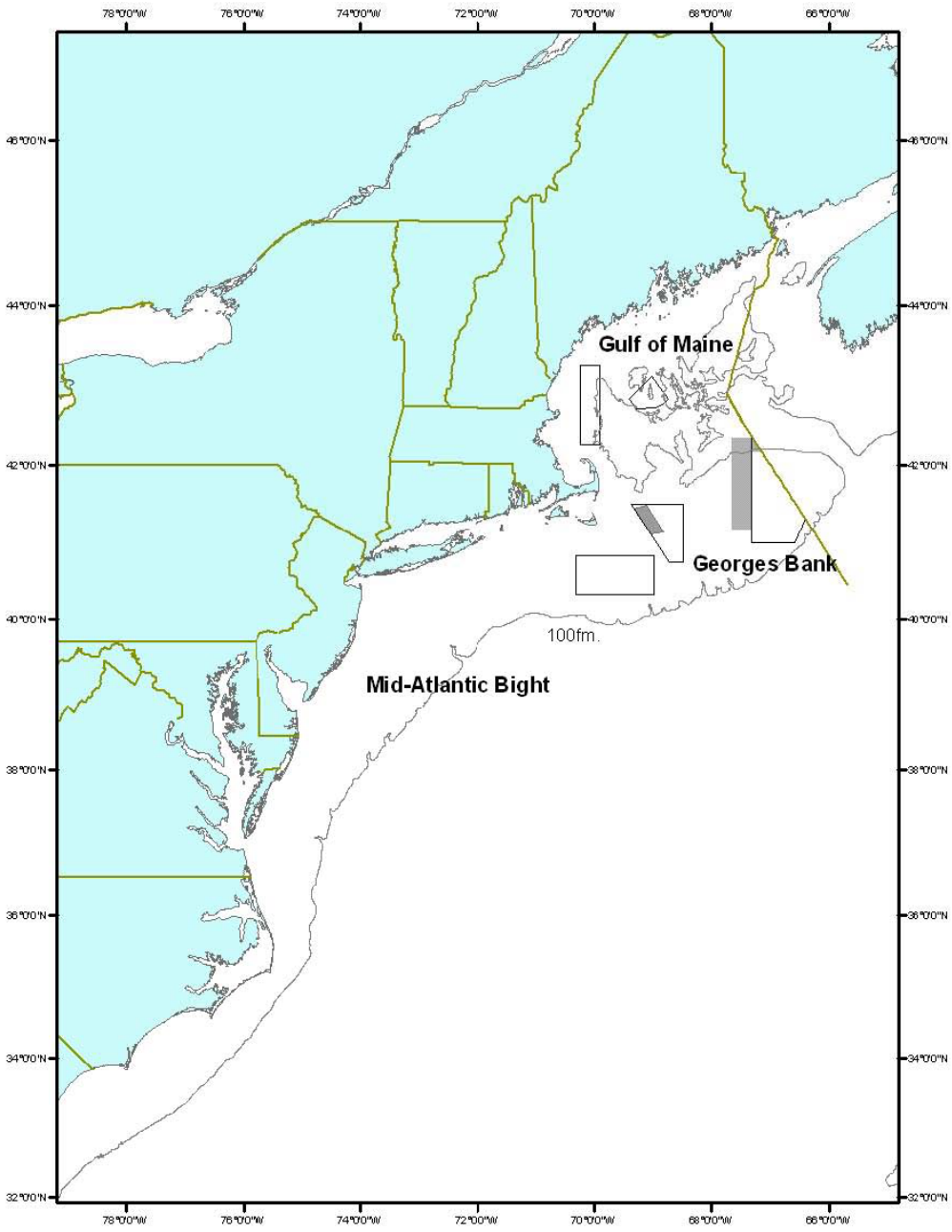


Figure 29- U.S. Northeast Shelf Ecosystem, showing multispecies year round mortality closed areas and current SAP areas (shaded)

The area affected by the Proposed Action has been identified as EFH for species managed under the NE Multispecies; Atlantic Sea Scallop; Atlantic Monkfish; Summer Flounder; Scup and Black Sea Bass; Squid, Atlantic Mackerel and Butterfish; Atlantic Surf Clam and Ocean Quahog; Atlantic Bluefish; Atlantic Billfish; and Atlantic Tuna, Swordfish and Shark Fishery Management Plans. In general, EFH for these species includes pelagic and demersal waters, saltmarsh creeks, seagrass beds, mudflats and open bay areas, as well as mud, sand, gravel and shell sediments over the continental shelf, and structured habitat containing sponges and other biogenic organisms (NMFS 2002). Specific text descriptions and accompanying maps detailing EFH by species and life stage are included in the Omnibus EFH Amendment.

From a biological perspective, habitats provide living things with the basic life requirements of nourishment and shelter. With regards to the species included in the northeast multispecies fishery management unit, Amendment 13 provided a detailed description of the physical and biological habitat characteristics of the area affected by the multispecies fishery, throughout its range. Framework 42 proposes measures that will impact the Gulf of Maine broadly and specific areas on George's Bank. Since the Category B (regular) DAS Pilot Program is not limited to a specific area, the entire geographic area described in Amendment 13 (the Northeast Region) is applicable to the Proposed Action. Key elements of that description are highlighted below.

Species	Life Stage	Depth	Substrate
American Plaice	A	45-150	Fine-grained sediments or substrate of sand or gravel
American Plaice	J	45-175	Fine-grained sediments or substrate of sand or gravel
Atlantic Cod	A	10-150	Rocks, pebbles, or gravel
Atlantic Cod	J	25-75	Cobble or gravel
Atlantic Halibut	A	20-60	Sand, gravel, or clay
Atlantic Halibut	J	100-700	Sand, gravel, or clay
Haddock	A	35-100	Pebble gravel
Haddock	J	40-150	*Broken ground, pebbles, smooth hard sand, smooth*
Ocean Pout	A	<110	Dig depressions in soft sediments
Ocean Pout	J	<80	*Smooth bottom near rocks or algae*
Ocean Pout	L	<50	*Close to nesting areas*
Ocean Pout	E	<50	*Sheltered nests in holes or crevices on hard bottom*
Offshore Hake	A	150-380	*Bottom habitats*
Offshore Hake	J	170-350	*Bottom habitats*
Pollock	A	15-365	Hard bottom including artificial reefs
Pollock	J	0-250	Aquatic vegetation or a substrate of sand, mud, or
Red Hake	A	10-130	Depressions with a substrate of sand and mud
Red Hake	J	<100	Shell fragments and live scallops
Redfish	A	50-350	Silt, mud, or hard bottom
Redfish	J	25-400	Silt, mud, or hard bottom
White Hake	A	5-325	Mud or fine-grained sand
White Hake	J	5-225	Seagrass beds or substrate of mud or fine-grained
Whiting	A	30-325	All substrate types
Whiting	J	20-270	All substrate types
Windowpane	A	1-75	Mud or fine-grained sand
Windowpane	J	1-100	Mud or fine-grained sand
Winter Flounder	A	1-100	Mud, sand, or gravel
Winter Flounder	J	1-50	Mud or fine-grained sand
Witch Flounder	A	25-300	Fine-grained substrate
Witch Flounder	J	50-450	Fine-grained substrate
Yellowtail Flounder	A	20-50	Sand or sand and mud
Yellowtail Flounder	J	20-50	Sand or sand and mud

Table 5- Depths and Substrates Associated With Essential Fish Habitats for Benthic Life Stage of 15 Species Included in the New England Multi-Species Fishery Management Plan (NEFMC, 1998).

With regards to the Monkfish FMP, Amendment 2 to the Monkfish FMP provided a detailed description of habitats potentially affected by the monkfish fishery. To summarize, fishing for monkfish occurs across the designated essential fish habitat (EFH) of all NEFMC- and MAFMC-managed species (see Amendment 13). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council, as all of the relevant species (i.e. species with EFH designated within the Northeast Region) are pelagic and not directly affected by benthic habitat impacts associated with the groundfish fishery.

Section 5.1 of the FSEIS to Monkfish Amendment 2 and Section 9.0 of the FEIS to Multispecies Amendment 13 described benthic habitats that exist within the range of these two fisheries, physical and biological characteristics of regional oceanographic sub-systems, and assemblages of fish and benthic organisms. They also included a description of canyon habitats on the edge of the continental shelf. Details relating to the Gulf of Maine, Georges Bank, and southern New England/Mid-Atlantic Bight sub-systems are provided in the following three sections. The EFH text descriptions and map designations for the various life stages of monkfish and groundfish complex species were defined in the Habitat Omnibus Amendment (NEFMC 1998a). Essential fish habitat designations which summarize the environmental needs and distribution of monkfish are contained below. Designations for species included in the

Multispecies fishery management unit can be found in Section 3.0 of the 1998 Habitat Omnibus Amendment (www.nefmc.org). For more information on monkfish and groundfish complex species EFH refer to the Habitat Omnibus Amendment (NEFMC 1998a).

A description of the physical environment of the Northeast multispecies fishery, including oceanographic and physical habitat conditions in the Gulf of Maine – Georges Bank region and the area south of New England is found in Section 9.1 of Amendment 13. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a).

3.2.1 GULF OF MAINE

The Gulf of Maine's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. The greatest number of invertebrates in this region is classified as mollusks, followed by annelids, crustaceans, echinoderms and other (Theroux and Wigley 1998). By weight, the order of taxa changes to echinoderms, mollusks, other, annelids and crustaceans. Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven types of bottom assemblages. These assemblages are identified in and their distribution is depicted in. This classification system considers benthic assemblage, substrate type and water properties. Several authors have examined the species assemblages and related them to habitat areas or physical characteristics. For example, Overholtz & Tyler (1985) identified five assemblages for this region (Table 6).

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

Table 6 - Gulf of Maine benthic assemblages as identified by Watling (1998) Figure 27 - Distribution of the seven major benthic assemblages in the Gulf of Maine as determined from both soft bottom quantitative sampling and qualitative hard bottom sampling.

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

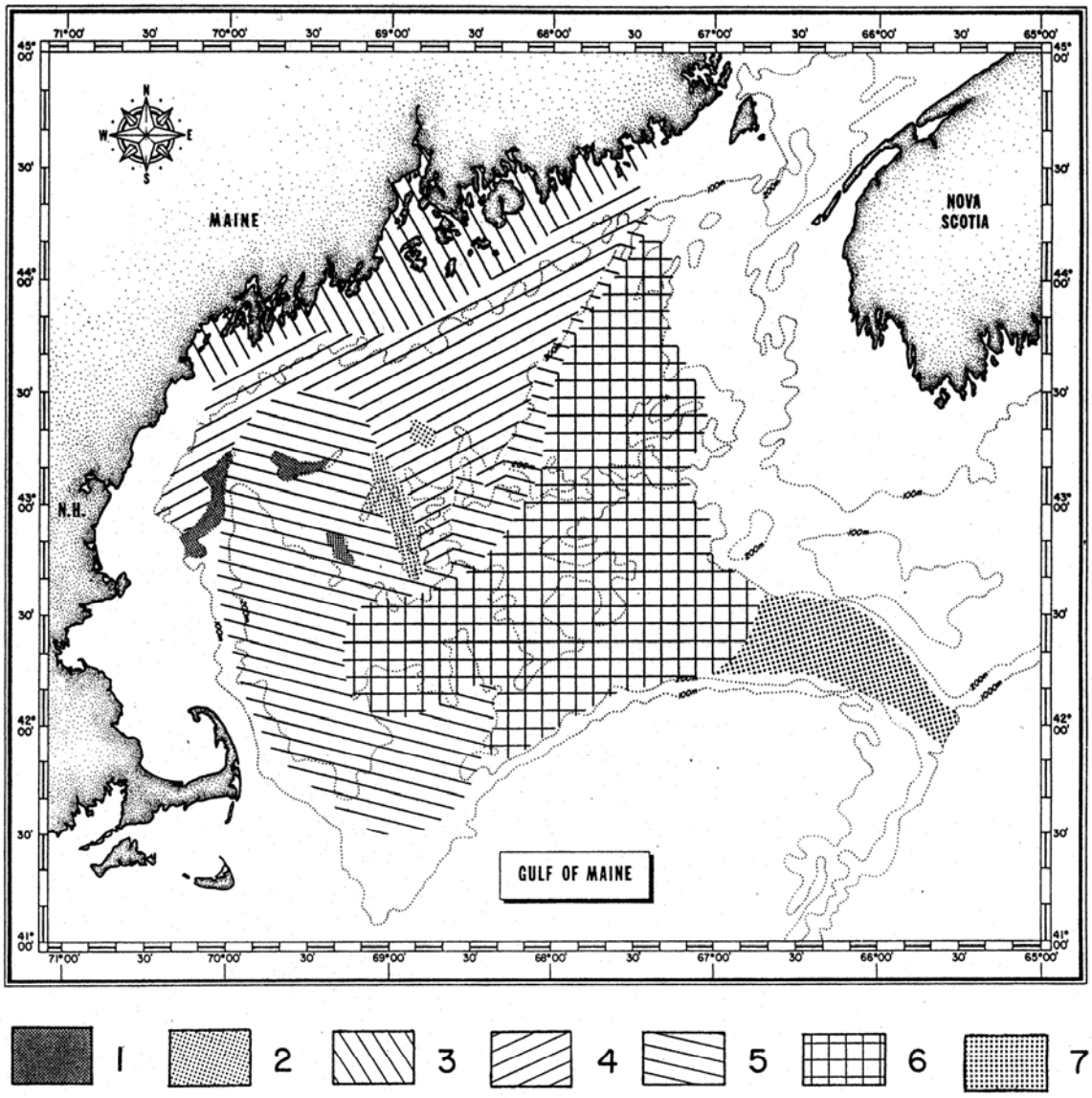


Table 7 - Comparison of demersal fish assemblages of Georges Bank and Gulf of Maine identified by Overholtz and Tyler (1985) and Gabriel (1992).

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

Overholtz & Tyler (1985)		Gabriel (1992)	
Assemblage	Species	Species	Assemblage
Slope & Canyon	offshore hake blackbelly rosefish Gulf stream flounder fourspot flounder monkfish, whiting white hake, red hake	offshore hake blackbelly rosefish Gulf stream flounder fawn cusk-eel, longfin hake, armored sea robin	Deepwater
Intermediate	whiting red hake monkfish Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	whiting red hake monkfish short-finned squid, spiny dogfish, cusk	Combination of Deepwater Gulf of Maine/Georges Bank & Gulf of Maine-Georges Bank Transition
Shallow	Atlantic cod haddock pollock whiting white hake red hake monkfish ocean pout yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin summer flounder sea raven, sand lance	Atlantic cod haddock pollock yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin	Gulf of Maine-Georges Bank Transition Zone Shallow Water Georges Bank-Southern New England
Gulf of Maine-Deep	white hake American plaice witch flounder thorny skate whiting, Atlantic cod, haddock, cusk Atlantic wolffish	white hake American plaice witch flounder thorny skate, redfish	Deepwater Gulf of Maine-Georges Bank
Northeast Peak	Atlantic cod haddock pollock ocean pout, winter flounder, white hake, thorny skate, longhorn sculpin	Atlantic cod haddock pollock	Gulf of Maine-Georges Bank Transition Zone

3.2.2 GEORGES BANK

The interaction of several environmental factors including availability and type of sediment, current speed and direction, and bottom topography have been found to combine to form seven sedimentary provinces on eastern Georges Bank (Valentine et al. 1993), which are outlined in Table 5 and depicted in Figure 7. Theroux and Grosslein (1987) identified four macrobenthic invertebrate assemblages that corresponded with previous work in the geographic area. They noted that it is impossible to define distinct boundaries between assemblages because of the considerable intergrading that occurs between adjacent assemblages;

however, the assemblages are distinguishable. Their assemblages are associated with those identified by Valentine et al. (1993).

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

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

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

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

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

Sedimentary Province	Depth (m)	Description	Benthic Assemblage
Northern Edge / Northeast Peak (1)	40-200	Dominated by gravel with portions of sand, common boulder areas, and tightly packed pebbles. Representative epifauna (bryozoa, hydrozoa, anemones,and calcareous worm tubes) are abundant in areas of boulders. Strong tidal and storm currents.	Northeast Peak
Northern Slope & Northeast Channel (2)	200-240	Variable sediment type (gravel, gravel-sand, and sand) scattered bedforms. This is a transition zone between the northern edge and southern slope. Strong tidal and storm currents.	Northeast Peak
North / Central Shelf (3)	60-120	Highly variable sediment type (ranging from gravel to sand) with rippled sand, large bedforms, and patchy gravel lag deposits. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.	Central Georges
Central & Southwestern Shelf -shoal ridges (4)	10-80	Dominated by sand (fine and medium grain) with large sand ridges, dunes, waves, and ripples. Small bedforms in southern part. Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.	Central Georges
Central & Southwestern Shelf -shoal troughs (5)	40-60	Gravel (including gravel lag) and gravel-sand between large sand ridges. Patch large bedforms. Strong currents. (Few samples – submersible observation noted presence of gravel lag, rippled gravel-sand, and large bedforms.) Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.	Central Georges
Southeastern Shelf (6)	80-200	Rippled gravel-sand (medium and fine-grained sand) with patchy large bedforms and gravel lag. Weaker currents; ripples are formed by intermittent storm currents. Representative epifauna include sponges attached to shell fragments and amphipods.	Southern Georges
Southeastern Slope (7)	4002000	Dominated by silt and clay with portions of sand (medium and fine) with rippled sand on shallow slope and smooth silt-sand deeper.	none

Table 8- Sedimentary provinces of Georges Bank, as defined by Valentine et al. (1993) and Valentine and Lough (1991) with additional comments by Valentine (personal communication) and Benthic Assemblages assigned from Theroux and Grosslein (1987).

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

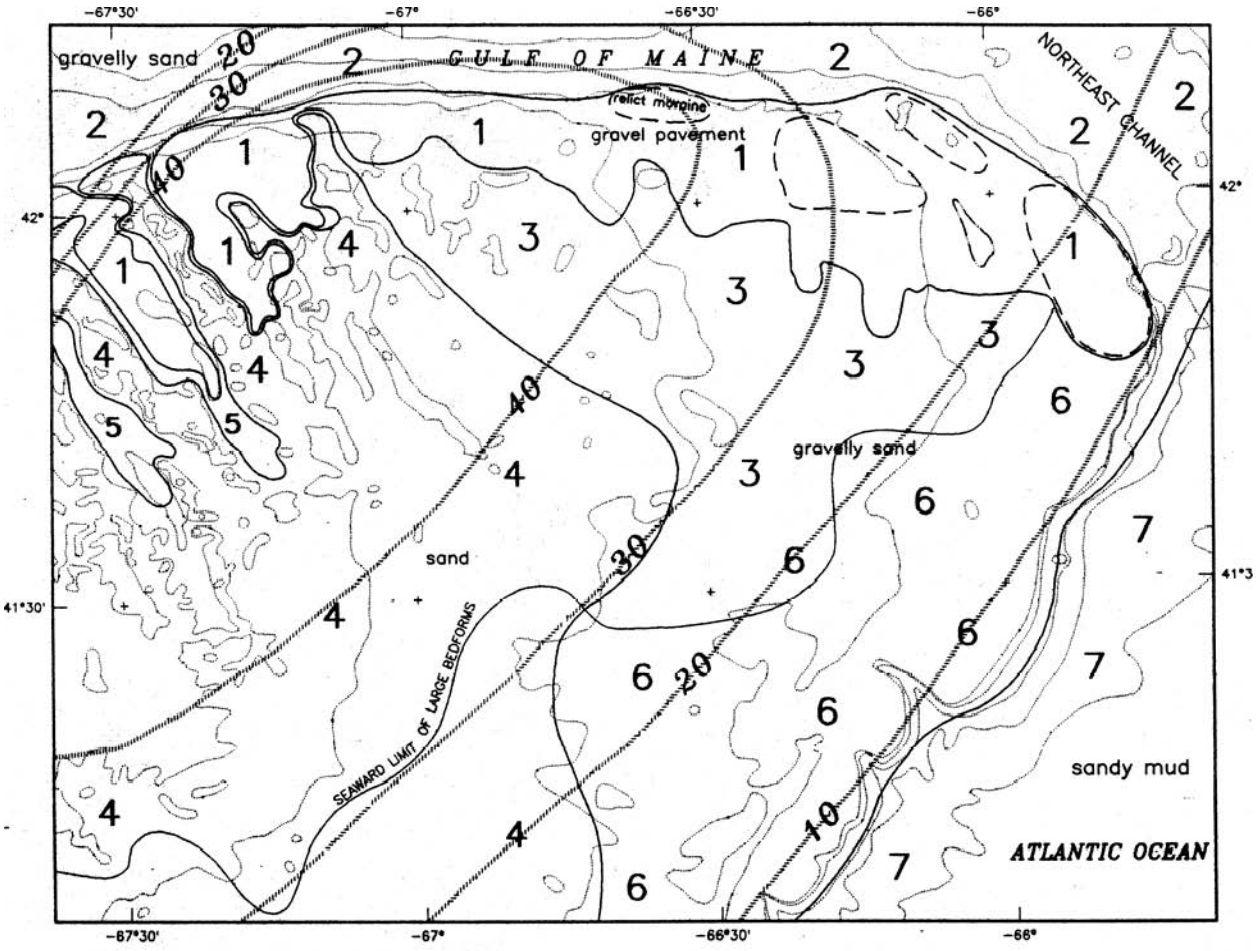


Figure 30 - Sedimentary provinces of eastern Georges Bank based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/sec).

Oceanographic frontal systems occur between water masses from the Gulf of Maine and Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution. Currents on Georges Bank include a weak, persistent clockwise gyre around the bank, a strong semidiurnal tidal flow predominantly northwest and southeast, and very strong, intermittent storm-induced currents, which can all occur simultaneously. Tidal currents over the shallow top of Georges Bank can be very strong, and keep the waters over the bank well mixed vertically. This results in a tidal front that separates the cool waters of the well-mixed shallows of the central bank from the warmer, seasonally stratified shelf waters on the seaward and shoreward sides of the bank. The clockwise gyre is instrumental in distribution of the planktonic community, including larval fish.

Currents and tides may also generate fronts, eddies, and divergence and convergence zones that may provide suitable habitat conditions to a suite of organisms. Fronts, eddies, and other convergence zones may function as a congregation area for complexes of organisms and influence the population dynamics of a region. Planktonic organisms may be especially influenced by the circulation of water masses (e.g. transport mechanism). Congregation zones may include areas of high primary productivity, high plankton concentrations, and efficient foraging habitats for larval fishes and other planktonic organisms. Larger organisms may also target fronts and eddies to prey upon the high density of planktonic organisms. Convergence zones (e.g. two currents coming together) may also act as transport

mechanisms, supplying food-rich surface waters to the seafloor. Divergence zones (e.g. currents moving away from each other), including upwelling events, have been associated with phytoplankton blooms. Divergence zones transport nutrient-rich bottom waters to the sea surface and promote primary production. These oceanographic features may provide necessary habitat conditions for the survivability, development, and growth of a variety of organisms at particular ontogenetic stages. Other physical oceanographic properties may contribute to pelagic habitat conditions, such as stratified water layers (e.g. thermoclines, haloclines, and pycnoclines), internal waves, plumes (e.g. riverine discharge). Physical oceanography constitutes several roles that influence several aspects of fishery resources and habitat conditions, including the transporting planktonic organisms and water masses throughout New England waters. Population dynamics and habitat conditions in New England are greatly influenced by oceanographic processes. (NEFMC, 1998).

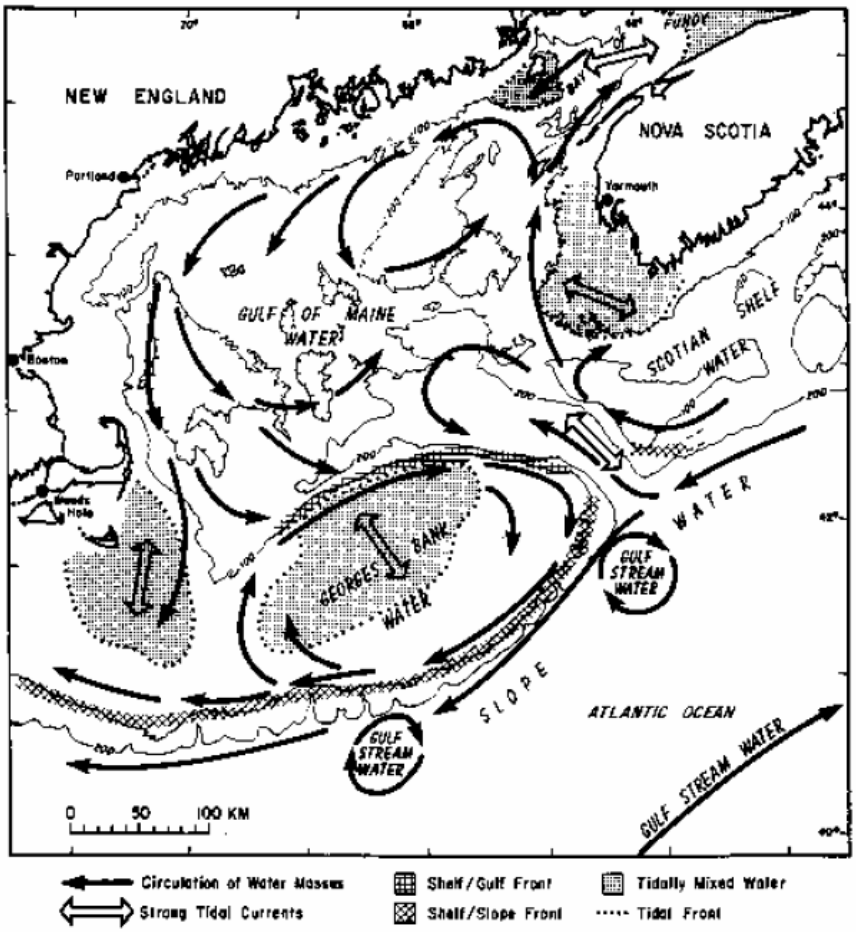


Figure 31- Map showing water mass circulation patterns in the Georges Bank – Gulf of Maine region. (Figure reproduced from Valentine and Lough 1991, in NEFMC- EFH Omnibus Amendment, 1998)

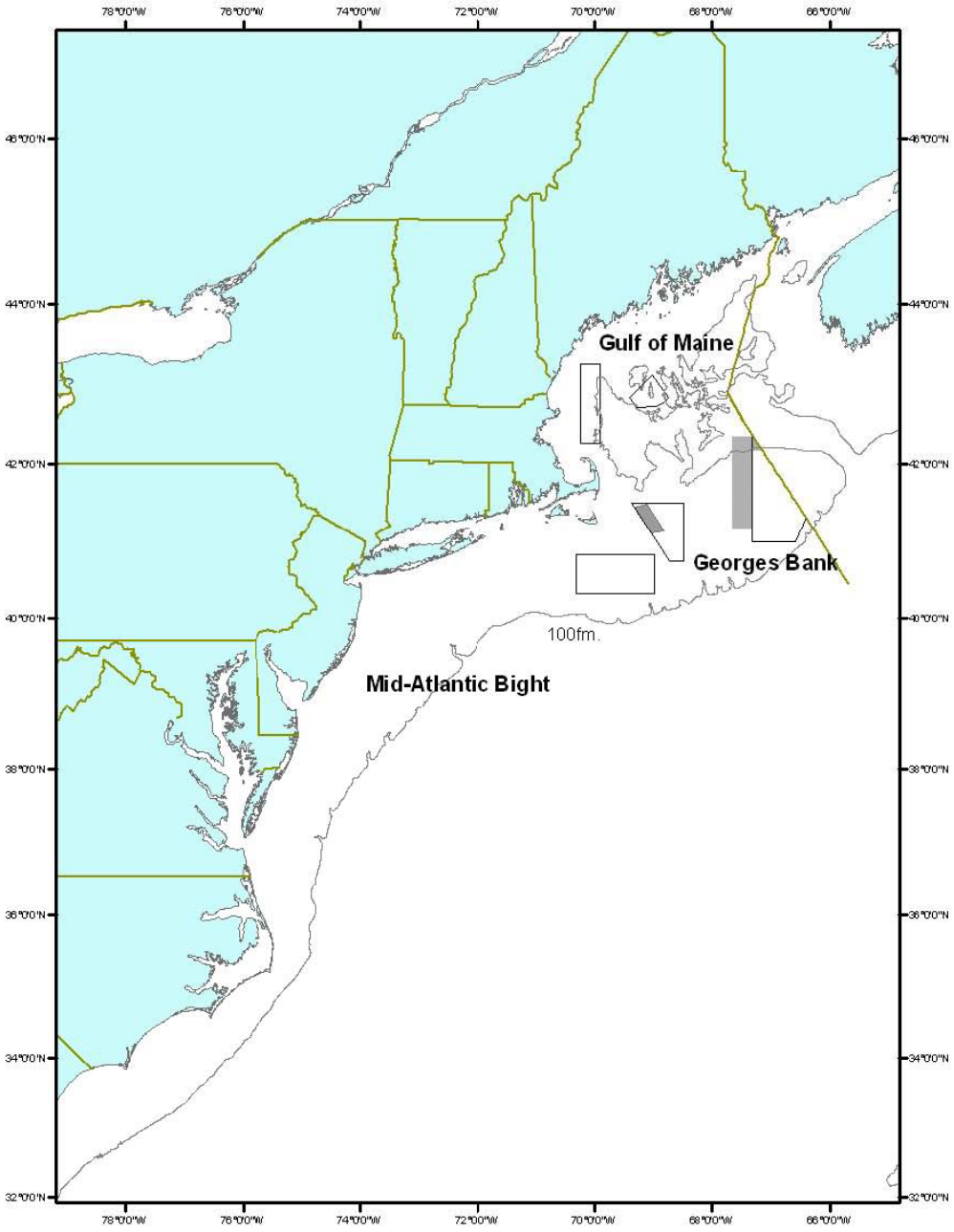
3.2.3 SOUTHERN NEW ENGLAND/MID-ATLANTIC BIGHT

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

Demersal fish assemblages were described at a broad geographic scale for the continental shelf and slope from Cape Chidley, Labrador to Cape Hatteras, North Carolina (Mahon et al. 1998) and from Nova Scotia to Cape Hatteras (Gabriel 1992). Factors influencing species distribution included latitude and depth. Results of these studies were similar to an earlier study confined to the Mid-Atlantic Bight continental shelf (Colvocoresses and Musick 1983). In this study, there were clear variations in species abundances, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. This is especially true for five strongly recurring species associations that varied slightly by season. The boundaries between fish assemblages generally followed isotherms and isobaths. The assemblages were largely similar between the spring and fall collections, with the most notable change being a northward and shoreward shift in the temperate group in the spring.

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

Table 9 - Major Recurrent Demersal Finfish Assemblages of the Mid-Atlantic Bight During Spring and Fall as Determined by Colvocoresses and Musik (1983).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36°00'N
34°00'N
32°00'N
Gulf of Maine
Georges Bank
100fm.
Mid-Atlantic Bight

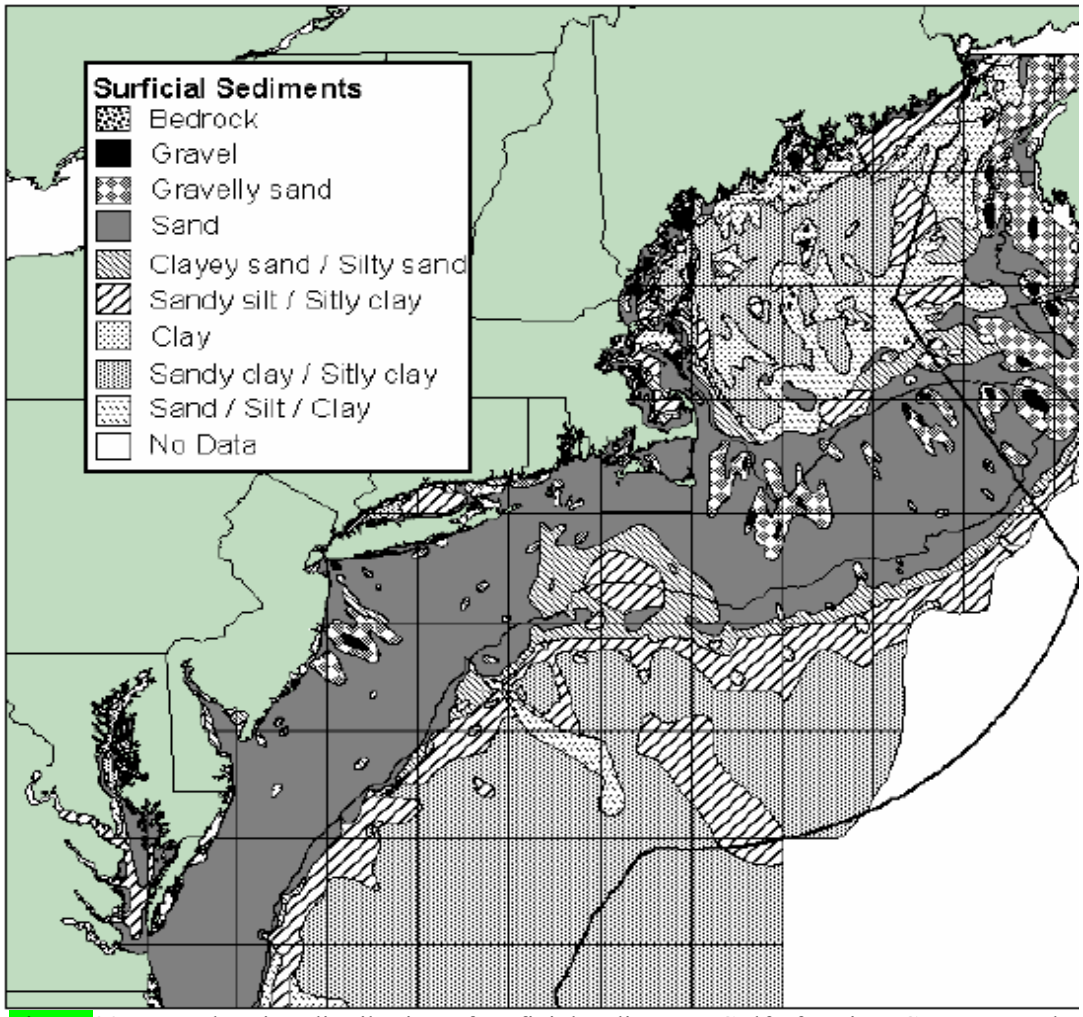

Figure 32- Map showing distribution of surficial sediments, Gulf of Maine, Georges Bank, and southern New England. (NEFMC, 1998).

SEDIMENT TYPE	REGION
bedrock	GOM
gravel[1]	GOM, GB[2], SNE[3]
gravel-sand	GOM, GB, SNE
sand	GOM, GB, SNE
clayey sand/silty sand	GOM, GB, SNE
sandy silt/clayey silt	GOM, SNE
clay	GOM, GB
sandy clay/silty clay	GOM, SNE
sand/silt/clay	GOM, SNE

KEY
1 gravel includes cobble and boulders
2 boulders common on the northern edge and northeast Peak of GB (Valentine and Lough 1991)
3 SNE (southern New England) is geologically similar to the middle Atlantic bight
* sediment classifications from Poppe *et al.* (1989)

Table 10: Type of surficial sediment* observed on the seafloor of the New England region. (NEFMC, 1998).

3.2.5 SCOPE OF DESCRIPTION AND SOURCE OF FURTHER INFO

A full description of the affected environment with regards to habitat can be found within the EA that accompanied Amendment 11 to the Northeast Multispecies FMP, Amendment 9 to the Atlantic Sea Scallop FMP, Amendment 1 to the Monkfish FMP, Amendment 1 to the Atlantic Salmon FMP and Sections of the Atlantic Herring FMP. This document is commonly known as the Omnibus EFH Amendment. This Amendment also contained EFH designations for all groundfish species managed by the NEFMC (NEFMC, Am 13 FSEIS, Section 9.0). However, the most recent information is contained in a 2004 NOAA Technical Memo (181) entitled "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." It should be referenced for further information which is outside the scope of the description included below.

3.2.5 EFH DESCRIPTIONS FOR SPECIES IN AFFECTED AREA

Table 9 (above) summarizes the EFH designations for the target species and those other Multispecies stocks with EFH designations and describes the EFH which can be found in the affected area.

A similar description of the depth and substrate features of EFH for the remaining 18 federally-managed species with benthic life stages is not included because EFH for the 15 species that are managed under the NE Multispecies FMP already covers a broad range of habitat types. The aerial extent of EFH for the juvenile and adult stages of all 33 species includes virtually the entire Northeast shelf.

3.2.5.1 Gear Effects

Gear effects to Essential Fish Habitat from hook and line equipment is expected to be minimal. Proper use of hook and line equipment has little or no impact on key habitat characteristics. Loss of gear is uncommon, relic gear on the bottom may cause minor alteration of the surface of the seafloor and may interact with vegetation in the immediate area. Neither of these interactions is anticipated to adversely impact the environmental services provided by essential fish habitat. On the other hand, heavier gear types that hook fisherman may resort to in the event that the preferred alternative is not selected, can cause adverse impacts to essential fish habitat.

Section 10.3.1.2.4 of Amendment 13 describes the general effects of trawls and dredges on benthic marine habitats, as reported in three recent reports (ICES 2000, Johnson 2002, and NRC 2002). (The report by Morgan and Chuenpagdee was not available when this summary was written: it generally confirms the findings of the other three reports). All four of these reports are international or national in scope and include information on the effects of types of trawls and dredges not used in the Northeast region of the U.S. (e.g., beam trawls and toothed scallop dredges) and affected habitats not found in the NE region (e.g, coral reefs and maerl beds). The conclusions reached are, nevertheless, pertinent to an evaluation of potential adverse impacts of the types of trawls and dredges used in this region. To re-iterate, the four major types of habitat modification caused by bottom trawls that are identified in the ICES (2001) report are the following:

- Loss or dispersal of physical features such as peak banks or boulder reefs (changes are always permanent 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 (changes may be permanent 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 decease in the physical patchiness of the sea floor (changes are not likely to be permanent);
- 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 (changes are not likely to be permanent).

The NRC (2002) report also identified three major effects of trawling and dredging, the first two of which are also mentioned in the ICES (2001) report:

- Reduced habitat complexity;
- Discernible changes in benthic communities (caused by repeated trawling and dredging);
- Reduced productivity of benthic habitats.

The four effects of trawling identified in the ICES (2001) report are listed in order of decreasing permanence. Given the MSA definition of "adverse" as "more than minimal and not temporary," the first effect is clearly adverse. The second effect may be permanent and the other two are not likely to be permanent. However, they are still considered as potential adverse impacts since they are effects that could persist in certain habitats that are exposed to more or less continual, or frequently repeated, trawling activity. Furthermore, given the similarity in the habitat effects of dredges and trawls noted in the NRC (2002) and Morgan and Chuenpagdee (2003) reports, all of these potential adverse effects are considered to apply equally well to both gear types.

Looking at the effects of bottom trawls, scallop dredges, and hydraulic clam dredges in the NE region, there is more specific information to evaluate. According to the October 2001 workshop report (NREFHSC 2002), otter trawls had greater overall impacts than scallop dredges, but affected physical and biological structure equally. Effects on biological structure scored higher than effects on physical structure for both gears. In addition, trawls were judged to have some effects on major physical features. 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 makes it possible to rank these three substrates in terms of their vulnerability to the effects of bottom trawling and dredging, bearing in mind that other factors such as frequency of disturbance from fishing and from natural events are also important. Otter trawls and scallop dredges were assigned higher impact scores in gravel, mud ranked second for trawls (and sand third), and sand ranked second for scallop dredges (this gear is not used in mud habitats). Clam dredges had low impacts compared to scallop dredges and trawls and are only used in sand and not used to target groundfish stocks.

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.

Results of a comprehensive review of available gear effect studies published through the summer of 2002 (Stevenson et al. 2004) that were relevant to the NE region of the U.S. are summarized in Section

10.3.1.2.4.2 of Amendment 13. Positive and negative effects of otter trawls and scallop dredges from these publications are listed by substrate type in Amendment 13 along with recovery times (when known). Without more information on recovery times, it is difficult to be certain which of the negative effects listed in these tables last for, say, more than a month or two. In fact, it is difficult to conclude in some cases (e.g., furrows produced by trawl doors) whether the habitat effect is positive, negative, or just neutral. Despite these shortcomings in the information, the scientific literature for the NE region does provide some detailed results that confirm the previous determinations of potential adverse impacts of trawls and dredges that were based on the ICES (2001), NRC (2002), and Morgan and Chuenpagdee (2003) reports.

3.3. Social and Economic Environment

3.3.1 BACKGROUND AND DEFINITIONS

The following passage has been excerpted in part from the "Fishing Communities and Fishing Dependency in the Northeast Region of the United States:"

> When the Magnuson Act was amended in 1996 by the Sustainable Fisheries Act, a number of standards were identified as requisite for fishery management plans. Among them, National Standard 8 dictates "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." In its section on definitions, the Act defines the term "fishing community" as "a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such a community"
> (Hall-Arber et al, 1998).

Despite this legal requirement, there is still a dearth of adequate data on this subject, and that which exists is open to interpretation. One of the better sources is the MIT Sea Grant report entitled "New England's Fishing Communities" by Madeleine Hall-Arber et al. It describes at length the different ways to define a fishing community and how this term may or may not be designated by a geographical location. For the general purposes of this document, fishing communities are areas where there are substantial numbers of residents who make their primary living from harvesting the sea. In particular, for the purposes of evaluating the proposed action, there are three levels of fishing communities – New England as a region, the Cape and Islands as a sub-region, and Chatham / Harwich as a community. In order to provide a more comprehensive analysis of current circumstances, we include data from New England for additional context.

The following sections presents both social and environmental parameters of the affected environment as they are inextricably tied together to form the socio-economic environment affected by fisheries management decisions such as the proposed action.

3.3.2 SOCIAL AND ECONOMIC STATUS OF THE AFFECTED AREA

3.3.2.1 Overview

The Affected Human Environment of the multispecies fishery was described in detail in section 9.4 of Amendment 13. That discussion described the Northeast Multispecies fishery from FY 1994 (the year of implementation of Amendment 5) through 2001in accordance with available data. The information provided in that discussion is useful for understanding the response of the fishery to past management actions and to corroborate forecasts about the fishery's response to the management actions incorporated into Amendment 13. That discussion also speaks to compliance with M-S Act requirements. The Act requires the investigation of proposed actions that may bear upon the importance of fishery resources to fishing communities in order to provide for the sustained participation of those communities and, (consistent with the conservation requirements of the M-S Act) to the extent practicable, minimize adverse economic impacts on those communities. Section 9.4 of Amendment 13 also helps fulfill the NEPA requirement to consider the interactions of the natural and human environments and the impacts on both systems from any changes resulting from new, revised or abandoned governmental actions or policies.

Similarly, the Affected Human Environment of the monkfish fishery was detailed in Section 5.3 of the FSEIS for Amendment 2 to the Monkfish FMP, and has been updated through fishing year 2003 in the annual Stock Assessment and Fishery Evaluation (SAFE) Report. The Council is preparing a 2004 SAFE Report concurrent with the annual adjustment procedure for the 2006 fishing year. Approximately 75% of the monkfish limited access permit holders also hold multispecies limited access permits. Since Framework 3 only directly affects vessels with both monkfish and multispecies limited access permits, the Affected Human Environment discussion below applies to the vessels and communities affected by Framework 3. A separate discussion is provided to highlight the vessels' and community dependence on the monkfish fishery for the subset of affected monkfish vessels.

Substantial changes took place in the multispecies fishery after FY 2001. In FY 2002 and 2003, the fishery was managed under provisions implemented as a result of a lawsuit (*Conservation Law Foundation et al v. Donald Evans*) that imposed additional restrictions that were not in place in FY 2001: reductions in effort, additional closed areas, changes in gear, mesh size, etc. The impacts of these additional restrictions could not be fully described in Amendment 13 because the data were not available when the document was prepared. Amendment 13 was implemented in FY 2004, and data summarized in the following sections describes the impacts on the human environment in the first year after implementation.

Amendment 13 specified target TACs for regulated groundfish stocks. These target TACs were established using projected fishing mortality rates and stock conditions as of the most recent assessment. While the final measure of biological success for the FMP are the fishing mortality rates, target TACs are used to monitor the effectiveness of the management program between assessments. Table X compares the estimated catch in FY 2004 to the target TACs established by Amendment 13. Since GARM II calculated catch for the calendar year and not the fishing year, estimated catch was calculated using preliminary commercial landing statistics published by NMFS. Where appropriate, discards were added using the annual discard-to-kept ratio calculated for a stock as reported in GARM II. For GOM cod and SNE/MA winter flounder, an estimate of recreational harvest was added based on the average of the last three years. For GB yellowtail flounder, the catch shown was calculated by NMFS NERO while monitoring the U.S./Canada area fishery.

This table shows that catch in FY 2004 was less than or equal to the target TAC for almost all major regulated groundfish stocks. The sole exception is GOM cod. Overall, the fishery harvested sixty-two percent of the total target TACs. However target fishing mortality rates were not achieved for all stocks and as a result additional restrictions were required leading to FW 42.

Stock	FY 2003 Landings	FY 2004 Landings	D/K	Total Comm.	Total Catch	FY 2004 Target TAC	Percent of TAC
GB Cod	5,116	2,943		2,943	2,943	2,949	100%
GB Haddock	5,925	6,903	8%	7,448	7,448	14,955	50%
GB Yellowtail					5,776	6,000	96%
SNE/MA Yellowtail	137	156	76%	275	275	707	39%
CC/GOM Yellowtail	1,404	689	16%	799	799	881	91%
GOM Cod	3,325	3,723	15%	4,281	5,781	4,850	119%
Witch Flounder	3,065	2,888	8%	3,116	3,116	5,174	60%
Plaice	2,061	1,656	25%	2,065	2,065	3,695	56%
GOM Winter Flounder	677	473		473	473	3,286	14%
SNE/MA Winter Flounder	1,818	1,226	2%	1,251	1,551	2,860	54%
GB Winter Flounder	2,970	2,783		2,783	2,783	3,000	93%
White Hake	3,848	3,162	5%	3,320	3,320	3,839	86%
Pollock	4,298	5,456		5,456	5,456	10,584	52%
Redfish	383	486		486	486	1,632	30%
GOM Haddock	1,006	916		916	916	4,831	19%
Totals	24,992	23,614			43,188	69,243	62%

Table 11– FY 2004 estimated catch compared to FY 2004 target TACs for major groundfish species (mt, live weight)

(1) FY 2004 commercial landings from NERO preliminary landing stats. Final values may be differ.
(2) D/K ratios from GARM II, only used if included in calculating TAC
(3) GOM cod total catch includes 1500 mt recreational catch (average of last three years)
(4) SNE/MA winter flounder includes 300 mt of recreational catch (average of last three years)
(5) GB haddock, GB cod, and GB YTF TACs shown are for U.S. only
(6) Components of catch compared to the TACs are the same as used to calculate the TAC
(7) Pollock TAC includes Canadian catch of this stock, but shares are not allocated
(8) Ocean pout, halibut, N/S windowpane not shown
(9) GB yellowtail flounder FY 2004 catch calculated by NMFS NERO and reported to 2005 TRAC

3.2.2.2 New England

The entire New England region has centuries of identification as a collection of fishing communities. The New England fisherman in his yellow slicker and corn cob pipe is a world-famous stereotype, underscored by the reality of thousands of people in this region of all types, men and women, young and old, who still make a living today from harvesting the sea. Georges Bank, the Gulf of Maine, and Stellwagen Bank all remain active fishing grounds where generations have ventured and many have died in pursuit of the seafood prized by this region. According to the Northeast Multispecies Amendment 13 SEIS, 1,888 active vessels landed $105 million worth of groundfish in 2000. The majority of this fleet used otter trawl gear, followed next in numbers by hook and line, and finally by gillnets. New Bedford had the greatest amount of landings, followed in order by Portland, Gloucester, Chatham, and Boston.

Justification for a region-wide, port-by-port consideration of socio-economic environmental impacts from the proposed action can be found in the Amendment 13 Supplemental Environmental Impact Statement (SEIS):

> It is important, however, to consider the impacts of the proposed alternatives across all communities. Social impacts can be defined as the changes that a fisheries management action may create in people's way of life (how they live, work, play, and interact), people's cultural traditions (shared beliefs, customs, and values), and people's community (population structure, cohesion, stability, and character). As such, social impacts may result from changes in flexibility, opportunity, stability, certainty, safety, and other factors that are not specific to any community but oftentimes to any individual or entity experiencing changes resulting from a fishing regulation. It is possible that the social impacts of some measures under consideration would not be experienced solely by one community group or another; rather, it is likely that some impacts would be experienced across communities, gear sectors, and vessel size classes. An example of this would be a reduction in allocated DAS if it is applied to all multispecies permit holders. Another example would be a mesh restriction for otter trawl vessels.
> (NEFMC, Am 13 FSEIA, Section 5.6.1.3)

The multispecies fishery in the Northeastern United States consists of a commercial and recreational harvesting sector. The commercial sector consists of a wide range of vessels of different sizes using different gear types. The vessels are homeported in several coastal states, with most vessels claiming homeports in Maine, New Hampshire, Massachusetts, and Rhode Island. Gears that are typically used in the fishery include otter trawls, sink gillnets, bottom longlines, and hook gear. Detailed descriptions of these gears, and their impacts on EFH, are provided in section 9.2.3 of Amendment 13.

Since the implementation of Amendment 5 in 1994, all vessels that land regulated groundfish for commercial sale have been required to have a permit. Moratorium -commonly called limited access - permits were granted to vessels based on fishing history during a defined period. Limited access permit holders land the greatest quantity of regulated groundfish. The only new limited access permits granted since 1994 have been to a small number of handgear vessels, but the ownership of many vessels issued permits has changed. Most limited access permits are restricted in the number of DAS that can be fished. In addition, there have been open access permit categories. Open access permits can be requested at any time, and vessels fishing under open access permits are prohibited from holding a limited access and open access permit at the same time. Permits are issued in different categories, depending on the activity and history of the vessel. There have been several changes in the defined permit categories, as Amendment 5, Amendment 7, and Amendment 13 all changed the category definitions (see Section X). For this reason, when examining fishing activity based on permit category, care must be taken to make comparisons to similar permits. Many groundfish vessels have permits for, and participate in, other fisheries. For some vessels, groundfish revenues are only a small part of total fishing revenues.

In 2004, there were 752 monkfish limited access vessels, of which 343 were Category C permits holding limited access permits in either a Multispecies (61%) or Scallop (48%) fisheries, and 355 were Category D permits, primarily (98%) holding limited access Multispecies permits. Overall, 74% of monkfish limited access permit holders also hold multispecies limited access permits. Vessels in all four monkfish permit categories also hold limited access permits in a number of New England and Mid-Atlantic fisheries.

The FMP also provides an open-access permit (Category E) for vessels that do not qualify for a limited access permit, allowing those vessels to land monkfish caught incidentally in other fisheries. Table X shows that the number of category E permits increased during the first few years of the FMP but has remained relatively steady since 2001.

Amendment 13 provided a comprehensive review of the commercial groundfish harvesting sector from FY 1994 through FY 2001. Landings and revenues for vessels with groundfish permits were reported for each fishing year, aggregated by permit category, vessel length, homeport state, and gear type. In addition, since one of the primary effort controls used in the fishery is limits on the DAS fished, similar categories were used to describe the allocation and use of DAS by limited access vessels. A brief overview of that information follows, updated with data for FY 2002 through FY 2004. Detailed information on monkfish landings and revenues through FY 2004 is currently being prepared for the annual adjustment and SAFE Report. A summary of those data are provided in a subsection below. Information on landings and revenues for FY 2004 is preliminary.

In addition to information on landings and revenues, this section includes brief overviews of several management programs that were adopted in Amendment 13 or subsequent frameworks and are being considered for modification or renewal in this action. These programs include the DAS leasing program, the CAII yellowtail flounder SAP, the CAI Hook Gear Haddock SAP, and the Eastern U.S./CA Area Haddock SAP.

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	13	7	3	8	0	0	0	0	5	2	1
B	41	20	5	17	1	0	0	0	12	0	3
C	343	129	257	281	209	0	0	163	145	109	1
D	355	123	202	311	349	0	0	20	154	106	6
TOTAL	752	279	467	617	559	0	0	183	316	217	11
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	13	54%	23%	62%	0%	0%	0%	0%	38%	15%	8%
B	41	49%	12%	41%	2%	0%	0%	0%	29%	0%	7%
C	343	38%	75%	82%	61%	0%	0%	48%	42%	32%	0%
D	355	35%	57%	88%	98%	0%	0%	6%	43%	30%	2%
TOTAL	752	37%	62%	82%	74%	0%	0%	24%	42%	29%	1%

Table 12– Number and Percent of monkfish limited access vessels also issued a limited access permit in other fisheries in 2004, by permit category

Fishing Year	Number of permits
1999	1466
2000	1882
2001	1991
2002	2142
2003	2120
2004	2256
2005	2258
TOTAL 3501	

Table 13 – 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.

3.3.3.1 DAS Allocations and Use

One of the principle management measures used to control groundfish fishing mortality is limits on the amount of time that permit holders can fish for regulated groundfish. Most permits are allocated a fixed number of DAS. Amendment 13 reduced overall DAS allocations and categorizes DAS into four categories. Category A DAS can be used to fish for any regulated groundfish stock and are similar to the DAS that were allocated before Amendment 13. Category B (regular) and (reserve) DAS can only be used to target healthy groundfish stocks within specific management programs that include controls on the incidental catch of unhealthy stocks. Category C DAS cannot be used until some point in the future.

In FY 2004, approximately 44,492 Category A DAS were allocated to 1,484 permit holders. This includes DAS allocated to permits in the Confirmation of Permit History (CPH) category, as well as permits that may not have been renewed by the end of the fishing year, and is the net allocation after any transfers, sanctions, etc. Of these allocated DAS, just over 30,000, or 68 percent, were used. While this is a nine percent higher rate of use of allocated DAS than in FY 2003, fewer DAS were used than were assumed in Amendment 13 when estimating biological impacts of the proposed management measures. Category A DAS use by-month was similar to recent years (Table 14). There are only minor variations in the number of DAS used in each month, with April remaining the month with the most Category A DAS used.

DAS use by permit category is summarized in Table 15. Fewer vessels used DAS in FY 2004 than in any recent year – only 773 permits, a decline of seventeen percent from the previous year. While the number of DAS used by 'combination' permit holders increased from FY 2003 to FY 2004, all other permit categories used fewer DAS in FY 2004. Individual permit DAS use declined by 28 percent compared to FY 2003 Individual and Fleet permits combined, large mesh permit DAS use declined by 74 percent, and hook gear permits DAS use declined by 41 percent.

DAS use by vessel length group is summarized in Table 16. All length groups used fewer DAS in FY 2004 than in FY 2003. DAS use by the smallest vessels declined by 54 percent, for vessels between 30 and 50 feet it declined by 31 percent, for vessels between 50 and 75 feet it declined by 29 percent, and for vessels 75 feet and over it declined by 23 percent. The distribution of DAS according to vessel length criteria in FY 2004 differs slightly from that in FY 2003. In the aggregate, the two middle groups each accounted for just under 40 percent of DAS used, the largest length group accounts for just over 20 percent, and the smallest group accounts for one percent or less in both years.

DAS use by homeport state (as recorded on the permit application) is summarized in Table 17. For the principal groundfish fishing states, there were only minor changes in the number of permits allocated DAS. Since FY 2002, the number of boats listing Maine as a homeport has increased, and is now 16 percent higher than in FY 2002. The number of vessels listing New Hampshire or Rhode Island as homeport also increased since FY 2002, while the number declined for other states including Massachusetts. All states experienced a decline in both allocated and used DAS. The decline in allocated DAS was similar for Massachusetts (34 percent), New Hampshire (33 percent), and Maine (32 percent), as was the decline in used DAS (Massachusetts – 24 percent, New Hampshire – 23 percent, Maine – 21 percent,). Reductions in allocated and used DAS were higher for the other states listed, with vessels listing New Jersey homeports experiencing the largest decline in allocated DAS at 62 percent, and a 59 percent decline in used DAS.

DAS use by the principal gear listed on a permit's groundfish permit application is summarized in Table 18. Note that this may not be the gear used while fishing for groundfish. All gear types received fewer allocated DAS in FY 2004 compared to FY 2003, and all gear types used fewer DAS as well. DAS used by permits claiming otter trawl as principal gear declined by 27 percent, DAS use by gillnets declined by 33 percent and DAS use by longlines declined 35 percent. DAS use by handline vessels declined by 37 percent.

Information from these same tables can be used to characterize the DAS that were not used in FY 2004. This may be helpful in assessing whether DAS are likely to be re-activated. Most of the unused DAS are held by vessels with a Category A permit (85 percent, or about 12,100 DAS). The largest number of

unused DAS were held by vessels in the 30 to less than 50 ft. length group (54 percent, or about 7,800 DAS). The 50 ft. to less than 75 ft length class held 3,975 unused DAS (28 percent) while vessels 75 feet and over held 1,303 unused Category A DAS (nine percent). With respect to homeport state, most unused DAS were held by vessels that listed Massachusetts as homeport (8,377 DAS, or 58 percent). Only 28 percent of the unused DAS are held by vessels that did not use any DAS; 72 percent, or over 14,400 DAS, are held by vessels that used DAS during FY 2004. In addition to Category A DAS, Category B (regular) (1,707) and Category B (reserve) (1,291) DAS were also used in FY 2004. Nearly all were used by vessels 50 feet and over in length, reflective of the fact that most opportunities to use these DAS were on Georges Bank (Table 19). 92 percent of the Category B (regular) DAS and 83 percent of the Category B (reserve) DAS were used by vessels that listed a Massachusetts homeport on their permit applications.

	2001 Fishing Year		2002 Fishing Year		2003 Fishing Year*		2004 Fishing Year	
	DAS Used	% Total DAS Used	DAS Used	% Total DAS Used	DAS Used	% Total DAS Used	DAS Used	% Total DAS Used
May	5,722	9	2,543	6	2,766	7	1,757	6
June	7,675	12	3,964	10	4,471	11	2,700	9
July	5,411	8	3,197	8	4,100	10	2,785	9
August	4,494	7	3,041	7	3,734	9	2,640	9
September	3,930	6	2,938	7	3,175	7	2,709	9
October	3,750	6	2,680	6	3,155	7	2,123	7
November	4,509	7	3,172	8	3,415	8	2,591	9
December	6,396	10	4,052	10	3,333	8	2,488	8
January	5,509	8	3,143	8	2,382	6	2,034	7
February	4,382	7	2,687	6	2,857	7	2,050	7
March	5,455	8	4,718	11	3,985	9	2,816	9
April	8,116	12	5,572	13	4,974	12	3,359	11
Total DAS Used:	65,347	100	41,707	100	42,347	100	30,052	100
Total DAS Allocated**	156,233	42	71,270	59	71,344	59	44,492	68

Table 14 – Category A DAS use by month, FY 2001- FY 2004

Categories		(1) Total Number of Permitted Vessels	(2) Total Days-at-Sea Allocated	(3) Number of Permitted Vessels that Called In	(4) DAS Allocated to Vessels that Called In	(5) Total DAS Used	(6) % of DAS Used by Permitted Vessels ((5)/(2)*100)	(7) % of DAS Used by Permitted Vessels that Called In ((5)/(4)*100)
2001	Individual	137	17,819	132	17,356	16,347	92	94
	Fleet	1,169	111,737	789	76,277	40,690	36	53
	Combination	47	2,348	23	1,681	1,102	47	66
	Hook Gear	174	16,646	95	9,104	2,356	14	26
	Large Mesh	62	7,682	58	7,171	4,853	63	68
	Total	1,589	156,233	1,097	111,589	65,347	42	59
2002	Individual	138	13,888	131	13,629	12,400	89	91
	Fleet	1,041	48,063	734	40,882	24,878	52	61
	Combination	47	1,637	16	962	705	43	73
	Hook Gear	120	3,649	61	2,432	875	24	36
	Large Mesh	56	4,033	50	3,858	2,849	71	74
	Total	1,402	71,270	992	61,763	41,707	59	68
2003	Individual	139	14,247	132	13,908	12,994	91	93
	Fleet	1,047	48,468	683	39,192	25,492	53	65
	Combination	47	1,651	15	928	727	44	78
	Hook Gear	115	3,466	54	2,127	760	22	36
	Large Mesh	56	3,511	47	3,178	2,374	68	75
	Total	1,404	71,344	931	59,334	42,347	59	71
2004	Individual	1,188	40,111	692	36,982	27,924	70	76
	Small Vessel Exemption	7	20	0		0	0	0
	Combination	37	1,509	25	1,450	1,090	72	75
	Hook Gear	115	1,374	38	1,085	455	33	42
	Large Mesh	57	987	17	766	617	68	88
	N/A	80	492	1	33	10	2	30
	Total	1,484	44,492	773	40,317	30,096	68%	75

Table 15 – DAS allocated and used by limited access permit category, FY 2001- FY 2004 (Source: NMFS DAS, permit databases)

Categories		(1) Total Number of Permitted Vessels	(2) Total Days-at-Sea Allocated	(3) Number of Permitted Vessels that Called In	(4) DAS Allocated to Vessels that Called In	(5) Total DAS Used	(6) % of DAS Used by Permitted Vessels ((5)/(2)*100)	(7) % of DAS Used by Permitted Vessels that Called In ((5)/(4)*100)
2001	1 - 29 feet	122	11,293	66	6,404	1,474	13	23
	30 - 49 feet	890	87,062	588	58,365	30,365	35	52
	50 - 74 feet	407	40,666	321	33,250	23,144	57	70
	75+ feet	170	17,212	122	13,571	10,364	60	76
	Total	1,589	156,233	1,097	111,589	65,347	42	59
2002	1 - 29 feet	93	2,546	43	1,497	527	21	35
	30 - 49 feet	751	33,815	525	28,562	16,895	50	59
	50 - 74 feet	393	24,008	303	21,839	16,035	67	73
	75+ feet	165	10,901	121	9,864	8,250	76	84
	Total	1,402	71,270	992	61,763	41,707	59	68
2003	1 - 29 feet	102	3,115	41	1,419	500	16	35
	30 - 49 feet	762	33,928	492	27,424	17,176	51	63
	50 - 74 feet	382	23,442	288	20,742	16,267	69	78
	75+ feet	158	10,859	110	9,750	8,403	77	86
	Total	1,404	71,344	931	59,334	42,347	59	71
2004	1 - 29 feet	162	1,264	24	563	231	18%	41
	30 - 49 feet	743	19,650	405	17,534	11,841	60%	68
	50 - 74 feet	361	15,546	248	14,757	11,571	74%	78
	75+ feet	159	7,757	96	7,463	6,454	83%	86
	Unknown	59	275			0	0%	0
	Total	1,484	44,492	749	40,317	30,096	68%	75%

Table 16 - DAS allocated and used by vessel length group, FY 2001- FY 2004 (Source: NMFS DAS, permit databases)

State (Homeport)		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	Total DAS Used	% of DAS Used by Permitted Vessels	% of DAS Used by Permitted Vessels that Called In
2001	Maine	213	21,141	130	13,517	9,397	44	70
	New Hampshire	77	7,791	62	6,331	4,647	60	73
	Massachusetts	847	83,956	629	64,591	39,617	47	61
	Rhode Island	127	12,452	86	8,510	4,701	38	55
	Connecticut	17	1,606	13	1,214	647	40	53
	New York	155	14,932	94	9,138	3,248	22	36
	New Jersey	89	8,367	50	4,990	1,428	17	29
	Other	64	5,988	33	3,299	1,664	28	50
	Total	1,589	156,233	1,097	111,589	65,347	42	59
2002	Maine	180	9,615	118	8,136	5,957	62	73
	New Hampshire	73	4,266	56	3,816	2,615	61	69
	Massachusetts	752	40,589	567	36,275	24,725	61	68
	Rhode Island	107	5,848	83	5,187	3,761	64	73
	Connecticut	17	871	12	732	370	43	51
	New York	136	5,084	91	4,139	2,112	42	51
	New Jersey	79	2,866	41	2,013	1,108	39	55
	Other	58	2,131	24	1,465	1,059	50	72
	Total	1,402	71,270	992	61,763	41,707	59	68
2003	Maine	187	10,394	119	8,680	6,898	66	79
	New Hampshire	68	4,220	53	3,714	2,733	65	74
	Massachusetts	752	40,347	522	34,465	24,226	60	70
	Rhode Island	115	5,975	84	5,264	4,044	68	77
	Connecticut	17	848	13	716	400	47	56
	New York	129	4,713	76	3,406	1,928	41	57
	New Jersey	85	2,965	46	1,949	1,213	41	62
	Other	51	1,882	18	1,141	905	48	79
	Total	1,404	71,344	931	59,334	42,347	59	71

2004	Maine	209	7,053	98	6,521	5,477	78%	84%
	New Hampshire	75	2,836	47	2,577	2,101	74%	82%
	Massachusetts	744	26,765	451	24,835	18,388	69%	74%
	Rhode Island	116	3,146	67	2,899	1,997	63%	69%
	Connecticut	19	436	12	393	250	57%	64%
	New York	128	1,934	56	1,506	792	41%	53%
	New Jersey	83	1,129	33	901	499	44%	55%
	Other	110	1,194	9	686	592	50%	86%
	Total	1,484	44,492	110	40,317	30,096	68%	75%

Table 17 – DAS allocations and use by homeport state, FY 2001 –FY 2004 (Source: NMFS DAS, permit databases)

Categories		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	Total DAS Used	% of DAS Used by Permitted Vessels	% of DAS Used by Permitted Vessels that Called In
2001	Bottom Trawl	841	82,442	650	66,458	44,011	53	66
	Midwater Trawl	3	294	2	196	130	44	66
	Other Trawl	12	1,215	8	823	558	46	68
	Longlines	222	21,368	115	11,064	4,217	20	38
	Hand line	170	16,363	84	8,145	1,960	12	24
	Gillnet	321	32,593	228	23,925	14,044	43	59
	Pots and Traps	12	1,176	5	490	72	6	15
	Other	8	782	5	488	356	46	73
	Total	1,589	156,233	1,097	111,589	65,347	42	59
2002	Bottom Trawl	787	45,473	620	41,454	29,183	64	70
	Midwater Trawl	4	182	3	164	69	38	42
	Other Trawl	11	549	8	495	336	61	68
	Longlines	170	5,746	87	4,061	1,801	31	44
	Hand line	124	3,494	56	2,156	866	25	40
	Gillnet	287	15,069	207	12,819	9,115	60	71
	Pots and Traps	13	372	5	228	78	21	34
	Other	6	385	6	385	260	67	67
	Total	1,402	71,270	992	61,763	41,707	59	68
2003	Bottom Trawl	793	45,954	574	39,904	29,909	65	75
	Midwater Trawl	5	254	3	179	118	46	66
	Other Trawl	10	524	7	449	322	61	72
	Longlines	170	5,759	75	3,647	1,553	27	43
	Hand line	124	3,484	57	2,047	769	22	38
	Gillnet	285	14,692	207	12,621	9,400	64	74
	Pots and Traps	12	354	3	163	71	20	43
	Other	5	324	5	324	206	64	64
	Total	1,404	71,344	931	59,334	42,347	59	71
2004	Bottom Trawl	794	30,463	502	28,338	21,739	71%	77%
	Midwater Trawl	6	131	2	109	30	23%	28%

	Other Trawl	10	279	6	278	230	82%	82%
	Longlines	163	2,621	59	2,065	1,014	39%	49%
	Hand line	133	1,332	35	964	481	36%	50%
	Gillnet	282	8,817	160	8,174	6,337	72%	78%
	Pots and Traps	11	85	2	85	50	58%	58%
	Other	85	764	7	303	215	28%	71%
	Total	1,484	44,492	773	40,317	30,096	68%	75%

Table 18 – DAS allocations and use by principal gear designation, FY 2001 – FY 2004 (Source: NMFS DAS, permit databases)

Length Group	B (regular)	B (reserve)
0 to less than 30	8	2
30 to less than 50	38	87
50 to less than 75	666	651
75 and Over	995	551
Unknown	0	0
Grand Total	1,707	1,291

Table 19 – Category B DAS use, FY 2004 (Source: NMFS DAS, permit databases)

3.3.3.1 Monkfish DAS

Starting in Year 2 of the Monkfish 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. In the NFMA, however, there is no monkfish trip limit when a vessel is on either a combined (monkfish/multispecies or monkfish/scallop) DAS or a multispecies-only DAS, and, consequently, multispecies vessels in Categories C and D and fishing in the NMFA do not call-in monkfish DAS. Therefore, DAS usage has been well below the total DAS allocated (Table 20), and primarily reflects monkfish fishing activity in the SFMA. In FY 2004 call-in vessels (that is those fishing primarily in the SFMA) only 35% of their allocated DAS, or 59%, 39%, 32% and 33% for Categories A though D, respectively. For comparison, in FY 2003, Category A and B call-in vessels used 70% and 55% of their allocated DAS, respectively, while Category B and D call-in vessels used 46% and 41%. The decline is usage rates is directly the result of the reduced number of DAS (28) that vessels were allowed to use in the SFMA in FY 2004, even though their overall allocation remained at 40 DAS. DAS usage by Category C and D vessels that also hold a multispecies limited access permit increased from FY 2001 to FY 2003, but declined in FY 2004 (Figure 20).

Permit Category	**All Vessels**		**Call-In Vessels**	
	DAS Allocated	**DAS Used**	**DAS Allocated**	**DAS Used**
A	625	316	535	316
B	2,038	607	1,538	607
C	17,429	939	2,936	939
D	18,027	1,691	5,143	1,691
TOTAL	**38,118**	**3,553**	**10,151**	**3,553**

Table 20 – Monkfish DAS usage, FY 2004 *Source: NMFS Days-at-Sea (DAS) database via onboard Vessel Monitoring System*

Permit Category	**DAS Allocated**	**DAS Used**				
		Monkfish	**Monkfish/ Multispecies**	**Monkfish/ Scallop**	**Total**	**% Used**
A	535	316	0	0	316	59%
B	1,538	607	0	0	607	39%
C	2,936	0	939	0	939	32%
D	5,143	0	1,691	0	1,691	33%
TOTAL	**10,151**	**923**	**2,630**	**0**	**3,553**	35%

Table 21 - Monkfish-only, Monkfish/Multispecies and Monkfish/Scallop DAS Usage by call-in vessels (vessels fishing in the SFMA), FY 2004. *Source: NMFS Days-at-Sea (DAS) database via onboard Vessel Monitoring Systems (VMS)*

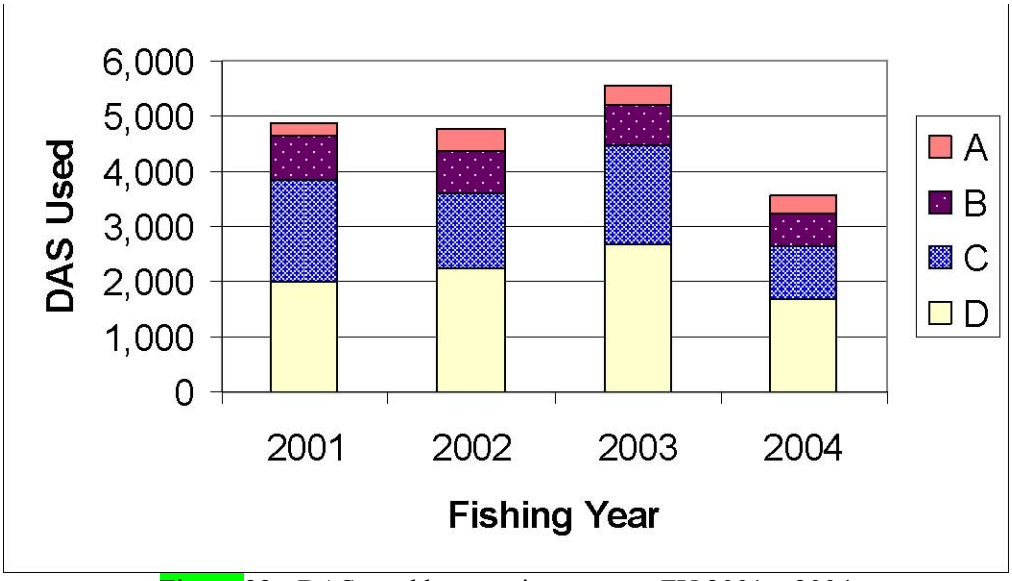

Figure 22 - DAS used by permit category, FY 2001 – 2004

3.3.3.2 Landings and Revenues

Landings and revenues by fishing year were summarized in Amendment 13, FW 40A, FW 40B, and FW 41. This section updates this information for FY 2001 through 2004. Minor differences exist between the information previously reported and this section due to updates to the databases and revisions to data queries. The data are also reported in different categories than in previous reports in order to capture changes in permit categories and changes in landings and revenues in communities. Landings and revenues for FY 2004 should be considered preliminary, as not all data may be reported and there may be corrections or revisions to the database in the future. There is also evidence that recent changes to the dealer reporting system have introduced uncertainty into the calendar year 2004 and 2005 data.

Regulated groundfish (cod, haddock, yellowtail flounder, winter flounder, witch flounder, windowpane flounder, plaice (dabs), pollock, redfish, Atlantic halibut, white hake, red/white hake mixed) and ocean pout landings and revenues are summarized in Table 22. This table includes all landings reported to the NMFS dealer database system, regardless of whether the landings can be attributed to a multispecies permit. It includes aggregate landings reported by states and landings that cannot be attributed to a permit as well as landings by vessels that did not possess a federal multispecies permit (i.e. landings from state registered vessels fishing in state waters). Regulated groundfish landings declined from 106 million pounds in FY 2001 to 79.6 million pounds (landed weight) in FY 2004, or 24.9 percent. Nominal revenues declined by 20.5 percent from FY 2001 ($106.1 million) to FY 2004 ($84.4 million), but revenues in constant 1999 dollars declined from $101.2 million in FY 2001 to $73.8 million in FY 2004, or 27 percent. The following sections summarize landings and revenues for groundfish permit holders only.

	Fishing Year			
	2001	2002	2003	2004
Landed weight (lbs.)	106,310,403	85,769,787	83,140,192	79,673,224
Live weight (lbs.)	116,673,620	94,560,545	91,691,778	87,071,413
Nominal revenues	$106,184,220	$102,167,428	$91,348,689	$84,413,555
Revenues (constant 1999 dollars)	$101,291,941	$98,120,698	$83,171,680	$73,789,602

Table 22 – Regulated groundfish landings and revenues, FY 2001 – FY 2004 Source: NMFS CFDBS. Prices adjusted to constant 1999 dollars using BLS PPI series WPUSOP3110

3.3.3.2.1 Landings and Revenues By Permit Category

Adopted in 1996, Amendment 7 implemented several different limited and open access permit categories in the multispecies fishery that were in effect in through FY 2003. The limited access permit categories were:

1. Individual
2. Fleet
3. Small vessel exemption
4. Hook gear
5. Combination vessel
6. Large mesh individual DAS
7. Large mesh fleet DAS

The open access categories were:

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

Amendment 13 modified groundfish permit categories by eliminating the Fleet DAS category, creating a limited access Handgear A category, and changing the designation of open-access handgear permits to a Handgear B permit category. The current limited access permit categories are:

1. Individual
2. Small vessel exemption
3. Hook Gear
4. Combination Vessel
5. Large Mesh Individual DAS
6. Handgear A
7. Handgear B
8. Scallop multispecies possession limit permit
9. Non-regulated multispecies permit
10. Charter/party (vessels cannot sell their catch and this is not considered a commercial permit)

Unlike previous reports, this section does not combine handgear permits with other permit categories so that the trends in groundfish landings by this category can be identified. In addition, both large mesh permit categories (fleet and individual DAS) are combined so that comparisons can be made before and after implementation of Amendment 13. Totals do not include data that cannot be reported due to confidentiality concerns.

Total landings by Individual and Fleet DAS permit holders (the primary components of the multispecies fleet) declined from 298 million pounds in FY 2001 to 243 million pounds in FY 2004, or about 18 percent. Landings by hook gear permit holders increased from 2.8 million pounds in FY 2001 to 8.6 million pounds in FY 2004. Large mesh permit holder landings increased from 8.3 million pounds to 12.7 million pounds during the same period. Total revenues did not follow the same patterns, however. While revenues for Individual and Fleet DAS permits declined from $183.7 million to $161.9 million, and hook gear revenues increased from $2.8 million to $3.8 million, large mesh permit holder revenues declined from $9.4 million to $6.5 million even though landings increased.

The number of groundfish permits landing regulated groundfish declined from 1,308 in FY 2001 to 937 in FY 2004, a decline of 28 percent. Regulated groundfish landings by permit holders declined from 103.4 million pounds in FY 2001 to 75.9 million pounds in FY 2004, a decline of 26.5 percent. All limited access permit categories landed less regulated groundfish in FY 2004 than in FY 2001. Hook gear, large mesh, and handgear (combined) categories showed increased landings from FY 2003 to FY 2004, while other permit categories experienced a decline. Groundfish revenues (in constant 1999 dollars) for permit holders declined from $98.7 million in FY 2001 to $70 million in FY 2004, or 29 percent. All limited access permit categories experienced a decline in groundfish revenues.

Average groundfish revenues for each permit remained nearly constant from FY 2001 ($75,464) to FY 2004 ($74,745). After an increase in FY 2002, average revenues were nearly the same in FY 2003 and FY 2004. Within limited access permit categories, the combined Individual and Fleet DAS permit holder average revenues declined from $104,503 in FY 2001 to $95,208 in FY 2004 (9 percent). Average groundfish revenues for hook gear permits increased from $15,553 to $24,192, while large mesh permit holder average revenues declined from $54,656 to $49,638. By combining DAS used with groundfish revenues, the average revenue per DAS by permit category can be estimated. Revenues per DAS peaked in FY 2002 for most categories, but are still higher in FY 2004 than in FY 2001 except for combination permits (Table 22).

	Fishing Year			
	2001	2002	2003	2004
Individual DAS	67,082,886	60,555,258	55,545,268	242,773,256
Fleet DAS	231,268,872	188,132,355	186,143,621	0
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.
Hook Gear	2,770,964	1,675,134	1,818,524	8,659,676
Combination Vessel	12,926,924	13,218,161	17,743,414	14,555,114
Large Mesh (Fleet and Ind.)	8,311,976	7,415,139	7,791,124	12,734,249
Handgear Open Access	126,761,476	72,361,485	143,865,251	Conf.
Handgear - A				2,237,854
Handgear - B				150,143,857
Open Access Combined	157,128,632	96,729,305	100,873,093	119,729,642
Total	606,251,730	440,086,837	513,780,295	550,833,648

Table 23 – Total landings (lbs., all species) by groundfish permit category (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Individual DAS	63,025,664	61,769,572	52,776,163	161,945,545
Fleet DAS	120,749,118	117,187,974	112,618,249	0
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.
Hook Gear	2,852,290	2,672,061	2,440,599	3,798,156
Combination Vessel	27,875,232	31,506,542	33,722,798	40,415,922
Large Mesh (Fleet and Ind.)	9,347,921	8,204,011	6,963,215	6,526,920
Handgear Open Access	28,876,200	24,430,067	28,567,536	Conf.
Handgear - A				1,329,704
Handgear - B				28,527,679
Open Access Combined	140,463,059	158,064,966	185,315,284	244,981,305
Total	393,189,483	403,835,192	422,403,844	487,525,230

Table 24 – Total revenues (1999 dollars) by permit category (Source: NMFS dealer, permit databases)

	Fishing Year			
	2001	2002	2003	2004
Individual DAS	132	131	131	690
Fleet DAS	734	676	649	
Small Vessel Exemption	4	1	1	2
Hook Gear	81	53	48	34
Combination Vessel	32	22	18	16
Large Mesh Ind. DAS	3	2	3	27
Large Mesh Fleet DAS	45	40	26	1
Handgear Open Access	226	179	156	0
Handgear - A				44
Handgear - B				75
Other open access	51	34	54	48
Total	1308	1138	1086	937

Table 25 – Number of multispecies permits landing regulated groundfish by permit category Table 27 – Regulated groundfish revenues (1999 dollars) by permit category (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Individual DAS	50,301,967	40,864,820	38,216,342	71,514,984
Fleet DAS	45,007,575	38,017,046	37,911,377	
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.
Hook Gear	1,098,050	528,342	478,978	627,033
Combination Vessel	3,820,879	2,465,981	2,839,056	1,884,694
Large Mesh (Fleet and Ind.)	2,679,578	1,352,573	1,303,702	1,523,528
Handgear Open Access	454,907	178,787	136,244	Conf.
Handgear - A				243,634
Handgear - B				68,427
Open Access Combined	49,841	69,615	137,776	100,601
Total	103,412,797	83,477,164	81,023,475	75,962,901

Table 26 – Regulated groundfish landings (lbs., landed weight), by permit category (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Individual DAS	47,350,276	45,337,884	36,329,010	65,693,764
Fleet DAS	43,149,345	44,378,189	39,425,668	0
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.
Hook Gear	1,259,791	762,448	645,149	822,541
Combination Vessel	3,817,705	2,910,922	2,966,103	1,757,455
Large Mesh (Fleet and Ind.)	2,623,493	1,609,948	1,185,943	1,389,876
Handgear Open Access	462,223	244,098	169,916	Conf.
Handgear - A				177,486
Handgear - B				89,749
Open Access Combined	44,313	82,499	128,340	105,183
Total	98,707,146	95,325,990	80,850,130	70,036,055

Table 27 – Regulated groundfish revenues (1999 dollars) by permit category (Source: NMFS dealer, permitdatabases)

	Fishing Year			
	2001	2002	2003	2004
Individual DAS	358,714	346,091	277,321	95,208
Fleet DAS	58,787	65,648	60,748	
(Combined Individual and Fleet)	104,503	111,172	97,121	
Small Vessel Exemption	Conf.	Conf.	Conf.	Conf.
Hook Gear	15,553	14,386	13,441	24,192
Combination Vessel	119,303	132,315	164,784	109,841
Large Mesh (Fleet and Ind.)	54,656	38,332	40,895	49,638
Handgear Open Access	2,045	1,364	1,089	
Handgear - A				4,034
Handgear - B				1,197
Open Access Combined	869	2,426	2,377	2,191
Total	75,464	83,766	74,448	74,745

Table 28 – Average regulated groundfish revenues (1999 dollars) by permit category

	2001	2002	2003	2004
Individual DAS	2,897	3,656	2,796	2,353
Fleet DAS	1,060	1,784	1,547	
(Individual and Fleet Combined)	1,587	2,407	1,968	
Hook Gear	535	871	849	1,808
Combination Vessel	3,464	4,129	4,080	1,612
Large Mesh (Fleet and Ind.)	541	565	500	2,253
Total	1,503	2,278	1,902	2,105

Table 29 – Average groundfish revenues (1999 dollars) per DAS for limited access DAS permit categories

3.3.3.2.2 Landings and Revenues by Vessel Length

Data was summarized for groundfish permit holders using vessel length as the criteria for groupings. While length is an imperfect proxy for fishing power, it is a readily understandable measure. Total landings increased between FY 2001 and FY 2004 for vessels less than 30 ft. and vessels between 30 and 50 ft., and declined for the two other size classes. Total revenues declined for vessels in the 30 to 50 ft. group and increased for all others.

Permitted vessels 75 feet an over in length landed 39 percent of regulated groundfish, vessels 50 to 75 feet landed 40 percent, vessels 30 to 50 feet landed 20 percent, and vessels less than 30 feet long landed less than one percent. Regulated groundfish landings declined for all length groups. The percentage of decline was inversely related to length group size. Vessels less than 30 ft. vessels experienced a 43 percent decline, vessels 30 to less than 50 ft. saw a 36 percent declined, vessels 50 to less than 75 ft. saw a 29.5 percent decline, and vessels 75 ft. an over saw a 16.2 percent decline. Similar patterns are evident for the changes in groundfish revenues.

	FY			
Length_Group	2001	2002	2003	2004
Less than 30	1,495,389	1,014,569	803,224	1,762,725
30 to less than 50	52,543,920	45,049,181	48,202,346	47,152,085
50 to less than 75	151,531,804	136,713,383	129,204,193	172,834,208
75 and over	400,687,205	257,309,891	335,571,309	329,131,596
Grand Total	606,258,318	440,087,024	513,781,072	550,880,614

Table 30– Total landings (lbs., all species) by vessel length group (Source: NMFS dealer, permit databases)

	FY			
Length_Group	2001	2002	2003	2004
Less than 30	1,424,591	1,118,139	1,168,695	1,963,784
30 to less than 50	56,990,900	52,382,614	50,111,408	50,488,564
50 to less than 75	122,166,309	126,437,970	127,060,363	135,028,741
75 and over	212,614,975	223,896,710	244,064,599	300,105,034
Grand Total	393,196,775	403,835,433	422,405,065	487,586,122

Table 31 – Total revenues (1999 dollars, all species) by vessel length group (Source: NMFS dealer, permit databases)

	FY			
Length_Group	2001	2002	2003	2004
Less than 30	839,251	396,167	354,991	482,878
30 to less than 50	23,905,156	17,927,058	18,436,523	15,305,823
50 to less than 75	43,518,214	34,342,719	32,791,598	30,707,862
75 and over	35,155,672	30,811,275	29,440,367	29,467,357
Grand Total	103,418,293	83,477,219	81,023,479	75,963,920

Table 32 – Regulated groundfish landings by vessel length group (Source: NMFS dealer, permit databases)

	FY			
Length_Group	2001	2002	2003	2004
Less than 30	941,506	569,663	460,279	519,821
30 to less than 50	23,414,935	21,908,376	19,405,092	16,612,189
50 to less than 75	40,378,809	37,929,211	32,015,334	26,188,956
75 and over	33,977,527	34,918,806	28,969,430	26,716,303
Grand Total	98,712,777	95,326,056	80,850,136	70,037,268

Table 33 – Regulated groundfish revenues (1999 dollars) by vessel length group (Source: NMFS dealer, permit databases)

3.3.3.2.3 Landings and Revenue by Gear

Summaries of landings and revenues by gear were also prepared. Reported gear in the dealer database is subject to error. With changes to the system in 2004 there is evidence that more landings and revenues are attributed to the incorrect gear code or are assigned to an "unknown" gear category (note the increase in the "all other gear" category for FY 2004). For these reasons, summaries by gear for FY 2004 may not be directly equivalent to those provided for earlier years.

Bottom trawls accounted for 70 percent of regulated groundfish landings in FY 2004, but experienced a 36.7 percent decline in landings since FY 2001. Sink gillnet vessels account for 11.6 percent of groundfish landings by groundfish permitted vessels; their landings declined 34.3 percent since FY 2001. In FY 2004, nearly 10 percent of groundfish landings could not be attributed to a specific gear based on dealer data.

	Fishing Year			
	2001	2002	2003	2004
Bottom Trawl	188,228,972	168,717,219	165,567,712	199,822,344
Bottom Longline	7,278,587	4,734,742	4,249,204	10,753,969
Handline/Rod/Reel	2,029,456	1,162,090	1,384,449	23,201,144
Sink Gillnet	33,552,326	28,087,121	36,058,742	23,574,454
Midwater Trawl(inc. pair)	250,058,561	124,735,845	186,731,452	110,915,255
Shrimp Trawl	1,369,085	3,104,192	2,634,737	356,845
Scallop dredge	43,250,450	45,266,061	52,767,095	61,563,855
Lobster Trap	4,608,975	4,238,146	4,054,289	467,676
All Other	75,881,906	60,041,608	60,333,392	120,225,072
Total	606,258,318	440,087,024	513,781,072	550,880,614

Table 34 – Total landings (lbs., landed weight) by gear (Source: NMFS dealer database)

	Fishing Year			
	2001	2002	2003	2004
Bottom Trawl	150,395,653	149,682,769	138,326,407	128,900,649
Bottom Longline	6,901,615	4,856,465	3,969,346	10,814,727
Handline/Rod/Reel	2,464,644	1,709,897	3,315,590	12,223,525
Sink Gillnet	32,581,184	28,559,046	27,640,682	20,716,331
Midwater Trawl(inc. pair)	15,140,466	8,294,244	12,802,395	10,117,934
Shrimp Trawl	2,940,742	4,204,671	1,689,768	901,269
Scallop dredge	145,908,250	171,634,498	198,627,537	256,031,824
Lobster Trap	11,056,443	10,002,216	9,822,531	1,122,663
All Other	25,807,778	24,891,627	26,210,809	46,757,200
Total	393,196,775	403,835,433	422,405,065	487,586,122

Table 35 – Total revenues (1999 dollars) by gear (Source: NMFS dealer database)

	Fishing Year			
	2001	2002	2003	2004
Bottom Trawl	84,308,295	71,062,949	67,531,231	53,399,152
Bottom Longline	2,755,125	1,017,788	1,128,411	2,042,216
Handline/Rod/Reel	1,646,085	758,320	567,999	1,695,734
Sink Gillnet	13,460,168	10,390,033	11,656,348	8,844,219
Midwater Trawl(inc. pair)	0	0	0	770,843
Shrimp Trawl	2,015	1,243	4,001	0
Scallop dredge	341,310	146,469	11,645	1,682,405
Lobster Trap	11,478	18,279	7,261	19,843
All Other	893,817	82,138	116,583	7,509,508
Total	103,418,293	83,477,219	81,023,479	75,963,920

Table 36 – Regulated groundfish landings (lbs., landed weight) by gear (Source: NMFS dealer database)

	Fishing Year			
	2001	2002	2003	2004
Bottom Trawl	80,484,892	80,500,707	67,660,828	47,833,115
Bottom Longline	3,213,608	1,509,437	1,365,583	2,559,638
Handline/Rod/Reel	1,893,695	1,092,070	807,927	2,123,995
Sink Gillnet	11,976,846	11,942,517	10,875,049	8,028,378
Midwater Trawl(inc. pair)	0	0	0	840,800
Shrimp Trawl	3,045	1,070	6,665	0
Scallop dredge	292,442	140,050	11,791	1,768,909
Lobster Trap	10,093	18,275	8,740	26,406
All Other	838,155	121,929	113,553	6,856,027
Total	98,712,777	95,326,056	80,850,136	70,037,268

Table 37 – Regulated groundfish revenues (1999 dollars) by gear (Source: NMFS dealer database)

3.3.3.2.4 Landings and Revenue by Homeport State

Permit holders list a homeport state when applying for their permit. This information is used to summarize landings and revenues by state as and as an indicator of the communities benefiting from groundfish-derived revenues. Note that the homeport state is not necessarily the port of landing or the home of the owner or operator of the vessel.

Most groundfish landings revenues are attributed to vessels that list homeport as Massachusetts, Maine, Rhode Island, or New Hampshire. Landings for groundfish permit holders from all four of these states declined between FY 2001 and FY 2004. Groundfish landings for Massachusetts vessels declined 26.3 percent, for New Hampshire vessels declined 31 percent, for Maine vessels declined 22 percent,, and for Rhode Island vessels declined 15.8 percent. Groundfish revenues for Massachusetts vessels declined 27.6 percent, for New Hampshire vessels declined 26.3 percent, for Maine vessels declined 24.7 percent,, and for Rhode Island vessels declined 31.5 percent.

	Fishing Year			
	2001	2002	2003	2004
ME	78,724,996	59,323,936	57,293,476	54,335,286
NH	13,367,647	5,642,063	12,581,323	40,061,562
MA	283,227,205	198,514,601	255,231,528	266,992,307
RI	75,348,434	38,070,333	43,504,270	45,785,822
CT	363,090	439,728	1,436,588	1,828,590
NY	30,724,670	27,716,785	26,217,127	22,378,153
NJ	88,004,781	70,218,101	77,464,613	74,989,884
DE	1,263,676	885,613	973,135	1,221,721
MD	1,124,305	1,109,931	911,642	1,090,051
VA	11,467,791	11,450,314	11,345,162	11,748,455
NC	19,079,500	23,031,633	22,944,851	26,319,436
FL	507,722	531,941	569,839	699,280
Other	3,054,501	3,152,045	3,307,518	3,430,067
Total	606,258,318	440,087,024	513,781,072	550,880,614

Table 38 – Total landings (lbs., landed weight) by homeport state (Source: NMFS dealer, permit databases)

	Fishing Year			
	2001	2002	2003	2004
ME	26,648,572	24,719,144	23,272,408	24,774,454
NH	8,418,482	7,075,586	6,090,693	9,153,546
MA	195,412,584	204,127,976	203,417,148	225,806,766
RI	30,800,864	28,547,281	31,463,327	30,256,897
CT	614,571	731,416	3,001,739	5,092,783
NY	26,409,700	25,138,900	23,452,497	20,898,353
NJ	44,299,399	47,744,846	58,019,883	77,080,772
DE	1,277,520	1,037,867	1,171,139	1,466,165
MD	980,506	899,123	861,470	1,065,106
VA	30,689,328	32,978,205	35,881,338	44,606,046
NC	20,075,649	24,658,834	28,596,262	36,901,704
FL	1,578,050	1,931,351	2,106,040	3,276,680
Other	5,991,550	4,244,904	5,071,122	7,206,850
Total	393,196,775	403,835,433	422,405,065	487,586,122

Table 39 – Total revenues (1999 dollars) by homeport state (Source: NMFS dealer, permit databases)

	Fishing Year			
	2001	2002	2003	2004
ME	15,319,317	11,649,857	12,854,761	12,015,318
NH	4,712,053	3,313,107	3,445,717	3,262,416
MA	67,392,307	54,942,388	50,527,509	49,674,945
RI	7,239,855	7,225,382	7,596,776	6,101,959
CT	115,152	206,295	205,084	164,476
NY	4,199,723	3,589,125	3,373,185	1,722,828
NJ	854,198	502,831	658,452	681,537
DE	795,924	510,232	520,868	738,535
MD	2,115	2,437	423	459
VA	847,588	149,890	271,458	166
NC	1,254,276	866,766	1,010,968	1,356,422
FL	0	636	250	0
Other	685,785	518,273	558,028	244,859
Total	103,418,293	83,477,219	81,023,479	75,963,920

Table 40 – Regulated groundfish landings (lbs., landed weight) by homeport state (Source: NMFS dealer, permit databases)

	Fishing Year			
	2001	2002	2003	2004
ME	14,098,122	12,316,308	11,474,684	10,624,622
NH	4,341,833	3,710,667	3,313,121	3,201,731
MA	65,043,154	64,172,777	52,134,291	47,097,741
RI	6,988,306	8,171,293	7,470,966	4,792,014
CT	100,283	214,740	229,318	162,007
NY	4,076,850	4,135,699	3,361,342	1,600,170
NJ	709,112	513,519	718,432	686,280
DE	793,705	550,726	531,451	732,119
MD	2,399	2,851	160	442
VA	835,778	211,224	249,159	115
NC	1,112,987	854,578	888,794	913,906
FL	0	1,005	106	0
Other	610,249	470,669	478,311	226,121
Total	98,712,777	95,326,056	80,850,136	70,037,268

Table 41 – Regulated groundfish revenues (1999 dollars) by homeport state (Source: NMFS dealer, permit databases)

3.3.3.2.5 Landings and Revenues by Landed Port Groups

Amendment 13 identified port groups that participated in the groundfish fishery and described changes in landings and revenues over time for those port groups. This section partially updates that information. The data in this section summarize landings and revenues by groundfish permit holders that occurred in a port group, regardless of the homeport of the vessel that landed the catch. It does not include landings of groundfish by vessels that did not have a groundfish permit (state registered vessels fishing in state waters).

The New Bedford Coast group had the most groundfish landings in both FY 2001 and FY 2004, followed by Gloucester and the North Shore and the Lower Mid-Coast Maine (which includes Portland). While these are the same three port groups that accounted for the most landings in FY 2001, since then there has been a slight shift and Gloucester and the North Shore has overtaken Lower Mid-Coast Maine. New Bedford landings declined 23.1 percent, Gloucester and the North Shore landings declined 23.7 percent, and Lower Mid-Coast Maine landings declined 25.9 percent. The only port group that saw an increase in groundfish landings was Southern Maine (+54 percent), but this group accounts for a miniscule part of total groundfish landings (less than 0.1 percent).

The New Bedford coast, Gloucester and the North Shore, and Lower Mid-Coast Maine are also the three largest port groups in terms of groundfish revenues. All three saw revenues decline from FY 2001 to FY 2004: New Bedford Coast -33 percent, Gloucester and the North Shore -20 percent, and Lower Mid-Coast Maine -28.3 percent. Southern Maine, Northern Coastal NJ, and Southern Coastal NJ increased groundfish revenues between FY 2001 and FY 2004, but these three groups account for only a small part of groundfish revenues.

		Fishing Year			
		2001	2002	2003	2004
Maine	DOWNEAST ME	Conf.	Conf.	1,370,037	1,274,174
	UPPER MID_COAST ME	45,475,509	20,846,839	21,739,636	33,528,959
	LOWER MID_COAST ME	86,291,510	48,763,435	57,138,362	45,978,105
	SOUTHERN ME	409,035	424,372	374,822	931,542
Maine Total		132,176,054	70,034,646	79,252,820	80,438,606
New Hampshire	COASTAL NH	13,944,028	18,220,967	23,343,645	19,849,330
New Hampshire Total		13,944,028	18,220,967	23,343,645	19,849,330
Massachusetts	GLOUCESTER AND NORTH SHORE	114,314,736	55,069,635	98,413,636	74,246,256
	BOSTON AND SOUTH SHORE	10,456,302	9,540,137	8,317,949	6,839,322
	CAPE AND ISLANDS	18,744,749	14,965,246	12,666,623	40,818,905
	NEW BEDFORD COAST	81,867,937	82,353,878	101,154,939	128,434,197
	Other MA	111,659	17,697	82,387	1,531
Massachusetts Total		225,495,383	161,946,593	220,635,534	250,340,211
Rhode Island	COASTAL RI	79,009,995	49,433,268	50,983,080	46,635,969
	Other RI	0	114,000	650,822	285,212
Rhode Island Total		79,009,995	49,547,268	51,633,902	46,921,181
Connecticut	COASTAL CT	0	147,133	1,327,493	1,902,366
Connecticut Total		0	147,133	1,327,493	1,902,366
New York	LONG ISLAND NY	22,558,582	20,447,040	18,375,148	16,475,538
	Other NY	Conf.	4,422	5,647	Conf.
New York Total		22,558,582	20,451,462	18,380,795	16,475,538
New Jersey	NORTHERN COASTAL NJ	24,017,723	22,609,450	19,766,855	19,487,126
	SOUTHERN COASTAL NJ	49,755,926	55,551,760	61,286,494	76,677,688
	Other NJ	Conf.	226,238	12,589	7,082
New Jersey Total		73,773,649	78,387,448	81,065,938	96,171,896
All Other		57,379,970	40,839,368	36,770,908	36,736,451
Total		604,337,661	439,574,885	512,411,035	548,835,579

Table 42 – Total landings (lbs., landed weight) by state and port group of landing (Source: NMFS dealer database)

		Fishing Year			
		2001	2002	2003	2004
Maine	DOWNEAST ME	Conf.	Conf.	1,567,200	1,096,791
	UPPER MID_COAST ME	5,523,321	3,983,693	3,642,532	3,499,187
	LOWER MID_COAST ME	26,966,607	24,222,250	21,479,155	20,572,472
	SOUTHERN ME	363,990	462,818	355,724	882,347
Maine Total		32,853,919	28,668,760	25,477,412	24,954,006
New Hampshire	COASTAL NH	7,933,548	7,013,721	5,707,132	7,356,352
New Hampshire Total		7,933,548	7,013,721	5,707,132	7,356,352
Massachusetts	GLOUCESTER AND NORTH SHORE	31,314,685	27,527,827	30,362,625	24,928,648
	BOSTON AND SOUTH SHORE	8,781,966	10,808,050	9,208,720	8,087,513
	CAPE AND ISLANDS	19,555,467	16,007,622	15,003,572	12,684,748
	NEW BEDFORD COAST	137,487,702	153,752,423	155,937,851	189,795,661
	Other MA	135,757	54,339	57,798	9,575
Massachusetts Total		197,275,578	208,150,261	210,570,566	235,506,145
Rhode Island	COASTAL RI	33,099,343	29,064,260	30,491,931	31,471,621
	Other RI	0	10,151	37,918	31,942
Rhode Island Total		33,099,343	29,074,411	30,529,849	31,503,562
Connecticut	COASTAL CT	0	14,813	1,827,501	4,364,964
Connecticut Total		0	14,813	1,827,501	4,364,964
New York	LONG ISLAND NY	18,953,727	17,190,332	15,878,884	15,169,063
	Other NY	Conf.	5,571	5,133	Conf.
New York Total		18,953,727	17,195,903	15,884,016	15,169,063
New Jersey	NORTHERN COASTAL NJ	23,191,525	24,438,418	26,242,579	30,149,723
	SOUTHERN COASTAL NJ	26,446,866	28,905,303	37,073,019	56,671,323
	Other NJ	Conf.	215,737	17,953	4,694
New Jersey Total		49,638,391	53,559,458	63,333,551	86,825,740
All Other		50,696,457	58,297,079	67,507,837	80,325,348
Total		390,450,962	401,974,407	420,837,865	486,005,180

Table 43 – Total revenues (1999 dollars) by state and port group of landing (Source: NMFS Dealer database)

		Fishing Year			
		2001	2002	2003	2004
Maine	DOWNEAST ME	Conf.	Conf.	0	0
	UPPER MID_COAST ME	1,776,235	1,495,340	1,453,711	645,998
	LOWER MID_COAST ME	18,548,510	14,065,240	13,844,756	13,757,184
	SOUTHERN ME	360,248	261,089	299,639	554,850
Maine Total		20,684,993	15,821,669	15,598,106	14,958,032
New Hampshire	COASTAL NH	3,881,879	2,625,237	2,926,183	3,441,705
New Hampshire Total		3,881,879	2,625,237	2,926,183	3,441,705
Massachusetts	GLOUCESTER AND NORTH SHORE	18,390,780	15,808,691	16,777,975	14,049,048
	BOSTON AND SOUTH SHORE	5,974,231	5,907,806	5,650,258	4,969,629
	CAPE AND ISLANDS	8,140,487	4,992,069	4,346,465	3,736,423
	NEW BEDFORD COAST	40,733,040	34,236,222	31,697,104	31,340,361
	Other MA	94,503	8,979	0	0
Massachusetts Total		73,333,041	60,953,767	58,471,802	54,095,461
Rhode Island	COASTAL RI	3,582,482	3,224,566	2,859,158	2,546,180
	Other RI	0	0	0	0
Rhode Island Total		3,582,482	3,224,566	2,859,158	2,546,180
Connecticut	COASTAL CT	0	0	6,003	127,971
Connecticut Total		0	0	6,003	127,971
New York	LONG ISLAND NY	1,319,273	584,058	658,362	347,996
	Other NY	Conf.	1,746	0	Conf.
New York Total		1,319,273	585,804	658,362	347,996
New Jersey	NORTHERN COASTAL NJ	578,599	262,028	498,746	432,743
	SOUTHERN COASTAL NJ	5,217	2,238	1,278	2,691
	Other NJ	Conf.	0	0	0
New Jersey Total		583,816	264,266	500,024	435,434
All Other		3,601	1,620	3,841	10,031
Total		103,389,085	83,476,929	81,023,479	75,962,810

Table 44 – Regulated groundfish landings (lbs., landed weight) by state and port group of landing (Source: NMFS dealer database)

		Fishing Year			
		2001	2002	2003	2004
Maine	DOWNEAST ME	Conf.	Conf.	0	0
	UPPER MID_COAST ME	1,536,473	1,544,274	1,314,704	546,146
	LOWER MID_COAST ME	17,084,498	14,938,683	12,529,905	12,250,829
	SOUTHERN ME	316,389	290,933	258,734	580,032
Maine Total		18,937,361	16,773,890	14,103,342	13,377,006
New Hampshire	COASTAL NH	3,669,818	3,124,968	2,818,639	3,369,105
New Hampshire Total		3,669,818	3,124,968	2,818,639	3,369,105
Massachusetts	GLOUCESTER AND NORTH SHORE	18,337,004	18,679,739	18,018,063	14,689,080
	BOSTON AND SOUTH SHORE	5,890,936	7,127,134	6,328,123	5,235,644
	CAPE AND ISLANDS	8,333,940	6,426,246	4,909,361	4,542,185
	NEW BEDFORD COAST	38,403,153	38,447,516	30,465,904	25,732,581
	Other MA	104,023	16,085	0	0
Massachusetts Total		71,069,056	70,696,720	59,721,451	50,199,489
Rhode Island	COASTAL RI	3,305,880	3,712,060	2,874,182	2,088,983
	Other RI	0	0	0	0
Rhode Island Total		3,305,880	3,712,060	2,874,182	2,088,983
Connecticut	COASTAL CT	0	0	5,033	106,222
Connecticut Total		0	0	5,033	106,222
New York	LONG ISLAND NY	1,216,979	698,168	740,911	374,781
	Other NY	Conf.	1,617	0	Conf.
New York Total		1,216,979	699,785	740,911	374,781
New Jersey	NORTHERN COASTAL NJ	485,958	315,221	583,554	507,516
	SOUTHERN COASTAL NJ	2,186	1,986	1,277	3,219
	Other NJ	Conf.	0	0	0
New Jersey Total		488,144	317,207	584,831	510,735
All Other		1,483	1,136	1,745	10,201
Total		98,688,720	95,325,765	80,850,136	70,036,522

Table 45- Regulated groundfish revenues (1999 dollars) by state and port group of landing (Source: NMFS dealer database)

Landings and Revenues for Primary Groundfish Ports

Amendment 13 identified eight primary groundfish ports (see Section 3.3.3). This section summarizes recent activity in those ports. All eight ports experienced a decline in the number of vessels with groundfish permits that landed regulated groundfish. The smallest decline was in Portland ME, which experienced a 5 percent decline in the number of permitted vessels landing regulated groundfish. Chatham/Harwichport experienced a 53 percent decline, the largest in any port over this period. Gloucester and New Bedford/Fairhaven, two other large ports, respectively experienced a 22 percent and a 21 percent decline. Most ports experienced a decline in total landings between FY 2001 and FY 2004, with New Bedford the sole exception. Boston, New Bedford/Fairhaven, and Pt. Judith saw an increase in total revenues, while all other ports experienced a decline. Groundfish landings declined in all ports, with Boston experiencing the least decline (8 percent) and Eastern Long Island the largest (71 percent). Groundfish landings declined 22 percent in Portland, 19 percent in Gloucester, and 23 percent in New Bedford/Fairhaven. Landings declined 59 percent in Chatham/Harwichport.

	2001	2002	2003	2004
Portland ME	117	111	105	111
Portsmouth NH	67	62	33	41
Gloucester MA	261	235	226	202
Boston MA	36	27	30	24
Chatham/Harwichport MA	248	179	150	116
New Bedford/Fairhaven	230	219	229	182
Pt Judith, RI	105	85	83	75
Eastern Long Island, NY	112	94	88	69

Table 46 – Number of vessels with multispecies permits landing regulated groundfish in principal groundfish ports (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Portland ME	75,554,441	46,867,048	56,192,626	44,330,373
Portsmouth NH	4,290,244	2,639,830	5,447,754	3,622,453
Gloucester MA	112,723,002	53,717,051	97,359,033	73,215,332
Boston MA	7,835,595	6,245,445	5,619,980	5,449,678
Chatham/Harwichport MA	11,284,149	7,675,769	8,832,267	7,244,056
New Bedford/Fairhaven	80,549,608	81,599,048	99,865,857	112,039,634
Pt Judith, RI	35,696,124	37,656,523	38,237,745	33,777,861
Eastern Long Island, NY	20,953,207	18,458,011	16,745,447	14,291,397

Table 47 – Total landings for principal groundfish ports (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Portland ME	24,495,657	22,416,205	20,442,786	19,587,623
Portsmouth NH	4,337,506	3,429,332	2,590,320	3,338,005
Gloucester MA	29,675,671	25,623,278	28,958,880	24,271,485
Boston MA	6,161,785	7,265,831	5,995,997	6,410,317
Chatham/Harwichport MA	9,192,985	6,963,426	7,505,361	7,520,297
New Bedford/Fairhaven	135,591,155	152,755,151	154,775,657	187,712,337
Pt Judith, RI	21,626,251	20,462,169	21,108,156	22,410,212
Eastern Long Island, NY	17,521,760	15,704,951	14,470,985	13,579,044

Table 48 – Total revenues (1999 dollars) for principal groundfish ports (Source: NMFS dealer, permit databases

	2001	2002	2003	2004
Portland ME	17,127,475	13,120,369	13,248,132	13,336,041
Portsmouth NH	2,292,399	1,249,678	1,574,926	1,604,137
Gloucester MA	16,995,463	14,766,480	15,911,942	13,755,265
Boston MA	4,179,936	4,023,466	3,614,632	3,846,639
Chatham/Harwichport MA	6,568,867	3,621,805	3,385,319	2,742,502
New Bedford/Fairhaven	40,730,450	34,234,701	31,693,225	31,340,092
Pt Judith, RI	2,206,179	1,863,781	1,602,789	1,685,393
Eastern Long Island, NY	1,163,630	546,352	615,226	337,261

Table 49 – Groundfish landings for principal groundfish ports (Source: NMFS dealer, permit databases)

	2001	2002	2003	2004
Portland ME	15,841,728	13,957,569	11,956,071	11,835,434
Portsmouth NH	1,953,759	1,285,313	1,266,358	1,371,651
Gloucester MA	16,918,799	17,330,635	16,944,675	14,317,266
Boston MA	4,212,193	4,864,040	3,859,636	3,948,158
Chatham/Harwichport MA	6,826,782	4,805,410	3,795,130	3,412,989
New Bedford/Fairhaven	38,400,108	38,445,632	30,463,853	25,732,374
Pt Judith, RI	2,055,422	2,157,415	1,697,689	1,425,866
Eastern Long Island, NY	1,084,559	658,862	698,401	363,752

Table 50 – Groundfish revenues for principal groundfish ports (Source: NMFS dealer, permit databases)

3.3.3.2.7 Landings and Revenues Summary

Groundfish landings and revenues declined substantially in FY 2004, coincident with the implementation of regulations adopting Amendment 13. When evaluated based on constant 1999 dollars, regulated groundfish revenues by groundfish permit holders were the lowest experienced during any year between FY 1994 and FY 2001. At just over $70 million, they were 30 percent lower than in FY 2001 and 15 percent lower than in FY 1997. Landing and revenue declines were widespread throughout the fishery and, with the exception of some minor port groups, occurred across almost all examined categories of groundfish permit holders. Major groundfish landing ports all experienced similar declines in landings and revenues. Average per vessel revenues did not change appreciably during this period because of the decline in permit holders landing regulated groundfish.

The changes in revenue for the fishery as a whole are similar to those that Amendment 13 estimated would occur, with a caveat. Analyses in Amendment 13 estimated changes in groundfish revenues based on average revenues over a baseline period (1998-2001) and predicted a twenty-five percent decline in nominal groundfish revenues as a result of restrictions on Category A DAS. Groundfish revenues declined thirty percent in FY 2004 from the 1998-2001 average (see Appendix V).

3.3.3.3 Days-At-Sea Leasing and Transfer Programs

Amendment 13 implemented two programs that allowed the transfer of DAS between permit holders. The DAS transfer program provided an opportunity for the permanent transfer of DAS from one groundfish permit to another. Through November of 2005, no DAS transfers had occurred. The DAS leasing program provided an opportunity for the temporary transfer of DAS from one permit to another. This program was frequently used. Appendix I provides a summary and analysis for this program in FY 2004. Major elements of that report are summarized below.

From May 2, 2004, through April 30, 2005, over 6,000 DAS were leased, at a value of $2.5 million. This is roughly fourteen percent of all Category A DAS that were allocated. Most DAS were leased by trawl vessels, although there were some leases by gillnet vessels. In terms of ports, vessels from Portland leased roughly 26 percent of the total, New Bedford vessels leased 18 percent, and Gloucester vessels leased 13 percent. Most DAS were leased by those vessels that were allocated between 48.3-98.4 Category A DAS – in other words, vessels that have been the most active in the groundfish fishery. Most leased DAS were actually used (5,615 used out of over 6,000 leased). This does not mean that lessees used all allocated DAS, however, since leased DAS are assumed to be used first. Leasing appears to have helped mitigate the economic impacts of Amendment 13, as it allowed many lessees to obtain enough DAS to continue to fish, meet overhead expenses, and pay crew.

The biological impacts of leasing are difficult to separate from the impacts of other Amendment 13 measures. Total DAS use (see Section 3.3.3.1) in FY 2004 was less than anticipated in Amendment 13, even though more leased DAS were used than allowed for in that analysis. The biological impacts do not appear to be conservation neutral, but they also do not appear to be the same for all stocks. As a result of DAS leasing, mortality appears to have increased for many stocks, but appears to have declined for SNE/MA yellowtail flounder and redfish. Overall, the biological impacts of leasing in FY 2004 do not appear to have been substantial.

The DAS leasing program resulted in an active market in the exchange of DAS, with nearly 15 percent of the baseline allocations being transferred through the leasing program. The primary users of the program were those vessels that received the highest DAS allocations in FY 2004, showing that the leasing market was mainly used by active groundfish vessels, the group predicted to have the largest reduction in fishing revenues under Amendment 13. The leasing program provided regulatory relief which allowed lessee vessels, on average, to fish enough to cover their overhead and crew expenses. Consistent with the analysis of Amendment 13, DAS tended to move to the primary groundfish fishing states of Maine and

Massachusetts. While the leasing program may have benefited some southern New England and mid-Atlantic stocks, it may have contributed to increased catches of several GOM and GB stocks. The differing impacts on different stocks illustrate the difficulty in levying a conservation tax in order to attain conservation neutrality. The levy would need to be stock or area specific and would have unintended consequences for other stocks. Additionally, other management measures that are implemented and their expected impact on the fleet would need to be considered.

These analyses are subject to the following sources of uncertainty:

1. The price paid for a leased DAS is reported by the lessee vessel and may not accurately reflect the actual price paid. There is anecdotal information that some lease agreements are based on a share of the catch, which would not yet be known when the lease report is provided to NMF.
2. It is difficult to separate the biological impacts of other management measures from the impacts of the DAS leasing program.
3. A key assumption when estimating biological impacts is that all fishing activity of a lessee vessel takes place in the broad management area (GOM/GB/SNE) where most of the vessel's trips occurred. This will bias the results. As additional data become available, it may be possible to refine this analysis.

Preliminary information for FY 2005 (through January) suggests that the DAS leasing market is more active than in FY 2004. Through January leases resulted in the transfer of 33 percent more DAS than during the same period in FY 2004. Average price per DAS appears to have declined by about 30 percent (from $579 to $388 per DAS). It is not clear if this will result in an increase in leasing activity for the entire fishing year, or is just an indication that vessels are executing leases earlier in the year.

	DAS Leased		Revenues	
Month	FY 2004	FY 2005	FY 2004	FY 2005
05	504	916	461,856	656,156
06	318	641	333,969	271,797
07	514	553	302,786	210,102
08	741	879	266,544	515,395
09	586	567	440,434	162,395
10	681	660	386,615	119,403
11	381	774	142,540	210,934
12	536	903	136,003	215,285
01	742	784	246,159	228,991
Grand Total	5,004	6,677	2,716,906	2,590,458

Table 51 – Comparison of FY 2004 and FY 2005 DAS leasing activity through January, 2006 (Source: NMFS DAS database)

3.3.3.4 Closed Area II Yellowtail Flounder Special Access Program

Amendment 13 implemented a SAP that allowed fishing in CAII to target GB yellowtail flounder while using Category B DAS. This program was subject to strict conditions, including a maximum possession limit, a limit on the number of trips each vessel could take in a month, and a maximum number of trips for the program. The program began June 1, 2004 and ended September 3, 2004 when the limit on trips was achieved. A detailed summary of catches and revenues in the program is summarized in Appendix II.

According to NMFS, there were 319 trips in the SAP that caught 8.3 million pounds of yellowtail flounder. Vessels were charged a total of 1,485 Category B DAS (both regular and reserve) while underway 1,995 days (vessels were not charged DAS to and from the SAP area). By combining information from the VTR, dealer, and DAS databases, landings and revenue information for 207 of the 319 trips were estimated. Yellowtail flounder (8.0 million lbs.), haddock (1.0 million lbs.), winter flounder (622,280 lbs.), skates and skate wings (720,000 lbs.), grey sole (226,000 lbs.), plaice (171,000 lbs.), lobster (159,000 lbs.), monkfish (various products, 271,000 lbs.) and scallops (106,000 lbs) were the primary species landed. The average catch per trip for yellowtail flounder was 24,348 lbs, haddock was 4,237 lbs, winter flounder was 2,057 lbs, and skates 7,400 lbs.

Revenues were estimated for 307 (out of 319 trips) that could be clearly linked in the dealer, VTR, and DAS databases. Estimated total revenues for these 307 trips were $7.2 million. Yellowtail flounder accounted for $3.45 million, haddock $929,000, lobster $645,000, scallops $501,000, and winter flounder $495,000. The overall average price received for yellowtail flounder in this SAP was $0.43 per pound. In comparison, the average price received for yellowtail flounder (all gear, all ports) between May and September 2003 was $0.92 per pound (3.8 million pounds landed worth $3.4 million). The average price for haddock on SAP trips was $0.89 per pound, while for the same period in 2003 it was $1.27 per pound (4.8 million pounds landed worth $6.1 million). Overall yellowtail flounder landings from May through September in FY 2004 were 11.9 million pounds worth $6.3 million, for an average price of $0.52 per pound. Overall haddock landings from May through September 2004 totaled 6.3 million lbs. worth $6.4 million, for an average price of $1.03 per pound.

There was considerable criticism that the SAP resulted in a derby fishery that reduced the economic benefits from the program. As shown in the previous paragraph, average price per pound for yellowtail flounder declined in FY 2004 during the SAP when compared to the same period the previous year. At the same time, the SAP resulted in a tripling in yellowtail landings and a sixty percent increase in yellowtail flounder revenues in FY 2004 when compared to the same period in FY 2003. An analysis of average revenue per trip showed that 80 percent of the identified trips earned more than $15,000 and 20 percent earned more than $30,000. About 80 percent of the trips earned more than $2,000 per day absent, about 60 percent earned more than $2,500 per day absent, and about 10 percent earned more than $5,000 per day absent. In comparison, Amendment 13 estimated the mean revenue per day for trawl vessels on trips that were not in the Gulf of Maine. For vessels between 50 and 70 feet in length, the mean revenue was $2,271 per day, while that for trawl vessels over 70 feet in length was $3,571.

Yellowtail flounder discards in the SAP were reviewed to determine the cause. Thirty-one (out of 319, or 9.7 percent) trawl trips in the CAII Yellowtail Flounder SAP were observed. Yellowtail flounder (600,805 lbs.), haddock (156,378 lbs.), sea scallops (88,634 lbs.), monkfish (68,417 lbs.), and winter skates (47,517 lbs.) were the top five kept species on these observed trips. The top discarded species were skates (704,205 lbs., all species), sea scallops (32,610 lbs.), yellowtail flounder (30,290 lbs.), and haddock (22,178 lbs.). The primary reason for yellowtail flounder discards on observed trips was that the fish were smaller than the regulatory minimum size (21,289 lbs., or 70 percent of observed discards). Vessels that had filled their quota discarded another 3,409 lbs. on observed trips, while 4,081 lbs. were discarded due to market conditions.

3.3.3.5 Category B (regular) DAS Pilot Project

FW 40A implemented a pilot project which allowed the use of Category B (regular) DAS to target healthy stocks. This program ran for four consecutive quarters, from November 19, 2004 to its termination on October 6, 2005. The program included strict reporting requirements, limits on the incidental catch of unhealthy stocks, and a limit on the total number of DAS used in each quarter. A

review of the first three quarters of the program is included in Appendix III. Data from the final quarter was not available when this report was prepared.

A total of 600 trips were taken in the Category B (regular) DAS pilot program from November 2004 through July 2005 (Table X). Trips were evenly distributed throughout the three quarters: Nov-Jan (31%), Feb05-April 05 (36%) and May-July 05 (33%). Most trips (459) were taken on Multispecies (77%) and 141 were taken for monkfish (24%) on a Multispecies DAS. Trips for Multispecies appeared to be distributed uniformly across quarters: Nov-Jan (36%), Feb05-April 05 (38%) and May-July 05 (26%). Monkfish trips were not distributed uniformly with 56% of the total monkfish trips were taken in May-July 05 quarter.

A total of 2,021 B (regular) DAS was used in the pilot B (regular) DAS program (Table X). B (regular)-DAS usage was similar in Nov 04-Jan 05 (600 DAS) and Feb 05-April 05 (521 DAS) period but was higher in May05-July 05 (900 DAS). Overall, 34% of the B (regular) DAS trips were observed with 36% coverage of Multispecies trips and 27% coverage of Monkfish trips. The percentage of total trips observed by quarter ranged from 24% to 45%.

Total catches taken on a B (regular) DAS pilot program is listed by species in Table X. Six species accounted for approximately 85% of the total catch: skates (21%), monkfish (16%), haddock (15%), yellowtail (13%) winter skate (11%) and winter flounder (9%).

The regulations for the Pilot Project require a vessel to "flip" from a Category B DAS to a Category A DAS if catch of an unhealthy stock exceeds the trip limit. Overall, 37% of all trips were flipped from a B (regular)-DAS to an A-DAS. Flipping rates on observed trips (46% flipped, 90% CI= 405-52%) were higher than non-observed trips (32% flipped, 90% CI=28%-36%) during the entire Nov-July time period. The observed flipping rate was higher for observed trips than non-observed trips in every quarter. A contingency table analysis indicates that flipping rate was not independent of whether a trip was observed or not for the Nov-July data set (N=535 trips, $P<0.0014$) and November-January period (N=128, P=0.036). The flipping rate was substantially higher for observed than non-observed in May-July period (N-206, P=.058). The flipping rate in February-April period (N=201, P=.20) was not statistically significantly. The available data suggests that flipping rates during the multispecies Category B (regular) DAS reported from Nov-2004 to July 2005 were not independent of whether an observer is present on the trip. F urther, the effect of having an observer onboard increased the observed flipping rate by a substantial amount in November-January and May-July period and a moderate amount in the February-April period.

Number of B (regular) DAS trips for Northeast multispecies Quarter	Nov04-Jan 05	Feb 05-April 05	May 05-July 05	Total Nov 04-July 05
Total trips	164	175	120	459
Observed trips	49	77	37	163
% of trips observed	30%	44%	31%	36%
Number of B (regular) DAS trips for Monkfish using multispecies DAS				
Total trips	24	38	79	141
Observed trips	9	18	11	38
% of trips observed	38%	47%	14%	27%
Total number of B (regular) DAS trips				
Total trips	188	213	199	600
Observed trips	58	95	48	201
% of trips observed	31%	45%	24%	34%
% of total trips for multispecies	87%	82%	60%	77%
% of total trips for Monkfish	13%	18%	40%	24%

Table 52 - Total number of B (regular) DAS trips by quarter.

	Nov04-Jan 05	Feb 05-April 05	May 05-July 05	Nov 04-July 05
B (regular) DAS	600	521	900	2021
% of total B (regular) DAS	30%	26%	45%	

Table 53 - Distribution of B DAS used in the pilot B (regular) DAS program

Species	Multispecies	Multispecies/monkfish	total catch
SKATES	2,111,637	696,145	2,807,782
MONKFISH	1,768,599	472,597	2,241,195
HADDOCK	1,955,847	81,496	2,037,343
YELLOWTAIL FLOUNDER	1,702,956	282	1,703,238
WINTER SKATE	997,125	568,019	1,565,144
WINTER FLOUNDER	1,258,213	5,810	1,264,023
POLLOCK	711,855	27,644	739,500
SUMMER FLOUNDER (FLUKE)	132,970	140,836	273,806
SEA SCALLOP	232,619	7,721	240,340
COD	196,203	1,380	197,583
LOBSTER	132,962	261	133,223
OCEAN REDFISH	129,212	2,796	132,007
WITCH FLOUNDER (GRAY SOLE)	84,851	1,107	85,958
AMERICAN PLAICE (DAB)	73,980	329	74,310
WHITE HAKE	63,028	267	63,296
WINDOWPANE	28,940	0	28,940
HORSESHOE CRAB	0	7,412	7,412
ATLANTIC WOLFFISH	5,520	0	5,520
CUSK	5,084	21	5,104
THORNY SKATE	2,258	89	2,347
CHAIN DOGFISH	1,052	0	1,052
ATLANTIC HALIBUT	817	0	817
BLUEFISH	458	200	658
TILEFISH,UNC	81	0	81
TILEFISH (GOLDEN TILEFISH)	52	0	52
TAUTOG	0	16	16
FISH, OTHER	0	12	12
LONG FINNED SQUID (LOLIGO)	2	0	2
total	11,596,321	2,014,439	13,610,760

Table 54 - Estimated catch (live pounds) from B (regular)-DAS pilot program for unflipped trips. Catch includes discards for cod, haddock, yellowtail, American Plaice, winter flounder, witch flounder, and white hake.

3.3.3.6 Closed Area 1 Hook Gear Haddock SAP

FW 40A implemented an SAP that allowed vessels to use hook gear while targeting GB haddock in a small area inside CAI. As implemented this SAP was only available to members of the GB Cod hook sector in FY 2004. FW 41 extended the program to non-sector vessels in FY 2005.

While data is not yet available from the SAP in FY 2005, information is available for FY 2004. The CAI Hook Gear Haddock SAP (as implemented, only available to GB Cod Hook Sector vessels) closed on December 31, 2004 after landing 1,038,776 pounds of haddock on 217 trips (an average of 4,786 lbs./trip landed). An additional 2,351 pounds of haddock were discarded. Only 20,265 pounds of cod were caught for a haddock/cod ratio of over 51:1.

3.3.3.7 Eastern U.S./CA Area Haddock SAP

In FY 2005, there were 58 trips in the Eastern U.S./CA Haddock SAP between May 1 and August 26, 2005 when the Eastern U.S./CA area was closed. 42 trips were to the Eastern U.S./CA Haddock SAP, while 16 trips were declared to the SAP and the Eastern U.S./CA area combined. Vessels were charged 269 DAS on these trips including 112 Category A DAS and 157 Category B DAS. The average number

of DAS/trip in the SAP area alone was 4.5, while for trips that fished in both the SAP area and the Eastern U.S./CA area it was 5.1. Note that vessels were not charged DAS while enroute the fishing area, so actual trip length was longer than the indicated average.

For trips to the SAP area only, 9 of the 42 trips were observed (21 percent). Of the nine observed trips, three flipped to a Category A DAS and six did not flip (33 percent flipping rate). There were no instances when an unobserved trip flipped to a Category A DAS. An analysis was performed to determine if there were significant differences in flipping rates between the observed and unobserved trips (see Appendix V for details). Because of the limited number of observed trips, the analysis used two tests for independence of the two factors (flipping and presence of an at-sea observer). The hypothesis tested was that the probability of flipping was independent of the presence of an observer. Both tests indicated that the hypothesis of independence should be rejected (Table X, Likelihood Ratio Chi-Square Test, $P<0.01$). The evidence indicates that the processes of having a trip flipped and having a trip observed were dependent for the Eastern US/Canada Haddock SAP in FY 2005. No confidence intervals for the proportions of flipped trips on observed versus non-observed trips could be evaluated since all of the flipped trips occurred with an observer ($p=100\%$) and no trips were flipped without an observer.

In order to characterize the landings and revenues from this SAP, the DAS and VTR databases were examined to determine landed catches on SAP trips. As of December 19, 2005, VTR data was only reported for 41 of the 58 trips (71 percent). These trips were made by twenty-two different vessels. Thus, the information here does not represent a complete census of all SAP trips but does give a preliminary indication of the species and quantities landed in this SAP. These forty-one trips landed 1.3 million pounds of various species (Table 56, top twenty-five species landed shown). Haddock accounted for 471,542 pounds, while winter flounder, pollock, and plaice were the other principal regulated groundfish species landed. For trips declared into both programs, the ratio of haddock to cod landed was 14:1, while haddock to winter flounder landed was 2:1. Note that while cod landings were limited by a trip limit, winter flounder landings were not. Trips in the SAP only were required to use a haddock separator trawl at all times, yet landed over 167,000 lbs. of winter flounder with a haddock to winter flounder ratio of less than 2:1. This was not anticipated by FW 40A, which expected that the separator trawl would catch few flounders. Indeed, if all flounders are summed together, the catch of flounders in this program in the SAP only area exceeded the catch of the target species (haddock).

The average quantity kept of all species on these trips was over 32,000 lbs. There was a wide range in haddock catch rates per day absent (days absent include transit time, and is not the same as DAS charged). Several trips caught less than 100 lbs. of haddock per day absent, while at the other extreme several trips caught more than 4,500 lbs. per day absent. All of these trips landed in one of four ports: New Bedford MA, Gloucester MA, Portland ME, or Pt. Judith RI.

This information includes landed catch and does not include discards. NMFS estimated cod discards in this SAP as 47,511 pounds through October 6, 2005. Estimates of discards of other species are not yet available, though a following section provides information on catches and discards on observed trips using a haddock separator trawl.

Contingency Table Analysis of Flipping Rates in 2005 Eastern US/CAN Haddock SAP 1

Null hypothesis: Observed flipping rate is independent of at-sea observation

14:12 Friday, December 23, 2005
The FREQ Procedure
Table of a by b

a(FLIPPED TRIP) Frequency	b(OBSERVED TRIP) YES	NO	Total
YES	3	0	3
NO	6	30	36
Total	9	30	39

Statistics for Table of a by b

Statistic	DF	Value	Prob
Chi-Square	1	10.8333	0.0010
Likelihood Ratio Chi-Square	1	9.6955	0.0018
Continuity Adj. Chi-Square	1	6.6475	0.0099
Mantel-Haenszel Chi-Square	1	10.5556	0.0012
Phi Coefficient		0.5270	
Contingency Coefficient		0.4663	
Cramer's V		0.5270	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Fisher's Exact Test

Cell (1,1) Frequency (F)	3
Left-sided Pr <= F	1.0000
Right-sided Pr >= F	0.0092
Table Probability (P)	0.0092
Two-sided Pr <= P	0.0092

Sample Size = 39

Table 54- Contingency Table Analysis of FY 2005 Eastern US/Canada Haddock SAP Trip Flipping Rates

Species	ACCESS_AREA		
	SAP Only	SAP and Eastern Area	Grand Total
COD	23,340	9,685	33,025
CUSK	849	60	909
FLOUNDER, AMERICAN PLAICE	67,042	5,425	72,467
FLOUNDER, WINDOWPANE		670	670
FLOUNDER, SUMMER	485	380	865
FLOUNDER, WINTER / BLACKBACK	167,125	68,570	235,695
FLOUNDER, WITCH / GRAY SOLE	48,297	5,835	54,132
FLOUNDER, YELLOWTAIL	54,094	131,199	185,293
HADDOCK	318,237	153,305	471,542
HAKE, MIX RED / WHITE, ROUND	6,253		6,253
HAKE, SILVER / WHITING	3,800		3,800
HAKE, WHITE	700	900	1,600
HALIBUT, ATLANTIC	287		287
LOBSTER, AMERICAN	13,210	2,210	15,420
MONK TAILS	19,565	1,950	21,515
MONKFISH / ANGLERFISH	23,063	3,440	26,503
POLLOCK	160,483	2,400	162,883
REDFISH / OCEAN PERCH	3,162	400	3,562
SCALLOP, SEA		501	501
SKATE UNCLASSIFIED	2,565	28,895	31,460
SKATE WINGS UNCLASSIFIED	7,176	3,300	10,476
WINTER SKATE WINGS	2,000	1,500	3,500
WOLFFISH / OCEAN CATFISH	218	20	238
Grand Total	921,951	420,645	1,342,596

Table 55 – Species landed on 41 trips in the Eastern U.S./CA Haddock SAP in FY 2005 (Source: NMFS VTR and DAS databases as of December 19, 2005)

3.3.3.8 Haddock Separator Trawl

This action proposes two measures that require use of the haddock separator trawl: an extension of the Eastern U.S./CA Haddock SAP, and a proposal to require the use of the separator trawl when participating in the Category B (regular) DAS Program (which may be renewed). There are a limited number of observed trips by vessels using the separator trawl which can be used to supplement experimental data on the performance of the trawl.

The observer (OBDBS) database was queried to identify trawl trips that used a separator panel (excluder device='3') in CY 2005. A total of 20 observed trips were identified in the database as of December 14, 2005. Additional observed trips may have occurred but may not yet be entered into the database. Fourteen trips were recorded as U.S./CA area trips while six trips were recorded as Category B (regular) DAS trips. This designation is made by the observer, and it is possible that they are not exclusive (e.g. a Category B (regular) program trip may occur in the U.S./CA area). Seven trips made tows both with and without the panel. Most trips used the separator panel in the Eastern U.S./Canada area (SAs 561 and 562). (Table X)

Catches (kept and discarded) of the top twenty-five species on tows using a separator panel are shown in Table X. Regulated groundfish accounted for sixty-five percent of the catch, with haddock, yellowtail flounder, cod, and winter flounder as the four largest regulated groundfish components. Combined

catches of skates (207,136 lbs.) exceeded the haddock catch (199,634 lbs.). The overall ratio of haddock to yellowtail flounder was 2.6:1, the ratio of haddock to cod was 4.2:1, and the ratio of haddock to winter flounder was 3.2:1. Monkfish, witch flounder, and plaice were also caught in substantial quantities.

The ratio of haddock to other species was compared for trips identified as occurring in the Category B (regular) DAS program and trips identified as taking place in the U.S./CA area. With only five observed trips using the separator trawl in the Category B (regular) DAS program these results should not be considered definitive. While the ratio of haddock to winter flounder in both programs was similar (3.1:1 in the U.S./CA area, 3.4:1 in the Category B(regular) DAS program), the ratio of haddock to yellowtail flounder was 4.1:1 in the U.S./CA program but 1.1:1 in the Category B (regular) DAS Pilot Program. The ratio of haddock to cod in the U.S./CA program was 3.8:1, while it was 7:1 in the Category B (regular) DAS program. The ratio of haddock to monkfish was similar in both programs.

Haddock discards accounted for six percent of the haddock catch (12,466 lbs.), with almost all discards due to the fish being smaller than the regulatory minimum. Cod discards accounted for fifty percent (21,504 lbs.) of the cod catch; sixty-seven percent of these discards were due to a filled vessel quota, twenty-three percent were due to high grading, and various other reasons were given for the remaining discards. Ninety-four percent of the skates caught were discarded, totaling 193,937 pounds. Winter skate (49,716 lbs.) and little skates (54,369 lbs.) were the largest components identified by species, but an additional 78,711 lbs. was identified as skates (NK). There were also 10,609 lbs. of barndoor skates caught, all discarded, and 532 lbs. of smooth skates.

Catch composition on tows using the separator trawl was examined by trip, focusing on regulated groundfish. All twenty trips caught haddock and cod while using a separator trawl, seventeen trips caught yellowtail, winter flounder, or monkfish, fifteen trips caught plaice, and thirteen trips caught grey sole (witch flounder). The ratio of haddock to cod for the twenty trips ranged from 0.2:1 to 22.4:1. For the seventeen observed trips that caught winter flounder, the ratio of haddock to winter flounder ranged from 0.1:1 to 186.8:1. For the trips that caught yellowtail flounder, the ratio of haddock to yellowtail flounder ranged from 0.1:1 to 5,230:1.

There were a total of 405 observed tows that used a separator trawl on these fifteen trips. Over these tows, haddock was caught on 370 tows (ninety-one percent), cod on 309 tows (seventy-six percent), yellowtail flounder on 266 tows (sixty-six percent), and winter flounder on 243 tows (sixty percent). The average catch of haddock per tow was 493 lbs., yellowtail flounder was 189 lbs., cod was 117 lbs., and winter flounder was 156 lbs. In comparison to the observed data, FW 40A estimated that the cod catch per tow would be between 47 and 92 lbs. and the haddock catch per tow would be 765 lbs. There was considerable variation in the catch of regulated groundfish between trips and tows. For example, four trips did not have any tows catching yellowtail flounder, four trips had occasional tows that caught small amounts, one trip had yellowtail catches decline as the trip passed, and six trips had frequent tows catching sizeable amounts of yellowtail flounder.

As reported earlier, seven trips made tows both with and without the separator trawl. These trips were examined to contrast the performance of tows using the separator trawl with tows that did not use the separator trawl by vessels that used both on the same trip. While this approach reduces the likelihood that any differences are due to differences between vessels, it does not resolve the issue that catches may be the result not just of the gear used, but numerous other factors: location, depth fished, etc. Catch composition differed: haddock accounted for twelve percent of the catch on tows without the separator trawl, and thirty-three percent of the catch on tows with the trawl (Table X). Overall, the ratio of haddock to cod for these trips, while not using the separator trawl, was 1.4:1, the ratio of haddock to yellowtail flounder was 0.7:1, the ratio of haddock to winter flounder was 11.8:1, and the ratio of haddock to monkfish was 1:1. While using a separator trawl, for these vessels the ratio of haddock to cod on the

same trip was 2.5:1, the ratio of haddock to yellowtail flounder was 7.4:1, the ratio of haddock to winter flounder was 3.1:1, and the ratio of haddock to monkfish was 6.3:1. In an effort to reduce the influence of tows in different areas, five trips were examined that fished in SA 561 and 562. The results, while not detailed here, were similar.

Program	Month	521	522	525	561	562	Total
US/CA	01	0	0	0	0	1	1
	03	1	0	0	4	3	5
	05	0	1	0	5	5	5
	06	0	0	1	0	2	2
	07	0	0	1	1	1	1
Sub-Total		1	1	1	10	10	14
CAT B (regular)	03	1	1	0	0	0	1
	05	0	0	1	0	2	2
	06	2	2	1	0	0	2
	07	0	1	0	0	0	1
Sub-Total		3	3	2	0	4	6
Grand Total		4	4	3	10	14	20

Table 56 – Observed trips using a separator panel, CY 2005 (OBDBS data available as of December 14, 2005)

COMNAME	521	522	525	552	561	562	Grand Total
HADDOCK	8,445	31,152	142	18	47,946	140,234	227,937
SKATE, LITTLE	25	83,432	1,977	500	5,975	44,916	136,825
FLOUNDER, YELLOWTAIL	1	1,375	4,633	30	3,834	91,623	101,496
MONKFISH (ANGLER, GOOSEFISH)	9,368	43,446	341	0	23,475	14,187	90,817
SKATE, WINTER (BIG)	2,105	10,700	357	693	21,087	51,773	86,715
SKATE, NK	1,770	235	1,500	0	8,766	70,805	83,076
FLOUNDER, WINTER (BLACKBACK)	5	174	67	420	9,461	54,546	64,673
COD, ATLANTIC	12,712	1,591	41	339	32,955	16,339	63,977
FLOUNDER, AMERICAN PLAICE	876	2,681	54	0	24,635	1,898	30,144
FLOUNDER, WITCH (GREY SOLE)	14,813	1,415	105	0	9,583	3,331	29,247
LOBSTER, AMERICAN	1,785	2,130	34	0	13,902	3,776	21,627
SKATE, BARNDOOR	98	434	306	0	515	10,369	11,722
CRAB, JONAH	11	9,310	0	0	24	157	9,502
POLLOCK	873	1,344	0	0	6,226	238	8,681
HAKE, WHITE	191	930	0	0	4,400	9	5,530
FLOUNDER, SAND DAB (WINDOWPANE)	0	3	136	15	70	3,813	4,037
SCALLOP, SEA	0	112	1	0	303	3,289	3,705
RAVEN, SEA	114	114	217	10	711	2,515	3,681
DOGFISH, SPINY	185	186	0	0	2,895	201	3,467
FLOUNDER, FOURSPOT	0	42	210	0	51	2,238	2,541
HAKE, RED (LING)	8	7	138	0	1,393	218	1,764
HERRING, ATLANTIC	0	1,482	0	0	4	0	1,486
STARFISH, SEASTAR,NK	6	717	2	0	11	713	1,449
FLOUNDER, SUMMER (FLUKE)	0	89	80	10	24	955	1,158
OCEAN POUT	9	41	8	0	128	804	990
Grand Total	53,400	193,142	10,349	2,035	218,374	518,947	996,247

Table 57 – Catches (pounds, live weight, kept and discarded) by statistical area on observed tows using a haddock separator trawl, CY 2005

COMNAME	Without Separator	With Separator	Grand Total
HADDOCK	17,679	40,893	58,572
SKATE, WINTER (BIG)	21,960	14,207	36,167
FLOUNDER, YELLOWTAIL	23,750	5,560	29,310
COD, ATLANTIC	12,920	16,146	29,066
MONKFISH (ANGLER, GOOSEFISH)	17,117	6,489	23,606
SKATE, LITTLE	14,346	5,754	20,100
SKATE, NK	2,875	14,163	17,038
FLOUNDER, WINTER (BLACKBACK)	1,494	13,209	14,703
FLOUNDER, AMERICAN PLAICE	10,462	1,416	11,878
LOBSTER, AMERICAN	7,109	3,359	10,468
FLOUNDER, WITCH (GREY SOLE)	4,135	1,715	5,850
POLLOCK	4,300	623	4,923
HAKE, WHITE	3,490	469	3,959
SCALLOP, SEA	2,766	150	2,916
DOGFISH, SPINY	1,893	98	1,991
HAKE, RED (LING)	1,410	0	1,410
SKATE, BARNDOOR	1,083	24	1,107
RAVEN, SEA	365	394	759
FLOUNDER, FOURSPOT	618	1	619
FLOUNDER, SAND DAB (WINDOWPANE)	48	407	455
OCEAN POUT	213	101	314
LUMPFISH	276	12	288
HALIBUT, ATLANTIC	0	263	263
FLOUNDER, SUMMER (FLUKE)	50	63	113
WOLFFISH, ATLANTIC	25	33	58
Grand Total	150,384	125,549	275,933

Table 58 – Catch composition (pounds, live weight) for seven trips that made tows with and without the separator panel, CY 2005 (Source: NMFS OBDBS as of December 12, 2005)

3.3.4 Recreational Harvesting Sector

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

Recreational catch of monkfish is only incidental and minimal, so the following discussion pertains only to groundfish fisheries. The targeted stocks include GOM and GB cod, GOM and GB haddock, and GOM and SNE/MA winter flounder. The recreational groundfish fishery with access to these resources is concentrated between southern Maine and Rhode Island, though winter flounder is targeted by recreational fishermen as far south as New Jersey.

Amendment 13 provided a detailed description of the recreational harvesting sector. Since this action considers measures that will affect the recreational fishery for GOM cod in the Gulf of Maine, the following discussion updates information on the recreational fishery for that stock during the period FY 2002 through FY 2004. The two primary sources of information on the recreational sector are the Marine Recreational Fisheries Statistical Survey (MRFSS) and VTRs submitted by party/charter vessels that possess a federal multispecies permit. The MRFSS system provides information on catches (including species and size distribution), passengers, and numbers of trips for all modes of recreational fishing. MRFSS only provides broad-scale information on area fished and is usually summarized by calendar year and not fishing year. Party/charter VTRs can be used to provide information on catches and number of trips. In addition, party/charter VTRs include information on the location of fishing activity. There are some differences in the data obtained from these two sources, though trends over time are similar.

According to MRFSS, in CY 2004 the number of GOM cod harvested by recreational fishermen was 50 percent fewer than were harvested in CY 2001 (Figure X). This was true for both private boat and party/charter modes. The private boat mode accounts for about two-thirds of the total recreational GOM cod catch. For party/charter vessels, VTR data typically results in higher estimates of GOM Cod harvest than are produced by MRFSS (Figure X). MRFSS values are used in the assessments. The number of angler trips harvesting GOM cod did not decline as much as the harvest, with the private mode showing a decline of 47 percent and the party/charter boat mode shows a decline of 43 percent (Figure X). VTR information on the number of party/charter trip and passengers does not show as large a decline between FY 2001 and FY 2004, while the VTR estimates of kept cod declined by 45 percent, similar to the MRFSS estimates (Figure X). According to MRFSS data, the kept catch accounts for less than half the total catch (Figure X).

The number of vessels participating in the party/charter industry and landing GOM cod can also be determined from VTRs. These data show that the number of operating units has remained relatively constant between FY 2001 and FY 2004. After a nine percent increase in operating units in 2003 compared to 2001, the number of units operating in 2004 was only one percent higher than in 2001. (Figure X).

MRFSS was also queried to determine the seasonal distribution of GOM cod catches by both private boat and party/charter modes. For the years 2001 through 2004, over 90 percent of GOM cod caught by the private boat mode is harvested between March and September (Figure X). For the party/charter mode, the primary season extends into October (Figure X). The MRFSS data is consistent with VTR data for the party/charter mode, showing little catch in the months of December through February (Figure X). Further evidence of the seasonal nature of the party/charter fishery is offered by the number of trips that kept cod or haddock, by month, from FY 2001 to FY 2004 (Figure X).

The size distribution of the GOM cod catch can also be estimated from MRFSS data. In 2004, 17 percent of the private boat harvest was less than the 22-inch minimum size that was in effect. About 45 percent of the catch by these vessels was larger than 24 inches (Figure X). Party/charter vessels had a better compliance rate with the minimum size regulation. Only 10 percent of this catch was less than the minimum size limit, and about 40 percent was larger than 24 inches (Figure X).

The catch of cod per angler on trips landing GOM cod is different between the private boat and party/charter modes based on MRFSS data. Private boats caught half of their GOM cod at a rate of six fish or fewer in 2004, with about 1 percent of the catch coming from trips that landed more than the bag limit (Figure X). In CY 2004, half the GOM cod catch by party/charter boats was at less than three fish per angler. About 2 percent of the catch was above the bag limits that were in effect in FY 2004 (Figure X).

MRFSS does not provide information on location of catches, other than whether it came from state or federal waters. Party/charter operators with federal permits are required to report the location of fishing activity on VTRs. This information was used to assign catches of GOM cod to thirty-minute squares or the WGOM closed area. Note that while the WGOM closed area overlaps several thirty-minute squares, the analysis was done in such a way that the catches as reported are independent (catches in the WGOM closed area are not assigned to a thirty-minute square). In FY 2004, 46.4 percent of the cod harvested by party charter vessels was reported caught form the WGOM closed area, 19.2 percent was caught from block 132 outside the WGOM closed area, and 12 percent was caught from block 124. Less than 10 percent was caught from blocks 125 and 133, and the remaining 11.7 percent was caught from various other areas (Figure X).

While GOM cod is the primary recreational groundfish target, other species are harvested. Recent years have seen an increase in the catch of GOM haddock, most noticeable in FY 2004. The haddock fishery is also seasonal, with little haddock caught between October and April (according to VTRs) (Figure X).

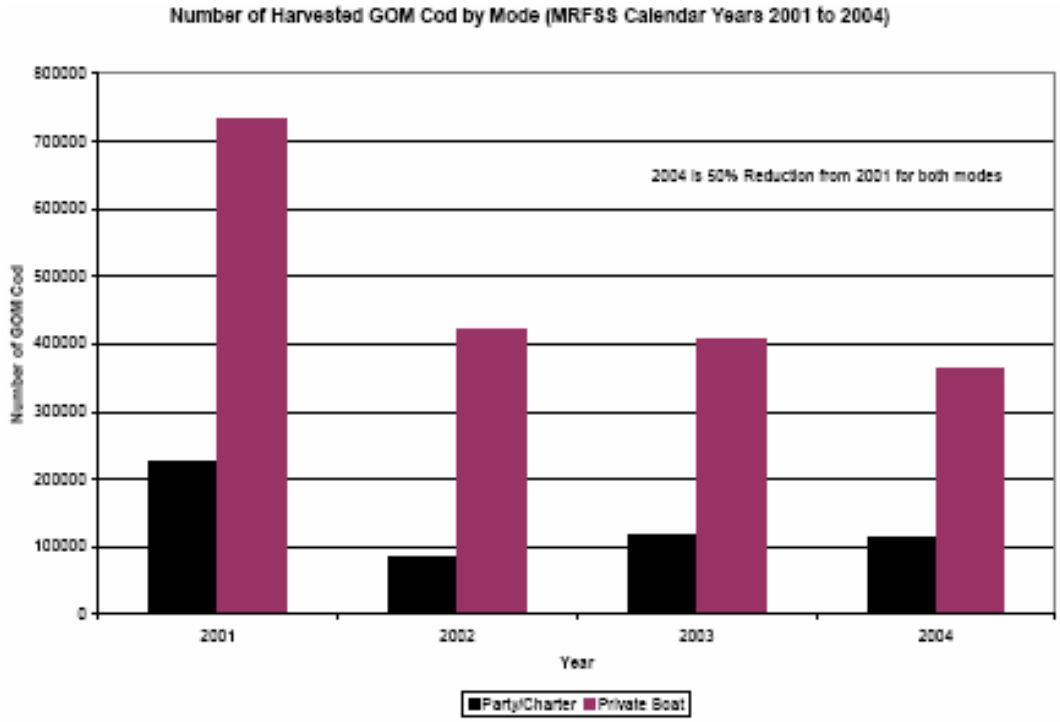

Figure 34– Calendar year GOM Cod harvest by mode (MRFSS)

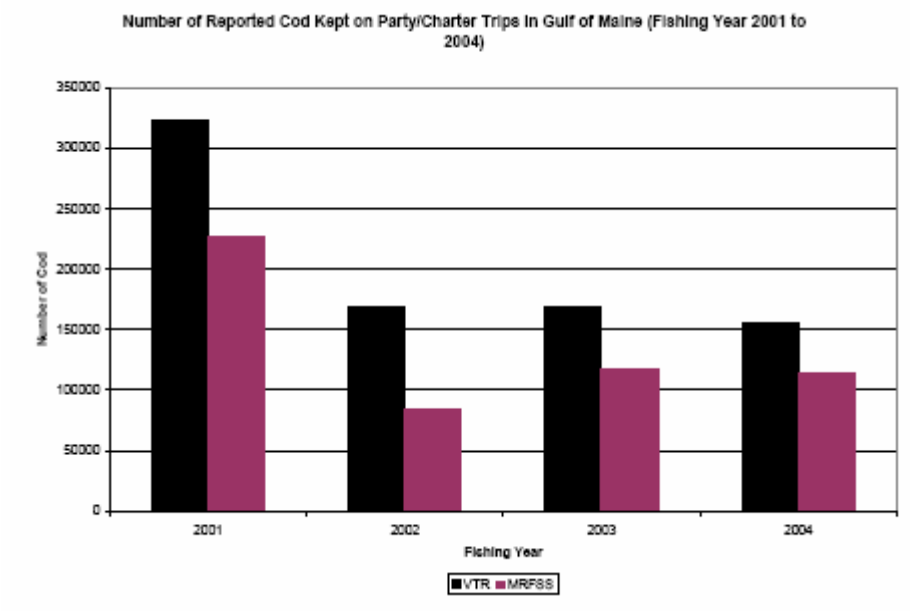

Figure 35 – FY 2001 – FY 2004 party/charter reported GOM cod kept (VTR)

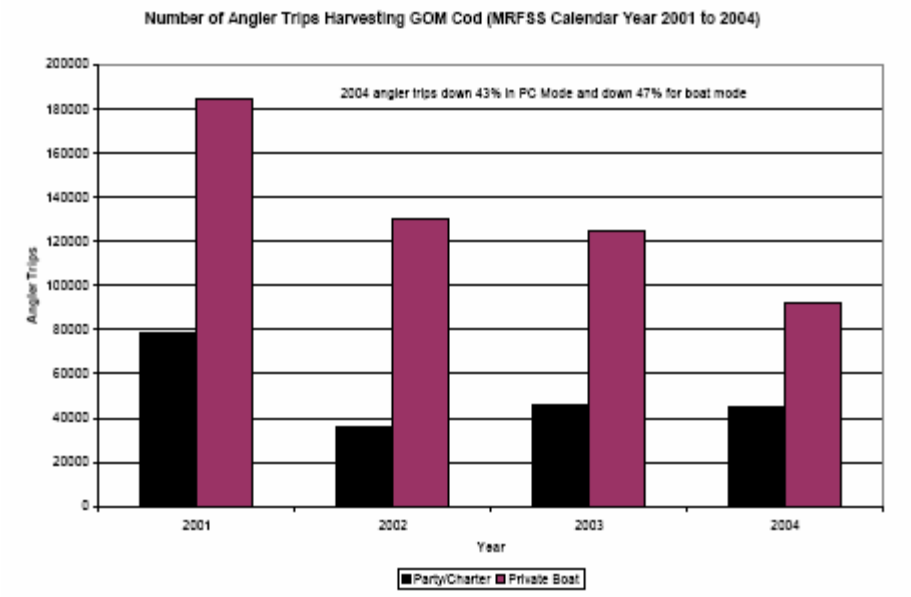

Figure 36 – Calendar year angler trips harvesting GOM cod (MRFSS)

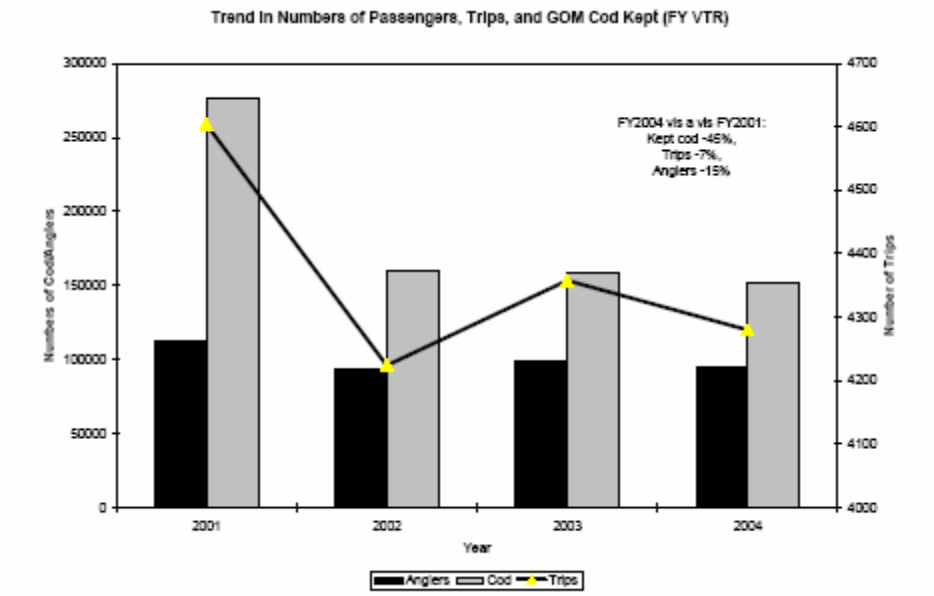

Figure 37 – Party/charter passengers, trips, and GOM cod kept (VTR)

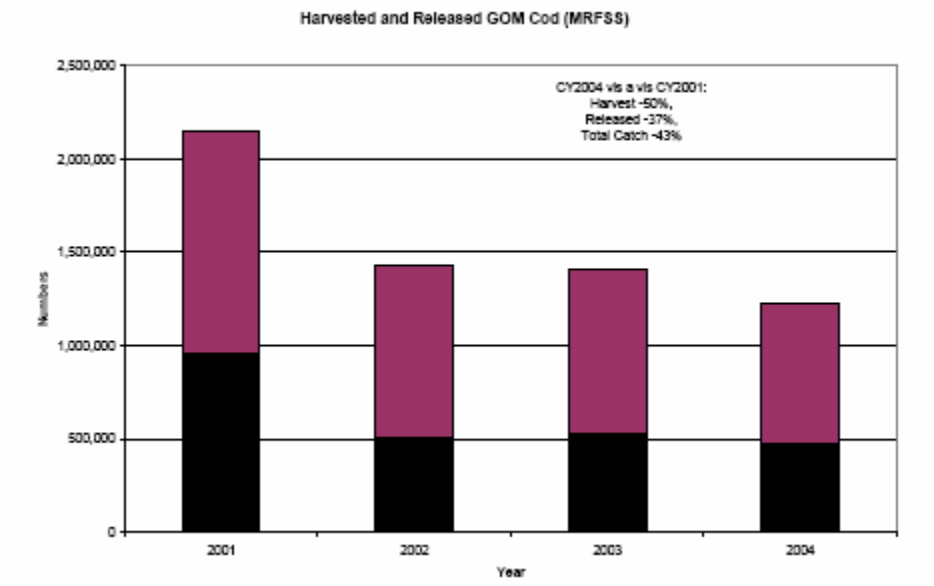

Figure 38 – Calendar year total GOM cod catch (MRFSS)

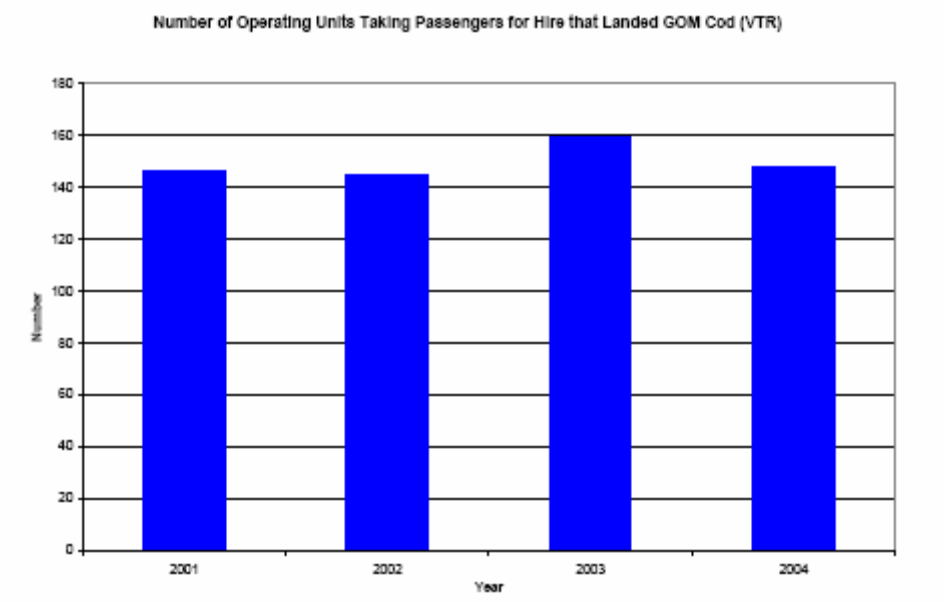

Figure 39 – Party/charter operating units that landed GOM cod (VTR)

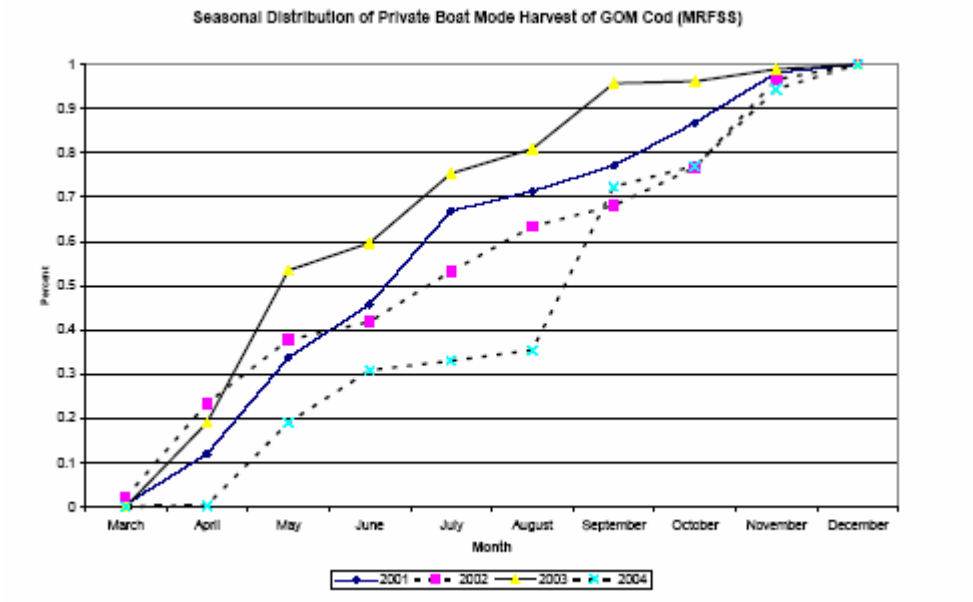

Figure 40 – Seasonal private boat GOM cod harvest (MRFSS)

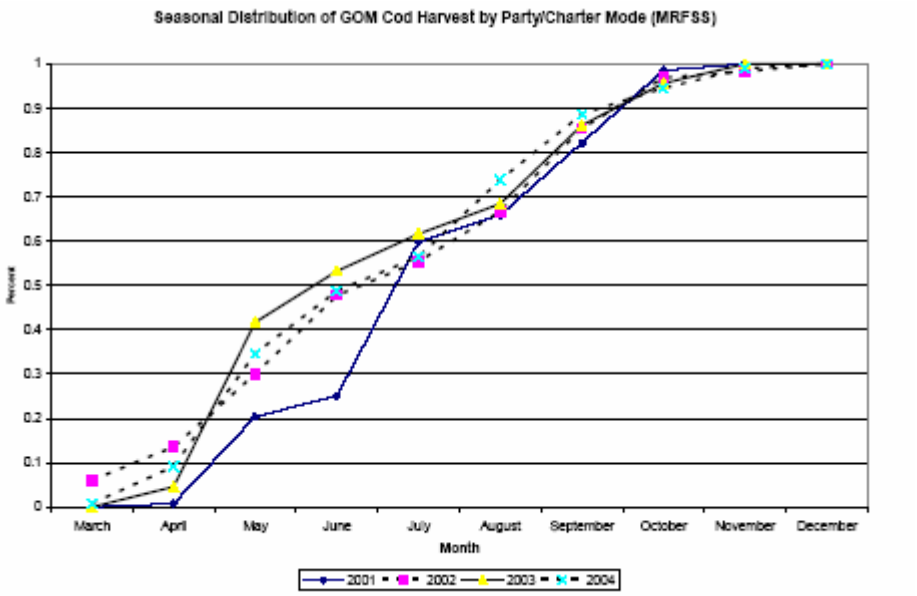

Figure 41– Seasonal party/charter GOM cod harvest (MRFSS)

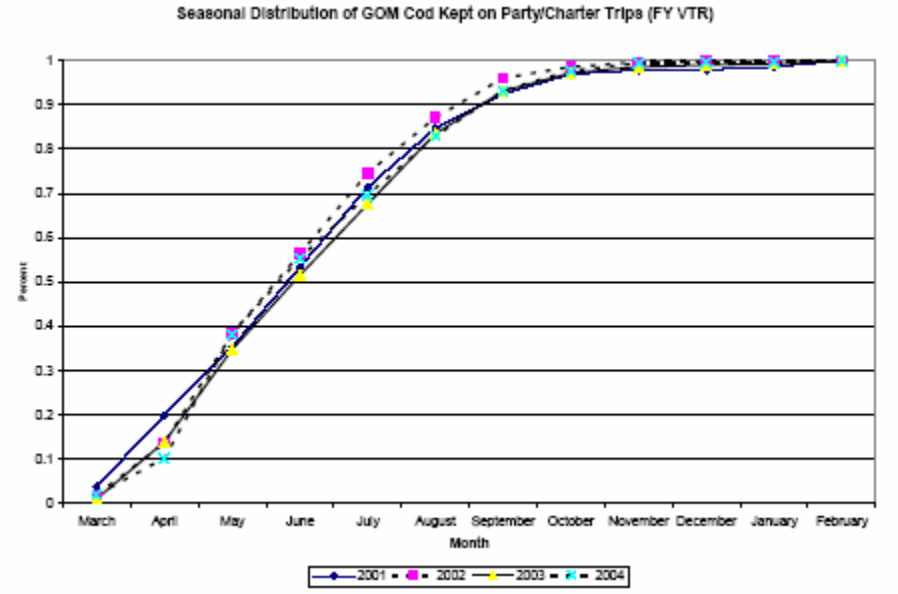

Figure 42 – Seasonal party/charter GOM cod kept (VTR)

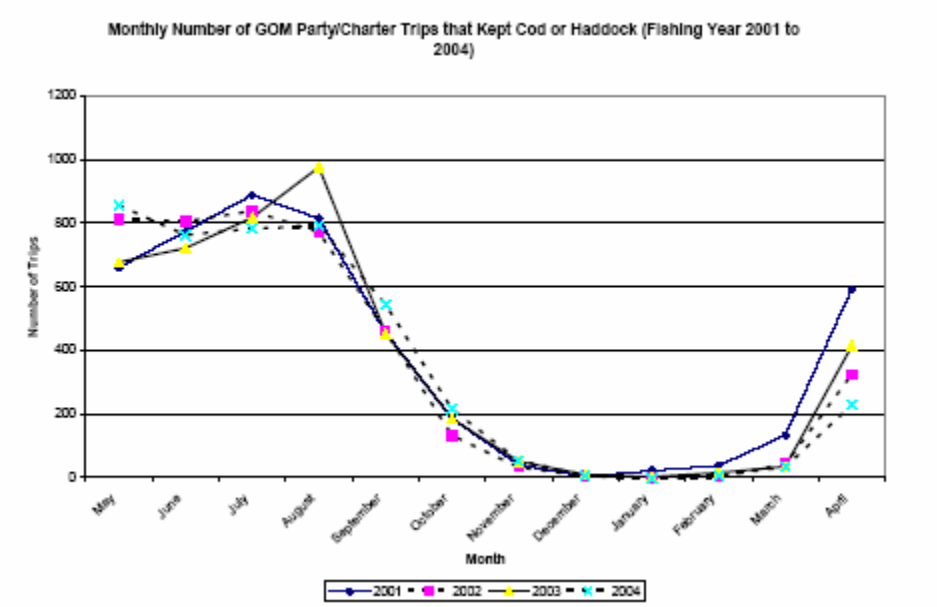

Figure 43 – Monthly number of party/charter trips keeping GOM cod (VTR)

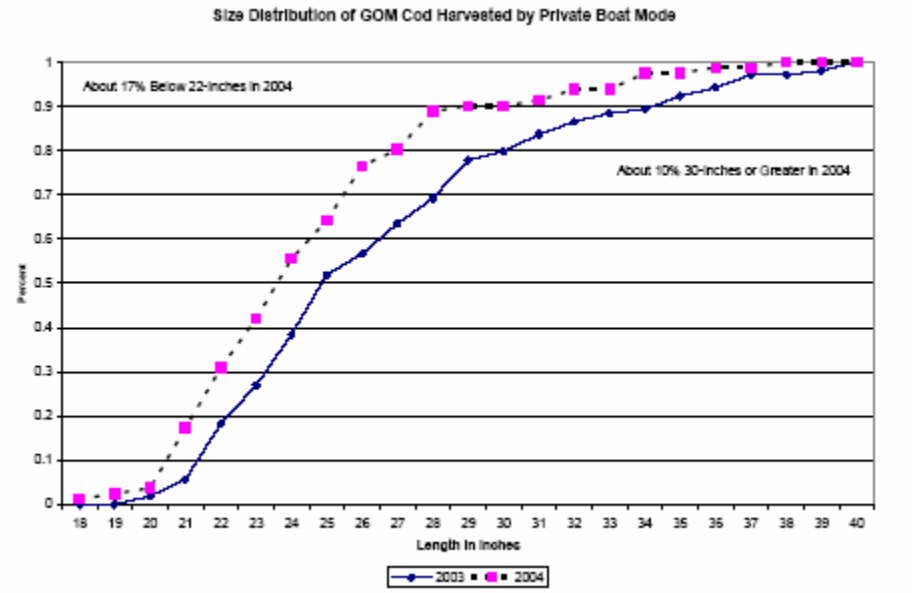

Figure 44 – CY 2003 and 2004 private boat GOM cod size distribution (MRFSS)

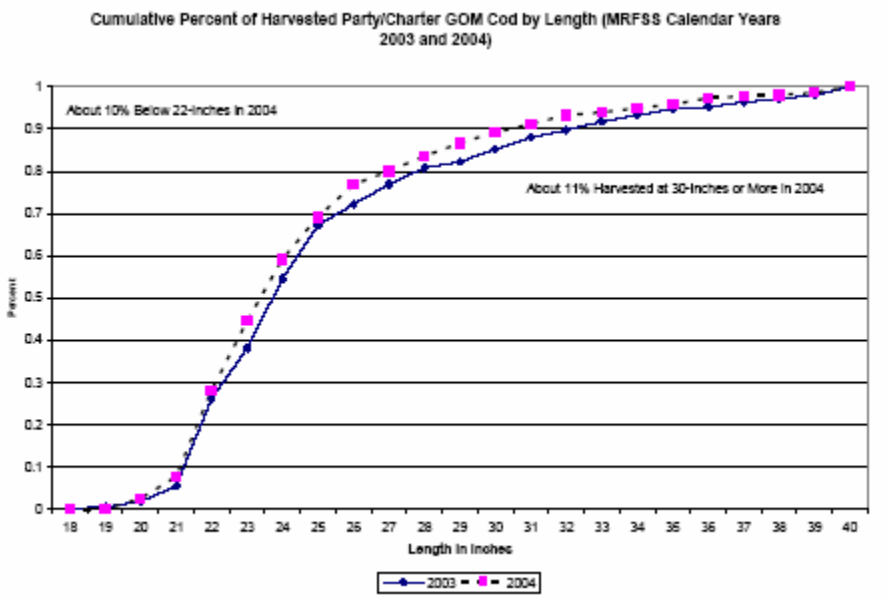

Figure 45 – CY 2003 and 2004 party/charter GOM cod size distribution (MRFSS)

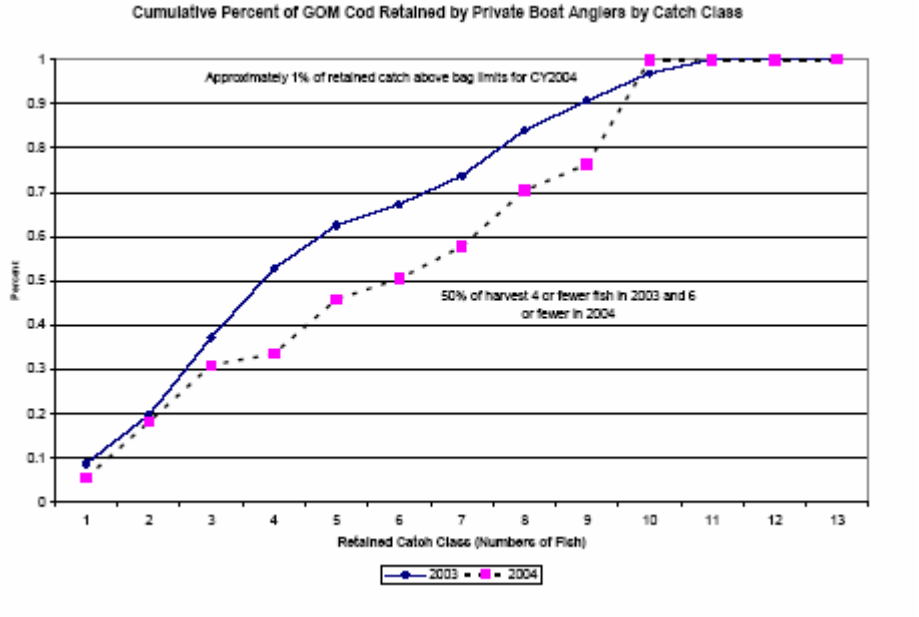

Figure 46 – Private boat catch per angler (MRFSS)

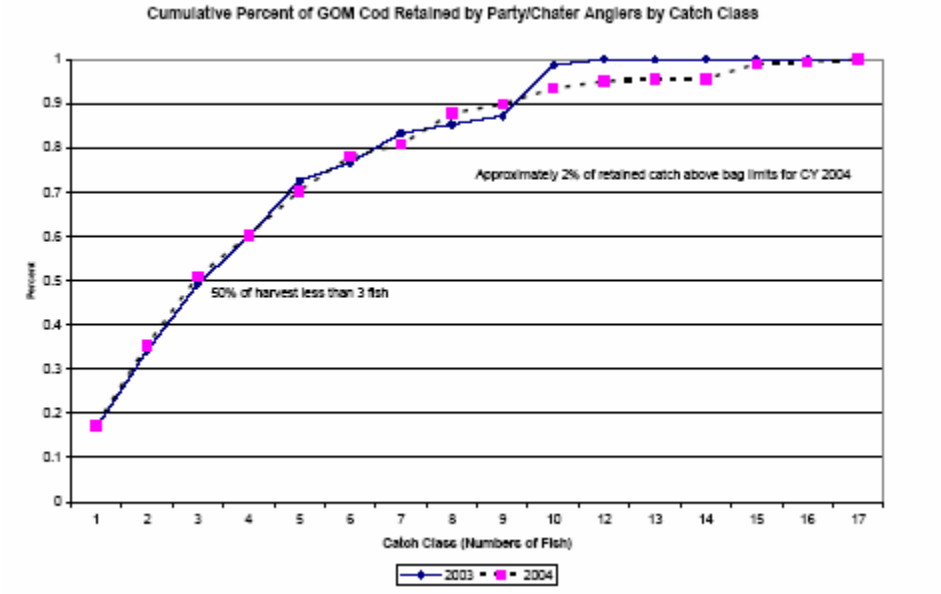

Figure 47 – Party/charter catch per angler (MRFSS)

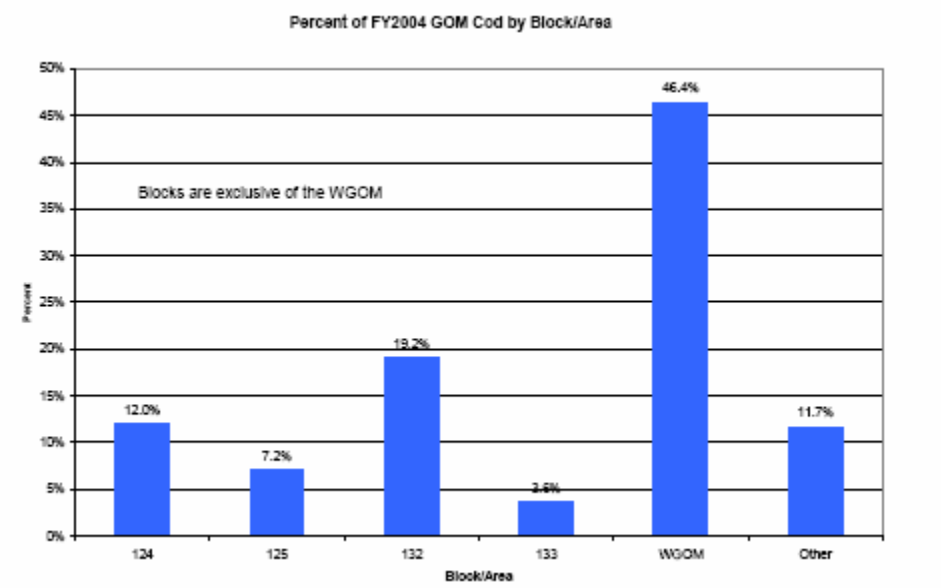

Figure 48 – FY 2004 party/charter GOM cod kept by area (Source: VTRs)

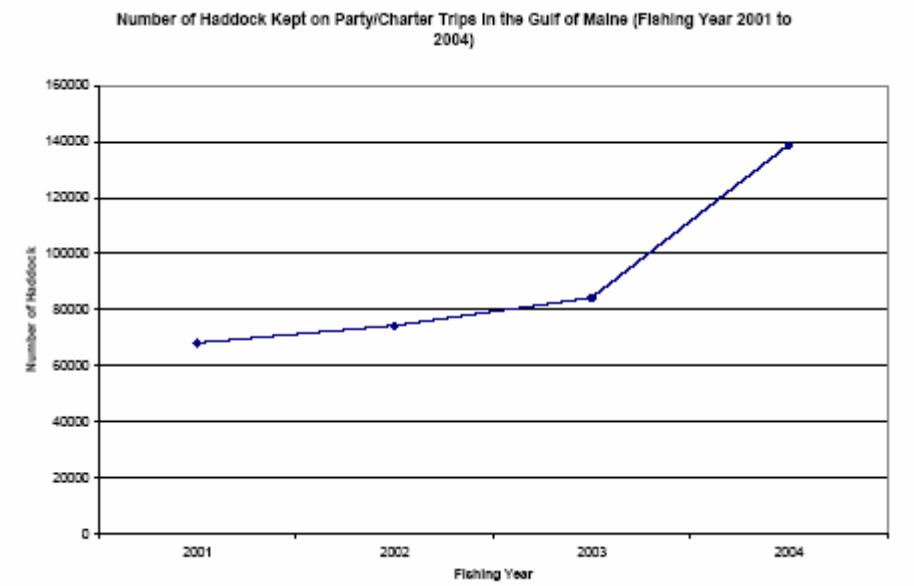

Figure 49 – FY 2001 to FY 2004 party/charter GOM haddock kept (VTR)

3.3.5 Processing and Wholesale Trade Sector

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

3.3.6 Communities

3.3.6.1 Background

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." Current guidance on National Standard 8 specifies that communities are place-based: geographic units such as towns and cities that might fit the Census Bureau's definition of a "place." But actual methodological guidelines are still in the process of refinement and resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. For example, the weigh-out data and the permit files

document landing and home ports, but these are not necessarily the same places where people live, where specific styles of and knowledge about fishing are practiced, or where the impacts of management are most strongly felt. It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other communities in the region.

In terms of the keywords "substantially dependent" and "substantially engaged," some have suggested, for example, that "substantial dependence" be measured in terms similar to the U.S. Department of Agriculture's criteria for determining whether rural communities are dependent on agriculture or logging. The Economic Research Service of the USDA, for example, classifies counties as farming dependent given a certain percentage of economic activity -- in this case labor and proprietor income. Some of the sources of data to consider in making determinations of fishing dependence are thus supplied in current guidance, such as landings information or numbers of participants, and the socio-cultural importance of the fishery. A determination of the extent of a given community's "substantial engagement" in the harvesting or processing of a fishery, is more difficult to determine when drawing from existing guidance. While the application of a percentage of economic income activity may be an appropriate way to determine "substantial dependence", there may be other valid criteria for determining "substantial dependence." For example, the determination could be based on a criteria based on a minimum level of activity (such as landings, number of vessels, etc.), or the presence of particular type of infrastructure (auctions, co-ops, state fish piers), or level of fishing activity (revenues, landings in weight, time spent fishing) that indicate a community is "substantially engaged" in fishing. Such an approach was used in Amendment 13 to identify fishing communities that are "substantially engaged" in fishing.

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

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

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

To identify primary and secondary port groups, groundfish landings by port were examined for the time period 1994-1999 from the dealer weighout database. Primary port groups represent the most active ports (currently) in the groundfish fishery and were selected based on groundfish landings greater than one million pounds annually since 1994 and/or the presence of significant groundfish infrastructure (auctions and co-ops, for example). In Amendment 13 and in the absence of specific guidance, these ports are considered fishing communities (as defined by the MSFCMA) because they have demonstrated a continued substantial engagement in fishing, here in particular the groundfish fishery. Secondary port groups consist of groups of ports in which some level of groundfish activity has been observed since 1994. This approach provides a way to consider the impacts of management measures on every port in which some amount of groundfish has been landed since 1994, and identifies some as fishing communities (as defined by NS8) based on substantial engagement. Though the analysis does not identify those fishing communities that meet the "substantial dependence" criteria, it is unlikely that the analysis misses any port which may be a fishing community based on the substantial dependence criteria because the impacts of the amendment are considered on nearly every port that has groundfish activity,
It is important to remember that because significant geographical shifts in the distribution of groundfish fishing activity have already occurred, the characterization of some ports as primary or secondary ports may not reflect their historical participation in and dependence on the groundfish fishery. A good example is Rockland, Maine. Historically, Rockland would have been considered a primary groundfish port, landing large quantities of redfish, flounders, and other groundfish, and serving as an important groundfish processing port, and would have met the test for "substantial engagement." In recent years, however (since the establishment of the Hague Line in 1984 and the decline of groundfish stocks in the early 1990s), fishing activity in Rockland has shifted from groundfish to other species like lobster and herring. This also reflects the apparent concentration of the groundfish fishery around Portland, Maine and the loss of the fishery to many coastal communities in northern Maine.

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

I. DOWNEAST MAINE – WASHINGTON COUNTY

A. Primary Multispecies Port

1. None

B. Secondary Multispecies Ports

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

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

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Communities

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

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

A. Primary Multispecies Ports

1. Portland

B. Secondary Multispecies Ports

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

IV. SOUTHERN MAINE – YORK COUNTY

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

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

V. OTHER MAINE – all other coastal Ports in Maine

VI. STATE OF NEW HAMPSHIRE – ROCKINGHAM AND STRAFFORD COUNTIES

A. Primary Multispecies Ports

1. Portsmouth

B. Secondary Multispecies Ports

1. NH Seacoast: Rye, Hampton/Seabrook, Hampton, and Seabrook

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

VIII. GLOUCESTER AND NORTH SHORE – ESSEX COUNTY

A. Primary Multispecies Ports

1. Gloucester

B. Secondary Multispecies Ports

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

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

A. Primary Multispecies Ports

1. Boston

B. Secondary Multispecies Ports

1. The South Shore: Scituate, Plymouth, and Marshfield (Green Harbor)

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

A. Primary Multispecies Ports

1. Chatham/Harwichport

B. Secondary Multispecies Ports

2 Provincetown
2 Other Cape Cod: Sandwich, Barnstable, Wellfleet, Woods Hole, Yarmouth, Orleans, and
2 Eastham
2 The Islands: Nantucket, Oak Bluffs, Tisbury, and Edgartown

XI. NEW BEDFORD COAST – BRISTOL COUNTY
A. Primary Multispecies Ports
1. New Bedford/Fairhaven
B. Secondary Multispecies Ports

1. Other Bristol County: Dartmouth, and Westport

XII. OTHER MASSACHUSETTS – all other coastal Ports in Massachusetts

XIII. STATE OF RHODE ISLAND – WASHINGTON AND NEWPORT COUNTIES
A. Primary Multispecies Ports
1. Point Judith
B. Secondary Multispecies Ports
1 Western RI: Charlestown, Westerly, South Kingstown (Wakefield), and North Kingstown
1 (Wickford)
1 Eastern RI: Newport, Tiverton, Portsmouth, Jamestown, Middletown, and Little Compton

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

XV. STATE OF CONNECTICUT – NEW LONDON, MIDDLESEX, NEW HAVEN, AND FAIRFIELD COUNTIES
A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports

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

XVI. OTHER CONNECTICUT – all other coastal Ports in Connecticut

XVII. LONG ISLAND, NEW YORK – SUFFOLK, NASSAU, QUEENS, AND KINGS COUNTIES
A. Primary Multispecies Ports
1. Eastern Long Island: Montauk, Hampton Bay, Shinnecock, and Greenport
B. Secondary Multispecies Ports

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

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

XIX. NORTHERN COASTAL NEW JERSEY – MONMOUTH AND OCEAN COUNTIES
A. Primary Multispecies Ports
1. None
B. Secondary Multispecies Ports

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

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

A. Primary Multispecies Ports

1. None

B. Secondary Multispecies Ports

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

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

XXII. DELAWARE

XXIII. MARYLAND

XXIV. VIRGINIA

XXV. NORTH CAROLINA

3.3.6.2 Monkfish communities

This section updates information contained in the FSEIS for Amendment 2. 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 multispecies or scallops.

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
Provinctown, 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.

Virtually all of the monkfish landed in Portland, Gloucester and Boston come from the NFMA, while about 1/2 of New Bedford's landings and only 3 percent of Pt. Judith's landings come from the NFMA. Portland and Boston's landings are almost totally from otter trawls, while otter trawls make up about ½ of New Bedford and Gloucester landings. Gloucester landings are evenly split between trawls and gillnets, while New Bedford also has about 18% of monkfish landings by scallop dredge. Pt. Judith landings are about 2/3 gillnet, while New Hampshire, New York and New Jersey landings are predominately (>80%) caught by gillnet gear.

3.3.6.3 Expected Impacts of Amendment 13

Amendment 13 includes detailed descriptive information on the primary and secondary port groups. This section summarizes the expected impacts of Amendment 13 on the identified port groups.

Short-term reductions in fishing vessel gross revenues are expected to have a negative impact on port groups. Analysis in Amendment 13 estimated that many port groups would have reductions in sales and income as a result of Amendment 13. While compared to the entire economies of these groups the losses are generally minor, they may have substantial impacts on fishing-related businesses. New Bedford MA is likely to have the most serious short-term impacts, followed by lower Mid-Coast Maine, Gloucester MA, and Boston MA. The distribution of the total impacts is illustrated in Figure 53 through Figure 55. These figures demonstrate that the impacts are not evenly distributed across all ports. Generally, those ports with an active groundfish fleet are expected to have more negative impacts. Some exceptions can also be seen. For example, the fact that Boston is a large financial, shipping, and insurance hub results in large impacts, even though the groundfish fleet in this port is small. During Amendment 13 public hearings, concern was expressed that the loss in fishing revenues and reductions in fishing time would lead to the failure of fishery support businesses such as gear and ice suppliers, etc., and the analyses underestimated these impacts.

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

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

The SIA in Amendment 13 concluded that as a result of regulations implemented since 1994, many groundfish vessels were having difficulty operating efficiently, maintaining year round income, and

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

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

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

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

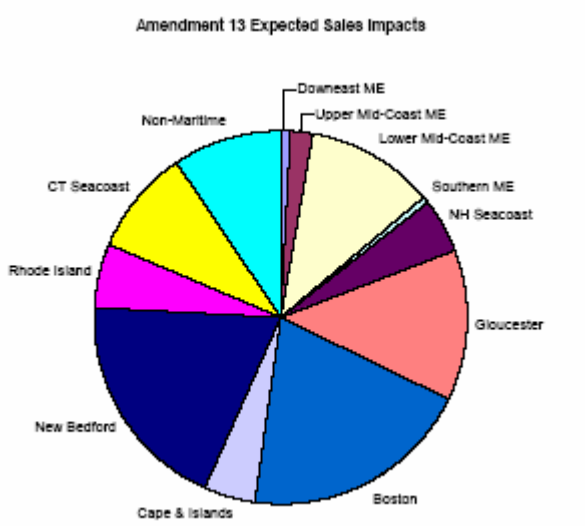

Figure 50- Amendment 13 expected sales impacts, by port group

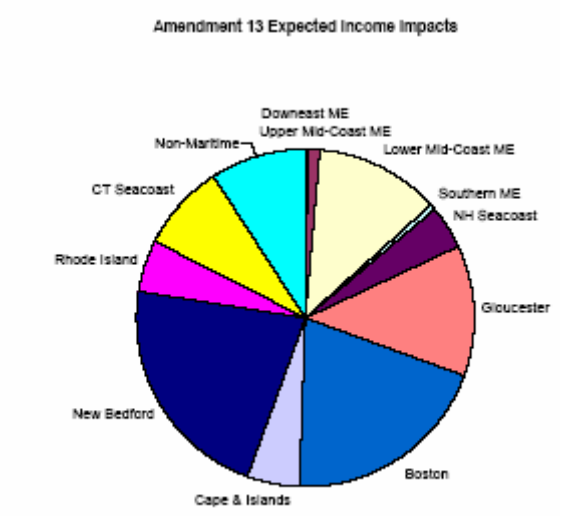

Figure 51 – Amendment 13 expected income impacts, by port group

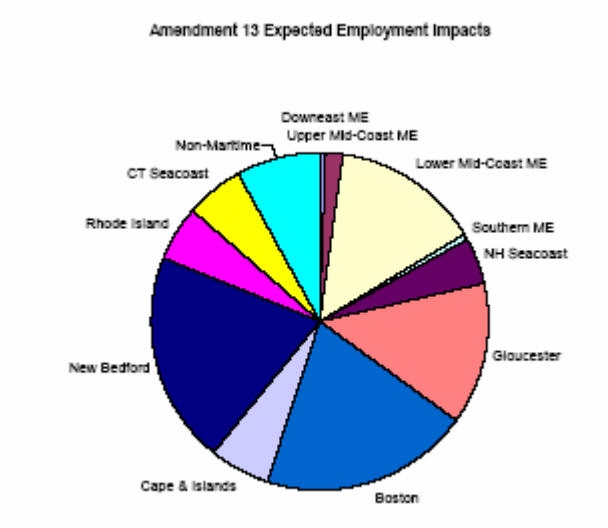

Figure 52 - Amendment 13 expected employment impacts, by port group

3.3.6.5 PORT ANALYSIS CRITERIA AND OVERVIEW

Ports in New England were selected for consideration based on the criteria outlined in the Amendment 13 SEIS, as listed below:

> The communities that are likely to experience significant impacts from the alternatives under consideration include those with at least one of the following characteristics:
> - an active and large multispecies fishing fleet,
> - vessels and shoreside facilities that currently depend on groundfish for a substantial portion of their business,
> - geographically close to areas proposed for additional seasonal or year-round closure, and
> - vessels that hold a substantial amount of latent effort (inactive DAS).
>
> (NEFMC, Am 13 FSEIA, Section 5.6.1.3)

And the assignment criteria outlined in the Marine Fisheries Initiative (MARFIN) report as presented in the NEFMC Amendment 13 SEIS are as follows:

> The port groups in this document are separated into primary and secondary groups. Primary groups are those communities that are substantially engaged in the groundfish fishery, as explained above, and which are likely to be the most impacted by groundfish management measures. Secondary groups are those communities that may not be substantially dependent or engaged in the groundfish fishery but have demonstrated some participation in the groundfish fishery since the 1994 fishing year (FY94).

Primary Community Groups
1. Portland, Maine
2. Portsmouth, New Hampshire
3. Gloucester, Massachusetts
4. Boston, Massachusetts
5. Chatham/Harwichport, Massachusetts

6. New Bedford/Fairhaven, Massachusetts
7. Point Judith, Rhode Island
Secondary Community Groups
8. Upper Mid-Coast 1, Maine
9. Lower Mid-Coast 1, Maine
10. NH Seacoast
11. South Shore, Massachusetts
12. Provincetown, Massachusetts
13. Eastern Rhode Island

Table 59 – Community Groups
(NEFMC, Am 13 FSEIS, Section 5.6.1.1.1)

3.3.6.5 PORT ANALYSIS SUMMARY

The following passages have been excerpted in part from the Am 13 FSEIS, Section 5.6.2 as prepared by the NEFMC:

> Both dependence on fisheries in general and dependence on the multispecies fishery are important to consider for the communities that are involved in groundfish harvesting that are most likely to be impacted by the proposed management measures. The MARFIN Report focuses on overall community dependence on fisheries; the additional information presented in [Amendment 13] focuses on dependence on the multispecies fishery in particular. Both measures of dependence are summarized below. In the MARFIN Report, fishing dependence was assessed based on three indices: 1) the percentage of labor force involved in fishing, 2) the percentage of related occupations within the Bureau of Labor Statistics category of fisheries/forestry/farming, and 3) a summary measure of a series of dependence ratios that compare the number of fishermen per hundred community residents to various alternative occupational roles that fishermen could enter with their particular skill profiles. The last of the indices described above, the occupational alternative index, is the most useful tool for comparison across different communities in the region (MARFIN 2001).
>
> The MARFIN Report divides the New England region into eleven sub-regions, which are also consistent with the sub-regions analyzed for this amendment using the Impact Analysis for Planning (IMPLAN) model, and then ranks these subregions from highest to lowest, based on fishing dependence. Table 7 below is from the MARFIN report and provides the fishing dependence indices for each sub-region. The MARFIN report explains that the three sub-regions with the highest dependence (Downeast Maine, Upper Midcoast Maine, Cape and Islands) share some characteristics that make these communities significantly more dependent on fishing resources than other regions of New England. These three regions are all relatively isolated from other parts of New England and have small islands and harbors, which give fishermen easy access to nearby fish and shellfish grounds.
>
> MARFIN suggests that the occupational alternative index is significantly lower for the Cape and Islands as compared to the two sub-regions in Maine, because the Cape has experienced intense pressures from tourism and gentrification. However, there is variation among ports within these sub-regions. For example, Chatham is one town on Cape Cod that has remained an active fishing port over the years and has

supported a successful fishing industry despite low biomass levels, increased regulations, and pressures from the recreational fishing and tourism industries.
(NEFMC, Am 13 FSEIS, Section 5.6.2)

MARFIN SUB-REGION	% Related Occupations	% of Total Employed	Alternative Occupation Ratio Summary
Downeast Maine	45	3.6	255.54
Upper Midcoast Maine	36	2.0	171.05
Cape and Islands	27	0.79	104.43
Lower Midcoast Maine	23	0.46	51.32
New Bedford/South Shore	27	0.40	38.95
Southern Maine	23	0.39	36.94
Rhode Island	24	0.31	30.86
Gloucester/North Shore	20	0.21	24.91
New Hampshire Coast	8	0.09	9.46
Boston Area	7	0.05	6.39
Connecticut Coast	2	0.01	2.61

Table 60 - Comparative fishing dependence indices for the eleven sub-regions of New England.
(MARFIN 2001 in NEFMC, Am 13 FSEIS, Section 5.6.2)

For the purposes of this assessment, groundfish revenues expressed as the percentage of total fisheries revenues from federally-permitted vessels homeported in a particular community group represent the community group's current dependence on the groundfish fishery. Information about dependence for all community groups can be found in the Affected Human Environment section of the NEFMC Amendment 13 SEIS. Table 8 ranks average dependence on multispecies from FY99 and FY00 for the communities of interest.
(NEFMC, Am 13 FSEIS, Section 5.6.2)

RANK	COMMUNITY GROUP	AVERAGE GROUNDFISH DEPENDENCE FY99-FY00
1	Chatham/Harwichport, MA	71.1%
2	Portland, ME	64.3%
3	Gloucester, MA	61.7%
4	Boston, MA	55.7%
5	Portsmouth, NH	54.7%
6	South Shore, MA	47.7%
7	Provincetown, MA	45.4%
8	NH Seacoast	44%
9	Lower Mid-Coast 1, ME	34%
10	Upper Mid-Coast 1, ME	23.1%
11	New Bedford/Fairhaven, MA	22.3%
12	Point Judith, RI	18.3%
13	Eastern Long Island, NY	16.9%
14	Eastern RI	11.5%
15	Northern Coastal NJ	3%

Table 61 – Ranking of dependence on groundfish for communities of interest.
(NEFMC, Am 13 FSEIS, Section 5.6.2)

3.3.6.6 OVERVIEW OF GB HOOK FISHERY

The GB Hook Sector, which operates out of Chatham and Harwich, is comprised of approximately 25 fishermen representing approximately 25 permits. Many of these fishermen are second- or third-generation fishermen that hope to pass along this tradition to their sons and daughters. Massachusetts, and specifically the ports of Chatham and Harwichport, has a longstanding history of catching cod.

3.3.6.6.1 CAPE COD AND THE ISLANDS

The very name of this region speaks volumes about its centuries-old connection to fishing. Ever since 1602, when Bartholomew Gosnold first landed in what is now Provincetown, fishing has drawn people to Cape Cod. The Pilgrims established fishing villages along the length of this sandy peninsula, and several of these endure today, although in much changed form. A look through any promotional material for the area prominently features fishing as a primary attraction for tourism and retirement activity. Seafood originating from towns such as Chatham, Wellfleet, and Eastham is renowned throughout New England for its freshness and quality. A drive through any of these towns at dawn reveals a working world of fishermen, trucks, and boats busily plying their trade. A wide range of ancillary businesses such as gear suppliers, fuel, bait, marine equipment, fish markets, and restaurants depend on this industry for survival. Little hard data exist to measure the financial scope of this industry, but it is clearly becoming a priority, and it is anticipated that such data will become available in the near future. Former Massachusetts Governor Mitt Romney created the Cape Cod Regional Competitiveness Council. NEMFC Council Chairman John Pappalardo was on their Fisheries / Agriculture Sub-Committee and has recommended that the NEFMC begin compiling this kind of data so there will be a better picture of the financial and social value of commercial fishing to the Cape and Islands.

The following passages have been excerpted in part from "Fishing Communities and Fishing Dependency in the Northeast Region of the United States":

> (On) The Cape and Islands… fishing is a natural occupation for those who live in such proximity to fertile fishing grounds. Furthermore, … distances to major population centers with diverse alternative employment are significant. Consequently, only the tourist industry rivals fishing in importance. Because tourism is limited to the mild or warm seasons, fishing is often regarded as an appropriate year-round enterprise.... Several of the Cape Cod & Islands ports are listed among the top ports [on Cape Cod and the Islands]. For example, Chatham has a ranking of four, Vineyard Haven is ranked as nine, and Sandwich is 14 out of the 36 ranked.
>
> On the gentrification scale, Vineyard Haven is ranked 5th and Provincetown and Chatham are ranked 13th and 14th, respectively. Despite gentrification, these ports are actively engaged in the fishing industry. Provincetown-Chatham are lumped together by "Fisheries of the United States." In comparison to other major U.S. ports in 1998-99, Provincetown-Chatham numbered among the top 50 ports with landings of 17.8 million pounds in 1998 and 20 million pounds in 1999. The value of these landings was $10.2 million in 1998 and $12.9 million in 1999.
>
> While the price per pound was approximately the same as found in Pt. Judith, a port to which Chatham is often compared, the quantities landed in Pt. Judith were much smaller. Chatham is the most active port of the Cape Cod & Islands sub-region. Though small, the town has an important longline/hook fleet in addition to gillnetters and lobster fishermen, a thriving shellfish industry, and a well-developed support industry. Innovation and flexibility are hallmarks of Chatham fishermen. The development of niche fisheries (e.g., dogfish and now, selling to the live fish market) is something that respondents reported with pride. Chatham also has a large retired population (almost a third of the whole). As noted elsewhere, increased cost of property and lack of year round rental property is a major concern.
> (Hall-Arber et al, 1998)

3.3.6.6.2 CHATHAM/HARWICHPORT, MASSACHUSETTS

The following passages have been excerpted in part from the Am 13 FSEIS, Section 9.4.5.8.3.1 as prepared by the NEFMC:

> Chatham, MA is a small coastal town on Cape Cod that is primarily known as a tourist destination. In addition to great beaches and quaint shops, another major attraction for tourists in Chatham is the opportunity to view fishermen unload their catch on the Town Pier. Chatham is a geologically diverse area that supports a vast number of different fisheries. According to the 1990 Census, the year-round population was 6,600 in 1989, but it is estimated that this number is increasing significantly in recent years. Close to half of the homes in Chatham are vacant in the winter months, and roughly one-third of the population is over 65. The population of Chatham in 1989 was 98.6% white, and the median household income was $31,315. The largest category of employed residents in 1995 was the "services" category, and fishing made up 12% of this category, representing a significant portion of the overall employment in Chatham.
>
> According to Chatham harbormaster documents, there are 279 commercial vessels at the Chatham Fish Pier and Stage Harbor mooring areas. It is estimated that about two-thirds of these vessels are small skiffs used for shellfishing. MARFIN found that there are currently 64 vessels with docking permits for the Town Pier; 22 gillnets, 17 longliners, 5 combination, 8 lobster vessels, several handline vessels, several draggers, and four party/charter boats. The Town Pier facilities are maintained by the Town and are dedicated solely to commercial fishing interests. In addition to the Town Pier, the majority of finfish activity actually takes place on the two private docks adjacent to the Town's facility. MARFIN found that the fleet in Chatham primarily targets Georges Bank stocks of groundfish and dogfish. The major species landed are codfish, dogfish, monkfish, haddock, bluefin tuna, and lobster. Chatham also has a substantial shellfish industry. There are numerous support services for the fishing industry in Chatham, such as fish buyers, cutters, gear workers, and shellfish shuckers. Some fishermen in this area only fish part of the year, and others switch their gear to fish for longer periods of time. MARFIN found that the majority of vessels in Chatham are owner-operated.
>
> The recreational sector is growing in Chatham. MARFIN determined that the favorite species for recreational fishermen in Chatham were striped bass, followed by bluefish, scup and cod. MARFIN found many fishing related organizations in Chatham, and some of them are very active in supporting Chatham fishermen and representing their voice in fisheries management. All fishermen interviewed by MARFIN believe there has been a change in effort over the past ten years, except for shellfish, which has remained stable over the years. Some Chatham fishermen voiced that they want to diversify, but they cannot get the permits to do it.
> (NEFMC, Am 13 FSEIS, Section 9.4.5.8.3.1)

The following passages have been excerpted in part from the Am 13 FSEIS, Section 5.6.1.3 as prepared by the NEFMC:

> In FY99 and FY00, Chatham and Harwichport averaged 5,980,850 pounds of groundfish landings and $7,254,100 in groundfish revenues, establishing it as an important port of landing for groundfish vessels and a primary port for the multispecies fishery. Chatham and Harwichport also serve as homeports for a significant number of multispecies vessels. In FY99 and FY00, an average of 95 multispecies vessels homeported in Chatham/Harwichport generated $6,844,500 in revenues from multispecies. Chatham's overall community dependence on multispecies as a percentage of total fisheries revenues

from federally-permitted vessels averaged about 71% from FY99 – FY00. It is likely that at least some of the active groundfish vessels in Chatham and Harwichport are even more than 71% dependent on the multispecies fishery.

At the social impact informational meeting in Chatham, a few residents of Chatham and Harwichport submitted comments reporting that they have experienced the most significant social impacts from the May closure on Georges Bank to protect cod. The majority of multispecies vessels from Chatham and Harwichport fish for Georges Bank cod and not Gulf of Maine cod.
(NEFMC, Am 13 FSEIS, Section 5.6.1.3)

4.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This EA presents two options including the proposed action which is approval of the Georges Bank Hook Sector and a No-Action alternative and analyzes the impacts of the alternatives which are described below.

4.1 Alternative 1 (No Action)

The No Action Alternative is the implementation of the GB Hook Sector Allocation without submission or approval of either the Operations Plan or any modified Operations Plan. While the Sector would be available under Alternative 1, all vessels would opt to remain in the Common Pool and fish under the regulations implemented in Amendment 13 and subsequent framework adjustments to the Northeast Multispecies FMP. Therefore, no allocation of GB cod would be made to the Sector.

Alternative 1 assumes that no vessels elect to enter the Sector. Under this alternative, all Hook vessels decide to remain in the Common Pool under the rules implemented in Amendment 13 and subsequent framework adjustments to the FMP. While there is a Sector (but not vessels electing to enter it), the Sector would not have any allocations. Alternative 1 would subject all GB Hook vessels to the input control measures designed to reduce the efficiency of the groundfish fleet in Amendment 13.

4.1.1 Effort Controls

The ratio of Category A and Category B DAS will be the default adopted by Amendment 13 (55/45) and equates to an 8.3 percent reduction in Category A DAS available to each permit, and a similar increase in Category B DAS.

4.1.2 Differential DAS Counting

When using Category A DAS in the areas shown in Figure X, vessels will be charged differential DAS. Vessel operators that plan to catch fish in these areas will be required to declare their intent to do so at the beginning of a trip using procedures that will be promulgated by the Regional Administrator. The required means for this notification will be via VMS, but other procedures may be authorized if necessary due to delays in implementing the VMS requirement for all vessels. A vessel that does not declare its intent to catch fish in this area is not permitted to do so on that trip. A vessel that does not declare its intent to fish in the area is not restricted from transiting the area, or being within the area (for example, to evade weather), with gear properly stowed. Differential DAS counting does not apply to the use of Category B DAS in these areas.

A vessel that declares its intent to fish in the GOM differential DAS area will be charged Category A DAS at the rate of 2:1 – that is, the vessel will be charged Category A DAS at two times the actual time underway. This rate will be charged for the entire trip, including any portions that occur outside of the differential DAS area. A vessel that declares its intent to fish in the SNE differential DAS area will be charged Category A DAS at the rate of 2:1 - that is, the vessel will be charged two times the actual time

underway. This rate will be charged only for time spent in the area. While unlikely, should a vessel declare its intent to fish in both areas on the same trip, differential DAS will be charged for the entire trip, consistent with the requirements for the GOM area.

Vessels declared into the day gillnet category that declare their intent to fish in a differential DAS counting area will be charged a minimum of 15 hours for any trip that is three hours or more in length, up to and including 7.5 hours (actual time underway, regardless of whether in a differential DAS area or not). For trips that are less than three hours, day gillnet vessels will be charged DAS at the appropriate differential rate. For trips that are over 7.5 hours, day gillnet vessels fishing in the GOM differential DAS area will be charged DAS at the differential rate.

Rationale: Differential DAS counting is designed to reduce fishing mortality on several stocks, including GOM cod, CC/GOM yellowtail flounder, and SNE/MA yellowtail flounder. When combined with a daily trip limit that is based on the time underway (not the DAS charged – see Section X) this will reduce the effort on these stocks. The inshore GOM differential DAS area is adjacent to several important fishing ports and any vessel sailing from or landing in those ports must transit the area. If a vessel is allowed to fish both inside and outside the area and only be charged differential DAS while in the area, it would reduce the effectiveness of this measure. Any vessel fishing an entire trip in the area wishing to catch the maximum trip limit (4,000 lbs. at 800 lbs per DAS) would have to be absent for five DAS and would be charged ten DAS. If a vessel were to fish both inside and outside the area on the same trip and only be charged differential DAS while in the area then the DAS charged would be lower. As an example, from the eastern boundary of the inshore GOM differential DAS area to Gloucester is about 37 nautical miles, or about 3.5 hours at ten knots. Allowing for one three hour tow to "top off" to the full GOM cod trip limit the vessel could conceivably be charged differential DAS for only 6.5 hours (3.5 hours of transit time plus the 3 hours of towing time) which would add only 6.5 hours to the DAS charged for the trip (6.5 hours times 2 is thirteen hours). The vessel would thus only be charged 5 days and 6.5 hours while catching the maximum GOM cod trip limit. In essence, this reduces the differential DAS rate from 2:1 to about 1.13:1 for these trips, greatly reducing the effectiveness of this measure. It is possible that a vessel operator could reduce this even further by skirting the edge of the area and only entering to make a short tow. Given the value of cod ($1.50 to $2 per pound in late CY 2005), the size of the trip limits proposed (800 lbs per DAS), and the limited number of DAS available, if vessels are not charged differential DAS for the entire trip there will be considerable incentive for fishermen to develop practices that circumvent the intent of differential DAS counting while complying with the regulations.

Unlike the inshore GOM differential DAS area, the SNE/MA differential DAS are not adjacent to the coast and vessels do not have to transit the area enroute homeport as frequently. In addition, the trip limits under consideration for SNE/MA yellowtail flounder are lower and the potential value of diverting to "top off" a trip is thus less. For this reason, differential DAS are charged only while fishing in the area, unless VMS is not adopted for all vessels. In that case, since it is not possible to track a vessel's location unless it is equipped with VMS, a vessel that declares into the area via IVR will be charged differential DAS for the entire trip.

4.1.3 Differential DAS Counting Area

Differential DAS counting will apply in the following areas (see Figure X):

Gulf of Maine:
Thirty minute squares 114/115/116/123/124/125/132/133/138/139/140,
described by the following
coordinates:

43-30N	(intersection with Maine shoreline)
43-30N	69-30W
43-00N	69-30W
43-00N	69-55W (eastern boundary, WGOM Closed Area)
42-30N	69-55W
42-30N	69-30W
41-30N	69-30W
41-30N	70-00W
(North to intersection with Cape Cod coast)	70-00W

Southern New England:
Area bounded by the following coordinates:

41-05N	71-45W
41-05N	70-00W
41-00N	70-00W
41-00N	69-30W
40-50N	69-30W
40-50N	70-20W
40-40N	70-20W
40-40N	70-30W
40-30N	72-30W
40-10N	73-00W
40-00N	73-15W
40-00N	73-40W
40-15N	73-40W
40-30N	73-00W
40-55N	71-45W
41-05N	71-45W

Rationale: The inshore GOM area is designed to reduce fishing mortality on GOM cod and CC/GOM yellowtail flounder. The area selected accounted for nearly 85 percent of GOM cod landings in FY 2004 and a similar percentage of CC/GOM yellowtail flounder. The SNE differential DAS area is designed to reduce mortality primarily on SNE/MA yellowtail flounder but may also reduce mortality on SNE/MA winter flounder. Amendment 13 proposed adopting differential DAS counting in the SNE RMA, a much larger area. Since yellowtail flounder is caught in well-defined locations, a smaller area is being proposed to allow some fishing for monkfish and winter flounder that will not be subject to differential DAS counting.

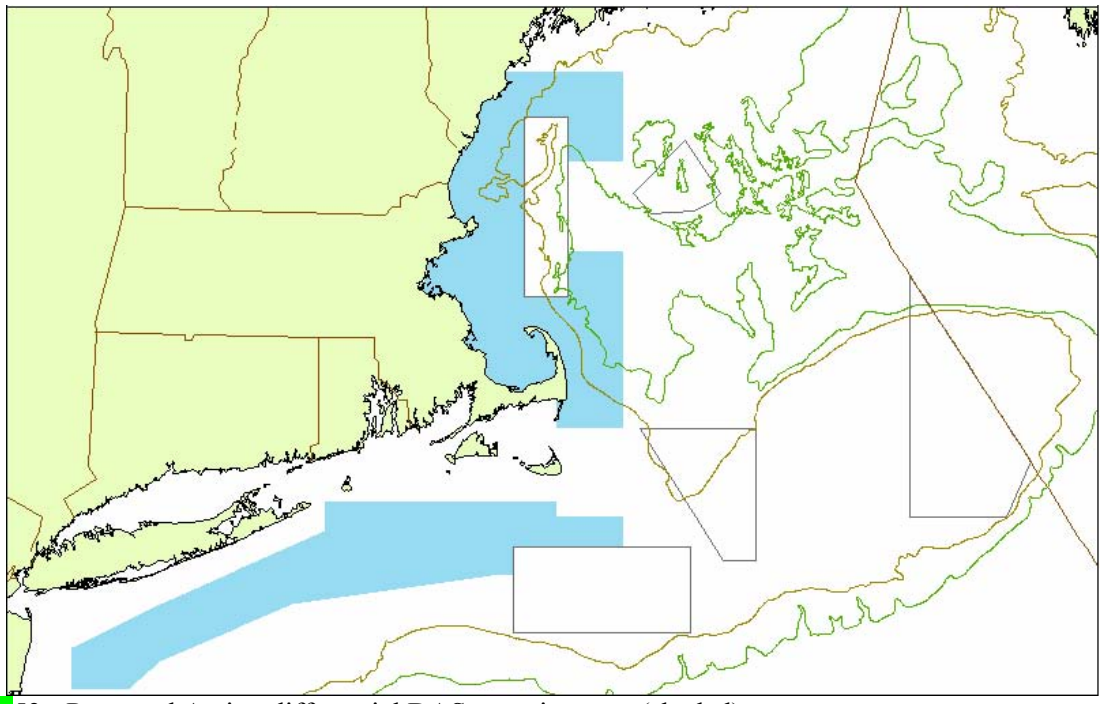

Figure 53 - Proposed Action differential DAS counting area (shaded)

4.1.4 Trip Limits

The following trip limits will be adopted. For vessels fishing in the differential DAS counting areas, trip limits are based on the time underway and not the DAS charged. With respect to the modified running clock for GOM or GB cod, vessels declared into the differential DAS area are not subject to the modified running clock.

GOM Cod:	800 lbs/day – 4,000 lbs/trip
GB Cod: 1,000 lbs/day –	10,000 lbs/trip
CC/GOM Yellowtail Flounder:	250 lbs/day – 1,000 lbs/trip
SNE/MA Yellowtail Flounder:	250 lbs/day – 1,000 lbs/trip
GB Winter Flounder:	5,000 lbs/trip
GB Yellowtail Flounder:	10,000 lbs/trip
White Hake:	1,000 lbs/day – 10,000 lbs/trip

Rationale: Trip limits for GOM cod and GB cod are unchanged. The trip limits for CC/GOM yellowtail flounder and SNE/MA yellowtail flounder are reduced to meet mortality objectives and are made identical to simplify regulations (this will remove the requirement that vessels declare into either the SNE/MA or CC/GOM yellowtail flounder stock area). A trip limit is established for GB yellowtail flounder to reduce mortality and also reduce the likelihood that the TAC will be caught early in the year. Trip limits for white hake and GB winter flounder are designed to reduce mortality on those two stocks.

The modified running clock was first adopted in an interim rule in August 1999 for GOM cod and in August 2002 for GB cod. This regulation requires vessels that land more than one day's limit of GOM or GB cod to not call-out of the DAS system until the vessel is charged the full twenty-four hours for the additional cod. A vessel landing two days of the trip limit, for example, must not call-out of the DAS system until it has been charged 48 hours on the DAS clock, and cannot depart on another trip until the full period has elapsed. The purpose of the running clock was to establish a closer link between DAS charged and the daily possession limit on multi-day trips. The application of differential DAS at a 2:1

rate removes the need for this provision. In order to land two days of the trip limit, the vessel must be underway at least twenty-four hours and one minute and will be charged just over forty-eight hours; a vessel landing three days of the limit from the differential DAS area must be underway at least forty eight hours and one minute and would be charged just over ninety-six hours on the DAS clock. The modified running clock requirement will still apply to vessels that are not fishing in the differential DAS counting area.

4.1.5 Trip Limit Adjustments

On species that have trip limits, the Regional Administrator has the authority and responsibility to monitor the catch in relationship to the target TACs and, in the event that it can be projected that at least 90% of the target TAC will not be caught in any given year, the Regional Administrator may adjust the trip limits upwards as appropriate consistent with procedures established by the Administrative Procedures Act (APA). Changes by the Regional Administrator can be made at any time, including before the start of the fishing year if necessary, in all areas (including the Eastern U.S./Canada area).
Adjustments to the GB yellowtail flounder trip limit may also be made under provisions for the U.S./CA area to prevent exceeding the TAC or to facilitate harvesting the TAC. These provisions allow this trip limit to be increased or decreased. The Regional Administrator (RA) can adjust this initial limit in FY 2007 if necessary to prevent exceeding, or to facilitate harvesting, the TAC. The Council offers the following guidance for consideration by NMFS when adjusting this trip limit (summarized in Table X). This guidance is intended to replace the existing provision that requires a reduction of the trip limit to 1,500 lbs/DAS and 15,000 lbs per trip when 70 percent of the TAC is caught, but does not replace the Regional Administrator's authority to adjust the TAC if necessary at other times (including prior to the beginning of the fishing year):

. If 30% of the TAC is reached during the first quarter, lower to 7,500 lbs.

. If 30% of the TAC is reached during the second quarter, continue 10,000 lbs.

. If 30% of the TAC is reached during the third quarter, increase to 25,000 lbs.

· If 30% is reached during the fourth quarter, remove the GBYT trip limit

If at any time during the fishing year and prior to reaching the 30% trigger the RA determines that the TAC is not likely to be attained, the RA may alter the trip limit upwards to 15,000 or 25,000 lbs./trip. Any additional adjustments could be made at 60%.

. If 60% of the TAC is reached during the first quarter, lower to 3,000 lbs.
. If 60% of the TAC is reached during the second quarter, lower to 5,000 lbs.
. If 60% of the TAC is reached during the third quarter, continue at 10,000 lbs.
. If 60% of the TAC is reached during the fourth quarter, increase to 25,000 lbs.

If at any time during the fishing year and prior to reaching the 60% trigger the RA determines that the TAC is not likely to be attained, the RA may alter the trip limit upwards to 25,000 lbs./trip or remove the trip limit altogether. An additional adjustment could be made at 60% or when approaching the TAC.

Fishing Year Quarter	GB Yellowtail Flounder Trip Limit Adjustment Catch reaches 30% of TAC during quarter	Catch reaches 60% of TAC during quarter
Quarter 1	7,500 lbs	3,000 lbs
Quarter 2	10,000 lbs	5,000 lbs
Quarter 3	25,000 lbs	10,000 lbs
Quarter 4	No limit	25,000 lbs
At any time if TAC is unlikely to be attained	Catch <= 30% of TAC 15,000 lbs to 25,000 lbs	Catch <= 60% of TAC 25,000 lbs or unlimited

Table 62 – GB yellowtail flounder trip limit adjustment guidance

Rationale: The RA is provided authority and guidance to adjust trip limits so that yield is not sacrificed. Several stocks are predicted to grow rapidly between 2006 and 2008 and target TACs to increase as a result. It may be necessary to relax trip limit restrictions to harvest the target TACs. In the case of GB yellowtail flounder, specifi62guidance is provided so that the industry can anticipate changes that may be made over the course of the year in order to harvest, but not exceed, the target TAC.

4.1.6 Controls on Monkfish, Skates and Dogfish

The No Action alternative also leaves Sector members subject to existing on monkfish, skates and dogfish as well as changes to Monkfish regulations to be implemented under Monkfish FW4.

4.1.7 Monkfish DAS and Trip Limits

Monkfish FW4 will implement new restrictions on monkfish DAS limiting vessels to 31 monkfish DAS with trip limits in the Northern management areas of 1,250 lb (567 kg) tail weight per DAS for limited access monkfish Category A and C vessels, and 470 lb (213 kg) tail weight per DAS for limited access monkfish Category B and D vessels. Vessels would be restricted to using no more than 23 of their allocated 31 monkfish DAS in the SFMA. This action would also establish SFMA trip limits of 550 lb (249 kg) tail weight for limited access monkfish Category A, C, and G vessels; and 450 lb (204 kg) tail weight per DAS for limited access monkfish Category B, D, and H vessels. These are the same trip limits in effect during FY2006.

Monkfish FW4 will also reduce the incidental catch limit for the NFMA. The proposed action would reduce the monkfish incidental catch limit applicable to limited access monkfish vessels (Categories A, B, C, D, F, G, and H) and open access monkfish vessels (Category E) fishing under a NE multispecies DAS in the NFMA from 400 lb (181 kg) tail weight per NE multispecies DAS, or 50 percent of the weight of fish on board, to 300 lb (136 kg) tail weight per DAS, or 25 percent of the weight of fish on board. The proposed incidental catch limit is equivalent to that implemented in the original FMP (64 FR 54732; October 7, 1999). Framework 4 does not change the incidental catch limits in the SFMA which remain at: (A) Category C, D, and F vessels. If any portion of a trip is fished only under a NE multispecies DAS, and not under a monkfish DAS, in the SFMA, a Category C, D, or F vessel may land up to 300 lb (136 kg) tail weight or 996 lb (452 kg) whole weight of monkfish per DAS if trawl gear is used exclusively during the trip, or 50 lb (23 kg) tail weight or 166 lb (75 kg) whole weight per DAS if gear other than trawl gear is used at any time during the trip.

4.1.8 Skate possession and landing restrictions remain as code in CFR§ 648.322

a) Skate wing possession and landing limit. A vessel or operator of a vessel that has been issued a valid Federal skate permit under this part, provided the vessel fishes under an Atlantic sea scallop, NE multispecies, or monkfish DAS as specified at §§648.53, 648.82, and 648.92, respectively, unless otherwise exempted under paragraph (b) of this section, may fish for, possess, and/or land up to the allowable daily and per trip limits specified as follows:

(1) Possess up to 20,000 lb (9,072 kg) of skate wings (45,400 lb (20,593 kg) whole weight) per trip of greater than 24 hours in duration; or
(2) Land up to 10,000 lb (4,536 kg) of skate wings (22,700 lb (10,296 kg) whole weight) per trip of 24hours or less in duration.

(b) Bait Letter of Authorization (LOA). A skate vessel owner or operator under this part may request and receive from the Regional Administrator an exemption from the skate wing possession limit restrictions, provided that the following requirements and conditions are met:

(1) The vessel owner or operator obtains an LOA. LOAs are available upon request from the Regional Administrator.
(2) The vessel owner/operator possesses and/or lands only whole skates less than 23 inches (58.42 cm) total length.
(3) The vessel owner or operator fishes for, possesses, or lands skates only for use as bait.
(4) Vessels that fish for, possess, and/or land any combination of skate wings and whole skates less than 23 inches (58.42 cm) total length must comply with the possession limit restrictions under paragraph (a) of this section for all skates or skate parts on board.
(5) Any vessel owner/operator meets the requirements at §648.13(h).
(6) Skate bait-only possession limit LOA—The vessel owner or operator possesses and lands skates in compliance with this subpart for a minimum of 7 days.

(c) Prohibitions on possession of skates. All vessels fishing in the EEZ portion of the Skate Management Unit are subject to the following prohibitions:

(1) A vessel may not retain, possess, or land barndoor or thorny skates taken in or from the EEZ portion of the Skate Management Unit.
(2) A vessel may not retain, possess, or land smooth skates taken in or from the GOM RMA described at §648.80(a)(1)(i). [68 FR 49701, Aug. 19, 2003, as amended at 69 FR 22988, Apr. 27, 2004]

4.1.9 Dogfish possession and landing restrictions remain as coded in CFR§ 648.235

(a) Quota Period 1. From May through October 31, vessels issued a valid Federal spiny dogfish permit specified under §648.4(a)(11) may:

(1) Possess up to 600 lb (272 kg) of spiny dogfish per trip; and
(2) Land only one trip of spiny dogfish per calendar day.

(b) Quota Period 2. From November 1 through April 30, vessels issued a valid Federal spiny dogfish permit specified under §648.4(a)(11) may:

(1) Possess up to 600 lb (272 kg) of spiny dogfish per trip; and
(2) Land only one trip of spiny dogfish per calendar day.

(c) Regulations governing the harvest, possession, landing, purchase, and sale of shark fins are found at part 600, subpart N, of this chapter. [66 FR 22476, May 4, 2001, as amended at 67 FR 6201, Feb. 11, 2002; 69 FR 53362, Sept. 1, 2004; 71FR 40438, July 17, 2006]

4.2 ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

The Preferred Alternative is approval of the GB Cod Hook Sector Operations Plan and receipt of an allocation of all regulated multispecies, monkfish, skates, and spiny dogfish for FY2008. Sector vessels would be subject to the regulations implemented under the Operations Plan.

As part of Amendment 13 to the Northeast Multispecies FMP, the concept of Sector Allocation was passed unanimously by the NEFMC (14-0) as an opportunity for a self-selecting group of fishermen with valid multispecies permits to voluntarily come together and form a cooperative for the purposes of attaining an allocation.

The proposed Preferred Alternative/Ops Plan has been deliberated by the prospective Sector members and represents the culmination of bi-weekly stakeholder meetings for over 2 years. Further refinement of the Ops Plan is expected throughout the term of the Sector as members grow increasingly familiar with management of a hard TAC. The process by which the Ops Plan was developed is but one example of the social benefits of its implementation. The Ops Plan is the result of authorizing formation of a Sector that empowers stakeholders to more closely "plug in" to the management infrastructure and hold a more active role in development of appropriate regulations.

Because the catch of all managed species would be constrained by hard TACs, the sector requests that it be exempted from other regulations designed specifically to control fishing mortality. Vessels participating in the Sector are legally-bound to uphold and abide by the following Operations Plan:

Hook Sector Harvest Plan
Fishing Year 2008-09 (May 2008 – April 2009)
Georges Bank Cod Hook Gear Sector Operations Plan Harvesting Rules

The members and the participating vessels of the Sector agree to be legally bound to follow the Operations Plan and Harvesting Rules for fishing year (FY) 2008 as described herein, notwithstanding those rules and regulations applicable to common pool multispecies vessels.

1. Aggregate Sector allocation:

The Sector Members agree that, collectively, they would not harvest more quota-managed groundfish, monkfish, and skates than the Sector TACs. Once any of the annual TACs are reached, no participating vessel may possess or land quota-managed groundfish, monkfish, and skates, or use any fishing gear capable of catching quota-managed groundfish, monkfish, skates, and spiny dogfish shark unless additional quota is obtained (see Harvesting Rule #2). Additionally, the Sector will operate within a minimum allocation amount of 2,000 pounds of TAC of any quota-managed species to all Sectors where fishing history is less than this minimum allocation amount. Species managed under a TAC are:

I. GOM Cod
II. GB Cod

III. GOM Haddock
IV. GB haddock
V. GB YT
VI. CC YT
VII. SNE YT
VIII. GOM Winter Flounder
IX. GB Winter Flounder
X. SNE/MA Winter Flounder
XI. GOM/GB Windowpane Flounder
XII. SNE/MA Windowpane Flounder
XIII. Witch Flounder
XIV. American Plaice
XV. Redfish
XVI. Pollock
XVII. White Hake
XVIII. Atlantic Halibut
XIX. Ocean Pout
XX. NMFA Monkfish
XXI. SFMA Monkfish
XXII. Clearnose Skate
XXIII. Little Skate
XXIV. Rosette Skate
XXV. Smooth Skate
XXVI. Thorny Skate
XXVII. Winter Skate
XXVIII. Barndoor Skate
XXIX. Spiny Dogfish Shark

2. Inter-Sector Quota Trading:
The Sector Manager will allow trading of catch allocations with other sectors, provided that both sectors are operating under allocations of all regulated multispecies. Trading will be allowed only within the year, and will be accurately monitored and accounted for in real-time. Furthermore, trading will not be allowed if it will cause a sector to exceed its 20% cap on any species.

3. Days-At-Sea ("DAS"): Each participating Permit and Participating Vessel will be exempt from all DAS requirements.

4. Sector Call-In: Each Participating Vessel must notify the Manager or his designated representative prior to departing from port when using fishing gear capable of catching quota-managed species.

5. Full retention: All quota-managed species harvested during any fishing operation must be retained and counted against the Sector's Allocations.

6. Size Limits: Participating vessels will be exempt from all minimum and maximum size limits on quota-managed species.

7. Species Trip Limits: Participating vessels shall be exempt from any and all trip limits.

8. Gear Restrictions: No Participating Vessel may fish for quota-managed species with any gear other than jigs, non-automated demersal longline, automated demersal longline, handgear, or gillnets. All Participating Vessels are subject to the same gear restrictions on marking and tagging gillnet gear. Participating vessels are exempt from mesh size limits and number of gillnet limits. A "circle hook" is defined as a hook with the point turned back towards the shank and the barbed end of the hook is displaced (offset) relative to the parallel plane of the eyed-end, or shank of the hook when laid on its side. Participating Vessels are exempt from the 3,600 hook limit.

9. GB Seasonal Closure/Spawning Season Restrictions: Participating Vessels are not required to adhere to the seasonal closure on Georges Bank (May 1 through May 31) or any rolling or habitat closure, or non-spawning blocks. However, Participating Vessels must continue to comply with the Spawning Season Restrictions. The 20 day spawning block (March-May) will remain in effect in accordance with NMFS regulations.

10. Closed Areas: Participating Vessels may fish in all non-spawning closed areas.

11. Fishing Area: Sector members will fish solely with hooks and solely within the Sector Area, defined as the state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464 to 639)

12. Delayed Operation Clause: If the Sector experiences delays in implementation by NMFS, the NEFMC, or other governing body, the Sector will be allowed to operate under the previous years' Harvesting Rules until implementation for the current year occurs. Any quota-managed species harvested during this time will be measured by the Sector Manager and counted towards the Sector's current TACs.

13. Future Catch Histories: Catch histories associated with the Sector will remain constant regardless of whether the vessels landed the fish. Furthermore, Sectors will be credited with their maximum TAC amount (20%) rather than the actual amount of fish caught.

14. Reporting: Sector members will be exempt from federal paper reporting requirements and, instead, will be granted authorization to utilize federally-approved electronic reporting techniques.

15. Administrative Burden: Sectors proposed prior to 2006 will not have to compensate NMFS for any administrative burden

In addition to the Ops Plan, Sector members are subject to a legally-binding Membership Agreement that delineates the interaction of members within the Sector, including governance, enforcement, and penalties for non-compliance. The Sector operates independent of common pool vessels that still operate under a "soft" TAC and input control measures (such as DAS) as the main controls for managing mortality. The self-governance and monitoring of the Sector allows members to maintain stewardship of the resource upon which they depend. It creates a sense of interconnectedness among fishermen that would discourage violation of the Sector Membership Agreement and Ops Plan. As the Sector manages itself at the community level, NMFS carries less of an enforcement burden. In addition, because community based management is flexible to annual and midseason modifications, it is more responsive to changes in the condition of the fishery than the traditional process has been.

4.3 Comparison of Alternatives

The table presented below identifies and compares those elements of the Operations Plan that are specific to the Sector (Preferred Alternative) to those elements of current regulations that would pertain to hook vessels in the Common Pool.

	Alternative 1 (No Action)	**Alternative 2** (Preferred Alternative)
Hard TACs for all regulated multispecies, monkfish, all skates, and spiny dogfish shark	No	Yes
Inter-sector quota sharing	No	Yes
Multispecies DAS and reporting requirements	Yes	No
Differential Multispecies DAS counting	Yes	No
Monkfish DAS and report requirements	Yes	No
Full retention of all quota-manages species	No	Yes
Exemption from minimum and maximum size limits	No	Yes
Exemption from all species' trip limits	No	Yes
Exemption from net and hook limits and size	No	Yes
Exemption from GB Seasonal Closure - May	No	Yes
Exemption from all rolling and year-round closures	No	Yes
Exemption from fishing blocks	No	Yes
Exemption from paper reporting (electronic reporting)	No	Yes
Increased monitoring, enforcement, & reporting requirements	No	Yes
Increased fees and penalties for rule-breaking	No	Yes
Increased efficiency and empowerment of fishermen	No	Yes

Table 63- Comparison of management measures for Sector alternative and No Action Alternative

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 ALTERNATIVE 1 (NO ACTION)

The No Action Alternative is the implementation of Amendment 13 and the GB Cod Hook Sector Allocation. While the Sector would be available through Alternative 1, all vessels would opt to remain in the Common Pool and fish under the regulations implemented under Amendment 13 and subsequent frameworks. Thus, no allocation of GB cod would be made to the Sector.

5.1.1 BIOLOGICAL IMPACTS

These vessels would not have a hard TAC to constrain them and with their efficient gear offering them a wider array of species to target, these vessels are likely to reach their daily trip limits of cod and monkfish and continue fishing, discarding all further cod and monkfish overboard. These discards can, and often do, reach levels upwards of multiple times the daily trip limit and can be difficult to avoid. This wasteful practice continues to undermine any rebuilding plan in place and does nothing but delay the goal of achieving MSY. As haddock continue to rebuild to higher levels, regulatory discarding will undermine this example of a "fisheries management success story."

Gillnetting and, to some extent hook fishing, has interactions with a broad range of species, which creates more opportunities for incidental catch. The following table illustrates the interactions that the gear types have with non-target (and target) species for 2004:

Year	Species	Sink/Anchor Gillnet Landings (metric tons)	Benthic Longline Landings (metric tons)
2004	GOOSEFISH	5,240.90	19.9
2004	MACKEREL, ATLANTIC	5,083.60	n/a
2004	SKATES	2,640.50	136.8
2004	COD, ATLANTIC	2,208.00	104.8
2004	POLLOCK	1,919.00	16
2004	HAKE, WHITE	849.7	48.5
2004	SHARK, SPINY DOGFISH	434.9	16.6
2004	FLOUNDER, WINTER	223.6	3.1
2004	FLOUNDER, YELLOWTAIL	195.4	n/a
2004	HADDOCK	187.5	267.8
2004	SQUIDS	113.8	n/a
2004	SCUPS OR PORGIES	112.1	n/a
2004	LOBSTER, AMERICAN	78.2	1.2
2004	FLOUNDER, SUMMER	70.9	n/a
2004	BLUEFISH	55.4	n/a
2004	REDFISH OR OCEAN PERCH	51.5	n/a
2004	FINFISHES, UNC FOR FOOD	47.1	n/a
2004	FLOUNDER, WITCH	36.2	n/a
2004	FLOUNDER,ATLANTIC,PLAICE	29.9	n/a
2004	HAKE, SILVER	25.8	n/a
2004	WOLFFISH, ATLANTIC	21.5	1.2
2004	MENHADEN, ATLANTIC	17.4	n/a
2004	CUSK	15.2	9.2
2004	HERRING, ATLANTIC	5.9	36
2004	SEA BASS, BLACK	5.8	3.1
2004	TAUTOG	5.4	n/a
2004	SCALLOP, SEA	4.7	6.2
2004	WEAKFISH	3.3	n/a
2004	MACKEREL, SPANISH	2.2	n/a
2004	TUNA, YELLOWFIN	2.2	9.5
2004	SHARK, PORBEAGLE	2.1	n/a
2004	HAKE, ATLANTIC, RED/WHITE	2	n/a
2004	HAKE, RED	1.9	n/a
2004	BUTTERFISH	1.8	n/a
2004	FLATFISH	1.5	n/a
2004	HALIBUT, ATLANTIC	1.5	n/a
2004	BASS, STRIPED	1.2	n/a
2004	SHRIMP, MARINE, OTHER	1.1	1.8
2004	SWORDFISH	n/a	69.7
2004	CRAB, DEEPSEA RED	n/a	33.1
2004	TILEFISHES	n/a	30.7
2004	SHARK, SHORTFIN MAKO	n/a	7.2
2004	TUNA, BIGEYE	n/a	4.9

2004	DOLPHINFISH	n/a	3.8
2004	TUNA, ALBACORE	n/a	1.3
2004	TUNA, BLUEFIN	n/a	1.1

The information is based on a NMFS landings database query for 2004 and filtered to show those species which were caught by sink gillnets in amounts greater than or equal to one (1) metric ton. This shows that with the application of this filter (≥ 1mt), sink gillnets interact with 38 species; benthic longlines interact with 24. It is expected that these overall totals would not change in the absence of the Sector. Impacts to species include continued fishing pressure for non-overfished stocks and delayed rebuilding for overfished stocks.

Protected Species

The Northeast sink gillnet fishery is classified as a Level I fishery under the 2006 List of Fisheries (LOF) at 50 CFR Part 229. The bottom longline fishery on Georges Bank is considered part of the Category III listing for the Northeast/Mid-Atlantic bottom longline fishery. An explanation of the classifications used in the LOF is as follows:

> *Category I fishery* means a commercial fishery determined by the Assistant Administrator to have frequent incidental mortality and serious injury of marine mammals. A commercial fishery that frequently causes mortality or serious injury of marine mammals is one that is by itself responsible for the annual removal of 50 percent or more of any stock's potential biological removal level.
>
> *Category III fishery* means a commercial fishery determined by the Assistant Administrator to have a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. A commercial fishery that has a remote likelihood of causing incidental mortality and serious injury of marine mammals is one that collectively with other fisheries is responsible for the annual removal of:
>
> (1) Ten percent or less of any marine mammal stock's potential biological removal level,
>
> or
>
> (2) More than 10 percent of any marine mammal stock's potential biological removal level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's potential biological removal level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator. (50 CFR 229.2)

Table 64 shows the marine mammals known to have had interactions with sink gillnets and bottom longlines on Georges Bank, as excerpted from the 2006 List of Fisheries at 50 CFR Part 229, which reclassified the "Northeast sink gillnet fishery" as a Category I fishery and the "Northeast/Mid Atlantic bottom longline/hook-and-line fishery" as a Category III fishery.

Fishery Description	Estimated # of vessels/persons	Marine mammal species and stocks incidentally killed/injured
Category I		
Northeast sink gillnet	341	Bottlenose dolphin, WNA offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, WNA Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA
Category III		
Northeast/Mid-Atlantic bottom longline/hook-and-line	46	None documented

Table 65 - List of marine mammals known to have interacted with the longline and gillnet fisheries in the Northeast. Excerpted from the 2006 Final LOF (Department of Commerce, 2006)

As can be seen, Northeast sink gillnets have more interactions with marine mammals than bottom longline gear. Under the No Action alternative in the absence of the Sector, it is expected that these overall totals would not change. This means that there would be a continued level of interaction with non-ESA listed marine mammal species, potentially driving their numbers over potential biological removal (PBR), and with ESA-listed marine mammal species, jeopardizing their chances of recovery.

Under the Atlantic Large Whale Take Reduction Plan (ALWTRP), Harbor Porpoise Take Reduction Plan (HPTRP), and Bottlenose Dolphin Take Reduction Plan (BDTRP), hook gear must meet federal requirements for design, method of deployment and recovery and other standards. In addition, hook fishermen must abide by rolling closures and seasonal and spawning periods of restricted fishing activity. Under the No Action alternative, Sector members would not have a hard TAC to constrain them; therefore, there would be an unlikely chance that large whale interactions would decrease.

According to the Northeast Fisheries Science Center Sea Turtle Program, four species of turtles migrate northward along the continental shelf of the eastern U.S. to forage in highly productive, nearshore habitats during the spring, summer and fall months: primarily early life history stages of cheloniid loggerhead (*Caretta caretta*), Kemp's ridley *(Lepidochelys kempii)* and green (*Chelonia mydas*) turtles; and sub-adult and adult leatherback turtles (*Dermochelys coriacea*).

Although sea turtles are known to interact with both gillnet and hook-and-line gear, these occurrences happen infrequently with these gear types in the proposed operating area. Between January 2002 and June 2006, 4,651 anchored sink gillnet trips were observed, and 487 bottom longline trips were observed. In this 54 month period, federal observers reported 11 incidental takes of sea turtles in the anchored sink gillnet fishery, and zero incidental takes of sea turtles in the bottom longline fishery. It should be noted that the term "incidental take" can mean "dead," "alive and injured," or "alive and uninjured." Sea turtles often inhabit waters more temperate than the Sector's Operating Area. Under the No Action alternative, Sector members would not have a hard TAC to constrain them; therefore, there would be an unlikely chance that large whale interactions would decrease.

Biological Conclusions
Should the No Action alternative be chosen, the Sector's allocations would not be granted. It would be expected that some percentage of hook vessels may convert to other methods of harvest including otter trawling, which is known to have higher rates of fish bycatch. In addition, many of the smallest vessels within the Sector may be forced to sell their permits because they would not have the protection of the allocations and would be out-competed by more efficient vessels. Without the allocations to contain fishing effort, gillnetters have more opportunity for increased interactions and incidental catch of non-target and protected species. In addition, there would be no method in place to control the large amounts of regulatory discards experienced by the fleet today.

5.1.2 HABITAT IMPACTS
According to the Magnuson Act, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (Department of Commerce, 1996).

The EFH Final Rule identifies adverse impacts as "any impact, which reduces quality and/or quantity of EFH. Adverse effects from fishing may include physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other components of the ecosystem" (NEFMC, 1998).

The *Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern United States*, October 23-25, 2001, had the following findings regarding the impacts of longline and gillnets on marine habitats: "The panel concluded that sink gillnets and longlines cause some low degree impacts in mud, sand and gravel habitats" (Department of Commerce, 2002). As stated in the EFH final rule, the intent of EFH "is to regulate fishing gears that reduce an essential habitat's capacity to support marine resources, not practices that produce inconsequential changes in the habitat" (Department of Commerce, 2002).

Habitat Conclusions
The No Action alternative is expected to have no habitat impacts because it is a baseline condition in which the multispecies fishery would continue to be conducted as is: without the creation of the Sector. Habitat impacts of the existing fishery have already been minimized by the establishment of the habitat closed areas and effort controls that were approved in Amendment 13 and subsequent framework actions. As such, no additional habitat impacts would result that haven't already been accounted for.

5.1.3 SOCIAL AND ECONOMIC IMPACTS
As noted at the Social Impact Informational Meetings, "because of increased regulations in many fisheries, small vessels have lost much of their flexibility to move from one fishery to another. In Chatham, meeting participants felt that regulations have 'boxed them in' to particular fisheries, making it difficult or impossible for them to maximize their opportunities and/or adjust to changing conditions. When combined with the inherent limitations of small vessels, the regulations have reduced fishing opportunities to the point that many fishermen cannot guarantee a year-round income from fishing for themselves or for their crew" (NEFMC, Am 13 FSEIS, Appendix I). The No Action Alternative would have negative social impacts on local hook fishermen and on the Chatham/Harwich community. Daily trip limits, in addition to a continued reduction in DAS, gear restrictions, and ever-increasing closed areas would likely eliminate the traditional, small-boat fleet.

Pending changes to multispecies groundfish management may potentially undermine the Sector concept as well as eliminate the likelihood that fishing with traditional hook and line methods remains profitable. This would cause disruption within the principle communities (Chatham/Harwichport) for shore-based businesses and could eventually lead to the loss of piers, wharves, and docks, all of which are in high

demand for residential purposes. This outcome would further diminish the possibility for these communities to re-renter the fishery once stocks have rebuilt. The well-documented social ills that follow the collapse of a traditional industry are likely to be the result of implementation of Alternative 1.

According to the Amendment 13 FSEIS, "Consistent with the requirements of the Magnuson-Stevens Act to prevent overfishing and rebuild overfished stocks, the proposed action will restrict fishing activity through the imposition of additional restrictions on fishing time, possession limits, and other measures…..these declines will probably have negative impacts on fishing communities throughout the region, but particularly on those ports that rely heavily on groundfish" (NEFMC, Am 13 FSEIS, Section 7.1.1).

Amendment 13 to the FMP, as passed by the NEFMC and approved by NMFS, is having severe, disproportional negative economic impacts on the GB hook fleet. Cape Cod supports a fleet of small-boat fishermen who operate in much the same manner that New Englanders have fished for generations: in small boats that are owned and operated by independent businessmen. The local groundfish fleet has been heavily impacted by successive regulatory changes over the last decade and most of the fishermen in the area are struggling to survive. Not only financial survival but physical survival of these fishermen is at stake. The low profitability of the fleet has left little money for vessel upkeep while regulatory changes and the distribution of fish has forced vessels to fish further from port. This small fleet has lost vessels, and more importantly, lives as a result over the last few years.

The Chatham and Harwichport-based groundfish fishery contributes to Cape Cod's charm, heritage and tradition. Furthermore, this traditional fishing community contributes to the tourist economy; with thousands of people going to the piers every year to see fish landed and then to local eateries to taste the fresh caught catch. Commercial fishing is one of the few non-tourist industries on Cape Cod and it provides one of the few opportunities for young people in the area to find high paying jobs. Without these small boat family fishermen, Cape Cod would not be the same.
Alternative 1 will have negative social impacts on the prospective Sector members and the communities of which they are a part. The social and economics impacts of Alternative 1 are analyzed in depth in the Framework 42 EA (NEFMC FW 42 Section 7.2). The analysis of FW 42 impacts is generally applicable to prospective Sector members. Only a summary of impacts and discussion of some key impacts are provide here and readers are referred to the FW 42 EA for a more in-depth analysis

Trip Limit
"Both gillnet and hook gear groups appear to be split between vessels that may experience significant revenue losses and vessels that may experience revenue gains. This disparity is likely due to differences in dependence on Georges Bank cod and Gulf of Maine cod. Because cod tends to represent such a high proportion of total fishing income for these two gear groups, revenues are very sensitive to changes in cod trip limits. Thus, while the Gulf of Maine cod trip limit would be double that of FY2001, the Georges Bank cod trip limit is more restrictive. This means that even with a 45% DAS reduction, hook and gillnet vessels with a high dependence on Gulf of Maine cod can increase total fishing income while vessels with high dependence on Georges Bank cod experience revenue losses" (NEFMC, Am 13 FSEIS, Section 5.4.4.1).

Gear Limit
Sector vessels are subject to the same gear restrictions on marking, tagging, mesh size, and number of gillnets applicable to common pool vessels using the same type of gear. The 3600 hook limit, and various gillnet limits prevent fishermen from maximizing opportunities when certain species are available for harvest in abundance. The opportunity to fish multiple tides is prevented by regulations that prohibit setting more than 3,600 hooks on a given day. This gear restriction limits the ability of vessels to recognize sufficient revenue to justify the expense and danger of fishing. The 3,600 hook limit was

introduced in the Interim Rule and fishermen have employed it since May 2002. The 3,600 hook limit does not allow fishermen the flexibility to maximize their catch when cod appear in their geographical range and unnecessarily restricts the opportunity of Sector members to maximize their efficiency and revenue. With these limited revenue opportunities, vessel owners would be forced to look for options other than hook and gillnet fishing, including leasing DAS to otter trawlers, selling their permits, or converting to otter trawling. The No Action alternative, because it lacks approval of the Operations Plan and allocations of all regulated multispecies, monkfish, skates, and spiny dogfish, would result in all vessel owners remaining outside the Sector so that they can exercise these options.

Discard Mortality

Under The No Action alternative, vessels would not have hard TACs to constrain them. With their efficient gear offering them a wider array of species to target, these vessels are likely to reach their daily trip limits and continue fishing, discarding all further fish overboard. By discarding these fish, Sector members are contributing to the inefficiency of the current regulatory system and may be experiencing significant revenue loss in the short-term and long-term.

Economic Impacts

The changes implemented under FW 42 (the No Action alternative) will affect any commercial groundfish vessel with a limited access permit and a DAS baseline greater than zero. Total nominal revenues landed by these vessels on trips where groundfish was landed was $109 million in FY 2004. The Proposed Action would result in a short-term reduction in total fishing revenues of $21 million, of which the majority ($15 million) would be losses in revenue from regulated groundfish. This represents 19 percent of total groundfish revenue. Since many of these vessels participate in other fisheries, it represents an 8 percent decline in total fishing revenue.

Impacts on revenues are not evenly distributed. The ports of Portsmouth NH, Gloucester MA, Boston MA, Portland ME, South Shore MA, Chatham MA, and Provincetown MA are expected to see a decline in the value of landed catch (all species) of more than four percent, but the loss in groundfish revenues is higher. The ports expected to have the largest loss in groundfish revenues include Other NH Coast (-43%), New Jersey (-40%), South Shore MA (-32%), and North Shore MA (-31%). When impacts are measures by homeport state of fishing vessel, at the median level of impacts the largest declines in total fishing revenues are expected for vessels with homeports in New Hampshire (-33%) and Massachusetts (-16%). The largest declines in total revenues (again, reported at the median level) are inversely related to vessel size: -16% for vessels less than 50 feet, -12% for vessels 50 to 70 feet, and -5% for vessels greater than 70 feet. Gillnet and trawl vessels are expected to have similar declines at the median (-13%), while total revenues for hook vessels are expected to decline 5%. Vessels that fish more than 75% of their time in the inshore GOM blocks are expected to lose 35% of total revenue at the median, while those that fish less than 75% of their time in the inshore blocks are expected to lose 10% of their total revenue at the median.

The reductions in revenues summarized in the previous paragraph do not take into account revenues from Special Access Programs (SAPs) or the Category B (regular) DAS Program. Estimates suggest that revenues from these programs should exceed $6 million, providing a measure of mitigation to the economic impacts.

Regional impacts were estimated using an input/output model of the Northeast Region. The estimated short-term impact on the northeast region gross sales was estimated as harvesters of $21 million for harvesters, $5 million for dealers, and $26 million for processors. Given this decline in gross sales of $52 million, the overall impact on the region's economy is estimated as $98 million. The largest impacts would be felt in the sub-regions of New Bedford ($14.4 million), Gloucester ($13.5 million), New York

coastal ($12.6 million), and Boston ($11.1 million). Impacts in Massachusetts account for 43% of total northeast region impacts.

Social Impacts

The increased regulation of the groundfish fishery implemented by this action will likely have negative impacts on several of the key social factors identified in Amendment 13. Reductions in DAS and differential DAS counting areas will cause disruptions in daily living and will reduce occupational opportunities in the groundfish fishery. It is likely that the attitudes of fishermen towards the regulations will also suffer negative impacts, as fishermen resent the imposition of additional regulations so soon after the adoption of Amendment 13. The social impacts will not be evenly distributed. The impacts on vessel safety are uncertain.

Some of the smaller inshore vessels that are most affected by the action may be unable to take advantage of these programs, however, and so their communities may not receive much benefit from them.

The trip limits on cod, yellowtail flounder, winter flounder and hake not only reduce the efficiency and profitability of the fleet. They often force vessels to discard fish which is damaging for the morale of the fishermen who understand the need to rebuild fish stocks and are upset by the waste of fish when they are finding it difficult to remain economically viable. The analysis in FW 42 Section 7.2.5.1.1 explains:

> Excessive regulatory discards cause fishermen to feel as if the fishery resource and their time are being wasted and that they are forced to shovel over dead fish at a loss to the resource, the market, and their revenue potential. The Proposed Action adopts or modifies trip limits for CC/GOM yellowtail flounder, SNE/MA yellowtail flounder, GB yellowtail flounder, GB winter flounder, and white hake. Trip limits for GOM and GB cod remain the same, while the trip limit for haddock is removed.

Summary of Economic and Social Impacts

Overall, The No Action alternative (which leaves prospective Sector members subject to the management measures implemented as FW 42) is likely to have a negative effect on the important social factors identified by Amendment 13. The further reductions in available Category A DAS, differential DAS counting areas, additional trip limits, adoption of a restricted Category B (regular) DAS program will make it more difficult for fishermen to maintain daily routines, operate in a safe manner, and maintain a positive attitude towards the management program. With these restrictions adopted barely two years after the major upheaval caused by the large effort reductions of Amendment 13, fishermen will no doubt question when the benefits promised by that rebuilding program will be realized. Landings and revenues declined in FY 2004, and are unlikely to increase for at least another year under this action. The economic impacts of this action on those affected communities are expected to be severe and in some cases may threaten the existence of fishing businesses in those communities. These port groups will have a difficult time adjusting to the restrictions and the action will have a negative impact on the key social factors identified.

There are some communities where the impacts may not be as severe due to elements of the action that attempt to mitigate impacts. DAS leasing and changes to SAPs may help some vessels and their communities adapt to the restrictions in this action. These benefits may prove localized to small groups of vessels, however, and are unlikely to change the overall perception that the social impacts of this action, in the short term, are largely negative. Successful rebuilding of groundfish stocks should lead to future benefits for fishermen and their communities but as noted in Amendment 13 it is not clear that current fishery participants will reap those benefits.

The hook fishery at Georges Bank would not survive the multiple regulation changes that would result from the No Action alternative. Left with fewer DAS, a high dependence on GB cod, and a limit on the

number of hooks and nets which can be used in a given day, and mandatory regulatory discards of all species over the daily trip limit, the hook fishery would likely succumb to negative economic impacts.

5.2 ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

The Preferred Alternative is approval of the GB Cod Hook Sector Operations Plan and receipt of allocations of all regulated multispecies, monkfish, skates, and dogfish for FY2008. Sector vessels would be awarded hard TACs and, subject to the regulations implemented under the Operations Plan, allowed to fish it (See Section X of this document).

5.2.1 BIOLOGICAL IMPACTS

Alternative 2 would have overall positive biological impacts because the Sector Ops Plan would ensure that a traditional portion of local multispecies is taken by hook and line methods rather than more efficient gears that are known to result in greater fish bycatch and habitat impacts. In addition, implementation of the Sector Ops Plan would reduce the amount of time that hook gear would be fishing in the water: by mandating the retention of all catch; and by operating under hard TACs rather than daily trip limits or DAS, the Sector would be able to harvest their allocations more efficiently and in less time. By increasing this efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential interactions with protected species. Hook and line gear has been used to target groundfish, monkfish, skates, and spiny dogfish for decades, and the biological impacts of the Sector would be predictable and minimal. In addition, the imposition of hard TACs on the Sector would ensure that Sector members are not participating in overfishing of its quota-managed species.

The Proposed Action will reduce fishing mortality on most groundfish stocks. In some instances fishing mortality that will result from these measures will be below the Amendment 13 targets. The Proposed Action will also reduce fishing mortality on monkfish, skates, and spiny dogfish as these stocks will be constrained by hard TACs. The expected reductions in groundfish fishing mortality are shown in the following table.

Species	Stock	Proposed Action Change In Fishing Mortality	Targeted Fishing Mortality Reduction from Effort Controls
Winter Flounder	GB	-41%	-35%
Winter Flounder	GOM	-52%	
Winter Flounder	SNE/MA	-19%	-9%
Cod	GB	-9%	0%
Cod	GOM	-44%	-32%
Haddock	GB	1%	
Haddock	GOM	-22%	
Plaice		-11%	
Pollock		-17%	
Redfish		-5%	
White Hake		-18%	-13%
Windowpane	NORTH	-31%	
Windowpane	SOUTH	-45%	
Witch	ALL	-25%	
Yellowtail	CC/GOM	-49%	-46%
Yellowtail	GB	-40%	-0%
Yellowtail	SNE/MA	-63%	-55%

For some stocks, rebuilding is expected to proceed more rapidly that anticipated by Amendment 13 as a result of this action. These stocks include GB haddock, GB cod, GOM cod. Because the Proposed

Action includes several changes to trip limits, this action may increase discard rates of GB yellowtail and winter flounder, CC/GOM and SNE/MA yellowtail flounder, and white hake. It is uncertain whether this will result in increased discards since effort is also being reduced and it is possible that the amount of discards may decrease even as discard rates increase. This may be particularly true for CC/GOM and SNE/MA yellowtail flounder, where the proposed differential DAS counting areas may reduce effort on these two stocks.

A key element of any Sector approach is the allocation of a specific amount of a resource to a particular Sector. As long as that allocation is consistent with target fishing mortality rates, this alternative is consistent with the biological objectives of the FMP. The Sector is seeking allocations of all regulated multispecies, monkfish, skates, and spiny dogfish.

The Sector allocations are a fixed share of the target TACs that are set to achieve the biological objectives of the FMP, and the Sector's catch will be strictly limited to less than or equal to these fixed catch levels. By staying within their allocated hard TACs, approval of the Sector Operations Plan would not compromise groundfish mortality targets of Amendment 13 or Framework 42. The Sector will ensure that nearly 20 groundfish permits do not contribute to overfishing of these stocks. Relative to the regulatory controls on the remainder of the fleet, the hard TACs the Sector would agree to abide by provide much stronger assurance that this sector of the industry's catch will remain below target levels. The effort controls and trip limits that the remainder of the fleet operate under are expected to constrain their catch below target levels, but do not directly do so and so provide less assurance.

By eliminating trip limits and requiring full retention, the Sector removes incentives for regulatory discards of legal sized fish which reduces mortality, waste and improves data quality for stock assessment purposes. According to the Amendment 13 FEIS, the Sector allocation is consistent with the biological objectives of the Amendment, given adherence to target fishing mortality rates (NEFMC, AM 13 FSEIS, Sec 5.2.4.18). The Sector will reduce discards in two ways: by eliminating trip limits and by sharing allocations between members. The daily trip limits that are designed to protect cod, yellowtail, white hake, and can result in regulatory discards when individual vessels exceed the daily possession limit. The Sector will allow members to retain 100% of its catch species that would otherwise be subject to discard when a trip limit is exceeded, and then provide opportunities for members to share allocations when individuals meet their own allocation share, and/or issue a stop fishing order to vessels that meet their allocation share but have not acquired allocation share from other members.

In addition to begin limited by hard TACs, the sector remains under effort controls that have been deemed (in analysis of prior management actions) to be sufficient (for most stocks more than sufficient) to maintain fishing mortality below target levels for all other stocks for which the Sector may not receive a fixed allocation.

In addition, "Over time, the GB Hook Sector alternative should have only minor biological impacts. This alternative is based on assigning an appropriate share of the resource to the participants in the Sector. The share is consistent with the rebuilding targets and the Sector must remain within its share or be penalized in following years. It is possible that in a specific year the Sector may catch more than its share, but this results in reductions in following years. Over time, the catch by the sector should be consistent with rebuilding goals." (NEFMC, AM 13 FSEIS, Sec 5.2.4.19). To counter the idea that the Sector would exceed its TACs, the GB Hook Sector Ops Plan has provisions for a 10% set aside of Sector TACs to guarantee that the Sector would not exceed the TACs in any given FY.

Several specific elements of the Harvesting Rules have direct impacts on the target and non-target species. The elements and their impacts are listed below:

a. The hard TACs (Harvesting Rule #1) set an absolute maximum poundage of fish that the Sector can catch each year and prevents the Sector from overfishing. Additionally, by operating within a minimal allocation amount of 2,000 pounds of TAC of any quota-managed species where fishing history is less than this amount, the Sector will not prematurely be shut down as stocks with low history continue to rebuild;
b. The ability to trade quota between Sectors (Harvesting Rule #2) will allow Sectors to maximize their efficiency and increase cooperation and stakeholder involvement of like-minded fishermen. This will ensure that a Sector is not shut down prematurely as stocks with low history continue to rebuild;
c. The full retention clause (Harvesting Rule #5) ensures that all catch of all quota-managed species will be landed and accounted for in the Sector's TACs. This will ensure that the Sector does not overfish these species through regulatory discarding;
d. By exempting the Sector from all size limits on quota-managed species (Harvesting Rule #6), will allow the Sector to distribute the effects of fishing mortality across the entire range of stock size distribution. Specifically, it will reduce pressure on the larger, more-reproductively-viable fish;
e. Elimination of the daily trip limit (Harvesting Rule #7) in lieu of a hard TAC will allow vessels to operate more efficiently and will likely reduce fishing time due to the achievement of the TAC;
f. Gear restrictions (Harvesting Rule #8) allow for the exemption of hook and gillnet size/mesh and number limits. This will distribute the effects of fishing mortality across the entire range of stock size distribution, reducing pressure on the larger, more-reproductively-viable fish. Furthermore, this will have minimal harmful impacts as effort and catch are strictly controlled through hard TACs. The circle hook requirement allows better survivability and easier escapement for non-quota-managed species. In addition, by entering into agreement with the Sector, fishermen are prevented from using mobile gear, which has been known to have higher levels of fish bycatch and discards than fixed gear;
g. By allowing the Sector to access non-spawning closed areas (Harvesting Rules #9 and #10) and exempting vessels from non-spawning blocks, Sector members have the ability to distribute themselves over time and space, greatly reducing the biological impacts on both target and non-target species due to concentrated fishing effort, including localized depletion and the resulting "memory loss";
h. The Sector Operating Area (Harvesting Rule #11) encompasses all state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464-639). A benefit of operating in this larger area is the ability of Sector members to distribute themselves over time and space, greatly reducing the biological impacts on both target and non-target species due to concentrated fishing effort, including localized depletion and the resulting "memory loss." Furthermore, by operating within the full extent of the area, the Sector is promoting hard TAC-based management, and the associated positive biological impacts, throughout the entire region;
i. Given the tendency for delayed approval of Sectors in the past, a clause that enables the Sector to operate under the previous years' Harvesting Rules (Harvesting Rule #12) until implementation for the current year occurs will ensure that not only will Sector members not be tied to the dock, waiting for approval, but will guarantee that not only can Sector members fish, but will do so under previously-approved rules, including hard TACs and reporting requirements more stringent than those placed upon Common Pool vessels;
j. Electronic vessel trip reporting (Harvesting Rule #14), along with other electronic methods of near-real time data collection, will allow for Sector and federal managers to monitor up to 20% of each total stock in near-real time. It will also eliminate the errors

and inefficiencies associated with paper reporting. Monitoring hard TACs in real time are essential: no longer will managers determine that a TAC has been exceeded days, weeks, or even months prior.

Protected Species

Table X in Section X of this document lists protected species in the region. Sector members would be employing gear in the same areas they have been fishing for centuries, so the effect on protected species in that area are likely to be similar to what they have been in the past. . However, by operating under a hard TAC rather than a daily trip limit, the Sector would be able to harvest their allocation of cod more efficiently and in less time. By increasing this efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential for protected species interactions.

The newly-reclassified Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Category III fishery under 50 CFR Part 229; the Northeast sink gillnet fishery is listed as a Category I fishery. Both fisheries would continue to operate within the mandated level of observer coverage. Entanglements are assumed to occur with increased frequency in areas where more gear is set. The Sector would continue to operate in areas and using gear types that they have traditionally used. A majority of hook-and-line gear would be set during the fall months in the offshore waters of Georges Bank; anchored sink gillnet gear would be set nearly year-round in the inshore waters of Georges Bank, and in winter months in the offshore waters of. Interactions between the aforementioned species and hook and line gear would vary over time and space, and include getting caught on other longline gear, entanglement in mesh (gillnet fishery), entanglement in float line (gillnet fishery), entanglement in groundline (gillnet and longline fisheries), entanglement in anchor line (gillnet and longline fisheries), or entanglement in vertical lines that connect the gear to the surface (gillnet and longline fisheries). Interactions occur when fishing gear overlaps both spatially and trophically with a species' niche. Spatial interactions are more "passive" and involve unintentional interactions with fishing gear. Trophic interactions are more "active" and occur when species use fishing gear to assist in their predation. When fishing gear is catching fish that protected species prey on, the protected species may interact with the fishing gear as they attempt to consume the fish. Both forms of interactions occur with bottom longline and anchored sink gillnet gear.

Despite the tendency for the gear to interact with protected species, the Sector is taking important steps to account for and mitigate these interactions. Because implementation of the Ops Plan would reduce the amount of time that hook and line gear would be fishing on Georges Bank, this alternative is anticipated to have a slight positive impact on protected species, compared to the No Action alternative, as the potential for interactions decreases: by increasing this efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential interactions with protected species. Through hard TACs (to cap effort), full retention of catch (to eliminate discards and increase efficiency) Sector management (to respond in near-real time to constantly changing species interactions), and exemption from daily trip limits in lieu of a hard TAC (to maximize efficiency and reduce the amount of time gear remains in the water), the Sector would account for and reduce the potential for marine mammal interactions. Further actions to reduce the likelihood of interactions between the gear types governed by this FMP and the marine mammals that inhabit the area in which these fisheries are prosecuted would be considered if deemed necessary. Thus, this alternative is anticipated to have a positive impact on protected species, including marine mammals and sea turtles, when compared to what may occur under the No Action alternative. Several specific elements of the Ops Plan that have impacts on protected species follow Several specific elements of the Harvesting Rules that have impacts on habitat are listed below:

(1) The hard TACs (Harvesting Rule #1) stop fishing activities with gear capable of catching regulated multispecies, monkfish, skates, and spiny dogfish, when any of the allocations are reached, thereby ending the potential for further habitat impacts;

(2) The full retention clause (Harvesting Rule #5) and the elimination of daily trip limits (Harvesting Rule #7) ensures that all catch of all quota-managed species will be landed and accounted for in the Sector's TACs. Due to this increased efficiency, the amount of time that hook and gillnet gear remains in the water is likely to decrease, therefore decreasing the habitat interactions;

(3) Gear restrictions (Harvesting Rule #8) require that Sector members will only pursue groundfish with fixed gear. Through daily communication with the Sector members, the Manager has the ability and authority to implement further gear/area restrictions if interactions with protected species can't be avoided. Additionally, fixed gear is known for minimal interactions with protected species: by entering into agreement with the Sector, vessels are prevented from using mobile gear, which has been known to have higher levels of negative habitat impacts;

(4) By allowing the Sector to access non-spawning closed areas (Harvesting Rules #9 and #10) and exempting vessels from non-spawning blocks, Sector members have the ability to distribute themselves over time and space, greatly reducing habitat impacts due to concentrated fishing effort. Once when any of the allocations are reached, the Sector will stop fishing activities with gear capable of catching regulated multispecies, monkfish, skates, and spiny dogfish, thereby ending the potential for further habitat impacts in these areas;

(5) The Sector Operating Area (Harvesting Rule #11) encompasses all state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464-639). A benefit of operating in this larger area is the ability of Sector members to distribute themselves over time and space, greatly reducing their habitat impacts due to concentrated fishing effort. Once when any of the allocations are reached, the Sector will stop fishing activities with gear capable of catching regulated multispecies, monkfish, skates, and spiny dogfish, thereby ending the potential for further habitat impacts in these areas;

5.1.1 Biological Conclusions

The impacts on quota-manages species would be positive, compared to the No Action alternative, as the Sector would harvest up to 20% of its quota-managed specues under a hard TAC ensuring that overfishing is not occurring on that portion of the population. The hard TACs provide a mechanism to restrict both the effort and landings of the Sector. Through daily communication with the Sector members, the Manager has the ability and authority to implement further gear restrictions if interactions with protected species can't be avoided. By operating under hard TACs rather than daily trip limist, the Sector would be able to harvest its allocations more efficiently and in less time. By increasing this efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential interactions with protected species. As the Operations Area includes areas traditionally used to target monkfish, and as GB cod can be found throughout this area, managing the Sector vessels in near-real time is essential for the success of the Sector.

5.1.2 HABITAT IMPACTS

See Section X of this document for background habitat goals statement from NMFS.

Hook and line gear is known to have minimal impacts on habitat (see Section X). By assuring that fishermen within the Sector use hook and line gear, Alternative 2 results in positive habitat impacts relative to the No Action alternative, under which some hook and line fishermen, who would otherwise utilize the Sector's allocations, would instead participate in the multispecies bottom trawl fishery. In addition, according to the Amendment 13 FEIS, "Sectors are not geographically constrained; it is unlikely

that they, as a management measure, will have any significant habitat impacts" (NEFMC, AM 13 FSEIS, Sec 5.3.4.15).

Access to areas temporarily closed to the rest of the fleet through rolling closures is not expected to have any significant habitat impacts since it simply changes the timing of access rather than the amount of effort. Since Sector members will be subject to hard TACs on stocks that are found in these areas, they may in fact reduce their overall level of effort if their catch rates of these species is higher than it would be when fishing in these areas outside of the rolling closures.

This excerpt from Table 135 of the Amendment 13 FEIS describes the habitat implications of sector allocation:

Alternative	Overall Habitat Impact	Feature	Description of Essential Fish Habitat Impact
Sector Allocation	Neutral Impact (0)	Approval of sector allocation proposal brought to NMFS through Council. Sector decides about movement among sectors. Allocation based on documented catch. Hard TACs by species.	As a management measure, sector allocation is not expected to have any significant habitat impacts.
GB Hook Sector	Neutral Impact (0)	Approval of GB Hook Sector	This sector allocation program is not expected to have any significant habitat impacts, especially since hook and line gear has been deemed not to have adverse impacts on EFH.

Table 66 - Habitat implications of Sector allocation as presented in the Amendment 13 FEIS. Note that this table does not contemplate every aspect of the Ops Plan. (NEFMC, Am 13 FEIS, Section 5.3.6.7)

Several specific elements of the Harvesting Rules that have impacts on habitat are listed below:

a. The hard TACs (Harvesting Rule #1) stop fishing activities with gear capable of catching regulated multispecies, monkfish, skates, and spiny dogfish, when any of the allocations are reached, thereby ending the potential for protected species interactions;
b. The full retention clause (Harvesting Rule #5) and the elimination of daily trip limits (Harvesting Rule #7) ensures that all catch of all quota-managed species will be landed and accounted for in the Sector's TACs. Due to this increased efficiency, the amount of time that hook and gillnet gear remains in the water is likely to decrease, therefore decreasing the potential for protected species interactions;
c. Gear restrictions (Harvesting Rule #8) require that Sector members will only pursue groundfish with fixed gear. Through daily communication with the Sector members, the Manager has the ability and authority to implement further gear/area restrictions if interactions with protected species can't be avoided. An exemption from the hook and gillnet size/mesh restrictions and limits may result in an increase amount of gear used,

however impacts will be carefully monitored and responded to appropriately. Additionally, hook gear is known for minimal interactions with protected species. Furthermore, mandate of circle hook use allows for better survivability prospects for protected species. By entering into agreement with the Sector, vessels are prevented from using mobile gear, which has been known to have higher levels of fish bycatch than fixed gear. Finally, all fixed gear used in the Sector will be in compliance with ALWTRP, HPTRP, and BDTRP regulations and notices.

d. By allowing the Sector to access non-spawning closed areas (Harvesting Rules #9 and #10) and exempting vessels from non-spawning blocks, Sector members have the ability to distribute themselves over time and space, greatly reducing the impacts on protected species due to concentrated fishing effort, including localized depletion and the resulting "memory loss";

e. The Sector Operating Area (Harvesting Rule #11) encompasses all state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464-639). A benefit of operating in this larger area is the ability of Sector members to distribute themselves over time and space, greatly reducing the impacts on protected species due to concentrated fishing effort, including localized depletion and the resulting "memory loss." Furthermore, if Sector members encounter large concentrations of protected species in an area, they have the obligation and the opportunity to relocate into other areas with fewer protected species. By mandating daily communication with the Manager, the Sector will be able to monitor its interactions with protected species in a larger area and in real-time;

f. Given the tendency for delayed approval of Sectors in the past, a clause that enables the Sector to operate under the previous years' Harvesting Rules (Harvesting Rule #12) until implementation for the current year occurs will ensure that not only will Sector members not be tied to the dock, waiting for approval, but will guarantee that not only can Sector members fish, but will do so under previously-approved rules, including near-real time monitoring and reporting requirements more stringent than those placed upon Common Pool vessels;

g. Electronic vessel trip reporting (Harvesting Rule #14), along with other electronic methods of near-real time data collection, will allow for Sector and federal managers to monitor protected species interactions in near-real time.

Habitat Conclusions

Clearly, implementation of the Ops Plan would have positive habitat impacts because it ensures that hook and line fishermen remain faithful to historic, low-impact methods rather then switching their effort to other, heavier gear types that have greater habitat impacts.

5.2.3 SOCIAL AND ECONOMIC IMPACTS

Alternative 2 would provide social benefits to the Sector members as well as to the Chatham/Harwichport, MA communities. Chatham/Harwichport, MA is more than 71% revenue dependent on groundfish stocks, particularly the GB cod stock. "Chatham's overall community dependence on multispecies as a percentage of total fisheries revenues from federally-permitted vessels averaged about 71% from FY99 – FY00. It is likely that at least some of the active groundfish vessels in Chatham and Harwichport are even more than 71% dependent on the multispecies fishery"(NEFMC, AM 13 FSEIS, Sec 5.6.1.3). By allowing the Ops Plan to be implemented, fishermen at the local level would be making decisions that impact the Sector members and the larger Chatham/Harwichport community. By making collective decisions, Sector members would foster interconnectedness amongst fishermen that would allow them to become more efficient while protecting the fabric of the traditional fishing community.

The Sector Ops Plan allows a range of management measures that would make the Sector economically viable for hook and line fishermen. By pairing hook and gillnet fishermen together in the Sector, cooperation would be maximized between the two groups; another positive social impact.

Because fishing with hook and line is labor intensive, the Sector would ensure that shoreside jobs such as baiting remain viable opportunities in Chatham/Harwichport. Shoreside jobs and infrastructure are identified and characterized in Section X of this EA. These opportunities would have benefits that trickle throughout the community.

Input controls, such as reduced GB cod trip limits and the GB closure in May, have a significant impact on the Chatham/Harwichport community. According to Amendment 13 FEIS, "At the social impact informational meeting in Chatham, a few residents of Chatham and Harwichport submitted comments reporting that they have experienced the most significant social impacts from the May closure on Georges Bank to protect cod. The majority of multispecies vessels from Chatham/Harwichport fish for Georges Bank cod and not Gulf of Maine cod. The measures proposed in Amendment 13 that are likely to impact this community group the most are those that modify or add nearshore area closures on Georges Bank and those that modify the Georges Bank cod trip limit" (NEFMC, AM 13 FSEIS, Sec 5.6.1.3).

The Amendment 13 FEIS concluded that negative distributional impacts affecting Chatham/Harwichport in Amendment 13 are mitigated by Sector allocation: "The proposed action does include some measures designed to mitigate these distributive impacts. The sector allocation and special access programs are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts. The EA for the settlement agreement estimated that an average of 46.5% of groundfish activity in Chatham and Harwichport could be affected by the recently-implemented Interim Action" (NEFMC, AM 13 FSEIS, Sec 5.6.1.3). The input controls of Amendment 13 increased the localized impacts experienced as a result of the Interim Rule. Furthermore, FW42 is expected to result in the following changes in revenues for the common poll vessels: -21 change in total revenue ($ million); -15 change in groundfish revenue ($ million); -19% change in total revenue on groundfish trips and in groundfish revenue; and -10% change in total revenue (NEFMC FW42 FSEIS 7.12.5). Sector management would allow for an offset to these costs.

Hook fishermen and the Chatham/Harwichport area are dependent on GB cod. Revenue dependence of 71% renders the fleet subordinate to the fish. Because of this, distributional impacts of fishery management are most severely felt in Chatham/Harwichport and amongst hook and line fishermen when GB cod is restricted. By implementing the Ops Plan in 2008 and allowing the benefits of community-based management, these negative distributional impacts would be minimized or mitigated.

By allowing fishermen to take part in localized decision-making, fishermen maximize their opportunity to make safety-conscious decisions and potentially save lives. This community-based management also allows for rapid response to changing developments on the ocean. Measures such as the individual quota and DAS usage pulse the fishery so it does not concentrate in times of questionable weather. Having the flexibility of the DAS exemption leads to cooperative fishing and allows the most tired vessels to rest at shore and fishermen to work together to avoid bad weather instead of racing to fish. Implementation of the Ops Plan would have major safety benefits and a positive social impact for both the Sector and Chatham/Harwichport area when compared to what may occur under the No Action alternative.

Implementation of the Sector and Ops Plan and allocations of regulated multispecies, monkfish, skates, and spiny dogfish shark would allow Sector members the flexibility to implement management measures that promote efficient methods of harvesting the resource with hook and line. This would allow Sector members to remain economically viable while adjusting to changing economic and fishing conditions. By allowing the Sector to create its own input controls while staying within a hard TAC, Sector members

would be able to realize greater economic returns on their investment in the groundfishery. This is crucial, given the anticipated -6.5% in total revenue for the port of Chatham as anticipated in FW42 (NEFMC FW42 FSEIS 7.12.5).

This has been very evident in the 3 years of Hook Sector operation. The daily presence of supportive fishermen in the Sector office is a testament to the effectiveness of this action. The socio-economic benefits gained by the Hook Sector have convinced the GB Cod Hook Sector to pursue this alternative. Furthermore, the NEFMC continues to receive applications for Sector management while developing Amendment 16 (which includes the concept of Sector management) and the Sector Omnibus Amendment. It is evident that Sectors are gaining a stronger foothold in the region, and can be partially attributed to the socio-economic success of the Hook Sector.

The following passages have been excerpted in part from the Amendment 13 FSEIS as prepared by the NEFMC:

> As discussed in Section 5.1.3, Chatham/Harwichport has a high degree of dependence on the groundfishery. As the FSEIS stated, the economic impacts of recent multispecies fishery management actions and the proposed changes in FW 42 would be reduced in Chatham/Harwichport through implementation of the Ops Plan. The Sector implementation allows a group of vessels to adapt their fishing behavior so that they remain economically viable in the face of increasing restrictions imposed to rebuild groundfish stocks. The ability to form and operate a Sector is an important component of providing flexibility to small commercial fishing entities to mitigate the economic impacts of Amendment 13 and subsequent framework adjustments. Further, the geographic location of the membership of this Sector provides an opportunity for their fishing communities to reduce localized economic impacts.
>
> The Sector Ops Plan allows flexibility to develop the fishery efficiently and offset economic impacts that result from fishing restrictions required to rebuild groundfish stocks. For instance, "the creation of a voluntary sector for longline/hook and gillnet vessels on GB provides an opportunity for vessels to mitigate the impacts of the management alternatives. By organizing into a cooperative, vessels may be able to develop more efficient ways to harvest groundfish and minimize the inefficiencies that result from the regulations… Depending upon the selected management alternative a sector allocation for this particular sector could be the difference between financial viability and business failure... Thus, relative to other gear sectors in other ports, the proposed GB Hook Sector Allocation may be an important component in regulatory design to offer small entity flexibility in the Chatham/Harwich fishing community.
> (NEFMC, Am 13, FSEIS section 5.4.9.3.1)

Sector allocation is cited repeatedly as a measure to mitigate economic harm caused by Amendment 13. For instance, "other opportunities have been created to ensure a viable fishing industry. The proposed action would allow the formation of voluntary, self-selecting sectors. These sectors may be able to develop more efficient means to harvest their portion of the resource" (NEFMC, Am 13 FSEIS, Section 7.2.10). Furthermore, "the Proposed Action contains a number of measures that would provide small entities with some degree of flexibility to be able to offset at least some portion of the estimated losses in profit. The major offsetting measures include the opportunity to use … sector allocation…" (NEFMC, Am 13 FSEIS, Section 7.3.3.7.2).

Several specific elements of the Harvesting Rules that have social and/or economic impacts are listed below:

(1) The hard TACs (Harvesting Rule #1) set an absolute maximum poundage of fish that the Sector can catch each year, which sets an anticipated amount of revenue a fisherman or a fishing community can expect for the year. Although there are times of the year when Sector members will not be fishing, they will have peace of mind that comes from knowing the Sector has allocations and therefore, will not contribute to overfishing. These allocations allow individuals, businesses, and communities to prepare business plans and fishing plans, providing a degree of economic stability. Furthermore, by preventing overfishing in the Sector, the hard TACs allow the possibility of a viable economic future for the fixed gear fleet;

(2) The ability to trade quota between Sectors (Harvesting Rule #2) will allow Sectors to maximize their efficiency and increase cooperation and stakeholder involvement of like-minded fishermen. This will ensure that a Sector is not shut down prematurely as stocks with low history continue to rebuild. By using the resource cooperatively as designed in the Ops Plan, Sector members can stay in business as stocks rebuild and the fleet is rationalized. As stated earlier, this will have corollary safety benefits. Allowing Sector members the necessary flexibility and means to create business plans that offer a reasonable shot at keeping them in business while stocks rebuild is the underlying principle of sector allocation;

(3) The Sector call-in provision (Harvesting Rule #4) allows the Manager to monitor the Sector members in real time so as to ensure that the hard TACs and individual quotas are not exceeded. This enforcement opportunity will provide economic security for Sector members;

(4) The full retention clause (Harvesting Rule #5) and the elimination of daily trip limits (Harvesting Rule #7) ensures that all catch of all quota-managed species will be landed and accounted for in the Sector's TACs. This will end regulatory discards, allowing Sector members to maximize per trip revenue. This creates an economic benefit to the Sector, as well as the community and the Nation as a whole, because America's fish will not be wasted;

(5) Gear restrictions (Harvesting Rule #8) ensure that Sector members will only pursue groundfish with fixed gear. This will have no economic impacts for the community as a whole because fishermen will not change current practices. In addition, fishermen will not incur the cost of switching gear. In addition, exemption from hook and gillnet size/mesh limits and amount provides the flexibility for Sector members to maximize revenue by bringing in more fish when the market is better. It also allows fishermen to take advantage of temporal and seasonal opportunities to catch the resource while avoiding bycatch of other species. Creating the flexibility to maximize revenue per trip allows the fleet to maximize revenue while minimizing expenses. This will bring positive economic impacts compared to the No Action alternative;

(6) By allowing the Sector to access non-spawning closed areas (Harvesting Rules #9 and #10) and exempting vessels from non-spawning blocks, Sector members have the ability to distribute themselves over time and space. It will keep from having the entire fleet out of business during the month of May, providing a positive social and economic impact as fishermen are generating essential revenues;

(7) The Sector Operating Area (Harvesting Rule #11) encompasses all state and federal regions of the Northeast Regional Statistical Areas (Statistical Areas 464-639). A benefit of operating in this larger area is the ability of Sector members to distribute themselves over time and space;

h. Given the tendency for delayed approval of Sectors in the past, a clause that enables the Sector to operate under the previous years' Harvesting Rules (Harvesting Rule #12) until implementation for the current year occurs will ensure that not only will Sector members

not be tied to the dock, waiting for approval, which generates immense levels of frustration and distrust, but will guarantee that not only can Sector members fish, but will do so under previously-approved rules;

i. Electronic vessel trip reporting (Harvesting Rule #14), along with other electronic methods of near-real time data collection, encourages state-of-the-art technology advancement, and solidifies the role of fishermen in cooperative research that will immediately and directly initiate a return on their business and generate efficiencies in their business plans;

j. The NMFS administrative burden (Harvesting Rule #15) is becoming increasingly large due to the time and effort requirements for developing Sectors. However, the Fixed Gear Sector was approved and implemented prior to the 2006 deadline; therefore, does not have to provide economic assistance to NMFS for development and review.

Social and Economic Conclusions

Compared with the No Action alternative, Alternative 2 would have positive social impacts for the GB Hook fleet and the Chatham/Harwichport area. Implementation of the Ops Plan provides safety benefits as well as regulatory flexibility that would allow cooperative harvest and the maximization of economic opportunity. Implementation of the Ops Plan and allocations of regulated multispceis, monkfish, skates, and spiny dogfish skark would allow the Sector the flexibility it needs to maximize revenues while minimizing expenses in the short term. It would allow Chatham/Harwichport to remain in the commercial groundfish business and benefit from the rebuilding of the groundfish resource.

5.3 QUALITATIVE COMPARATIVE IMPACT ASSESSMENT

As this document describes, there would be different impacts depending on which alternative is chosen. Each alternative is expected to have a negligible impact on the biological and physical environment; thus, each alternative is equal in these respects. Alternative 2 offers overall positive social impacts compared to the No Action alternative (Alternative 1). In regards to economic impacts, Alternative 2 provides economic benefits to Sector members that may not be realized as compared to Alternative 1. Table 14 summarizes these impacts as well as cumulative impacts of the alternatives.

	Biological Impacts				Habitat Impacts	Social impacts			Economic Impacts			Cumulative Impacts
	Overall	Target Species	Non-target species	Protected Species		Overall	Chatham/ Harwich	Hook Gear Sector	Economic Impacts	Chatham/ Harwich	Hook Gear Sector	
Alternative 2 (Sector operations plan)	**Most beneficial compared to the No Action Alternative**: No overfishing, reduced bycatch, and no redirection of effort onto Gulf of Maine stocks	**Positive**: Full retention and allocation ensures no overfishing	**Positive**: No net increase in catch of non-target species and no redirection of effort onto Gulf of Maine stocks	**Positive**: No net increase and minimal impacts	**Positive**: More fixe hook fishermen and less habitat interactions	**Positive**: Maximum social benefits	**Positive**: Shoreside jobs would remain	**Positive**: Safety benefits, more cooperation	**Positive**: Most efficient measures would be utilized	**Positive**: Small entity flexibility	**Positive**: Creates efficiency and stabilizes revenues	**Positive (+):** Implementation of the Sector Ops Plan would mitigate harmful impacts of Amendment 13 to the Northeast Multispecies FMP by conveying environmental, social, and economic benefits directly to the Sector members. It would protect hook and line fishermen and the local community of Chatham/Harwich
Aggregate sector allocation (Hard TAC)	**Positive**	**Positive**: Prevents overfishing	**Positive**: Stops bycatch once TAC is met	**Positive**: No net increase and minimal impacts	**Positive**: Ends Sector impacts once TAC is met	**Positive**: Provides certainty and long range planning	**Positive**: Maintains low impact hook fishery	**Positive**: Maintains low impact hook fishery	**Positive**: Allows for planning and ensures economic stability	**Positive**: Provides realistic expectations of economic activity	**Positive**: Allows for planning	
Monthly quota targets	**Negligible**	**Negligible**	**Negligible**: Temporal limit on bycatch	**Positive:** Stop fishing at quota and reduces interactions	End Sector impacts once quota is met	**Positive**	**Positive:** Spread catch throughout year and creates more opportunities	**Positive:** Spread catch throughout year and creates more opportunities	**Positive**: Evenly distribute resources throughout year	**Positive**: Provide groundfish to communities throughout the year	**Positive**: Distributes catches throughout the year and creates stability	
DAS allocations	**Positive**	**Positive**: Protects against overfishing	**Positive**: Identify number of possible fishing events	**Negligible**	**Negligible**: Gear considered low impact	**Positive**	**Positive**: Continue social structure familiar to community	**Negligible**	**Positive**	**Negligible:** Maintain relative distribution of catches	**Negligible:** Maintain relative distribution of catches	
DAS redistribution/ pooling	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Positive**	**Positive:** Maximizes efficiency within sector	**Positive:** Maximizes efficiency within sector	**Positive**	**Negligible**	**Positive**: Maximizes efficiency	
Full retention	**Positive**	Ensures no overfishing through discards	**Not Applicable**	**Negligible**: hook fishery not considered a threat given the low occurrence of turtles in the proposed study area	**Not Applicable**	**Positive**	**Positive:** Ends regulatory discards and creates goodwill	**Positive:** Ends regulatory discards and increases efficiency	**Positive**	**Negligible**	**Positive:** Prevents discards and maximizes per trip revenue	
Hook size and limits	**Positive**	Reduces undersized cod catches	Increases survivability and escapement	Increases survivability and escapement	Allow minimal disturbance	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Positive**	**Negligible**	**Positive:** Creates flexibility and allows fishers to maximize efficiency	

May seasonal closure exemption	**Negligible**	**Negligible**: Hard TAC controlled	**Negligible**: DAS limited	**Negligible**: Hook fishery not considered a threat given the low occurrence of turtles in the proposed study area	**Negligible**: Gear considered low impact	**Positive**: Safety and flexibility increase	**Positive**: Permits DAS to be used during safer month	**Positive**: Restores temporal access to hook fishery	**Negligible**: Possible benefit to members due to limited supply	**Negligible**: Allows segment of fleet opportunity during closure	**Positive**: Allows portion of TAC to be fished during "good" weather month	
Gear restrictions	**Positive**	**Positive:** Elimination of regulatory discards	No increase	No increase	**Positive:** Prevent conversion to mobile gear	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	

Table 67 - Biological, habitat, social, economic and cumulative impacts of the proposed management measure in comparison to the No Action alternative presented in this EA.

5.4 ESSENTIAL FISH HABITAT ASSESSMENT

Description of Action
The "Preferred Alternative" is implementation approval of the GB Cod Hook Sector Operations Plan. The Sector is a group of self-selecting fishermen that have come together voluntarily and cooperatively for the purposes of efficiently harvesting annual allocations of all regulated multispecies, monkfish, skates, and spiny dogfish shark using hook gear and gillnets in the GB Cod Hook Sector Operating Area. The Sector would operate under hard TACs of its quota-managed species to meet the overfishing mandates of the SFA amendment to the Magnuson Act.

The "No Action Alternative" is the implementation of the GB Cod Hook Sector Allocations without submission or approval of neither the Operations Plan nor any modified Operations Plan. While the Sector would be available under this alternative, all vessels would opt to remain in the Common Pool and fish under the regulations implemented in Amendment 13 and subsequent framework adjustments to the Northeast Multispecies FMP. Therefore, no allocations would be made to the Sector and the fishermen would not be restricted by area or gear type.

Assessing Potential Adverse Impacts on EFH
See Section X of this document for background habitat goals statement from NMFS.

Alternative 1 is expected to have no habitat impacts because it is a baseline condition in which the multispecies fishery would continue to be conducted as is: without the creation of the Sector. Habitat impacts of the existing fishery have already been minimized by the establishment of the habitat closed areas and effort controls that were approved in Amendment 13 and subsequent framework actions. As such, no additional habitat impacts would result that haven't already been accounted for.

The Preferred Alternative is expected to have positive habitat impacts because it ensures that hook fishermen remain rather then switching their effort to other gear types that have greater habitat impacts.
This excerpt from Table 135 of the Amendment 13 FEIS describes the habitat implications of sector allocation can be seen below:

Alternative	Overall Habitat Impact	Feature	Description of Essential Fish Habitat Impact
Sector Allocation	Neutral Impact (0)	Approval of sector allocation proposal brought to NMFS through Council. Sector decides about movement among sectors. Allocation based on documented catch. Hard TACs by species.	As a management measure, sector allocation is not expected to have any significant habitat impacts.
GB Hook Sector	Neutral Impact (0)	Approval of GB Hook Sector	This sector allocation program is not expected to have any significant habitat impacts, especially since fishing with hook and line has been deemed not to have adverse impacts on EFH.

Table 68 – Habitat implications of Sector allocation as presented in the Amendment 13 FEIS. Note that this table does not contemplate every aspect of the Ops Plan. (NEFMC, Am 13 FEIS, Section 5.3.6.7)

Question 3 of the FONSI asks "Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?" In response, the Proposed Action is not expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the under the Magnuson Act and identified in the FMP. The hook and line gear used by Sector members in the proposed action has minimal adverse impacts on marine habitats or EFH.

By operating under hard TACs and within the Sector Ops Plan, it can clearly be seen that the net effect of the previously-mentioned management measures ("harvesting rules") would result in a positive habitat impact.

Conclusions
Clearly, implementation of the Ops Plan would have positive habitat impacts because it ensures that hook and line fishermen remain rather then switching their effort to other gear types that have greater habitat impacts. Upon approval of the Ops Plan, Sector members would voluntarily restrict themselves to using only hook and gillnet gear (gear with known minimal habitat impacts) and only in the GB Cod Hook Sector area. Under Alternative 1, fishermen would have the ability to switch to more efficient gear types, including bottom trawls, which have a much greater adverse impact on benthic habitats than hook and line.

5.5 IMPACTS TO MARINE MAMMALS, ENDANGERED OR THREATENED SPECIES, AND OTHER PROTECTED RESOURCES

In the Northeast region, marine mammals, endangered, and protected species utilize marine habitats to feed, reproduce, and utilize as nursery areas and migratory corridors. Some species occupy these areas year-round while others use these regions only seasonally or move traverse inshore and offshore waters. Due to the overlap between ecological niche and commercial fishing operations, these species occasionally interact with fishing gear. Species that are known to have interacted with the longline and/or gillnet fisheries in the proposed area are as follows: Bottlenose, Common, Risso's, and White-Sided dolphin; Fin, Humpback, Canadian East Coast Minke, Pilot, and North Atlantic Right whale; Harbor Porpoise; Gray, Hooded, Harbor, and Harp seal; Leatherback, Kemp's Ridley, Green, and Loggerhead turtle. The status of these species inhabiting the Northwest Atlantic, not including turtle species, has been discussed in detail in the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments. Initial assessments were presented in Blaylock et al. (1995) and are updated in Waring et al. (2005).

The Northeast/Mid Atlantic bottom longline/hook-and-line fishery is currently listed in Category III of the LOF. In addition, the Northeast sink gillnet fishery is currently listed in Category I of the MMPA LOF. Interactions between the aforementioned species and fishing gear include getting caught on hooks (longline gear), entanglement in mesh (gillnet fishery), entanglement in float line (gillnet fishery), entanglement in groundline (gillnet and longline fisheries), entanglement in anchor line (gillnet and longline fisheries), or entanglement in vertical lines that connect the gear to the surface (gillnet and longline fisheries).

The Northeast/Mid-Atlantic bottom longline/hook-and-line fishery recorded no incidental injuries or deaths of any endangered marine mammals, seals, or sea turtles in the MMPA LOF for 2005 or 2006 for the proposed area. Additionally, the Northeast Fisheries Observer Program Annual Marine Mammal and

Sea Turtle Incidental Take Report, zero incidental takes of marine mammals, seals, or sea turtles occurred with bottom longline gear in 2005 and 2006 in the proposed area.

According to the LOF, the list of marine mammals incidentally killed or injured in the Northeast sink gillnet fishery in 2005 and 2006 included Offshore Bottlenose, Common, Risso's, and White-sided dolphin; Fin, Minke, Humpback, and North Atlantic Right whales; Gray, Harbor, Harp, and Hooded seals; and Harbor porpoise. The Northeast Fisheries Observer Program Annual Marine Mammal and Sea Turtle Incidental Take Reports indicate that 177 marine mammal and 2 turtle interactions occurred in 2005, and 70 marine mammal and 0 turtle interactions in 2006.

Given the low occurrence of loggerheads and leatherbacks and the rarity of green, Kemp's ridley, and hawksbill turtles in the region, it is unlikely that the proposed action would have any adverse impact on ESA-listed or other sea turtles.

Over time limited access as well as a cap on landings and effort should contribute toward a reduction in marine mammal interactions, and harbor porpoise specifically. Additionally, less gillnet fishing, provided that effort does not simply shift, may have a direct positive impact on achieving the PBR goals for endangered whales. Based on information collected in similar fisheries, the major gear types used in the monkfish fishery appear to have few interactions with sea turtles, although it must be acknowledged there is little or no information available from the Southern Management Area where such occurrences are likely to take place (NEFMC, Monkfish FMP).

According to Waring et. al., effort patterns in sink gillnet fisheries within the proposed area are heavily influenced by pinger requirements, marine mammal time/area closures, fish time/area closures, and gear restrictions due to fish conservation measures, the ALWTRP, and the HPTRP. Effort patterns in bottom longline fisheries result from fish time/area closures, gear restrictions, the ALWTRP, and the HPTRP. These controls would further assist the Sector in monitoring and ultimately reducing its interactions with marine mammals, endangered, threatened, or protected species.

Although marine mammals often frequent the proposed area, they seldom interact with hook and line gear. The Sector proposal is not expected to increase their interactions with these marine mammals. The Sector anticipates using its hard TACs (to cap effort), full retention of catch (to eliminate discards and increase efficiency) and Sector management (to respond in near-real time to constantly changing species interactions) as tools to minimize the potential for protected species interactions. Furthermore, by increasing the Sector's efficiency, the duration of fishing trips will be reduced; by increasing their operating efficiency, hook and line gear would be fishing in the water for less time than it would under common pool rules, thereby reducing the potential interactions with protected species. Thus, the Sector anticipates a decreasing rate of interactions with marine mammals, endangered or threatened species, and other protected resources.

The Sector would continue to operate in a traditional manner in a traditional fishing area. However, by operating under a hard TAC rather than a daily trip limit (current management), the Sector would be able to harvest their allocation of cod more efficiently and in less time. Through an increase in efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential interactions with protected species. Although the Sector would operate differently (monkfish fishing versus cod fishing) during different times of the year, and as the potential for protected species interactions changes, the overall effects of the Sector on protected species are anticipated to be positive. Furthermore, through daily communication with the Sector members, the Manager has the ability and authority to implement further gear and area restrictions if interactions with protected species can't be avoided. The ability of the Manager to monitor the Sector in near-real time is the basis for its effectiveness and a model for regional fisheries management.

5.6 CUMULATIVE IMPACTS

Cumulative impacts are the impacts on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Table X provides an overview of the cumulative impacts of the proposed alternative in relation to the No Action alternative. Much of the cumulative effects outlined therein and related below are derivative of the detailed Environmental Impacts sections of this document (X through X) and the cumulative impacts discussion in the Amendment 13 FSEIS. The analyses that follow are qualitative in nature.

5.6.1 GEOGRAPHIC AND TEMPORAL SCOPE

Since Alternative 1 is a continuation of the input controls that have evolved since Amendment 5, the temporal scope of the cumulative effects assessment begins in 1994 with the implementation of the DAS system.

As mandated in Amendment 13, Sectors must submit an EA and Ops Plan to the RO on an annual basis. As such, the scope of the Ops Plan only spans one fishing year; however, due to the constantly changing regulatory environment, the EA must look forward to the reasonably foreseeable future actions of NMFS and the NEFMC and attempt to analyze the potential impacts they may have on the Sector. The temporal scope of the cumulative impacts analysis includes the current condition of the ecosystem components and looks forward to the reasonably foreseeable future actions of NMFS and the NEFMC in an effort to analyze the potential impacts they may have on the Sector.

Past, Present and Reasonably ForEseeable Future Actions

Past, present, and reasonably foreseeable future actions in the Northeast Multispecies fishery are described, and their impacts summarized, in Section X of this document. The cumulative impacts of the most recent actions in the Northeast Multispecies are summarized here.

Cumulative Sector Impacts following implementation of Framework 42

Measures considered in Framework 42 have the potential to further reduce efficiency and fishing opportunities for Sector members. While it is premature to identify the likely outcome, the range of alternatives under consideration would likely negatively impact the members of the GB Cod Hook Sector by compromising the opportunity of the Sector to harvest its allocations of all regulated multispecies, monkfish, skates, and spiny dogfish. The measures in FW 42 are designed to have overall positive impacts on biological resources (i.e., reduce mortality on certain groundfish stocks); however, the FW 42 measures have disproportionate impacts on Sector members due to the prohibition on use of non fixed gear, restrictions on DAS leasing, and reductions to the capacity of the fleet.

Reasonably Foreseeable Future Actions

The NEFMC has initiated a Sector Omnibus Amendment to be developed by the Ad Hoc Sector Omnibus Committee. Creation of this Amendment would allow for insertion of Sector-specific language into all FMPs under the NEFMC, in an attempt to streamline future sector development and implementation.

Additionally, the NEFMC has started work on the next regulatory action: Amendment 16. The previous Amendment (13) called for a review of multispecies rebuilding progress and, if necessary, adjustments to regulations at the beginning of the 2009 FY. For several stocks, Amendment 13 calls for further reductions in fishing mortality beginning in 2009. Assessments are planned in 2008 to evaluate stock status and rebuilding targets. Amendment 16 is being initiated so that the NEFMC can react quickly to the results of those assessments in order to continue stock rebuilding and achieve optimum yield from the fishery (NEFMC).

5.6.2 ALTERNATIVE 1 (NO ACTION)

No cumulative impacts have been identified for Alternative 1 that have not been analyzed by the FSEIS for Framework 42. Because Alternative 1 is a continuation of the input controls that have evolved since Amendment 5 in the 1990s, the cumulative impacts are the same as Framework 42. The cumulative impacts were analyzed in Framework 42: "The cumulative impacts of past and present management actions have resulted in substantial effort reductions in the multispecies fishery. Although this has benefited some stocks (GB haddock), rebuilding has been slow for others (GB and GOM cod, CC/GOM, GB and SNE/MA yellowtail flounder, GB and SNE/MA winter flounder and white hake). It is anticipated that new effort reductions implemented under Amendment 13 and this action will end overfishing for all stocks, while also creating new opportunities for groundfish vessels to target healthy stocks" (NEFMC FW42 Section 7.11.4).

Additionally, "The cumulative effects of this action are not likely to have a significant impact on regulated groundfish stocks (target and non-target), non-groundfish species (incidental catch and bycatch), endangered and other protected species, and habitat, including non-fishing effects. The overall reductions in fishing effort adopted by previous management actions would have a positive biological impact on groundfish and other stocks. This action would further reduce fishing effort on many stocks in order to maintain progress in the rebuilding program. While there may be a small increase in mortality for some stocks (GB haddock) as a result of increased SAPs and the use of Category B (regular) DAS, this increase is not likely to have a significant impact. With respect to endangered and other protected species, the proposed measures would have negligible impacts. Impacts on habitat and EFH are also expected to be minimal. Therefore, the Proposed Action would not result in significant cumulative impacts to fisheries resources, habitat, protected species. The cumulative effects of this action are likely to have a significant impact on fishing communities and the economic returns from the groundfish fishery. Additional short-term revenue losses are expected to result from the need to reduce fishing mortality on several stocks to continue stock rebuilding" (NEFMC FW42, Section 7.11.4)

While the overall cumulative impacts of Alternative 1 are considered to be negligible, the cod-dependent hook and line fishery of Georges Bank would not survive the multiple regulation changes that apply to Common Pool vessels and Alternative 1. Furthermore, additional restrictive measures are expected in Amendment 16 if the 2008 assessments reflect the current mindset of much of the fleet, including further reductions in DAS and trip limits. The Sector Omnibus Amendment, if completed in a timely manner and implemented appropriately, may provide minimal relief. However, under the No Action alternative, the hook fishery would likely experience mostly negative direct social and economic impacts compared to Alternative 2.

5.6.3 ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Alternative 2 would approve and implement the GB Hook Sector Ops Plan for FY2008. This would have minimal or positive direct biological, habitat, social and economic impacts, as outlined in Section X of this EA, and also by the excerpt below from Table 363, Section 5.7 of the Amendment 13 FSEIS. It should be noted that this excerpt does not present cumulative impacts per se, but instead it demonstrates the minimal-to-positive nature of the categorical impacts of Sector Allocation, both general and gear specific. However, because of the limited scope (less than 25 vessels compromising less than 20% of the catch of the aforementioned species) of the proposed management measure when considered in the context of the overall Northeast Multispecies fishery, minimal positive cumulative impacts would result. Implementation of the Ops Plan would allow the Sector the flexibility it needs to maximize revenues while minimizing expenses in the short term. It would allow Chatham/Harwichport to remain in the commercial groundfish business and benefit from the rebuilding of the groundfish resource. This has been very evident in the 3 years of Hook Sector operation. The daily presence of supportive fishermen in the Sector office is a testament to the effectiveness of this action. The socio-economic benefits gained by the Hook Sector have convinced the GB Cod Hook Sector to pursue this alternative. Furthermore, the

NEFMC continues to receive applications for Sector management while developing Amendment 16 (which includes the concept of Sector management) and the Sector Omnibus Amendment. It is evident that Sectors are gaining a stronger foothold in the region, and can be partially attributed to the socio-economic success of the Hook Sector.

Alternative Name	Effects on Communities	Effects on Groundfish Stocks	Effects on Protected Species	Effects on Habitat
Sector Allocation (general) (Proposed action)	(+) increased opportunity participate in regulatory process; provides autonomy to fishers	(O)	(O)	(O)
• Formation of a Sector				
• Sector Review and Approval				
o Option 1 – Streamlined Approval Process				
o Option 2 – Periodic Adjustment Process (Proposed tion)				
• Movement Between Sectors				
o Option 1				
o Option 2				
o Option 3 (Proposed action)				
• Allocation of Resources				
o Option 1				
o Option 2 (Proposed action)				
• Mortality/Conservation Controls				
• Enforcement of Sector Provisions/VMS Requirements				
• Interaction of Sector with Common Pool Vessels				
Georges Bank Hook/Gillnet Sector Allocation	(+) increased opportunity to participate in regulatory process; provides autonomy to GB cod hook and gillnet sectors	(+) gear restrictions, TACs, closed seasons	(O)	(O)
• Georges Bank Cod Hook Sector (Proposed action)				
• Georges Bank Cod Gillnet Sector (Not selected)				

Table 69 - Impacts of Sector Allocation components of Amendment 13
(NEFMC, Am 13 FSEIS, Section 5.7)

Georges Bank has been intensively fished for centuries with all manner of gear for all manner of species. Consequently, many fisheries have impacted the ecosystem found there. It is unlikely that the proposed action would interact with any other fisheries or actions to cause direct impacts on biological, physical, social, or economic resources in the Georges Bank management area that, when considered together, would result in cumulative impacts. Rather in the context of the groundfish fishery, the proposed action would result in some minor direct and indirect impacts.

While Alternative 2 would have negligible biological and habitat implications, its combined positive social and economic impacts constitute a positive impact that is mainly experienced by the GB hook fleet and the Chatham/Harwichport area. Although negligible, the biological impacts of Alternative 2 clearly have the potential to be positive: a portion landings would be securely constrained under the two-fold protection of hard TACs and full retention. When social and economic impacts are considered, it is clear that Alternative 2 would have positive cumulative impacts for the GB hook fleet and the Chatham/Harwichport area that would not be realized under Alternative 1. Because the GB cod trip limit is reduced from what it was prior, past actions, such as Amendment 13 and upcoming framework adjustments, have and are expected to continue to have disproportionate negative impacts on communities and fleets that are most dependent on GB cod (NEFMC, Am 13 FSEIS, Executive Summary). As such, Chatham/Harwichport and the GB hook fleet are expected to share a disproportionate burden under the current regulatory environment. The disproportionate economic impacts of the past, present, and reasonably foreseeable future actions may only be mitigated through the positive direct impacts that would be experienced through implementation of the GB Hook Sector Ops Plan for FY2008. The positive cumulative impacts that would be derived from many factors outlined in Sections X and X of this

EA include the preservation of sink gillnetting and bottom longlining as viable businesses, the preservation of the infrastructure that supports it, the localized cooperative decision-making that crafted the Ops Plan, and the social benefits generated by working closely within the community with the GB Cod Hook Sector. The excerpt below of relevant parts of Table 367, Section 5.7 of the Amendment 13 FSEIS presents the cumulative impacts of the proposed action:

Alternative Name	Cumulative Effects on Communities	Cumulative Effects on Groundfish Stocks	Cumulative Effects on Protected Species Species	Cumulative Effects on Habitat
Georges Bank Hook/Gillnet Sector Allocation	positive for hook/gillnet sectors, extent unknown	positive, low (Georges Bank)	unknown	none
• Georges Bank Cod Hook Sector (selected)				

Table 70 - Relevant excerpts from the summary of impacts of Amendment 13 (NEFMC, Am 13 FSEIS, Section 5.7)

Further consideration of the Amendment 13 FSEIS bolsters the conclusions of this EA: "In general, sector allocation may be positive for fishermen, since it provides them with more control over specific management measures that would affect their fishing practices. It may lend flexibility to fishers and a greater sense of involvement in the regulatory process. Cumulative effects on fishing communities are, however, unknown at this time. Cumulative effects on the resource and habitat are negligible" (NEFMC, Am 13 FSEIS, Section 5.7.7.1). Furthermore, "Designed by stakeholders in the hook and fixed gear sectors, this proposal is likely to have some positive cumulative effects for Georges Bank hook and fixed gear vessels and their associated communities, although the extent of these benefits are unknown. The cumulative effects of this alternative on the resource are positive for Georges Bank cod for which a quota is established, and positive but low for other Georges Bank stocks due to the additional effort restrictions proposed. There are no cumulative effects on habitat" (NEFMC, Am 13 FSEIS, Section 5.7.7.1).

By creating and implementing a model for other groups to create sectors, Alternative 2 would have a positive, though unquantifiable, social cumulative impact. As groups of fishermen voluntarily come together for the purpose of securing a resource allocation in New England, the Ops Plan provides a model to follow. By being some of the first fishermen in New England to voluntarily accept a hard TAC-based and community-based management regime, the Sector is creating a positive example for the fleet that could translate into social and economic benefit to other fishing groups, while continuing to meet mortality objectives on groundfish stocks. Working with the local hook fleet to form the GB Cod Hook Sector has provided economic (cost-sharing) opportunities and social cohesiveness within the community.

Past management measures, beginning with Amendment 5 in the mid-1990s, have, over time, restricted GB hook and line fishermen with input controls that make hook and line fishing increasingly inefficient. This inefficiency eventually came to the point that Amendment 13, as characterized in Alternative 1, would likely force most bottom longliners and gillnetters to switch to other gears or otherwise shift their effort to more efficient vessels. Amendment 16 will most likely further reduce effort and increase inefficiency in the common pool, but will compliment the Sector Omnibus Amendment and allow for pre-existing Sectors to further develop and refine their operations, maximizing the flexibility and accountability of the Sector. The proposed Sector, with implementation of the Ops Plan, has a positive cumulative impact on the GB hook and line fleet and the Chatham/Harwichport area as it allows the fleet to escape the inefficiencies of past management actions.

Summary of Cumulative Impacts

As a whole, approval and implementation of the suite of management measures contained in the Ops Plan (Alternative 2), when considered in conjunction with other past, present, and reasonably foreseeable future actions, would result in minor positive social and economic cumulative impacts. It would not result in cumulative impacts to target species, non-target species, protected resources, or habitat. Each measure in the Ops Plan is designed to be a piece of a larger whole that creates an opportunity for the GB

hook fleet to survive and for Chatham/Harwichport to remain an active part of the commercial groundfish industry in New England. Alternative 1 would not provide additional social or economic benefits to Sector members nor would it provide any additional protection or benefits to target species, non-target species, protected resources, or habitat, which result in negligible cumulative impacts. Alternative 2 creates a positive cumulative impact when compared with the No Action alternative. Whereas the biological and habitat impacts of Alternative 2 are not compelling in and of themselves, when coupled with the positive social and economic impacts that Alternative 2 offers. Thus, Alternative 2 offers a positive cumulative impact in comparison with the No Action alternative.

7.0 LIST OF PREPARERS

This document was prepared through the cooperative efforts of members of the staffs of the Cape Cod Commercial Hook Fishermen's Association and NOAA Fisheries Service.

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7.0 LIST OF AGENCIES AND PERSONS CONSULTED

The Northeast Regional Office (NERO) of NOAA Fisheries Service and the NEFMC Staff were consulted in preparing this EA.

8.0 REGULATORY IMPACT REVIEW

Description of the Management Objectives

The NEFMC has authorized the formation of Sectors under Amendment 13 to the Northeast Multispecies FMP and has set forth criteria for establishing Sectors in that action. The Sector Ops Plan, approved and implemented under Framework 42 to the same FMP, provides the specific details for how the Sector would function and is required to finalize formation of the Sector. However, the RA must, on an annual basis, approve the Sector's Ops Plan and Agreement. For specific Goals and Objectives to the Amendment, and to see specific goals for the Sector, please refer to Section X of the EA. Additionally, Sector objectives must take into account the requirements of multiple laws and mandates, including MSA, ESA, MMPA, CZMA, NEPA, APA, QRA, IPA, and EOs 13132, 13158, and 12898. For further information on these laws and mandates, please refer to Section X of the EA.

Description of the Fishery

The Sector is a group of less than 20 self-selecting, small, dayboat hook and gillnet fishermen that have come together voluntarily and cooperatively for the purposes of efficiently harvesting annual allocations of all regulated multispecies, monkfish, skates, and spiny dogfish shark. Each business qualifies as a Small Business under the Small Business Administration (SBA). The Sector would operate under hard TACs to meet the overfishing mandates of the SFA amendment to the Magnuson Act. The Sector participants target GB cod as a primary species, but have had to diversify their fishing businesses to catch other groundfish, monkfish, skates, and spiny dogfish shark. They operate year-round, but most intensely from the late-spring to late-fall. They would operate within the GB Sector Operating Area, defined in Section X in the EA, and would be legally bound to adhering to the Sector's Harvesting Rules, outlined in Section X of the EA.

Statement of the Problem

Amendment 13 will end overfishing and initiate rebuilding plans for stocks in the groundfish complex, as well as minimize bycatch and protect habitat. It will also bring about many positive environmental changes and increased revenue in the long-term but is likely to result in social and economic costs for the New England groundfish fleet in the short-term. Additionally, input control management measures have diminished other fleets in the Gulf of Maine and on Georges Bank. Low trip limits and a diminished GB cod stock status have severely undermined the ability of the GB hook fleet to remain economically viable.

The Sector would allow the GB hook fleet to survive and prosper as stocks rebuild. In addition, the Sector would provide a model for other New England day boat fleets that seek alternative management options. The Sector represents proven opportunity for fishermen to lead the way in promoting conservation and stewardship of the resources on which they depend. Authorization of the Sector would provide a vehicle to mitigate many of the Amendment 13 impacts on the historic fishing communities of Chatham and Harwichport, and may be applicable to other geographic areas. Likewise, full implementation of the GB Cod Hook Sector Ops Plan would establish additional means to generate social, economic, and environmental efficiencies. Authorization of the Sector would initiate a viable framework for GB hook vessels to alleviate social and economic hardships while meeting the biological objectives of Amendment 13. For further analysis, please refer to Section Xof the EA.

Description and Economic Analysis of Each Selected Alternative

Alternative 1 is a No Action Alternative: implementation of the Sector Allocations without submission or approval of neither the Operations Plan nor any modified Operations Plan. While the Sector would be available under Alternative 1, all vessels would opt to remain in the Common Pool and fish under the regulations implemented in Amendment 13 and subsequent framework adjustments to the Northeast Multispecies FMP. Therefore, no allocations would be made to the Sector.

Alternative 1 would have negative social impacts on local hook fishermen and on the Chatham/Harwich community. Daily trip limits cause substantial hardship for these communities, particularly when considered in the aggregate with other input controls applied across the New England fleet. Broadly applied measures intended to *reduce effort*, including intermittent reduction in DAS, gear restrictions, and ever-increasing closed areas would instead *eliminate* the traditional, small-boat fleet. As noted at the Social Impact Informational Meetings, "because of increased regulations in many fisheries, small vessels have lost much of their flexibility to move from one fishery to another. In Chatham, meeting participants felt that regulations have 'boxed them in' to particular fisheries, making it difficult or impossible for them to maximize their opportunities and/or adjust to changing conditions. When combined with the inherent limitations of small vessels, the regulations have reduced fishing opportunities to the point that many fishermen cannot guarantee a year-round income from fishing for themselves or for their crew" (NEFMC, Am 13 FSEIS, Appendix I). For further economic analysis, please refer to Section X of the EA.

Alternative 2, the Preferred Alternative, is approval of the 2008 GB Cod Hook Sector Operations Plan and receipt of allocations of all regulated multispecies, monkfish, skates, and spiny dogfish shark for FY2008. Sector vessels would be subject to the regulations implemented under the Harvesting Rules (please see Section X of the EA). In addition to the Ops Plan, Sector members are subject to a legally-binding Membership Agreement that delineates the interaction of members within the Sector, including governance, enforcement, and penalties for non-compliance.

Alternative 2 would provide social benefits to the Sector members as well as to the Chatham/Harwichport, MA communities, which are more than 71% revenue dependent on groundfish stocks, particularly the GB cod stock (NEFMC, AM 13 FSEIS, Sec 5.6.1.3). The Sector Ops Plan allows a range of management measures that would make fishing economically viable for hook fishermen. The Amendment 13 FEIS concluded that negative distributional impacts affecting Chatham/Harwichport in

Amendment 13 are mitigated by Sector allocations: "The proposed action does include some measures designed to mitigate these distributive impacts. The sector allocation and special access programs are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts. The EA for the settlement agreement estimated that an average of 46.5% of groundfish activity in Chatham and Harwichport could be affected by the recently-implemented Interim Action" (NEFMC, AM 13 FSEIS, Sec 5.6.1.3). For further economic analysis, please refer to Section X of the EA.

Conclusions

Amendment 13 to the FMP, as passed by the NEFMC and approved by NMFS, is having severe, disproportional negative economic impacts on the GB hook fleet. Compared with the No Action alternative, Alternative 2 would have positive social impacts for the GB hook fleet and the Chatham/Harwichport area. Implementation of the Ops Plan provides safety benefits as well as regulatory flexibility that would allow cooperative harvest and the maximization of economic opportunity. Implementation of the Ops Plan and allocations of all regulated multispecies, monkfish, skates, and spiny dogfish shark would allow the Sector the flexibility it needs to maximize revenues while minimizing expenses in the short term. It would allow Chatham/Harwichport to remain in the commercial groundfish business and benefit from the rebuilding of the groundfish resource. For further conclusions, please refer to Section X (Alternative 1), and Section X (Alternative 2) of the EA.

9.0 DETERMINATION OF SIGNIFICANCE UNDER E.O. 12866

NMFS 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, job, the environment, public health or safety, or State, local or tribal governments or communities;*

   The proposed 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. The SBA defines a small business in the commercial fishing and recreational fishing sector, as a firm with receipts (gross revenues) of up to $4 million. According to this definition, each member of the Sector qualifies as a small business; their cumulative effect on the economy is less than $100 Million.

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 was approved as part of Framework 42 to the Northeast FMP (71 FR 62156, October 23, 2006), authorized by the NEFMC and approved by NOAA NMFS. Therefore, there is no interference with actions taken by another agency, and no inconsistencies would be created in the management of commercial fisheries in the Northeast.

3. *Materially alter the budgetary impact of entitlements, grants, use fees, or loan programs or the rights and obligations of recipients thereof;*

   The proposed action requests approval and implementation of the Sector Ops Plan during the 2008 fishing year. Sector members must have documented landings of GB cod during the

qualifying period in order to be eligible for participation in the Sector. Sector members would be required to declare their intention to join the Sector to the NMFS RA on an annual basis. Once declared into the Sector, members would fish for all regulated multispecies, monkfish, skates, and spiny dogfish shark within the Georges Bank Sector area (defined earlier). Furthermore, Sector members must utilize hook-and-line gear to target groundfish. Sector members would be legally bound by a Membership Contract that sets forth the requirements for each member as well as a schedule of penalties for violations of Sector rules. The proposed action does not materially alter the budgetary impact of entitlements, grants, use fees, or loan programs or the rights and obligations of recipients thereof.

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 pursuant to the mandates of Framework 42 to the Northeast FMP (71 FR 62156, October 23, 2006). Therefore, the proposed action would not be considered significant.

Because none of these criteria apply, NMFS has determined that the proposed action to approve and implement the Sector Operations Plan for 2008-2009, is not significant for the purpose of E.O. 12866.

The Regulatory Flexibility Act requires agencies to assess the impacts of their proposed regulations on small entities. The Regulatory Flexibility Act Analysis (RFAA) determines whether the proposed action would have a significant economic impact on a substantial number of small entities. The SBA size standards define whether a business entity is small and, thus, eligible for Government programs and preferences reserved for "small business" concerns. Size standards have been established for all for-profit economic activities or industries in the North American Industry Classification System (NAICS). The SBA defines a small business in the commercial fishing and recreational fishing sector, as a firm with receipts (gross revenues) of up to $4 million

9.1 INITIAL REGULATORY FLEXIBILITY ANALYSIS

The following section provides an assessment and discussion of the potential economic impacts, as required of the RFA, of various proposed management and regulatory actions and alternatives. The objective of the RFA is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. The initial RFA (IRFA) must identify the number and types of businesses that would be regulated, indicate how many of these entities are small businesses, explain the expected economic impact of the regulation on small businesses, and describe any feasible alternatives that would minimize the economic impacts. The number of regulated entities for this action is fewer than 20 vessels, each of which would be considered a small entity, based on the definition as stated above. The economic impact resulting from this action on these small entities is positive since the action would mitigate the disproportionate impacts of Amendment 13 on the Chatham/Harwichport hook fleet.

Description of the Reasons Why Action by Agency is Being Considered

The specification of hard TACs is necessary in order to limit resource mortality in the proposed area. Limitation of fishing mortality in this area enhances management of such stocks. Upon approval of the Ops Plan, the Hook Sector would be fishing under hard TACs of all regulated multispecies, monkfish, skates, and spiny dogfish shark, ensuring that they do not contribute to overfishing of those species. Further description of the purpose and need for the TACs is contained in Section X. The specification of Target TACs is necessary in order to enable the allocation of all regulated multispecies, monkfish, skates, and spiny dogfish shark to the GB Hook Sector.

The Objectives and Legal Basis for the Proposed Action

The Northeast (NE) Multispecies Fishery Management Plan and promulgating regulations at 50 CFR §§ 648.87(b.)

Estimate of the Number of Small Entities

Under the SBA size standards for small fishing entities ($4 million), all permitted and participating vessels in the groundfish fishery are considered to be small. Gross sales by any one entity (vessel) do not exceed this threshold. The maximum number of entities that could be affected by the proposed TAC is approximately 1,000 vessels: the approximate number of vessels in New England with limited access multispecies days-at-sea (DAS) permits and an allocation of Category A or B DAS. Realistically however, the number of vessels that would chose to fish in the Sector will be fewer than 20 vessels. Therefore, those vessels subject to the restrictions associated with the TACs would be substantially less than 1,000 vessels. The number of vessels who anticipate participating in the Sector in FY2008 is approximately 20. However, this number is not likely to increase substantially in FY2009 and beyond, principally due to more restrictive management measures anticipated for that year.

Reporting, Recordkeeping and Other Compliance Requirements

The proposed action mandates reporting requirements that are more stringent and precise than current federal regulations. Sector reporting and recordkeeping regulations do not exempt participants from State and Federal reporting and recordkeeping, but compliment them and are mandated in addition to current State and Federal requirements. A full list of compliance requirements is enumerated in the Sector Operations Plan.

Duplication, Overlap or Conflict with other Federal Rules

The proposed action that would be allowed under this action was approved as part of Framework 42 to the Northeast FMP (71 FR 62156, October 23, 2006), authorized by the NEFMC and approved by NOAA NMFS. It does not duplicate, overlap, or conflict with other Federal rules.

Alternatives which Minimize any Significant Economic Impact of Proposed Action on Small Entities

The Preferred Action would create a positive economic impact for the participating vessels because it would mitigate the harmful, disproportionate impacts of Amendment 13 and ensuing Frameworks on the Chatham/Harwichport hook fleet. At this time, quantitative data on the precise economic impacts is still being collected and developed. However, the economic impacts are fungible and can aptly be described qualitatively: by coming out from under the inefficient input controls of the current management regime and by operating under hard TACs Sector members would remain economically viable while adjusting to changing economic and fishing conditions. Furthermore, the affects of the "No Action" alternative are *inconsistent* with the fishery management plan in both the short and long term. As such, the no action alternative would provide fewer economic benefits to the industry and the affected communities in the long term than when compared with the proposed alternative described herein.

Economic Impacts on Small Entities Resulting from Proposed Action

The proposed action would affect less than 20 commercial fishing vessels from Chatham and Harwichport that have voluntarily joined the Sector. In FY99 and FY00, Chatham and Harwichport averaged 5,980,850 pounds of groundfish landings and $7,254,100 in groundfish revenues, establishing it as an important port of landing for groundfish vessels and a primary port for the multispecies fishery. In FY99 and FY00, an average of 95 multispecie vessels homeported in Chatham/Harwichport generated $6,844,500 in revenues from fishing under multispecie permits. Chatham's overall community dependence on multispecie landings as a percentage of total fisheries revenues from federally-permitted vessels averaged about 71% from FY99 – FY00. Some of the active groundfish vessels in Chatham and Harwichport are even more than 71% dependent on the multispecie fishery.

The Amendment 13 FEIS concluded that negative distributional impacts affecting Chatham/Harwichport in Amendment 13 are mitigated by Sector allocation:

> "The proposed action does include some measures designed to mitigate these distributive impacts. The sector allocation and special access programs are specifically designed to foster ways to target healthy stocks to mitigate some of these distributional impacts. The EA for the settlement agreement estimated that an average of 46.5% of groundfish activity in Chatham and Harwichport could be affected by the recently implemented Interim Action" (NEFMC, AM 13 FSEIS, Sec 5.6.1.3).

Sector allocation is cited *repeatedly* and characterized as a measure that will mitigate economic harm to Chatham/Harwichport that will be caused by Amendment 13. For instance, "other opportunities have been created to ensure a viable fishing industry. The proposed action would allow the formation of voluntary, self-selecting sectors. These sectors may be able to develop more efficient means to harvest their portion of the resource" (NEFMC, Am 13 FSEIS, Section 7.2.10). Furthermore, "the Proposed Action contains a number of measures that would provide small entities with some degree of flexibility to be able to offset at least some portion of the estimated losses in profit. The major offsetting measures include the opportunity to use … sector allocation…" (NEFMC, Am 13 FSEIS, Section 7.3.3.7.2). The Sector Ops Plan allows a range of management measures that would make the Sector economically viable for hook fishermen. For further economic impacts, please refer to Section X (Table X) of the EA.

10.0 APPLICABLE LAW

Magnuson-Stevens Fishery Conservation and Management Act (MSA)

The proposed action fully complies with all elements of the Magnuson Act, including the National Standards, and the Northeast Multispecie Fishery Management Plan.

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 proposed action will not jeopardize the continued existence of the threatened and endangered species within or outside of the geographic locus of effect. Some listed species may, from time-to-time, interact with bottom longline and anchored sink gillnet fisheries. The extent of these interactions varies depending on the gear-type deployed and the area and season in which it is fished. The impacts of the proposed action on protected species are considered in Section X of the EA. Although the Northeast sink gillnet fishery is listed as a Category I fishery in the MMPA LOF, interactions with protected species are not expected to increase. The multiple hard TACs would provide mechanisms to restrict both the effort and landings of the Sector. Through daily communication with the Sector members, the Manager has the ability and authority to implement additional gear restrictions in the event of episodic or chronic interactions between sector fishing activies and endangered species. Operation under hard TACs rather than daily trip limits ensure that fishermen operating under the auspices of the Sector will be able to harvest their allocations more efficiently and in less time. By increasing this efficiency, gear would remain in the water less time than it would under common pool rules, *thereby reducing the potential interactions with protected species*. In addition, none of the proposed exempted activities are expected to result in the additional adverse impacts that would change the basis for the determinations made in previous consultations. Both hook and anchored sink gillnet interactions with endangered species are expected to remain unchanged or be reduced due to increased monitoring, accountability, and fishing

efficiency (Section 3.1.3). In conclusion, NOAA Fisheries Service has determined that there would be no increased direct or indirect impacts on protected resources, including endangered or threatened species or their habitat. As such, no threat the activities can not reasonably be forseen to jeopardize the existence of any listed species.

Marine Mammal Protection Act (MMPA)

All U.S. commercial fishing operations are placed into one of three categories based on their levels of incidental and serious injury of marine mammals as required by Section 118 of the MMPA. The anchored sink gillnet fishery in the Northeast is listed as a Category I fishery (frequent incidental mortality) while the Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Category III fishery (remote likelihood of, or no known incidental mortality).

Although the Proposed Action may affect species inhabiting the proposed area, the measures described herein would not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the Proposed Action. Through hard TACs of all regulated multispecies, monkfish, skates, and spiny dogfish shark (to cap effort), full retention of catch (to eliminate discards and increase efficiency) Sector management (to respond in near-real time to constantly changing species interactions), and exemption from daily trip limits in lieu of hard TACs (to maximize efficiency and reduce the amount of time gear remains in the water), the Sector would account for and reduce the potential for marine mammal interactions. Further actions to reduce the likelihood of interactions between the gear types governed by this FMP and the marine mammals that inhabit the area in which these fisheries are prosecuted would be considered if deemed necessary.

NOAA Fisheries Service has concluded that there would be no direct or indirect negative impacts on marine mammals, that the proposed action is consistent with the provisions of the MMPA, and that the proposed action would not alter existing measures to protect the species likely to inhabit the management units of the subject fisheries.

Coastal Zone Management Act (CZMA)

According to Section 307(c)(1) of the CZMA, all Federal activities that directly affect the coastal zone shall be consistent with approved state coastal zone management programs to the maximum extent practicable. The NEFMC has determined that this action would have no effect on any coastal use or on resources of under the jurisdiction of any state. The NEFMC has determined that this action would have no effect on any coastal use or resources of any state. Letters documenting the negative determination by the NEFMC would be sent to the coastal zone management program offices of the aforementioned states. A list of the specific state contacts and a copy of the letters would be available upon completion and if requested.

National Environmental Policy Act (NEPA)

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Finding of No Significant Impact for Approval of the Georges Bank Cod Hook Sector Operations Plan

National Marine Fisheries Service

National Oceanic and Atmospheric Administration Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition,

the Council on Environmental Quality regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant in making a Finding of No Significant Impact, and has been considered individually as well as in concert with the other criteria. The significance of this action is analyzed based on the NOAA Administrative Order 216-6 criteria and CEQ's context and intensity criteria. These include:

1) *Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?*

Response: The Proposed Action would not jeopardize the sustainability of the target species (cod) affected by the action. The GB Cod Hook Sector will operate under enforced annual TACs for all regulated multispecies, monkfish, skates, and spiny dogfish shark that will be tracked with greater precision than the existing measures that would prevail under the no action alternative. The biological impacts of the proposed action are analyzed in Section X.

2) *Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?*

Response: The Proposed Action is not expected to jeopardize the sustainability of any non-target species. Mortality of non-target species would be controlled within the Sector by continued use of hard TACs (Sections X and X).

3) *Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?*

Response: The Proposed Action is not expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the under the Magnuson Act, and identified in the FMP. The hook and line equipment used by Sector members in the proposed action has minimal adverse impacts on marine habitats or EFH (Sections X and X)

4) *Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?*

Response: The Proposed Action is not expected to have a substantial adverse impact on public health and safety. The proposed GB Cod Hook Sector involves routine fishing operations and would not decrease safety at sea. In fact, it is expected that the centralized and local controls placed on the Sector as well as economic imperatives will result in positive impacts on public health and safety. This heightened level of safety would be realized through increased training and preparation, daily monitoring and increased communication among Sector members. In addition, the preferred alternative affords fishermen in the sector the latitude to respond rapidly to changing developments on the ocean (Section X) including episodic storm effects.

5) *Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

Response: The Proposed Action is not expected to have an increased adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species. Use of hook and line equipment within the GB Cod Sector is not expected to increase interference with threatened species, marine mammals, or their habitat. By mandating the retention of all legal-sized catch and by operating under multiple hard TACs rather daily trip limits, the Sector would be able to harvest their allocations more efficiently and in less time. By increasing this

efficiency, gear would remain in the water less time than it would under common pool rules, thereby reducing the potential interactions with protected species. Because implementation of the Ops Plan would reduce the amount of time that hook and line fishing gear would remain in the water, this alternative may have some positive impact on protected species as the potential for interactions decreases (Section X).

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, etc.)?*

Response: The Proposed Action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. Implementation of the Operations Plan that will be enabled under the preferred alternative will cap the maximum amount of effort within the Sector. In addition, it may prevent hook fishermen from converting to otter trawling, leasing days to otter trawlers, or selling permits to otter trawlers. As a result, the biodiversity and ecosystem impacts common to the otter trawl fleet would not expand (Section X and X).

7) *Are significant social or economic impacts interrelated with natural or physical environmental effects?*

Response: The preferred alternative is expected to have positive social and economic effects, however these effects under the Proposed Action are not interrelated with significant natural or physical environmental effects. As discussed in the EA, no significant social, economic, or biological adverse impacts are expected as a result of this project (Sections X and X and X).

8) *Are the effects on the quality of the human environment likely to be highly controversial?*

Response: The implementation of the GB Hook Sector was approved by a majority of the NEFMC. Through the implementation of hard TACs as an alternative to more customary DAS rubric, the Hook Sector may draw some attention and differing opinions. However, healthy discussions revolving around alternative forms of management will allow for the NEFMC to more inclusively, informatively and effectively evaluate alternatives for manage the fishery resources under its jurisdiction (Section X). In addition, the preferred alternative's effects on the quality of the human environment are not expected to negatively impact target species, non-target species, habitat or protected resources as described in Section X.

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?*

Response: There are no known historic or cultural resources, park land, prime farmlands, wetlands, or wild scenic rivers in the study area. The general impacts to EFH from the use of hook and line gear would be minimal, and the level of damage to the habitat overall is considered to be quite low (Section X of original EA- Habitat Impacts (Alternative 2: Preferred Alternative) with rapid recovery.

10) *Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

Response: The Sector Operations Plan would mitigate harmful impacts of Amendment 13 to the Northeast Multispecies FMP by conveying environmental, social, and economic benefits directly to the Sector members, and thereby to the communities of Chatham and Harwichport. The effects

of the proposed action on the human environment are not expected to be highly uncertain or to involve unique or unknown risks (Section X).

11) *Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?*

Response: The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts (Section X).

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 historical resources?*

Response: There are no specified adjacent human communities that would be affected by the Sector Operations Plan. The preferred alternative would affect activities that take place on ocean waters and would not affect any human communities on the adjacent shorelines. There are no known districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. Due to the minimal impact on the human environment, the effect of the Sector Operations Plan would not be significant to scientific, cultural, or historical resources.

13) *Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?*

Response: No non-indigenous species would be introduced during the Proposed Action because operation of the Sector is confined to a traditional fishing area (Section X). Therefore, introduction or spread of non-indigenous species is minimized.

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?*

Response: The NEFMC has authorized the formation of Sectors under Amendment 13 to the Northeast Multispecies FMP and has set forth criteria for establishing Sectors in that action. The Proposed Action was initiated in response to Amendment 13, as would any related future actions. The Proposed Action does not set a precedent because it abides by the criteria set forth in Amendment 13. However, it should be noted that while Amendment 13 established the process for Sector allocation, each sector proposal is considered individually on its own merits and expected impacts, and include a specified process for public comment and consideration.

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?*

Response: The Proposed Action is not expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. In addition to Sector rules, the Sector would comply with all local, regional, and national laws and permitting requirements.

16) *Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species*?

Response: The Proposed Action is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species. As stated in Section X, impact on resources, encompassing groundfish, and other stocks is expected to be minimal.

10.1 DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Approval of the Georges Bank Cod Hook Sector Operations Plan, it is hereby determined that the Approval of the Georges Bank Cod Hook Sector Operations Plan will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

_____ _____

Assistant Administrator for Fisheries, NOAA Date

Administrative Procedure Act (APA)

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

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 does not propose to modify any existing collections or to add any new collections; therefore, no review under the PRA is necessary.

Information Quality Act (Section 515)

In accordance with the Information Quality Act (Public Law 106-554), the Office of Management and Budget directed each Federal agency to issue guidelines that ensure the quality, objectivity, utility, and integrity of information disseminated by Federal agencies. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Information Quality Act. Information must meet standards of utility, integrity, and objectivity. This section provides information that demonstrates compliance with these standards.

Utility of Information Product

A *Is the information helpful, beneficial or serviceable to the intended user?*

The EA contains a description of the authority for the formation of a Sector, as well as a description of the Georges Bank Cod Hook Sector and the proposed Sector agreement and Operations Plan. In addition,

this EA contains specific information on the proposed number of participants in the Sector and the amount of TACs proposed for allocation to the Sector. Therefore, the EA contains the various information elements of interest to the public and necessary for decision makers to make informed decisions.

B *Is the data or information product an improvement over previously available information? Is it more current or detailed? Is it more useful or accessible to the public? Has it been improved based on comments from or interactions with customers?*

The proposed Sector Agreement and Operations Plan for the 2008 fishing year is the third Sector proposal submitted by the Sector; the first was submitted for FY2006. However, Sector vessels were not allowed to fish during the 2006 fishing year prior to approval of the Sector and Operations Plan. Due to delays in the implementation of FW42, final approval and implementation occurred in November 2006. As such, the number of vessels that were eligible to participate in the Sector (1) was substantially smaller than anticipated since most vessels could not afford to forgo fishing operations until approval of the Sector. The Sector looks forward to no delays in implementation for FY2008 and anticipates a larger number of vessels participating (12).

C. *What media are used in the dissemination of the information? Printed publications? CD-ROM? Internet? Is the product made available in a standard data format? Does it use consistent attribute naming and unit conventions to ensure that the information is accessible to a broad range of users with a variety of operating systems and data needs?*

The Federal Register notice that announces the proposed Operations Plan and Sector Agreement will be made available in printed publication and on the Internet website for the Northeast Regional Office. Instructions for obtaining a copy of this EA are included in the Federal Register notice.

Integrity of Information Product

The information product meets the following standards for integrity:

All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of Office of Management and Budget (OMB) Circular A-130; the Computer Security Act; and the Government Information Security Act. If information is confidential, it 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 of Information

(1) Indicate which of the following categories of information products apply for this product:

	Original Data
	Synthesized Products
	Interpreted Products
	Hydrometeorological, Hazardous Chemical Spill, and Space Weather Warnings, Forecasts, and Advisories
	Experimental Products
X	Natural Resource Plans

(2) Describe how this information product meets the applicable objectivity standards.

What published standard(s) governs the creation of the Natural Resources Plan? Does the Plan adhere to the published standards?

The Sector Operations Plan and Sector Agreement must comply with the requirements of the Northeast Multispecies FMP, as well as the requirements of the Magnuson-Stevens Act, NEPA, APA, CZMA, ESA, MMPA, and EOs 12612 (Federalism), 12630 (Property Rights), 12866 (Regulatory Planning), and 13158 (MPAs, Marine Protected Areas). The NMFS Administrator, Northeast Region, has authority, under 50 CFR 648.87, to approve the Operations Plan and Sector Agreement and allocate TACs to the Sector. NOAA Fisheries Service has made a preliminary determination that the proposed Sector Agreement and Operations Plan are consistent with the FMP and all applicable laws. In making a final decision, NOAA Fisheries Service will take into account comments received on the proposed rule and pertinent information that may be more current than previous information.

Was the Plan developed using the best information available? Please explain.

The proposed Sector Agreement and Operations Plan are based upon currently available information, and the proposed TACs are based upon the best scientific information available, including Amendment 13 and FW42 and FW4.

Has a clear distinction been drawn between policy choices and the supporting science upon which they are based? Have all supporting materials, information, data and analyses used within the Plan been properly reference to ensure transparency?

The policy choices that are proposed are supported by the available scientific information. The overall GB cod target TAC from which the proposed GB cod hard TAC for the Sector is derived was based upon Amendment 13 data as well as the 2005 GARM II data in accordance with the process described in the FMP. The supporting materials and analyses used to develop the additional TACs are contained in readily available documents. The process utilized to develop the Sector TACs is described in the FMP.

Describe the review process of the Plan by technically qualified individuals to ensure that the Plan is valid, complete, unbiased, objective and relevant. For example, internal review by staff who were not involved in the development of the Plan to formal, independent, external peer review. The level of review should be commensurate with the importance of the Plan and the constraints imposed by legally enforceable deadlines.

The NMFS Administrator, Northeast Region made a preliminary determination that the proposed Sector Operations Plan, Sector Agreement, and proposed Sector TAC are consistent with Amendment 13, the FMP, and applicable laws. Staff from the Sustainable Fisheries Division and Fishery Statistics Division and staff responsible for implementation of NEPA reviewed the pertinent information. Establishment of the TACs involved scientists with specialties in population dynamics, stock assessment methods, and demersal resources. In accordance with the FMP regulations, the RA will make a final determination after obtaining public comment.

Executive Order 13132 (Federalism)

This EO established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The EO also lists a series of policy-making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in the Approval of the Georges Bank Cod Hook Sector Operations Plan. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under EO 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.

Executive Order 13158 (Marine Protected Areas (MPAs))

The EO on MPAs requires Federal agencies whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions and, to the extent permitted by law and to the maximum extent practicable, in taking such actions to avoid harm to the natural and cultural resources that are protected by an MPA. The EO directs Federal agencies to refer to the MPAs identified in a list developed and maintained by the Departments of Commerce and Interior. As of the date of submission of this document, the List of MPAs has not yet been developed. No further guidance related to this EO is available at this time.

Executive Order 12898 (Environmental Justice)

EO 12898 requires that "to the greatest extent practicable and permitted by law each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the United States and its territories and possessions…". Few, if any, low income or ethnic minority populations participate in the local hook fishery. Those that do are more likely to be crew members rather than owners/operators. Very few minority populations reside in Chatham/Harwichport and almost none currently participate in this fishery. Due to the scale of the fishery (approximately 20 vessels in FY2007), there is no indication that the Preferred Alternative will have disproportionately high and adverse effects on income-poor or minority populations; thus, the overall impacts are not expected to be significant.

11.0 GLOSSARY

Glossary

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

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

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

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

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

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

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

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship S=1 A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define BMSY and FMSY reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1^{+}, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

BMSY: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to FMSY. For most stocks, BMSY is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ BMSY, depending on the species.

Bthreshold: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below Bthreshold. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve Btarget as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, Bthreshold is often defined as either 1/2BMSY or 1/4 BMSY. Bthreshold is also known as Bminimum.

Btarget: A desirable biomass to maintain fishery stocks. This is usually synonymous with BMSY or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^{+} biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^{+} biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (BMSY or proxy) as a management objective. The biomass threshold (Bthreshold or Bmin) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

Discards: animals returned to sea after being caught; see Bycatch (n.)

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals. Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exempt fisheries: Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

F0.1: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

FMAX: a fishing mortality rate that maximizes yield per recruit. FMAX is less conservative than F0.1.

FMSY: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

Fthreshold: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses FMSY or FMSY proxy for Fthreshold. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*;

juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Lethrinids: Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A50 is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^{+} mean biomass; mean biomass summed across ages 3 and over is 3^{+} mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Minimum spawning stock threshold: the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding predominantly on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

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

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

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

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

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

Status Determination: A determination of stock status relative to Bthreshold (defines overfished) and Fthreshold (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

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

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

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

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

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

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

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

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

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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11.0 GLOSSARY OF ACRONYMS AND TERMS

ALWTRP	Atlantic Large Whale Take Reduction Plan
APA	Administrative Procedure Act
BDTRP	Bottlenose Dolphin Take Reduction Plan
CCCCHFA	Cape Cod Commercial Hook Fishermans Association
Council	New England Fishery Management Council
DAS	Days-at-Sea
DFO	Department of Fisheries and Oceans
DPS	Distinct Population Segment
DQA	Information Quality Act
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Endangered Species Act of 1973
F	Mortality
FMP	Fishery Management Plan
FMSY	Mortality That Produces the Maximum Sustainable Yield
FONSI	Finding of No Significant Impact
FSEIS	Final Supplemental Environmental Impact Statement
FW40A	Framework Adjustment 40A
FW40B	Framework Adjustment 40B
FW41	Framework Adjustment 41
FW42	Framework Adjustment 42
FY	Fishing Year
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GB Cod	Georges Bank Cod
GB Haddock	Georges Bank Haddock
GB Hook Sector	Georges Bank Cod Hook Sector
Gillnetter	Gillnet gear employed by fisherman
GOM	Gulf of Maine
Handline	Hook gear employed by hand (jig)
Hook Sector	Georges Bank Cod Hook Sector
HPTRP	Harbor Porpoise Take Reduction Plan
IMPLAN	Impact Analysis for Planning
Jig	Hook gear employed by hand or rod
Jigger	Fisherman or vessel which employs rod and reel and/or handline

Longline	Demersal longline or tub trawl
LOF	List of Fisheries
Magnuson Act	Magnuson-Stevens Fishery Conservation and Management Act of 1996
Manager	Individual employed by the Sector to manage the Sector
MARFIN	Marine Fisheries Initiative
MMPA	Marine Mammal Protection Act of 1972
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
mt	Metric Ton
NE	New England
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NERO	Northeast Regional Office
OMB	Office of Management and Budget
Operating Area	Georges Bank Cod Hook Sector Area
Operations Plan	Georges Bank Cod Hook Sector Allocation Operations Plan
Ops Plan	Georges Bank Cod Hook Sector Allocation Operations Plan
OY	Optimum Yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
RA	Regional Administrator
SAP	Special Access Program
SAW	Stock Assessment Workshop
Sector	Georges Bank Cod Hook Sector
Sector Area	Georges Bank Cod Hook Sector Area
SFA	1996 Sustainable Fisheries Act Amendment to the Magnuson-Stevens Fishery Conservation and Management Act
SEIS	Supplemental Environmental Impact Statement
SNE	Southern New England
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
WGOM	Western Gulf of Maine Closed Area

Appendix 1: Draft List of Sector Participants:

VESSEL NAME	HOMEPORT	GEAR TYPE
SAGA	Chatham/Harwichport, MA	Hook
MISS MELODYE	Chatham/Harwichport, MA	Hook
POOH BAH	Chatham/Harwichport, MA	Hook
MISS JENNIFER	Chatham/Harwichport, MA	Hook
FIASCO	Chatham/Harwichport, MA	Hook
YELLOW BIRD	Chatham/Harwichport, MA	Hook
TENACIOUS	Chatham/Harwichport, MA	Hook
NEVER ENOUGH	Chatham/Harwichport, MA	Hook
GLORY K	Chatham/Harwichport, MA	Hook
SEA HOOK	Chatham/Harwichport, MA	Hook
MISS MORGAN	Chatham/Harwichport, MA	Hook
RIENA MARIE	Chatham/Harwichport, MA	Hook
SEA WIN	Chatham/Harwichport, MA	Hook
TIME BANDIT	Chatham/Harwichport, MA	Hook
PEGGY B II	Chatham/Harwichport, MA	Hook
LYNDSY LIZ	Chatham/Harwichport, MA	Hook
BACK OFF	Chatham/Harwichport, MA	Hook
ARLIE X	Chatham/Harwichport, MA	Hook
SEA HOUND	Chatham/Harwichport, MA	Hook
KELLY J	Chatham/Harwichport, MA	Hook
ALICIA ANN	Chatham/Harwichport, MA	Hook
TUNA ECLIPSE	Chatham/Harwichport, MA	Hook
SURF BREAKER	Chatham/Harwichport, MA	Hook
NONAME	Chatham/Harwichport, MA	Hook
SEA HOLLY	Chatham/Harwichport, MA	Hook